

RESOLUCIÓN NÚMERO (0350-2020) MD-DIMAR-SUBMERC-AREM 23 DE JULIO DE 2020

“Por medio de la cual se modifica el Título 9 de la Parte 2 “*Seguridad Marítima*” REMAC 4 “*Actividades Marítimas*” y se adicionan unos artículos a dicho Título, en lo concerniente a acoger unas resoluciones emitidas por el Comité de Seguridad Marítima de la Organización Marítima Internacional y por la Conferencia de 1995 de los Gobiernos contratantes de dicho convenio, las que a su vez modifican los Capítulo II-2 Construcción - prevención, detección y extinción de incendios, Capítulo III Dispositivos y medios de salvamento y el Capítulo IV Radiocomunicaciones del Convenio Internacional para la Seguridad de la Vida Humana en el Mar de 1974 (SOLAS 74 enmendado), incorporado a la legislación nacional mediante la Ley 8 de 1980.”

EL DIRECTOR GENERAL MARÍTIMO

En uso de sus facultades legales, particularmente en las contenidas en el numeral 5 del artículo 5 del Decreto Ley 2324 de 1984 y en el numeral 4 del artículo 2 del Decreto 5057 de 2009 y

CONSIDERANDO

Que la Dirección General Marítima es la Autoridad Marítima Nacional que ejecuta la política del Gobierno en materia marítima y tiene por objeto la dirección, coordinación y control de las actividades marítimas, en los términos señalados en el Decreto Ley 2324 de 1984.

Que numeral 5° del artículo 5° del Decreto-Ley 2324 de 1984, determina que la Dirección General Marítima tiene la función de regular, dirigir y controlar las actividades relacionadas con la seguridad de la navegación en general y la seguridad de la vida humana en el mar.

Que el numeral 6° del artículo 5° del Decreto Ley 2324 de 1984, asigna a la Dirección General Marítima la función de autorizar la operación de las naves y artefactos navales en aguas Colombianas.

Que Colombia adhirió mediante Ley 8 de 1980 al Convenio Internacional para la Seguridad de la Vida Humana en el Mar de 1974 y al Protocolo de 1978, mediante la cual acogió tanto el texto del convenio como todos los anexos técnicos.

Que el artículo VIII de dicho Convenio, determina que las enmiendas a los capítulos II a VIII del Anexo -en que figuran las disposiciones técnicas del

Convenio- se considerarán aceptadas transcurrido un plazo de dos años (o al término de un plazo diferente fijado en el momento de la aprobación) a menos que sean rechazadas, dentro de un periodo especificado, por un tercio de los Gobiernos Contratantes o por un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50% del tonelaje bruto de la flota mercante mundial.

Que el artículo 26 de la Ley 730 de 2001, establece que las naves y artefactos navales deben reunir las condiciones de seguridad previstas en la legislación nacional y en los convenios internacionales.

Que la Dirección General Marítima es la autoridad designada por el Gobierno Nacional para la implementación y el cumplimiento de los instrumentos internacionales marítimos en ejercicio de las disposiciones contenidas en el artículo 2 del decreto 5057 del 30 de diciembre de 2009.

Que el numeral 4 del artículo 2 del Decreto 5057 de 2009, establece como función de la Dirección General Marítima dictar las reglamentaciones técnicas relacionadas con las actividades marítimas y la seguridad de la vida humana en el mar.

Que a la Dirección General Marítima en cumplimiento a lo dispuesto en el Decreto 5057 de 2009 le corresponde dictar las reglamentaciones técnicas para las actividades marítimas, la seguridad de la vida humana en el mar, la prevención de la contaminación marina proveniente de buques.

Que mediante Resolución No. 135 del 27 de febrero de 2018 se expidió el Reglamento Marítimo Colombiano (REMAC), el cual en su artículo 3 determinó la estructura, incluyendo en el REMAC 4: “*Actividades Marítimas*”, lo concerniente a los Instrumentos internacionales emitidos por Comité de Seguridad Marítima de la Organización Marítima Internacional (OMI).

Que dando cumplimiento a lo dispuesto en el artículo 5° de la Resolución número 135 de 27 de febrero de 2018, se hace necesario modificar y adicionar unos artículos al Capítulo 1 del Título 9 de la Parte 2 del REMAC 4 “*Actividades Marítimas*”, mediante los cuales se acogen unas resoluciones del Comité de Seguridad Marítima de la Organización Marítima Internacional y por la Conferencia de 1995 de los Gobiernos contratantes de dicho convenio, por medio de las cuales se modifican los Capítulo II-2 Construcción - prevención, detección y extinción de incendios, Capítulo III Dispositivos y medios de salvamento y el Capítulo IV Radiocomunicaciones del Convenio Internacional para la Seguridad de la Vida Humana en el Mar de 1974 (SOLAS 74 enmendado, incorporado a la legislación nacional mediante la Ley 8 de 1980).

Que en mérito de lo anterior, el Director General Marítimo

- 6) Resolución MSC. 13 (57) del 11 de abril de 1989, Enmiendas de 1989 (MSC.13 (57)) (compartimentado, prevención de incendios). En vigor desde el 1 febrero 1992.
- 7) Resolución MSC. 19 (58) del 25 de mayo de 1990, (Construcción: Subdivisión, y estabilidad, instalaciones de máquinas y eléctricas). En vigor desde el 1 febrero 1992.
- 8) Resolución MSC. 26 (60) del 10 de abril de 1992, (estabilidad con avería en los buques de pasaje de transbordo rodado existentes). En vigor desde el 1 octubre 1994.
- 9) Resolución MSC. 27 (61) del 11 de diciembre de 1992, (prevención de incendios). En vigor desde el 1 octubre 1994.
- 10) Resolución MSC. 47 (66) del 4 de junio de 1996, (Construcción, compartimentado y estabilidad) En vigor desde el 1 julio 1998.
- 11) Resolución MSC. 57 (67) del 5 de diciembre de 1996, (construcción, instalaciones de máquinas e instalaciones eléctricas, prevención, detección y extinción de incendios). En vigor desde el 1 de julio 1998.
- 12) Resolución MSC. 65 (68) del 4 de junio de 1997, (compartimentado y estabilidad de los buques). En vigor desde el 1 julio 1999.
- 13) Resolución MSC. 69 (69) del 18 de mayo de 1998, (construcción). En vigor desde el 1 julio 2002.
- 14) Resolución MSC. 99 (73) del 5 de diciembre de 2000, (disposiciones de remolque de emergencia, material que contiene asbesto, gestión de seguridad, seguridad para embarcaciones de alta velocidad). En vigor desde 01 de julio del 2002.
- 15) Resolución MSC.133 (76) del 12 de diciembre de 2002. Disposiciones Técnicas relativas a los medios de acceso para las inspecciones. Carácter obligatorio internacional en fecha 01/Jul/04. Directriz Técnica. En vigor desde 01 de enero de 2005.
- 16) Resolución MSC. 134 (76) del 12 de diciembre de 2002, capítulos II-1, II-2, III and XII (Disposiciones técnicas sobre medios de acceso para inspección MSC.133 (76)), protección contra incendios, seguridad de graneleros) En vigor desde el 1 julio 2004. Enmendada por la resolución MSC 158. (78) del 20 de mayo de 2004.
- 17) Resolución MSC. 151 (78) del 20 de mayo de 2004, Acceso exterior e interior a los espacios situados en la zona de la carga de los petroleros y

graneleros y a proa de dicha zona" (compartimentado, instalaciones eléctricas, prevención de incendios). En vigor desde el 1 julio 1986.

- 18) Resolución MSC.168 (79)), adoptada 9 de diciembre de 2004 entró en vigencia a partir del 1 de julio de 2006.
- 19) Resolución MSC. 170 (79) del 9 de diciembre de 2004, Construcción - estructura, subdivisión y estabilidad, maquinaria e instalaciones eléctricas. En vigor desde el 01 de julio del 2006.
- 20) Resolución MSC. 194 (80) del 20 de mayo de 2005, Construcción - Estructura, Subdivisión y Estabilidad, Maquinaria E instalaciones eléctricas. En vigor desde 01 de julio de 2006.
- 21) Resolución MSC.215 (82), adoptada el 8 de diciembre de 2006 (Norma de desempeño para recubrimientos protectores para tanques de lastre de agua de mar dedicados en todo tipo de buques y espacios de revestimiento de doble cara de graneleros). En vigor desde 01 de julio de 2008.
- 22) Resolución MSC. 216 (82) del 8 de diciembre de 2006, Protección contra la corrosión de los tanques de lastre de agua de mar de los petroleros y graneleros. En vigor desde 01 de enero 2008 (Anexo I), 01 de enero 2009(Anexo II) y 01 de julio de 2010 (Anexo III).
- 23) Resolución MSC. 256 (84) del 16 de mayo de 2008, Procedimientos y medios de remolque de emergencia. En vigor desde 01 de enero de 2010.
- 24) Resolución MSC. 269 (85) del 04 de diciembre de 2008, Información de estabilidad intacta. En vigor desde 01 de Julio de 2010 (Anexo I) y 01 de enero 2011 (Anexo II).
- 25) Resolución MSC. 282(86) del 5 de junio del 2009, Estructura de los buques, Regla 3.5 Nueva instalación de materiales que contengan asbesto. Instalaciones de máquinas. En vigor desde 01 de enero 2011.
- 26) Resolución MSC 290(87) del 21 de mayo del 2010, generalidades y estructuras de los buques. En vigor desde 01 de enero de 2012.
- 27) Resolución MSC. 291(87) del 21 mayo del 2010, Parte A-1. Estructura de los buques. En vigor desde 01 de enero de 2012.
- 28) Resolución MSC. 308(88) del 03 de diciembre del 2010, código internacional para la aplicación de procedimientos de ensayo de exposición al fuego, 2010. En vigor desde 01 de julio de 2012.

- 29) Resolución MSC. 325(90) del 24 de mayo del 2012. En vigor desde 24 de mayo del 2012.
- 30) Resolución MSC. 338(91) del 30 de noviembre del 2012, Niveles de ruido a bordo de buques. En vigor desde 01 de julio de 2014.
- 31) Resolución MSC. 365(93) del 22 de mayo del 2014. Parte C. Instalaciones de máquinas. En vigor desde 01 de enero 2016.
- 32) Resolución MSC.392 (95) del 11 de junio de 2015, (Proyectos y disposiciones alternativos). En vigor desde 01 de enero de 2017.
- 33) Resolución MSC.409 (97) del 25 de noviembre de 2016, (Construcción: de naves). En vigor desde 01 de enero de 2019.
- 34) Resolución MSC.421 (98) del 15 de junio de 2017, (Construcción, compartimentado y estabilidad). En vigor desde 01 de enero de 2020.
- 35) Resolución MSC.436 (99) del 24 de mayo de 2018, (Información operacional y capacidad de los sistemas de los buques de pasaje tras un siniestro por inundación.) En vigor desde 01 de enero de 2020.

PARÁGRAFO. Las Resoluciones del Comité de Seguridad Marítima de la OMI, por medio de las cuales se modifica el Capítulo II-1 Construcción - estructura, compartimentado y estabilidad, instalaciones de máquinas e instalaciones eléctricas del Convenio Internacional para la Seguridad de la Vida Humana en el Mar (SOLAS enmendado incorporado a la legislación nacional mediante la Ley 8 de 1980, contenidas en el presente artículo forman parte integral de la presente Resolución.

ARTÍCULO 4.2.9.1.2. Acoger en el ámbito nacional, la Resolución adoptada por la Conferencia de los Gobiernos Contratantes de la Convención Internacional para la Seguridad de la Vida Humana en el Mar, 1974 -, única y exclusivamente en lo pertinente a la modificación del Capítulo II-1 Construcción - estructura, compartimentado y estabilidad, instalaciones de máquinas e instalaciones eléctricas, del Convenio Internacional para la Seguridad de la Vida Humana en el Mar (SOLAS enmendado), incorporado a la legislación nacional mediante la Ley 8 de 1980, así:

1. Resolución 1 De La Conferencia de Gobiernos Contratantes de la Convención Internacional para la Seguridad de la Vida Humana en el Mar, 1974, adoptada el 29 de Noviembre de 1995.

PARÁGRAFO. La Resolución 1 de La Conferencia de Gobiernos Contratantes de la Convención Internacional para la Seguridad de la Vida Humana en el Mar, 1974, adoptada el 29 de Noviembre De 1995, , por medio de la cual se modifica el Capítulo II-1 Construcción - estructura, compartimentado y estabilidad, instalaciones de máquinas e instalaciones eléctricas del Convenio Internacional para la Seguridad de la Vida Humana en el Mar (SOLAS enmendado incorporado a la legislación nacional mediante la Ley 8 de 1980, contenida en el presente artículo forman parte integral de la presente Resolución.

ARTÍCULO 2º. Adiciónense unos artículos al Capítulo 1 del Título 9 a la Parte 2 del REMAC 4 “Actividades Marítimas”, en los siguientes términos:

Artículo 4.2.9.1.3. Acoger en el ámbito nacional, las Resoluciones emitidas por el Comité de Seguridad Marítima de la Organización Marítima Internacional-, única y exclusivamente en lo pertinente a la modificación del Capítulo II-2 Construcción - prevención, detección y extinción de incendios, del Convenio Internacional para la Seguridad de la Vida Humana en el Mar de 1974 (SOLAS 74, enmendado), incorporado a la legislación nacional mediante la Ley 8 de 1980, así:

- 1) Resolución MSC 1(XLV) del 20 de noviembre de 1981. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de septiembre de 1984.
- 2) Resolución MSC. 6(48) del 17 de junio de 1983. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de Julio de 1986.
- 3) Resolución MSC. 13(57) del 11 de abril de 1989. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de febrero de 1992.
- 4) Resolución MSC. 22(59) del 23 de mayo de 1991. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de julio de 1993.
- 5) Resolución MSC. 24(60) del 10 de abril de 1992. Construcción - prevención, detección y extinción de incendios. En vigor desde 1 de octubre de 1994.
- 6) Resolución MSC. 27(61) del 11 de diciembre de 1992. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de octubre de 1994.

- 7) Resolución MSC 31 (63) del 23 de mayo 1994. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de Julio de 1998.
- 8) Resolución MSC 57(67) del 5 de diciembre de 1996. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de Julio de 1998.
- 9) Resolución MSC. 99 (73) del 5 de diciembre de 2000. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de enero 2002.
- 10) Resolución MSC. 134 (76) del 12 de diciembre de 2004. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de julio de 2004.
- 11) Resolución MSC. 194 (80) del 20 de mayo de 2005. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de enero de 2009.
- 12) Resolución MSC. 201 (81) del 1 de julio de 2006. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de julio de 2010.
- 13) Resolución MSC. 216 (82) del 8 de diciembre de 2006. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de julio de 2008.
- 14) Resolución MSC. 256(84) del 16 de mayo de 2018. Construcción - prevención, detección y extinción de incendios. En vigor desde 1 de enero de 2010.
- 15) Resolución MSC. 269 (85) del 04 de diciembre del 2008. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de enero 2011.
- 16) Resolución MSC. 291 (87) del 21 de mayo del 2010. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de enero 2012.
- 17) Resolución MSC. 308 (88) del 03 de diciembre del 2010. Construcción - prevención, detección y extinción de incendios. En vigor desde 1 de julio de 2012.
- 18) Resolución MSC. 338 (91) del 30 de noviembre del 2012. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de julio de 2014.

- 19) Resolución MSC. 365 (93) del 22 de mayo del 2014. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de enero de 2016.
- 20) Resolución MSC 380(94) del 21 de noviembre 2014. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de Julio de 2016.
- 21) Resolución MSC 392 (95) del 11 de junio de 2015, Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de enero de 2017.
- 22) Resolución MSC 404(96) del 19 de mayo de 2016. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de enero de 2020.
- 23) Resolución MSC 409(97) del 25 de noviembre 2016. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de enero de 2020.
- 24) Resolución MSC.421 (98) del 15 de junio de 2017. Construcción - prevención, detección y extinción de incendios. En vigor desde el 1 de enero de 2020.

PARÁGRAFO. Las Resoluciones del Comité de Seguridad Marítima de la OMI, por medio de las cuales se modifica el Capítulo II-2 Construcción - prevención, detección y extinción de incendios del Convenio Internacional para la Seguridad de la Vida Humana en el Mar (SOLAS enmendado), incorporado a la legislación nacional mediante la Ley 8 de 1980, contenidas en el presente artículo forman parte integral de la presente Resolución.

ARTÍCULO 4.2.9.1.4. Acoger en el ámbito nacional, las Resoluciones emitidas por el Comité de Seguridad Marítima de la Organización Marítima Internacional-, única y exclusivamente en lo pertinente a la modificación del Capítulo III “Dispositivos y medios de salvamento”, del Convenio Internacional para la Seguridad de la Vida Humana en el Mar (SOLAS enmendado), incorporado a la legislación nacional mediante la Ley 8 de 1980, así:

- 1) Resolución MSC.1 (45) del 20 de noviembre de 1981. Dispositivos y medios de salvamento. En vigor desde el 01 septiembre 1984.
- 2) Resolución MSC.6 (48) del 17 de junio de 1983. Dispositivos y medios de salvamento. En vigor desde el 01 julio 1986.
- 3) Resolución MSC.13 (57) del 11 de abril de 1989. Dispositivos y medios de salvamento. En vigor desde el 01 febrero 1992.

- 4) Resolución MSC.22 (59) del 23 de mayo de 1991. Dispositivos y medios de salvamento. En vigor desde el 1 enero 1994.
- 5) Resolución MSC.27 (61) del 11 de diciembre de 1992. Dispositivos y medios de salvamento. En vigor desde el 01 octubre 1994.
- 6) Resolución MSC.47 (66) del 4 de junio de 1996. Dispositivos y medios de salvamento. En vigor desde el 01 de julio 1998.
- 7) Resolución MSC.91 (72) del 26 de mayo de 2000. Dispositivos y medios de salvamento. En vigor desde el 01 de enero 2002.
- 8) Resolución MSC.134 (76) del 12 de diciembre de 2002. Dispositivos y medios de salvamento. En vigor desde el 01 de julio 2004.
- 9) Resolución MSC.152 (78) del 20 de mayo de 2004. Dispositivos y medios de salvamento. En vigor desde el 01 de julio 2006.
- 10) Resolución MSC.170 (79) del 9 de diciembre de 2004. Dispositivos y medios de salvamento. En vigor desde el 01 de julio 2006.
- 11) Resolución MSC.201 (81) del 18 de mayo de 2006. Dispositivos y medios de salvamento. En vigor desde el 01 de julio 2010.
- 12) Resolución MSC 215 (82) de 8 de diciembre de 2006. En vigor desde el 01 de julio de 2008.
- 13) Resolución MSC.216 (82) del 8 de diciembre de 2006. Dispositivos y medios de salvamento. En vigor desde el 01 de julio 2008.
- 14) Resolución MSC.256 (84) del 16 de mayo del 2008. Dispositivos y medios de salvamento. En vigor desde el 01 de enero 2010.
- 15) Resolución MSC.317 (89) del 20 de mayo de 2011. Dispositivos y medios de salvamento. En vigor desde el 01 de enero 2013.
- 16) Resolución MSC. 325 (90) del 24 de mayo de 2012. En vigor desde el 01 de enero de 2014.
- 17) Resolución MSC. 338 (91) del 30 de noviembre de 2012. En vigor desde el 1 de Julio de 2014.
- 18) Resolución MSC.350 (92) del 21 de junio de 2013. Dispositivos y medios de salvamento. En vigor desde el 01 de enero 2015.

- 19) Resolución MSC.404 (96) del 19 de mayo de 2016. Dispositivos y medios de salvamento. En vigor desde el 01 de enero 2020.
- 20) Resolución MSC.421 (98) del 15 de junio de 2017. Dispositivos y medios de salvamento. En vigor desde el 01 de enero 2020.

PARÁGRAFO. Las Resoluciones del Comité de Seguridad Marítima de la OMI, por medio de las cuales se modifica el Capítulo III Dispositivos y medios de salvamento, del Convenio Internacional para la Seguridad de la Vida Humana en el Mar (SOLAS enmendado) del Convenio Internacional para la Seguridad de la Vida Humana en el Mar (SOLAS enmendado), incorporado a la legislación nacional mediante la Ley 8 de 1980, contenidas en el presente artículo forman parte integral de la presente Resolución.

ARTÍCULO 4.2.9.1.5. Acoger en el ámbito nacional las siguientes Resoluciones de la Conferencia de Estados contratantes del Convenio Internacional para la Seguridad de la Vida Humana en el Mar de 1974 (SOLAS 74, enmendado) de 1988 y 1995:

- 1) Resolución 1 de la Conferencia de los Estados contratantes del Convenio Internacional para la Seguridad de la Vida Humana en el Mar (SOLAS enmendado) adopción de enmiendas al Convenio SOLAS en lo concerniente al Capítulo IV sobre Radiocomunicaciones en el Convenio de Seguridad y Socorro Marítimo de 1988, del 9 de noviembre de 1988, en vigor desde el 1 de febrero de 1992.
- 2) Resolución 1 de la Conferencia de los Estados contratantes del Convenio Internacional para la Seguridad de la Vida Humana en el Mar (SOLAS enmendado), adoptada el 21 de noviembre de 1995, en vigor desde el 1 de enero de 1997, adopción de enmiendas al Convenio SOLAS en lo concerniente Capítulo III Dispositivos y medios de salvamento y Capítulo IV Radiocomunicaciones.

ARTÍCULO 4.2.9.1.6. Acoger en el ámbito nacional, las Resoluciones emitidas por el Comité de Seguridad Marítima de la Organización Marítima Internacional-, única y exclusivamente en lo pertinente a la modificación del Capítulo IV Radiocomunicaciones, del Convenio Internacional para la Seguridad de la Vida Humana en el Mar (SOLAS enmendado), incorporado a la legislación nacional mediante la Ley 8 de 1980, así:

- 1) Resolución MSC.1 (XLV) del 20 de enero de 1981. Radiocomunicaciones. En vigor desde el 1 de septiembre de 1984.
- 2) Resolución MSC.6 (48) del 17 de junio de 1983. Radiocomunicaciones. En vigor desde el 1 julio 1986.

- 3) Resolución MSC.13 (57) del 11 de abril de 1989. Radiocomunicaciones. En vigor desde el 1 febrero 1992.
- 4) Resolución MSC. 22 (59) del 23 de mayo de 1991. Radiocomunicaciones. En vigor desde el 01 de enero de 1994.
- 5) Resolución MSC.27 (61) del 11 de diciembre de 1992. Radiocomunicaciones. En vigor desde el 1 octubre 1994.
- 6) Resolución MSC.69 (69) del 20 de mayo de 1998. Radiocomunicaciones. En vigor desde el 1 julio 2002.
- 7) Resolución MSC.123 (75) del 24 de mayo 2002. Radiocomunicaciones. En vigor desde el 1 enero 2004.
- 8) Resolución MSC.152 (78) del 20 de mayo de 2004. Radiocomunicaciones. En vigor desde el 1 de julio de 2006.
- 9) Resolución MSC.201 (81) del 18 de mayo de 2006. Radiocomunicaciones. En vigor desde el 1 de julio de 2010.
- 10) Resolución MSC.239 (83) del 12 de octubre de 2007. Radiocomunicaciones. En vigor desde 1 de julio de 2009.
- 11) Resolución MSC.256 (84) del 16 de mayo de 2008. Radiocomunicaciones. En vigor desde el 1 enero de 2010.1
- 12) Resolución MSC.436 (99) del 1 de enero de 2018. Radiocomunicaciones. En vigor desde el 1 enero de 2020.

PARÁGRAFO. Las Resoluciones del Comité de Seguridad Marítima de la OMI, por medio de las cuales se modifica el Capítulo IV Radiocomunicaciones, del Convenio Internacional para la Seguridad de la Vida Humana en el Mar (SOLAS enmendado) del Convenio Internacional para la Seguridad de la Vida Humana en el Mar (SOLAS enmendado), incorporado a la legislación nacional mediante la Ley 8 de 1980, contenidas en el presente artículo forman parte integral de la presente Resolución.

ARTÍCULO 3°. Incorporación. La presente resolución modifica el Título 9 de la Parte 2 “Seguridad Marítima “ REMAC 4 “Actividades Marítimas” y se adicionan unos artículos a dicho Título, en lo concerniente a acoger unas resoluciones emitidas por el Comité de Seguridad Marítima de la Organización Marítima Internacional y por la Conferencia de 1995 de los Gobiernos contratantes de dicho convenio, las que a su vez modifican los Capítulo II-2 Construcción - prevención,

detección y extinción de incendios, Capítulo III Dispositivos y medios de salvamento y el Capítulo IV Radiocomunicaciones del Convenio Internacional para la Seguridad de la Vida Humana en el Mar de 1974 (SOLAS 74 enmendado), incorporado a la legislación nacional mediante la Ley 8 de 1980.

ARTÍCULO 4°. Vigencia. La presente resolución empieza a regir a partir de su publicación en el Diario Oficial.

PUBLÍQUESE Y CÚMPLASE,

Dado en Bogotá D.C.,



Controlante Controlante JUAN FRANCISCO HERRERA LEAL
Director General Marítimo

RESOLUTION MSC.1(XLV)
adopted on 20 November 1981

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.1(XLV)
adopted on 20 November 1981

**ADOPTION OF AMENDMENTS TO THE
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT
SEA, 1974**

THE MARITIME SAFETY COMMITTEE,

NOTING Article VIII(b) of the International Convention for the Safety of Life at Sea, 1974, hereafter referred to as "the Convention", concerning the procedure for amending the Annex to the Convention, other than the provisions of Chapter I thereof,

NOTING FURTHER the functions which the Convention confers upon the Maritime Safety Committee for the consideration and adoption of amendments to the Convention,

HAVING CONSIDERED at its forty-fifth session amendments to the Convention proposed and circulated in accordance with Article VIII(b)(i) thereof,

1 ADOPTS in accordance with Article VIII(b)(iv) of the Convention amendments to Chapters II-1, II-2, III, IV, V and VI of the Convention, the texts of which are given in the Annex to the present resolution;

2 DETERMINES in accordance with Article VIII(b)(vi)(2)(bb) of the Convention that all of the above-mentioned amendments shall be deemed to have been accepted unless, prior to 1 March 1984, more than one third of Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than fifty per cent of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3 INVITES Contracting Governments to note that in accordance with Article VIII(b)(vii)(2) of the Convention the amendments, upon their acceptance in accordance with paragraph 2 above, shall enter into force on 1 September 1984;

4 REQUESTS the Secretary-General in conformity with Article VIII(b)(v) of the Convention to transmit certified copies of the present resolution and the texts of the amendments contained in the Annex to all Contracting Governments to the International Convention for the Safety of Life at Sea, 1974;

5 FURTHER REQUESTS the Secretary-General to transmit copies of the resolution and its Annex to Members of the Organization which are not Contracting Governments to the Convention.

At its forty-fifth session held in November 1981, the Maritime Safety Committee adopted certain amendments to the International Convention for the Safety of Life at Sea, 1974 (SOLAS) in accordance with the procedure specified in Article VIII(b)(iv). Forty-one Contracting Governments to the 1974 SOLAS Convention were present at the session and the texts of the amendments to that Convention were all adopted unanimously.

ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR
THE SAFETY OF LIFE AT SEA, 1974

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CHAPTER II-1

CONSTRUCTION – SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

The existing text of Chapter II-1 is replaced by the following:

PART A – GENERAL

Regulation 1

Application

1.1 Unless expressly provided otherwise, this Chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 September 1984.

1.2 For the purpose of this Chapter, the term “a similar stage of construction” means the stage at which:

- .1 construction identifiable with a specific ship begins; and
- .2 assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is less.

1.3 For the purpose of this Chapter:

- .1 the expression “ships constructed” means “ships the keels of which are laid or which are at a similar stage of construction”;
- .2 the expression “all ships” means “ships constructed before, on or after 1 September 1984”;
- .3 a cargo ship, whenever built, which is converted to a passenger ship shall be treated as a passenger ship constructed on the date on which such a conversion commences.

2 Unless expressly provided otherwise:

- .1 for ships constructed before 1 September 1984, the Administration shall ensure that subject to the provisions of paragraph 2.2 the requirements which are applicable under Chapter II-1 of the International Convention for the Safety of Life at Sea, 1974*, to new or existing ships as defined in that Chapter are complied with;

* The text as adopted by the International Conference on Safety of Life at Sea, 1974.

- .2 for tankers constructed before 1 September 1984, the Administration shall ensure that the requirements which are applicable under Chapter II-1 of the Annex to the Protocol of 1978 relating to the International Convention for the Safety of Life at Sea, 1974, as amended in 1981 to new or existing ships as defined in that Chapter are complied with.

3 All ships which undergo repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to these ships. Such ships if constructed before 1 September 1984 shall, as a rule, comply with the requirements for ships constructed on or after that date to at least the same extent as they did before undergoing such repairs, alterations, modifications or outfitting. Repairs, alterations and modifications of a major character and outfitting related thereto shall meet the requirements for ships constructed on or after 1 September 1984 in so far as the Administration deems reasonable and practicable.

4 The Administration of a State may, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of this Chapter unreasonable or unnecessary, exempt from those requirements individual ships or classes of ships entitled to fly the flag of that State which, in the course of their voyage, do not proceed more than 20 miles from the nearest land.

5 Any passenger ship which is permitted under Regulation III/27(c) to carry a number of persons in excess of the lifeboat capacity provided, shall comply with the special standards of subdivision set out in Regulation 6.5, and the associated special provisions regarding permeability in Regulation 5.4, unless the Administration is satisfied that, having regard to the nature and conditions of the voyage, compliance with the other provisions of the Regulations of this Chapter and Chapter II-2 is sufficient.

6 In the case of passenger ships which are employed in special trades for the carriage of large numbers of special trade passengers, such as the pilgrim trade, the Administration of the State whose flag such ships are entitled to fly, if satisfied that it is impracticable to enforce compliance with the requirements of this Chapter, may exempt such ships from those requirements, provided that they comply fully with the provisions of:

- .1 the Rules annexed to the Special Trade Passenger Ships Agreement, 1971; and
- .2 the Rules annexed to the Protocol on Space Requirements for Special Trade Passenger Ships, 1973.

Regulation 2

Definitions

For the purpose of this Chapter, unless expressly provided otherwise:

1.1 "Subdivision load line" is a water-line used in determining the subdivision of the ship.

1.2 "Deepest subdivision load line" is the water-line which corresponds to the greatest draught permitted by the subdivision requirements which are applicable.

2 "Length of the ship" is the length measured between perpendiculars taken at the extremities of the deepest subdivision load line.

3 "Breadth of the ship" is the extreme width from outside of frame to outside of frame at or below the deepest subdivision load line.

4 "Draught" is the vertical distance from the moulded base line amidships to the subdivision load line in question.

5 "Bulkhead deck" is the uppermost deck up to which the transverse watertight bulkheads are carried.

6 "Margin line" is a line drawn at least 76 mm below the upper surface of the bulkhead deck at side.

7 "Permeability of a space" is the percentage of that space which can be occupied by water. The volume of a space which extends above the margin line shall be measured only to the height of that line.

8 "Machinery space" is to be taken as extending from the moulded base line to the margin line and between the extreme main transverse watertight bulkheads, bounding the spaces containing the main and auxiliary propulsion machinery, boilers serving the needs of propulsion, and all permanent coal bunkers. In the case of unusual arrangements, the Administration may define the limits of the machinery spaces.

9 "Passenger spaces" are those spaces which are provided for the accommodation and use of passengers, excluding baggage, store, provision and mail rooms. For the purposes of Regulations 5 and 6, spaces provided below the margin line for the accommodation and use of the crew shall be regarded as passenger spaces.

10 In all cases volumes and areas shall be calculated to moulded lines.

11 "Weathertight" means that in any sea conditions water will not penetrate into the ship.

Regulation 3

Definitions relating to Parts C, D and E

For the purpose of Parts C, D and E, unless expressly provided otherwise:

1 "Steering gear control system" is the equipment by which orders are transmitted from the navigating bridge to the steering gear power units. Steering gear control systems comprise transmitters, receivers, hydraulic control pumps and their associated motors, motor controllers, piping and cables.

2 “Main steering gear” is the machinery, rudder actuators, steering gear power units, if any, and ancillary equipment and the means of applying torque to the rudder stock (e.g. tiller or quadrant) necessary for effecting movement of the rudder for the purpose of steering the ship under normal service conditions.

3 “Steering gear power unit” is:

- .1 in the case of electric steering gear, an electric motor and its associated electrical equipment;
- .2 in the case of electrohydraulic steering gear, an electric motor and its associated electrical equipment and connected pump;
- .3 in the case of other hydraulic steering gear, a driving engine and connected pump.

4 “Auxiliary steering gear” is the equipment other than any part of the main steering gear necessary to steer the ship in the event of failure of the main steering gear but not including the tiller, quadrant or components serving the same purpose.

5 “Normal operational and habitable condition” is a condition under which the ship as a whole, the machinery, services, means and aids ensuring propulsion, ability to steer, safe navigation, fire and flooding safety, internal and external communications and signals, means of escape, and emergency boat winches, as well as the designed comfortable conditions of habitability are in working order and functioning normally.

6 “Emergency condition” is a condition under which any services needed for normal operational and habitable conditions are not in working order due to failure of the main source of electrical power.

7 “Main source of electrical power” is a source intended to supply electrical power to the main switchboard for distribution to all services necessary for maintaining the ship in normal operational and habitable conditions.

8 “Dead ship condition” is the condition under which the main propulsion plant, boilers and auxiliaries are not in operation due to the absence of power.

9 “Main generating station” is the space in which the main source of electrical power is situated.

10 “Main switchboard” is a switchboard which is directly supplied by the main source of electrical power and is intended to distribute electrical energy to the ship’s services.

11 “Emergency switchboard” is a switchboard which in the event of failure of the main electrical power supply system is directly supplied by the emergency source of electrical power or the transitional source of emergency power and is intended to distribute electrical energy to the emergency services.

12 "Emergency source of electrical power" is a source of electrical power, intended to supply the emergency switchboard in the event of failure of the supply from the main source of electrical power.

13 "Power actuating system" is the hydraulic equipment provided for supplying power to turn the rudder stock, comprising a steering gear power unit or units, together with the associated pipes and fittings, and a rudder actuator. The power actuating systems may share common mechanical components, i.e., tiller, quadrant and rudder stock, or components serving the same purpose.

14 "Maximum ahead service speed" is the greatest speed which the ship is designed to maintain in service at sea at the deepest sea-going draught.

15 "Maximum astern speed" is the speed which it is estimated the ship can attain at the designed maximum astern power at the deepest sea-going draught.

16 "Machinery spaces" are all machinery spaces of category A and all other spaces containing propelling machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces.

17 "Machinery spaces of category A" are those spaces and trunks to such spaces which contain:

- .1 internal combustion machinery used for main propulsion; or
- .2 internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW; or
- .3 any oil-fired boiler or oil fuel unit.

18 "Control stations" are those spaces in which the ship's radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralized.

19 "Chemical tanker" is a cargo ship constructed or adapted and used for the carriage in bulk of any liquid product listed in the summary of minimum requirements of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk to be adopted by the Maritime Safety Committee under the authority of the Assembly of the Organization conferred by resolution A.490(XII), hereinafter referred to as "Bulk Chemical Code", as may be amended by the Organization, or any liquid substance listed or provisionally assessed as category A, B or C in Appendix II to Annex II of the International Convention for the Prevention of Pollution from Ships in force.

20 "Gas carrier" is a cargo ship constructed or adapted and used for the carriage in bulk of any liquefied gas or other substance listed in Chapter XIX of the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Assembly of the Organization by resolution

A.328(IX), hereinafter referred to as "Gas Carrier Code" as has been or may be amended by the Organization.

21 "Deadweight" is the difference in tonnes between the displacement of a ship in water of a specific gravity of 1.025 at the load water-line corresponding to the assigned summer freeboard and the lightweight of the ship.

22 "Lightweight" is the displacement of a ship in tonnes without cargo, fuel, lubricating oil, ballast water, fresh water and feedwater in tanks, consumable stores, and passengers and crew and their effects.

PART B – SUBDIVISION AND STABILITY*

(Part B applies to passenger ships and to cargo ships, as indicated in the regulations)

Regulation 4

Floodable length in passenger ships

1 The floodable length at any point of the length of a ship shall be determined by a method of calculation which takes into consideration the form, draught and other characteristics of the ship in question.

2 In a ship with a continuous bulkhead deck, the floodable length at a given point is the maximum portion of the length of the ship, having its centre at the point in question, which can be flooded under the definite assumptions set forth in Regulation 5 without the ship being submerged beyond the margin line.

3.1 In the case of a ship not having a continuous bulkhead deck, the floodable length at any point may be determined to an assumed continuous margin line which at no point is less than 76 mm below the top of the deck (at side) to which the bulkheads concerned and the shell are carried watertight.

3.2 Where a portion of an assumed margin line is appreciably below the deck to which bulkheads are carried, the Administration may permit a limited relaxation in the watertightness of those portions of the bulkheads which are above the margin line and immediately under the higher deck.

* Instead of the requirements in this Part, the Regulations on Subdivision and Stability of Passenger Ships as an Equivalent to Part B of Chapter II of the International Convention for the Safety of Life at Sea, 1960, adopted by the Organization by resolution A.265(VIII), may be used, if applied in their entirety.

Regulation 5

Permeability in passenger ships

1.1 The definite assumptions referred to in Regulation 4 relate to the permeabilities of the spaces below the margin line.

1.2 In determining the floodable length, a uniform average permeability shall be used throughout the whole length of each of the following portions of the ship below the margin line:

- .1 the machinery space as defined in Regulation 2;
- .2 the portion forward of the machinery space; and
- .3 the portion abaft the machinery space.

2.1 The uniform average permeability throughout the machinery space shall be determined from the formula:

$$85 + 10 \left(\frac{a - c}{v} \right)$$

where:

a = the volume of the passenger spaces, as defined in Regulation 2, which are situated below the margin line within the limits of the machinery space;

c = the volume of between deck spaces below the margin line within the limits of the machinery space which are appropriated to cargo, coal or stores;

v = the whole volume of the machinery space below the margin line.

2.2 Where it is shown to the satisfaction of the Administration that the average permeability as determined by detailed calculation is less than that given by the formula, the detailed calculated value may be used. For the purpose of such calculation, the permeability of passenger spaces, as defined in Regulation 2, shall be taken as 95, that of all cargo, coal and store spaces as 60, and that of double bottom, oil fuel and other tanks at such value as may be approved in each case.

3 Except as provided in paragraph 4, the uniform average permeability throughout the portion of the ship forward of or abaft the machinery space shall be determined from the formula:

$$63 + 35 \frac{a}{v}$$

where:

a = the volume of the passenger spaces, as defined in Regulation 2, which are situated below the margin line, forward of or abaft the machinery space; and

v = the whole volume of the portion of the ship below the margin line forward of or abaft the machinery space.

4.1 In the case of a ship which is permitted under Regulation III/27(c) to carry a number of persons on board in excess of the lifeboat capacity provided, and is required under Regulation 1.5 to comply with special provisions, the uniform average permeability throughout the portion of the ship forward of or abaft the machinery space shall be determined from the formula:

$$95 - 35 \frac{b}{v}$$

where:

- b = the volume of the spaces below the margin line and above the tops of floors, inner bottom, or peak tanks, as the case may be, which are appropriated to and used as cargo spaces, coal or oil fuel bunkers, store-rooms, baggage and mail rooms, chain lockers and fresh water tanks, forward of or abaft the machinery space; and
- v = the whole volume of the portion of the ship below the margin line forward of or abaft the machinery space.

4.2 In the case of ships engaged on services where the cargo holds are not generally occupied by any substantial quantities of cargo, no part of the cargo spaces is to be included in calculating "b".

5 In the case of unusual arrangements the Administration may allow, or require, a detailed calculation of average permeability for the portions forward of or abaft the machinery space. For the purpose of such calculation, the permeability of passenger spaces as defined in Regulation 2 shall be taken as 95, that of spaces containing machinery as 85, that of all cargo, coal and store spaces as 60, and that of double bottom, oil fuel and other tanks at such value as may be approved in each case.

6 Where a between deck compartment between two watertight transverse bulkheads contains any passenger or crew space, the whole of that compartment, less any space completely enclosed within permanent steel bulkheads and appropriated to other purposes, shall be regarded as passenger space. Where, however, the passenger or crew space in question is completely enclosed within permanent steel bulkheads, only the space so enclosed need be considered as passenger space.

Regulation 6

Permissible length of compartments in passenger ships

1 Ships shall be as efficiently subdivided as is possible having regard to the nature of the service for which they are intended. The degree of subdivision shall vary with the length of the ship and with the service, in such manner that the highest degree of subdivision corresponds with the ships of greatest length, primarily engaged in the carriage of passengers.

2 *Factor of subdivision*

2.1 The maximum permissible length of a compartment having its centre at any point in the ship's length is obtained from the floodable length by multiplying the latter by an appropriate factor called the factor of subdivision.

2.2 The factor of subdivision shall depend on the length of the ship, and for a given length shall vary according to the nature of the seervice for which the ship is intended. It shall decrease in a regular and continuous manner:

- .1 as the length of the ship increases, and
- .2 from a factor A, applicable to ships primarily engaged in the carriage of cargo, to a factor B, applicable to ships primarily engaged in the carriage of passengers.

2.3 The variations of the factors A and B shall be expressed by the following formulae (1) and (2) where L is the length of the ship as defined in Regulation 2:

$$A = \frac{58.2}{L-60} + .18 \text{ (L = 131 m and upwards)} \dots\dots\dots (1)$$

$$B = \frac{30.3}{L-42} + .18 \text{ (L = 79 m and upwards)} \dots\dots\dots (2)$$

3. *Criterion of service*

3.1 For a ship of given length the appropriate factor of subdivision shall be determined by the criterion of service numeral (hereinafter called the criterion numeral) as given by the following formulae (3) and (4) where:

- C_s = the criterion numeral;
- L = the length of the ship (metres), as defined in Regulation 2;
- M = the volume of the machinery space (cubic metres), as defined in Regulation 2; with the addition thereto of the volume of any permanent oil fuel bunkers which may be situated above the inner bottom and forward of or abaft the machinery space;
- P = the whole volume of the passenger spaces below the margin line (cubic metres), as defined in Regulation 2;
- V = the whole volume of the ship below the margin line (cubic metres);
- P_1 = KN where:
 - N = the number of passengers for which the ship is to be certified, and
 - K = 0.056L

3.2 Where the value of KN is greater than the sum of P and the whole volume of the actual passenger spaces above the margin line, the figure to be taken as P_1 is that sum or two-thirds KN, whichever is the greater.

When P_1 is greater than P -

$$C_s = 72 \frac{M + 2P_1}{V + P_1 - P} \dots\dots\dots (3)$$

and in other cases -

$$C_s = 72 \frac{M + 2P}{V} \dots\dots\dots (4)$$

3.3 For ships not having a continuous bulkhead deck the volumes are to be taken up to the actual margin lines used in determining the floodable lengths.

4 *Rules for subdivision of ships other than those covered by paragraph 5*

4.1 The subdivision abaft the forepeak of ships of 131 m in length and upwards having a criterion numeral of 23 or less shall be governed by the factor A given by formula (1); of those having a criterion numeral of 123 or more by the factor B given by formula (2); and of those having a criterion numeral between 23 and 123 by the factor F obtained by linear interpolation between the factors A and B, using the formula:

$$F = A - \frac{(A - B)(C_s - 23)}{100} \dots\dots\dots (5)$$

Nevertheless, where the criterion numeral is equal to 45 or more and simultaneously the computed factor of subdivision as given by formula (5) is .65 or less, but more than .50, the subdivision abaft the forepeak shall be governed by the factor .50.

4.2 Where the factor F is less than .40 and it is shown to the satisfaction of the Administration to be impracticable to comply with the factor F in a machinery compartment of the ship, the subdivision of such compartment may be governed by an increased factor, which, however, shall not exceed .40.

4.3 The subdivision abaft the forepeak of ships of less than 131 m but not less than 79 m in length having a criterion numeral equal to S, where:

$$S = \frac{3,574 - 25L}{13}$$

shall be governed by the factor unity; of those having a criterion numeral of 123 or more by the factor B given by the formula (2); of those having a criterion numeral between S and 123 by the factor F obtained by linear interpolation between unity and the factor B using the formula:

$$F = 1 - \frac{(1 - B)(C_s - S)}{123 - S} \dots\dots\dots (6)$$

4.4 The subdivision abaft the forepeak of ships of less than 131 m but not less than 79 m in length and having a criterion numeral less than S, and of ships of less than 79 m in length shall be governed by the factor unity, unless, in either case, it is shown to the satisfaction of the Administration to be

impracticable to comply with this factor in any part of the ship, in which case the Administration may allow such relaxation as may appear to be justified, having regard to all the circumstances.

4.5 The provisions of paragraph 4.4 shall apply also to ships of whatever length, which are to be certified to carry a number of passengers exceeding 12 but not exceeding –

$$\frac{L^2}{650}, \text{ or } 50, \text{ whichever is the less.}$$

5 *Special standards of subdivision for ships which are permitted under Regulation III/27(c) to carry a number of persons on board in excess of the lifeboat capacity provided and are required under Regulation 1.5 to comply with special provisions*

5.1.1 In the case of ships primarily engaged in the carriage of passengers, the subdivision abaft the forepeak shall be governed by a factor of .50 or by the factor determined according to paragraphs 3 and 4, if less than .50.

5.1.2 In the case of such ships of less than 91.5 m in length, if the Administration is satisfied that compliance with such factor would be impracticable in a compartment, it may allow the length of that compartment to be governed by a higher factor provided the factor used is the lowest that is practicable and reasonable in the circumstances.

5.2 Where, in the case of any ship whether of less than 91.5 m or not, the necessity of carrying appreciable quantities of cargo makes it impracticable to require the subdivision abaft the forepeak to be governed by a factor not exceeding .50, the standard of subdivision to be applied shall be determined in accordance with the following sub-paragraphs .1 to .5, subject to the condition that where the Administration is satisfied that insistence on strict compliance in any respect would be unreasonable, it may allow such alternative arrangement of the watertight bulkheads as appears to be justified on merits and will not diminish the general effectiveness of the subdivision.

- .1 The provisions of paragraph 3 relating to the criterion numeral shall apply with the exception that in calculating the value of P_1 for berthed passengers K is to have the value defined in paragraph 3, or 3.5 m^3 , whichever is the greater, and for unberthed passengers K is to have the value 3.5 m^3 .
- .2 The factor B in paragraph 2 shall be replaced by the factor BB determined by the following formula:

$$BB = \frac{17.6}{L - 33} + .20 \text{ (} L = 55 \text{ m and upwards)}$$

- .3 The subdivision abaft the forepeak of ships of 131 m in length and upwards having a criterion numeral of 23 or less shall be governed by the factor A given by formula (1) in paragraph 2.3; of those having a criterion numeral of 123 or more by the factor BB given by the formula in paragraph 5.2.2; and of those having a criterion numeral between 23 and 123 by the factor F obtained by linear

interpolation between the factors A and BB, using the formula:

$$F = A - \frac{(A - BB)(C_s - 23)}{100}$$

except that if the factor F so obtained is less than .50 the factor to be used shall be either .50 or the factor calculated according to the provisions of paragraph 4.1, whichever is the smaller.

- .4 The subdivision abaft the forepeak of ships of less than 131 m but not less than 55 m in length having a criterion numeral equal to S_1 where -

$$S_1 = \frac{3,712 - 25L}{19}$$

shall be governed by the factor unity; of those having a criterion numeral of 123 or more by the factor BB given by the formula in paragraph 5.2.2; of those having a criterion numeral between S_1 and 123 by the factor F obtained by linear interpolation between unity and the factor BB using the formula:

$$F = 1 - \frac{(1 - BB)(C_s - S_1)}{123 - S_1}$$

except that in either of the two latter cases if the factor so obtained is less than .50 the subdivision may be governed by a factor not exceeding .50.

- .5 The subdivision abaft the forepeak of ships of less than 131 m but not less than 55 m in length and having a criterion numeral less than S_1 and of ships of less than 55 m in length shall be governed by the factor unity, unless it is shown to the satisfaction of the Administration to be impracticable to comply with this factor in particular compartments, in which event the Administration may allow such relaxations in respect of those compartments as appear to be justified, having regard to all the circumstances, provided that the aftermost compartment and as many as possible of the forward compartments (between the forepeak and the after end of the machinery space) shall be kept within the floodable length.

Regulation 7

Special requirements concerning passenger ship subdivision

1 Where in a portion or portions of a ship the watertight bulkheads are carried to a higher deck than in the remainder of the ship and it is desired to take advantage of this higher extension of the bulkheads in calculating the floodable length, separate margin lines may be used for each such portion of the ship provided that:

- .1 the sides of the ship are extended throughout the ship's length to the deck corresponding to the upper margin line and all openings in the

shell plating below this deck throughout the length of the ship are treated as being below a margin line, for the purposes of Regulation 17; and

- .2 the two compartments adjacent to the "step" in the bulkhead deck are each within the permissible length corresponding to their respective margin lines, and, in addition, their combined length does not exceed twice the permissible length based on the lower margin line.

2.1 A compartment may exceed the permissible length determined by the rules of Regulation 6 provided the combined length of each pair of adjacent compartments to which the compartment in question is common does not exceed either the floodable length or twice the permissible length, whichever is the less.

2.2 If one of the two adjacent compartments is situated inside the machinery space, and the second is situated outside the machinery space, and the average permeability of the portion of the ship in which the second is situated differs from that of the machinery space, the combined length of the two compartments shall be adjusted to the mean average permeability of the two portions of the ship in which the compartments are situated.

2.3 Where the two adjacent compartments have different factors of subdivision, the combined length of the two compartments shall be determined proportionately.

3 In ships of 100 m in length and upwards, one of the main transverse bulkheads abaft the forepeak shall be fitted at a distance from the forward perpendicular which is not greater than the permissible length.

4 A main transverse bulkhead may be recessed provided that all parts of the recess lie inboard of vertical surfaces on both sides of the ship, situated at a distance from the shell plating equal to one-fifth the breadth of the ship, as defined in Regulation 2, and measured at right angles to the centre line at the level of the deepest subdivision load line. Any part of a recess which lies outside these limits shall be dealt with as a step in accordance with paragraph 5.

5 A main transverse bulkhead may be stepped provided that it meets one of the following conditions:

- .1 the combined length of the two compartments, separated by the bulkhead in question, does not exceed either 90 per cent of the floodable length or twice the permissible length, except that, in ships having a factor of subdivision greater than .9, the combined length of the two compartments in question shall not exceed the permissible length;
- .2 additional subdivision is provided in way of the step to maintain the same measure of safety as that secured by a plane bulkhead;
- .3 the compartment over which the step extends does not exceed the permissible length corresponding to a margin line taken 76 mm below the step.

6 Where a main transverse bulkhead is recessed or stepped, an equivalent plane bulkhead shall be used in determining the subdivision.

7 If the distance between two adjacent main transverse bulkheads, or their equivalent plane bulkheads, or the distance between the transverse planes passing through the nearest stepped portions of the bulkheads, is less than 3.0 m plus 3 per cent of the length of the ship, or 11.0 m whichever is the less, only one of these bulkheads shall be regarded as forming part of the subdivision of the ship in accordance with the provisions of Regulation 6.

8 Where a main transverse watertight compartment contains local subdivision and it can be shown to the satisfaction of the Administration that, after any assumed side damage extending over a length of 3.0 m plus 3 per cent of the length of the ship, or 11.0 m whichever is the less, the whole volume of the main compartment will not be flooded, a proportionate allowance may be made in the permissible length otherwise required for such compartment. In such a case the volume of effective buoyancy assumed on the undamaged side shall not be greater than that assumed on the damaged side.

9 Where the required factor of subdivision is .50 or less, the combined length of any two adjacent compartments shall not exceed the floodable length.

Regulation 8

Stability of passenger ships in damaged condition

1.1 Sufficient intact stability shall be provided in all service conditions so as to enable the ship to withstand the final stage of flooding of any one main compartment which is required to be within the floodable length.

1.2 Where two adjacent main compartments are separated by a bulkhead which is stepped under the conditions of Regulation 7.5.1 the intact stability shall be adequate to withstand the flooding of those two adjacent main compartments.

1.3 Where the required factor of subdivision is .50 or less but more than .33 intact stability shall be adequate to withstand the flooding of any two adjacent main compartments.

1.4 Where the required factor of subdivision is .33 or less the intact stability shall be adequate to withstand the flooding of any three adjacent main compartments.

2.1 The requirements of paragraph 1 shall be determined by calculations which are in accordance with paragraphs 3, 4 and 6 and which take into consideration the proportions and design characteristics of the ship and the arrangement and configuration of the damaged compartments. In making these calculations the ship is to be assumed in the worst anticipated service condition as regards stability.

2.2 Where it is proposed to fit decks, inner skins or longitudinal bulkheads of sufficient tightness to seriously restrict the flow of water, the Administration shall be satisfied that proper consideration is given to such restrictions in the calculations.

2.3 In cases where the Administration considers the range of stability in the damaged condition to be doubtful, it may require investigation thereof.

3 For the purpose of making damage stability calculations the volume and surface permeabilities shall be in general as follows:

Spaces	Permeability
Appropriated to cargo, coal or stores	60
Occupied by accommodation	95
Occupied by machinery	85
Intended for liquids	0 or 95*

* Whichever results in the more severe requirements.

Higher surface permeabilities are to be assumed in respect of spaces which, in the vicinity of the damage waterplane, contain no substantial quantity of accommodation or machinery and spaces which are not generally occupied by any substantial quantity of cargo or stores.

4 Assumed extent of damage shall be as follows:

- .1 longitudinal extent: 3.0 m plus 3 per cent of the length of the ship, or 11.0 m whichever is the less. Where the required factor of subdivision is .33 or less the assumed longitudinal extent of damage shall be increased as necessary so as to include any two consecutive main transverse watertight bulkheads;
- .2 transverse extent (measured inboard from the ship's side, at right angles to the centre line at the level of the deepest subdivision load line): a distance of one-fifth of the breadth of the ship, as defined in Regulation 2; and
- .3 vertical extent: from the base line upwards without limit;
- .4 if any damage of lesser extent than that indicated in paragraphs 4.1, 4.2 and 4.3 would result in a more severe condition regarding heel or loss of metacentric height, such damage shall be assumed in the calculations.

5 Unsymmetrical flooding is to be kept to a minimum consistent with efficient arrangements. Where it is necessary to correct large angles of heel, the means adopted shall, where practicable, be self-acting, but in any case where controls to cross-flooding fittings are provided they shall be operable from above the bulkhead deck. These fittings together with their controls as well as the maximum heel before equalization shall be acceptable to the Administration. Where cross-flooding fittings are required the time for equalization shall not exceed 15 minutes. Suitable information concerning the use of cross-flooding fittings shall be supplied to the master of the ship.*

* Reference is made to the Recommendation on a Standard Method for Establishing Compliance with the Requirements for Cross-Flooding Arrangements in Passenger Ships, adopted by the Organization by resolution A.266(VIII).

6 The final conditions of the ship after damage and, in the case of unsymmetrical flooding, after equalization measures have been taken shall be as follows:

- .1 in the case of symmetrical flooding there shall be a positive residual metacentric height of at least 50 mm as calculated by the constant displacement method;
- .2 in the case of unsymmetrical flooding the total heel shall not exceed 7°, except that, in special cases, the Administration may allow additional heel due to the unsymmetrical moment, but in no case shall the final heel exceed 15°;
- .3 in no case shall the margin line be submerged in the final stage of flooding. If it is considered that the margin line may become submerged during an intermediate stage of flooding, the Administration may require such investigations and arrangements as it considers necessary for the safety of the ship.

7 The master of the ship shall be supplied with the data necessary to maintain sufficient intact stability under service conditions to enable the ship to withstand the critical damage. In the case of ships requiring cross-flooding the master of the ship shall be informed of the conditions of stability on which the calculations of heel are based and be warned that excessive heeling might result should the ship sustain damage when in a less favourable condition.

8.1 No relaxation from the requirements for damage stability may be considered by the Administration unless it is shown that the intact metacentric height in any service condition necessary to meet these requirements is excessive for the service intended.

8.2 Relaxations from the requirements for damage stability shall be permitted only in exceptional cases and subject to the condition that the Administration is to be satisfied that the proportions, arrangements and other characteristics of the ship are the most favourable to stability after damage which can practically and reasonably be adopted in the particular circumstances.

Regulation 9

Ballasting of passenger ships

1 Water ballast should not in general be carried in tanks intended for oil fuel. In ships in which it is not practicable to avoid putting water in oil fuel tanks, oily-water separating equipment to the satisfaction of the Administration shall be fitted, or other alternative means, such as discharge to shore facilities, acceptable to the Administration shall be provided for disposing of the oily-water ballast.

2 The provisions of this Regulation are without prejudice to the provisions of the International Convention for the Prevention of Pollution from Ships in force.

Regulation 10

Peak and machinery space bulkheads, shaft tunnels, etc. in passenger ships

1 A forepeak or collision bulkhead shall be fitted which shall be watertight up to the bulkhead deck. This bulkhead shall be located at a distance from the forward perpendicular of not less than 5 per cent of the length of the ship and not more than 3 m plus 5 per cent of the length of the ship.

2 Where any part of the ship below the water-line extends forward of the forward perpendicular, e.g. a bulbous bow, the distances stipulated in paragraph 1 shall be measured from a point either:

- .1 at the mid-length of such extension; or
- .2 at a distance 1.5 per cent of the length of the ship forward of the forward perpendicular; or
- .3 at a distance 3 m forward of the forward perpendicular;

whichever gives the smallest measurement.

3 Where a long forward superstructure is fitted, the forepeak or collision bulkhead shall be extended weathertight to the deck next above the bulkhead deck. The extension need not be fitted directly above the bulkhead below provided it is located within the limits specified in paragraph 1 or 2 with the exemption permitted by paragraph 4 and the part of the deck which forms the step is made effectively weathertight.

4 Where bow doors are fitted and a sloping loading ramp forms part of the extension of the collision bulkhead above the bulkhead deck the part of the ramp which is more than 2.3 m above the bulkhead deck may extend forward of the limit specified in paragraphs 1 and 2. The ramp shall be weathertight over its complete length.

5 An afterpeak bulkhead, and bulkheads dividing the machinery space, as defined in Regulation 2, from the cargo and passenger spaces forward and aft, shall also be fitted and made watertight up to the bulkhead deck. The afterpeak bulkhead may, however, be stepped below the bulkhead deck, provided the degree of safety of the ship as regards subdivision is not thereby diminished.

6 In all cases stern tubes shall be enclosed in watertight spaces of moderate volume. The stern gland shall be situated in a watertight shaft tunnel or other watertight space separate from the stern tube compartment and of such volume that, if flooded by leakage through the stern gland, the margin line will not be submerged.

Regulation 11

Collision bulkheads in cargo ships

1 For the purpose of this Regulation "freeboard deck", "length of ship" and "forward perpendicular" have the meanings as defined in the International Convention on Load Lines in force.

2 A collision bulkhead shall be fitted which shall be watertight up to the freeboard deck. This bulkhead shall be located at a distance from the forward perpendicular of not less than 5 per cent of the length of the ship or 10 m, whichever is the less, and, except as may be permitted by the Administration, not more than 8 per cent of the length of the ship.

3 Where any part of the ship below the water-line extends forward of the forward perpendicular, e.g. a bulbous bow, the distances stipulated in paragraph 2 shall be measured from a point either:

- .1 at the mid-length of such extension; or
- .2 at a distance 1.5 per cent of the length of the ship forward of the forward perpendicular; or
- .3 at a distance 3 m forward of the forward perpendicular;

whichever gives the smallest measurement.

4 The bulkhead may have steps or recesses provided they are within the limits prescribed in paragraph 2 or 3. Pipes piercing the collision bulkhead shall be fitted with suitable valves operable from above the freeboard deck and the valve chest shall be secured at the bulkhead inside the forepeak. The valves may be fitted on the after side of the collision bulkhead provided that the valves are readily accessible under all service conditions and the space in which they are located is not a cargo space. All valves shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable. No door, manhole, ventilation duct or any other opening shall be fitted in this bulkhead.

5 Where a long forward superstructure is fitted the collision bulkhead shall be extended weathertight to the deck next above the freeboard deck. The extension need not be fitted directly above the bulkhead below provided it is located within the limits prescribed in paragraph 2 or 3 with the exemption permitted by paragraph 6 and the part of the deck which forms the step is made effectively weathertight.

6 Where bow doors are fitted and a sloping loading ramp forms part of the extension of the collision bulkhead above the freeboard deck the part of the ramp which is more than 2.3 m above the freeboard deck may extend forward of the limit specified in paragraph 2 or 3. The ramp shall be weathertight over its complete length.

7 The number of openings in the extension of the collision bulkhead above the freeboard deck shall be restricted to the minimum compatible with the design and normal operation of the ship. All such openings shall be capable of being closed weathertight.

Regulation 12

Double bottoms in passenger ships

1 A double bottom shall be fitted extending from the forepeak bulkhead to the afterpeak bulkhead as far as this is practicable and compatible with the design and proper working of the ship.

- .1 In ships of 50 m and upwards but less than 61 m in length a double bottom shall be fitted at least from the machinery space to the forepeak bulkhead, or as near thereto as practicable.
- .2 In ships of 61 m and upwards but less than 76 m in length a double bottom shall be fitted at least outside the machinery space, and shall extend to the fore and after peak bulkheads, or as near thereto as practicable.
- .3 In ships of 76 m in length and upwards, a double bottom shall be fitted amidships, and shall extend to the fore and after peak bulkheads, or as near thereto as practicable.

2 Where a double bottom is required to be fitted its depth shall be to the satisfaction of the Administration and the inner bottom shall be continued out to the ship's sides in such a manner as to protect the bottom to the turn of the bilge. Such protection will be deemed satisfactory if the line of intersection of the outer edge of the margin plate with the bilge plating is not lower at any part than a horizontal plane passing through the point of intersection with the frame line amidships of a transverse diagonal line inclined at 25° to the base line and cutting it at a point one-half the ship's moulded breadth from the middle line.

3 Small wells constructed in the double bottom in connexion with drainage arrangements of holds, etc., shall not extend downwards more than necessary. The depth of the well shall in no case be more than the depth less 460 mm of the double bottom at the centre line, nor shall the well extend below the horizontal plane referred to in paragraph 2. A well extending to the outer bottom is, however, permitted at the after end of the shaft tunnel. Other wells (e.g., for lubricating oil under main engines) may be permitted by the Administration if satisfied that the arrangements give protection equivalent to that afforded by a double bottom complying with this Regulation.

4 A double bottom need not be fitted in way of watertight compartments of moderate size used exclusively for the carriage of liquids, provided the safety of the ship, in the event of bottom or side damage, is not, in the opinion of the Administration, thereby impaired.

5 In the case of ships to which the provisions of Regulation 1.5 apply and which are engaged on regular service within the limits of a short international voyage as defined in Regulation III/2, the Administration may permit a double bottom to be dispensed with in any part of the ship which is subdivided by a factor not exceeding .50, if satisfied that the fitting of a double bottom in that part would not be compatible with the design and proper working of the ship.

Regulation 13

Assigning, marking and recording of subdivision load lines for passenger ships

1 In order that the required degree of subdivision shall be maintained, a load line corresponding to the approved subdivision draught shall be assigned and marked on the ship's sides. A ship having spaces which are specially adapted for the accommodation of passengers and the carriage of cargo alternatively may, if the owners desire, have one or more additional load lines assigned and marked to correspond with the subdivision draughts which the Administration may approve for the alternative service conditions.

2 The subdivision load lines assigned and marked shall be recorded in the Passenger Ship Safety Certificate, and shall be distinguished by the notation C.1 for the principal passenger condition, and C.2, C.3, etc. for the alternative conditions.

3 The freeboard corresponding to each of these load lines shall be measured at the same position and from the same deck line as the freeboards determined in accordance with the International Convention on Load Lines in force.

4 The freeboard corresponding to each approved subdivision load line and the conditions of service for which it is approved, shall be clearly indicated on the Passenger Ship Safety Certificate.

5 In no case shall any subdivision load line mark be placed above the deepest load line in salt water as determined by the strength of the ship or the International Convention on Load Lines in force.

6 Whatever may be the position of the subdivision load line marks, a ship shall in no case be loaded so as to submerge the load line mark appropriate to the season and locality as determined in accordance with the International Convention on Load Lines in force.

7 A ship shall in no case be so loaded that when it is in salt water the subdivision load line mark appropriate to the particular voyage and condition of service is submerged.

Regulation 14

Construction and initial testing of watertight bulkheads, etc., in passenger ships and cargo ships

1 Each watertight subdivision bulkhead, whether transverse or longitudinal, shall be constructed in such a manner that it shall be capable of supporting, with a proper margin of resistance, the pressure due to the maximum head of water which it might have to sustain in the event of damage to the ship but at least the pressure due to a head of water up to the margin line. The construction of these bulkheads shall be to the satisfaction of the Administration.

2.1 Steps and recesses in bulkheads shall be watertight and as strong as the bulkhead at the place where each occurs.

2.2 Where frames or beams pass through a watertight deck or bulkhead, such deck or bulkhead shall be made structurally watertight without the use of wood or cement.

3 Testing main compartments by filling them with water is not compulsory. When testing by filling with water is not carried out, a hose test is compulsory; this test shall be carried out in the most advanced stage of the fitting out of the ship. In any case, a thorough inspection of the watertight bulkheads shall be carried out.

4 The forepeak, double bottoms (including duct keels) and inner skins shall be tested with water to a head corresponding to the requirements of paragraph 1.

5 Tanks which are intended to hold liquids, and which form part of the subdivision of the ship, shall be tested for tightness with water to a head up to the deepest subdivision load line or to a head corresponding to two-thirds of the depth from the top of keel to the margin line in way of the tanks, whichever is the greater; provided that in no case shall the test head be less than 0.9 m above the top of the tank.

6 The tests referred to in paragraphs 4 and 5 are for the purpose of ensuring that the subdivision structural arrangements are watertight and are not to be regarded as a test of the fitness of any compartment for the storage of oil fuel or for other special purposes for which a test of a superior character may be required depending on the height to which the liquid has access in the tank or its connexions.

Regulation 15

Openings in watertight bulkheads in passenger ships

1 The number of openings in watertight bulkheads shall be reduced to the minimum compatible with the design and proper working of the ship; satisfactory means shall be provided for closing these openings.

2.1 Where pipes, scuppers, electric cables, etc. are carried through watertight subdivision bulkheads, arrangements shall be made to ensure the watertight integrity of the bulkheads.

2.2 Valves not forming part of a piping system shall not be permitted in watertight subdivision bulkheads.

2.3 Lead or other heat sensitive materials shall not be used in systems which penetrate watertight subdivision bulkheads, where deterioration of such systems in the event of fire would impair the watertight integrity of the bulkheads.

3.1 No doors, manholes, or access openings are permitted:

- .1 in the collision bulkhead below the margin line;
- .2 in watertight transverse bulkheads dividing a cargo space from an adjoining cargo space or from a permanent or reserve bunker, except as provided in paragraph 12 and in Regulation 16.

3.2 Except as provided in paragraph 3.3 the collision bulkhead may be pierced below the margin line by not more than one pipe for dealing with fluid in the forepeak tank, provided that the pipe is fitted with a screwdown valve capable of being operated from above the bulkhead deck, the valve chest being secured inside the forepeak to the collision bulkhead.

3.3 If the forepeak is divided to hold two different kinds of liquids the Administration may allow the collision bulkhead to be pierced below the margin line by two pipes, each of which is fitted as required by paragraph 3.2, provided the Administration is satisfied that there is no practical alternative to the fitting of such a second pipe and that, having regard to the additional subdivision provided in the forepeak, the safety of the ship is maintained.

4.1 Watertight doors fitted in bulkheads between permanent and reserve bunkers shall be always accessible, except as provided in paragraph 11.2 for between deck bunker doors.

4.2 Satisfactory arrangements shall be made by means of screens or otherwise to prevent the coal from interfering with the closing of watertight bunker doors.

5 Within spaces containing the main and auxiliary propulsion machinery including boilers serving the needs of propulsion and all permanent bunkers, not more than one door apart from the doors to bunkers and shaft tunnels may be fitted in each main transverse bulkhead. Where two or more shafts are fitted the tunnels shall be connected by an inter-communicating passage. There shall be only one door between the machinery space and the tunnel spaces where two shafts are fitted and only two doors where there are more than two shafts. All these doors shall be of the sliding type and shall be so located as to have their sills as high as practicable. The hand gear for operating these doors from above the bulkhead deck shall be situated outside the spaces containing the machinery if this is consistent with a satisfactory arrangement of the necessary gearing.

6.1 Watertight doors shall be sliding doors or hinged doors or doors of an equivalent type. Plate doors secured only by bolts and doors required to be closed by dropping or by the action of a dropping weight are not permitted.

6.2 Sliding doors may be either:

- Hand-operated only, or
- power-operated as well as hand-operated.

6.3 Authorized watertight doors may therefore be divided into three classes:

Class 1 – hinged doors;

Class 2 – hand-operated sliding doors;

Class 3 – sliding doors which are power-operated as well as hand-operated.

6.4 The means of operation of any watertight door whether power-operated or not shall be capable of closing the door with the ship listed to 15° either way.

6.5 In all classes of watertight doors indicators shall be fitted which show, at all operating stations from which the doors are not visible, whether the doors are open or closed. If any of the watertight doors, of whatever class, is not fitted so as to enable it to be closed from a central control station, it shall be provided with a mechanical, electrical, telephonic, or any other suitable direct means of communication, enabling the officer of the watch promptly to contact the person who is responsible for closing the door in question, under previous orders.

7 Hinged doors (class 1) shall be fitted with quick action closing devices, such as catches, workable from each side of the bulkhead.

8 Hand-operated sliding doors (class 2) may have a horizontal or vertical motion. It shall be possible to operate the mechanism at the door itself from either side, and in addition, from an accessible position above the bulkhead deck, with an all round crank motion, or some other movement providing the same guarantee of safety and of an approved type. Departures from the requirement of operation on both sides may be allowed, if this requirement is impossible owing to the layout of the spaces. When operating a hand gear the time necessary for the complete closure of the door with the vessel upright, shall not exceed 90 seconds.

9.1 Power-operated sliding doors (class 3) may have a vertical or horizontal motion. If a door is required to be power-operated from a central control, the gearing shall be so arranged that the door can be operated by power also at the door itself from both sides. The arrangement shall be such that the door will close automatically if opened by local control after being closed from the central control, and also such that any door can be kept closed by local systems which will prevent the door from being opened from the upper control. Local control handles in connexion with the power gear shall be provided each side of the bulkhead and shall be so arranged as to enable persons passing through the doorway to hold both handles in the open position without being able to set the closing mechanism in operation accidentally. Power-operated sliding doors shall be provided with hand gear workable at the door itself on either side and from an accessible position above the bulkhead deck, with an all round crank motion or some other movement providing the same guarantee of safety and of an approved type. Provision shall be made to give warnings by sound signal that the door has begun to close and will continue to move until it is completely closed. The door shall take a sufficient time to close to ensure safety.

9.2 There shall be at least two independent power sources capable of opening and closing all the doors under control, each of them capable of operating all the doors simultaneously. The two power sources shall be controlled from the central station on the navigating bridge provided with all the necessary indicators for checking that each of the two power sources is capable of giving the required service satisfactorily.

9.3 In the case of hydraulic operation, each power source shall consist of a pump capable of closing all doors in not more than 60 seconds. In addition, there shall be for the whole installation hydraulic accumulators of sufficient capacity to operate all the doors at least three times, i.e., closed-open-closed. The fluid used shall be one which does not freeze at any of the temperatures liable to be encountered by the ship during its service.

10.1 Hinged watertight doors (class 1) in passenger, crew and working spaces are only permitted above a deck the underside of which, at its lowest point at side, is at least 2.0 m above the deepest subdivision load line.

10.2 Watertight doors, the sills of which are above the deepest load line and below the line specified in paragraph 10.1 shall be sliding doors and may be hand-operated (class 2), except in vessels engaged on short international voyages and required to have a factor of subdivision of .50 or less in which all such doors shall be power-operated. When trunkways in connexion with refrigerated cargo and ventilation or forced draught ducts are carried through more than one main watertight subdivision bulkhead, the doors at such openings shall be operated by power.

11.1 Watertight doors which may sometimes be opened at sea, and the sills of which are below the deepest subdivision load line shall be sliding doors. The following rules shall apply:

- .1 when the number of such doors (excluding doors at entrances to shaft tunnels) exceeds five, all of these doors and those at the entrance to shaft tunnels or ventilation or forced draught ducts, shall be power-operated (class 3) and shall be capable of being simultaneously closed from a central station situated on the navigating bridge;
- .2 when the number of such doors (excluding doors at entrances to shaft tunnels) is greater than one, but does not exceed five,
 - .2.1 where the ship has no passenger spaces below the bulkhead deck, all the above-mentioned doors may be hand-operated (class 2);
 - .2.2 where the ship has passenger spaces below the bulkhead deck all the above-mentioned doors shall be power-operated (class 3) and shall be capable of being simultaneously closed from a central station situated on the navigating bridge;
- .3 in any ship where there are only two such watertight doors and they are situated in the machinery space or in the bulkheads bounding such space, the Administration may allow these two doors to be hand-operated only (class 2).

11.2 If sliding watertight doors which have sometimes to be open at sea for the purpose of trimming coal are fitted between bunkers in the between decks below the bulkhead deck, these doors shall be operated by power. The opening and closing of these doors shall be recorded in such log book as may be prescribed by the Administration.

12.1 If the Administration is satisfied that such doors are essential, watertight doors of satisfactory construction may be fitted in watertight bulkheads dividing cargo between deck spaces. Such doors may be hinged, rolling or sliding doors but shall not be remotely controlled. They shall be fitted at the highest level and as far from the shell plating as practicable, but in no case shall the outboard vertical edges be situated at a distance from the shell plating which is less than one-fifth of the breadth of the ship, as defined in Regulation 2, such distance being measured at right angles to the centre line of the ship at the level of the deepest subdivision load line.

12.2 Such doors shall be closed before the voyage commences and shall be kept closed during navigation; the time of opening such doors in port and of closing them before the ship leaves port shall be entered in the log book. Should any of the doors be accessible during the voyage, they shall be fitted with a device which prevents unauthorized opening. When it is proposed to fit such doors, the number and arrangements shall receive the special consideration of the Administration.

13 Portable plates on bulkheads shall not be permitted except in machinery spaces. Such plates shall always be in place before the ship leaves port, and shall not be removed during navigation except in case of urgent necessity. The necessary precautions shall be taken in replacing them to ensure that the joints shall be watertight.

14 All watertight doors shall be kept closed during navigation except when necessarily opened for the working of the ship, in which case they shall always be ready to be immediately closed.

15.1 Where trunkways or tunnels for access from crew accommodation to the stokehold, for piping, or for any other purpose are carried through main transverse watertight bulkheads, they shall be watertight and in accordance with the requirements of Regulation 19. The access to at least one end of each such tunnel or trunkway, if used as a passage at sea, shall be through a trunk extending watertight to a height sufficient to permit access above the margin line. The access to the other end of the trunkway or tunnel may be through a watertight door of the type required by its location in the ship. Such trunkways or tunnels shall not extend through the first subdivision bulkhead abaft the collision bulkhead.

15.2 Where it is proposed to fit tunnels or trunkways for forced draught, piercing main transverse watertight bulkheads, these shall receive the special consideration of the Administration.

Regulation 16

Passenger ships carrying goods vehicles and accompanying personnel

1 This Regulation applies to passenger ships regardless of the date of construction designed or adapted for the carriage of goods vehicles and accompanying personnel where the total number of persons on board, other than those specified in Regulation 1/2(e)(i) and (ii), exceeds 12.

2 If in such a ship the total number of passengers which include personnel accompanying vehicles does not exceed $N = 12 + \sqrt{A/25}$, where A = total deck area (square metres) of spaces available for the stowage of goods vehicles and where the clear height at the stowage position and at the entrance to such spaces is not less than 4 m, the provisions of Regulation 15.12 in respect of watertight doors apply except that the doors may be fitted at any level in watertight bulkheads dividing cargo spaces. Additionally, indicators are required on the navigating bridge to show automatically when each door is closed and all door fastenings are secured.

3 When applying the provisions of this Chapter to such a ship, N shall be taken as the maximum number of passengers for which the ship may be certified in accordance with this Regulation.

4 In applying Regulation 8 for the worst operating conditions, the permeability for cargo spaces intended for the stowage of goods vehicles and containers shall be derived by calculation in which the goods vehicles and containers shall be assumed to be non-watertight and their permeability taken as 65. For ships engaged in dedicated services the actual value of permeability for goods vehicles or containers may be applied. In no case shall the permeability of the cargo spaces in which the goods vehicles and containers are carried be taken as less than 60.

Regulation 17

Openings in the shell plating of passenger ships below the margin line

1 The number of openings in the shell plating shall be reduced to the minimum compatible with the design and proper working of the ship.

2 The arrangement and efficiency of the means for closing any opening in the shell plating shall be consistent with its intended purpose and the position in which it is fitted and generally to the satisfaction of the Administration.

3.1 Subject to the requirements of the International Convention on Load Lines in force, no sidescuttle shall be fitted in such a position that its sill is below a line drawn parallel to the bulkhead deck at side and having its lowest point 2.5 per cent of the breadth of the ship above the deepest subdivision load line, or 500 mm, whichever is the greater.

3.2 All sidescuttles the sills of which are below the margin line, as permitted by paragraph 3.1 shall be of such construction as will effectively prevent any person opening them without the consent of the master of the ship.

3.3.1 Where in a between decks, the sills of any of the sidescuttles referred to in paragraph 3.2 are below a line drawn parallel to the bulkhead deck at side and having its lowest point 1.4 m plus 2.5 per cent of the breadth of the ship above the water when the ship departs from any port, all the sidescuttles in that between decks shall be closed watertight and locked before the ship leaves port, and they shall not be opened before the ship arrives at the next port. In the application of this paragraph the appropriate allowance for fresh water may be made when applicable.

3.3.2 The time of opening such sidescuttles in port and of closing and locking them before the ship leaves port shall be entered in such log book as may be prescribed by the Administration.

3.3.3 For any ship that has one or more sidescuttles so placed that the requirements of paragraph 3.3.1 would apply when it was floating at its deepest subdivision load line, the Administration may indicate the limiting mean draught at which these sidescuttles will have their sills above the line drawn parallel to the bulkhead deck at side, and having its lowest point 1.4 m plus 2.5 per cent of the breadth of the ship above the water-line corresponding to the limiting mean draught, and at which it will therefore be permissible to depart from port without previously closing and locking them and to open them at sea on the responsibility of the master during the voyage to the next port. In tropical zones as defined in the International Convention on Load Lines in force, this limiting draught may be increased by 0.3 m.

4 Efficient hinged inside deadlights so arranged that they can be easily and effectively closed and secured watertight, shall be fitted to all sidescuttles except that abaft one-eighth of the ship's length from the forward perpendicular and above a line drawn parallel to the bulkhead deck at side and having its lowest point at a height of 3.7 m plus 2.5 per cent of the breadth of the ship above the deepest subdivision load line, the deadlights may be portable in passenger accommodation other than that for steerage passengers, unless the deadlights are required by the International Convention on Load Lines in force to be permanently attached in their proper positions. Such portable deadlights shall be stowed adjacent to the sidescuttles they serve.

5 Sidescuttles and their deadlights which will not be accessible during navigation shall be closed and secured before the ship leaves port.

6.1 No sidescuttles shall be fitted in any spaces which are appropriated exclusively to the carriage of cargo or coal.

6.2 Sidescuttles may, however, be fitted in spaces appropriated alternatively to the carriage of cargo or passengers, but they shall be of such construction as will effectively prevent any person opening them or their deadlights without the consent of the master.

6.3 If cargo is carried in such spaces, the sidescuttles and their deadlights shall be closed watertight and locked before the cargo is shipped and such closing and locking shall be recorded in such log book as may be prescribed by the Administration.

7 Automatic ventilating sidescuttles shall not be fitted in the shell plating below the margin line without the special sanction of the Administration.

8 The number of scuppers, sanitary discharges and other similar openings in the shell plating shall be reduced to the minimum either by making each discharge serve for as many as possible of the sanitary and other pipes, or in any other satisfactory manner.

9.1 All inlets and discharges in the shell plating shall be fitted with efficient and accessible arrangements for preventing the accidental admission of water into the ship.

9.2.1 Subject to the requirements of the International Convention on Load Lines in force, and except as provided in paragraph 9.3, each separate discharge led through the shell plating from spaces below the margin line shall be provided with either one automatic non-return valve fitted with a positive means of closing it from above the bulkhead deck or with two automatic non-return valves without positive means of closing, provided that the inboard valve is situated above the deepest subdivision load line and is always accessible for examination under service conditions. Where a valve with positive means of closing is fitted, the operating position above the bulkhead deck shall always be readily accessible and means shall be provided for indicating whether the valve is open or closed.

9.2.2 The requirements of the International Convention on Load Lines in force shall apply to discharges led through the shell plating from spaces above the margin line.

9.3 Machinery space main and auxiliary sea inlets and discharges in connexion with the operation of machinery shall be fitted with readily accessible valves between the pipes and the shell plating or between the pipes and fabricated boxes attached to the shell plating. The valves may be controlled locally and shall be provided with indicators showing whether they are open or closed.

9.4 All shell fittings and valves required by this Regulation shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable. All pipes to which this Regulation refers shall be of steel or other equivalent material to the satisfaction of the Administration.

10.1 Gangway, cargo and coaling ports fitted below the margin line shall be of sufficient strength. They shall be effectively closed and secured watertight before the ship leaves port, and shall be kept closed during navigation.

10.2 Such ports shall in no case be so fitted as to have their lowest point below the deepest subdivision load line.

11.1 The inboard opening of each ash-shoot, rubbish-shoot, etc. shall be fitted with an efficient cover.

11.2 If the inboard opening is situated below the margin line, the cover shall be watertight, and in addition an automatic non-return valve shall be fitted in

the shoot in an easily accessible position above the deepest subdivision load line. When the shoot is not in use both the cover and the valve shall be kept closed and secured.

Regulation 18

Construction and initial tests of watertight doors, sidescuttles, etc., in passenger ships and cargo ships

- 1 In passenger ships:
 - .1 the design, materials and construction of all watertight doors, sidescuttles, gangway, cargo and coaling ports, valves, pipes, ash-shoots and rubbish-shoots referred to in these Regulations shall be to the satisfaction of the Administration;
 - .2 the frames of vertical watertight doors shall have no groove at the bottom in which dirt might lodge and prevent the door closing properly.
- 2 In passenger ships and cargo ships each watertight door shall be tested by water pressure to a head up to the bulkhead deck or freeboard deck respectively. The test shall be made before the ship is put into service, either before or after the door is fitted.

Regulation 19

Construction and initial tests of watertight decks, trunks, etc. in passenger ships and cargo ships

- 1 Watertight decks, trunks, tunnels, duct keels and ventilators shall be of the same strength as watertight bulkheads at corresponding levels. The means used for making them watertight, and the arrangements adopted for closing openings in them, shall be to the satisfaction of the Administration. Watertight ventilators and trunks shall be carried at least up to the bulkhead deck in passenger ships and up to the freeboard deck in cargo ships.
- 2 After completion, a hose or flooding test shall be applied to watertight decks and a hose test to watertight trunks, tunnels and ventilators.

Regulation 20

Watertight integrity of passenger ships above the margin line

- 1 The Administration may require that all reasonable and practicable measures shall be taken to limit the entry and spread of water above the bulkhead deck. Such measures may include partial bulkheads or webs. When partial watertight bulkheads and webs are fitted on the bulkhead deck, above or in the immediate vicinity of main subdivision bulkheads, they shall have

watertight shell and bulkhead deck connexions so as to restrict the flow of water along the deck when the ship is in a heeled damaged condition. Where the partial watertight bulkhead does not line up with the bulkhead below, the bulkhead deck between shall be made effectively watertight.

2 The bulkhead deck or a deck above it shall be weathertight. All openings in the exposed weather deck shall have coamings of ample height and strength and shall be provided with efficient means for expeditiously closing them weathertight. Freeing ports, open rails and scuppers shall be fitted as necessary for rapidly clearing the weather deck of water under all weather conditions.

3 Sidescuttles, gangway, cargo and coaling ports and other means for closing openings in the shell plating above the margin line shall be of efficient design and construction and of sufficient strength having regard to the spaces in which they are fitted and their positions relative to the deepest subdivision load line.

4 Efficient inside deadlights, so arranged that they can be easily and effectively closed and secured watertight, shall be provided for all sidescuttles to spaces below the first deck above the bulkhead deck.

Regulation 21

Bilge pumping arrangements

1 Passenger ships and cargo ships

1.1 An efficient bilge pumping system shall be provided, capable of pumping from and draining any watertight compartment other than a space permanently appropriated for the carriage of fresh water, water ballast, oil fuel or liquid cargo and for which other efficient means of pumping are provided, under all practical conditions. Efficient means shall be provided for draining water from insulated holds.

1.2 Sanitary, ballast and general service pumps may be accepted as independent power bilge pumps if fitted with the necessary connexions to the bilge pumping system.

1.3 All bilge pipes used in or under coal bunkers or fuel storage tanks or in boiler or machinery spaces, including spaces in which oil-settling tanks or oil fuel pumping units are situated, shall be of steel or other suitable material.

1.4 The arrangement of the bilge and ballast pumping system shall be such as to prevent the possibility of water passing from the sea and from water ballast spaces into the cargo and machinery spaces, or from one compartment to another. Provision shall be made to prevent any deep tank having bilge and ballast connexions being inadvertently flooded from the sea when containing cargo, or being discharged through a bilge pipe when containing water ballast.

1.5 All distribution boxes and manually operated valves in connexion with the bilge pumping arrangements shall be in positions which are accessible under ordinary circumstances.

2 *Passenger ships*

2.1 The bilge pumping system required by paragraph 1.1 shall be capable of operation under all practicable conditions after a casualty whether the ship is upright or listed. For this purpose wing suction shall generally be fitted except in narrow compartments at the end of the ship where one suction may be sufficient. In compartments of unusual form, additional suction may be required. Arrangements shall be made whereby water in the compartment may find its way to the suction pipes. Where, for particular compartments, the Administration is satisfied that the provision of drainage may be undesirable, it may allow such provision to be dispensed with if calculations made in accordance with the conditions laid down in Regulation 8.2.1 to 8.2.3 show that the survival capability of the ship will not be impaired.

2.2 At least three power pumps shall be fitted connected to the bilge main, one of which may be driven by the propulsion machinery. Where the criterion numeral is 30 or more, one additional independent power pump shall be provided.

2.3 Where practicable, the power bilge pumps shall be placed in separate watertight compartments and so arranged or situated that these compartments will not be flooded by the same damage. If the main propulsion machinery, auxiliary machinery and boilers are in two or more watertight compartments, the pumps available for bilge service shall be distributed as far as is possible throughout these compartments.

2.4 On a ship of 91.5 m in length and upwards or having a criterion numeral of 30 or more, the arrangements shall be such that at least one power bilge pump shall be available for use in all flooding conditions which the ship is required to withstand, as follows:

- .1 one of the required bilge pumps shall be an emergency pump of a reliable submersible type having a source of power situated above the bulkhead deck; or
- .2 the bilge pumps and their sources of power shall be so distributed throughout the length of the ship that at least one pump in an undamaged compartment will be available.

2.5 With the exception of additional pumps which may be provided for peak compartments only, each required bilge pump shall be so arranged as to draw water from any space required to be drained by paragraph 1.1.

2.6 Each power bilge pump shall be capable of pumping water through the required main bilge pipe at a speed of not less than 2 m/sec. Independent power bilge pumps situated in machinery spaces shall have direct suction from these spaces, except that not more than two such suction shall be required in any one space. Where two or more such suction are provided there shall be at least one on each side of the ship. The Administration may require independent power bilge pumps situated in other spaces to have

separate direct suction. Direct suction shall be suitably arranged and those in a machinery space shall be of a diameter not less than that required for the bilge main.

2.7.1 In addition to the direct bilge suction or suction required by paragraph 2.6 a direct suction from the main circulating pump leading to the drainage level of the machinery space and fitted with a non-return valve shall be provided in the machinery space. The diameter of this direct suction pipe shall be at least two-thirds of the diameter of the pump inlet in the case of steamships, and of the same diameter as the pump inlet in the case of motorships.

2.7.2 Where in the opinion of the Administration the main circulating pump is not suitable for this purpose, a direct emergency bilge suction shall be led from the largest available independent power driven pump to the drainage level of the machinery space; the suction shall be of the same diameter as the main inlet of the pump used. The capacity of the pump so connected shall exceed that of a required bilge pump by an amount deemed satisfactory by the Administration.

2.7.3 The spindles of the sea inlet and direct suction valves shall extend well above the engine room platform.

2.8 All bilge suction piping up to the connexion to the pumps shall be independent of other piping.

2.9 The diameter d of the bilge main shall be calculated according to the following formula. However, the actual internal diameter of the bilge main may be rounded off to the nearest standard size acceptable to the Administration:

$$d = 25 + 1.68 \sqrt{L(B + D)}$$

where d is the internal diameter of the bilge main (millimetres);

L and B are the length and the breadth of the ship (metres) as defined in Regulation 2; and

D is the moulded depth of the ship to bulkhead deck (metres).

The diameter of the bilge branch pipes shall meet the requirements of the Administration.

2.10 Provision shall be made to prevent the compartment served by any bilge suction pipe being flooded in the event of the pipe being severed or otherwise damaged by collision or grounding in any other compartment. For this purpose, where the pipe is at any part situated nearer the side of the ship than one-fifth of the breadth of the ship (as defined in Regulation 2 and measured at right angles to the centreline at the level of the deepest subdivision load line), or is in a duct keel, a non-return valve shall be fitted to the pipe in the compartment containing the open end.

2.11 Distribution boxes, cocks and valves in connexion with the bilge pumping system shall be so arranged that, in the event of flooding, one of the bilge pumps may be operative on any compartment; in addition, damage to a pump or its pipe connecting to the bilge main outboard of a line drawn at

one-fifth of the breadth of the ship shall not put the bilge system out of action. If there is only one system of pipes common to all the pumps, the necessary valves for controlling the bilge suction must be capable of being operated from above the bulkhead deck. Where in addition to the main bilge pumping system an emergency bilge pumping system is provided, it shall be independent of the main system and so arranged that a pump is capable of operating on any compartment under flooding condition as specified in paragraph 2.1; in that case only the valves necessary for the operation of the emergency system need be capable of being operated from above the bulkhead deck.

2.12 All cocks and valves referred to in paragraph 2.11 which can be operated from above the bulkhead deck shall have their controls at their place of operation clearly marked and shall be provided with means to indicate whether they are open or closed.

3 *Cargo ships*

At least two power pumps connected to the main bilge system shall be provided, one of which may be driven by the propulsion machinery. If the Administration is satisfied that the safety of the ship is not impaired, bilge pumping arrangements may be dispensed with in particular compartments.

Regulation 22

*Stability information for passenger ships and cargo ships**

1 Every passenger ship regardless of size and every cargo ship having a length, as defined in the International Convention on Load Lines in force, of 24 m and upwards, shall be inclined upon its completion and the elements of its stability determined. The master shall be supplied with such information satisfactory to the Administration as is necessary to enable him by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service. A copy of the stability information shall be furnished to the Administration.

2 Where any alterations are made to a ship so as to materially affect the stability information supplied to the master, amended stability information shall be provided. If necessary the ship shall be re-inclined.

3 The Administration may allow the inclining test of an individual ship to be dispensed with provided basic stability data are available from the inclining test of a sister ship and it is shown to the satisfaction of the Administration that reliable stability information for the exempted ship can be obtained from such basic data.

* Reference is made to the Recommendation on Intact Stability for Passenger and Cargo Ships under 100 metres in length, adopted by the Organization by resolution A.167(ES. IV) and Amendments to this Recommendation, adopted by the Organization by resolution A.206(VII).

4 The Administration may also allow the inclining test of an individual ship or class of ships especially designed for the carriage of liquids or ore in bulk to be dispensed with when reference to existing data for similar ships clearly indicates that due to the ship's proportions and arrangements more than sufficient metacentric height will be available in all probable loading conditions.

Regulation 23

Damage control plans in passenger ships

There shall be permanently exhibited, for the guidance of the officer in charge of the ship, plans showing clearly for each deck and hold the boundaries of the watertight compartments, the openings therein with the means of closure and position of any controls thereof, and the arrangements for the correction of any list due to flooding. In addition, booklets containing the aforementioned information shall be made available to the officers of the ship.

Regulation 24

Marking, periodical operation and inspection of watertight doors, etc. in passenger ships

1 This Regulation applies to all ships.

2.1 Drills for the operating of watertight doors, sidescuttles, valves and closing mechanisms of scuppers, ash-shoots and rubbish-shoots shall take place weekly. In ships in which the voyage exceeds one week in duration a complete drill shall be held before leaving port, and others thereafter at least once a week during the voyage.

2.2 All watertight doors, both hinged and power operated, in main transverse bulkheads, in use at sea, shall be operated daily.

3.1 The watertight doors and all mechanisms and indicators connected therewith, all valves, the closing of which is necessary to make a compartment watertight, and all valves the operation of which is necessary for damage control cross connexions shall be periodically inspected at sea at least once a week.

3.2 Such valves, doors and mechanisms shall be suitably marked to ensure that they may be properly used to provide maximum safety.

Regulation 25

Entries in log of passenger ships

1 This Regulation applies to all ships.

2 Hinged doors, portable plates, sidescuttles, gangway, cargo and coaling ports and other openings, which are required by these Regulations to be kept closed during navigation, shall be closed before the ship leaves port. The time of closing and the time of opening (if permissible under these Regulations) shall be recorded in such log book as may be prescribed by the Administration.

3 A record of all drills and inspections required by Regulation 24 shall be entered in the log book with an explicit record of any defects which may be disclosed.

PART C – MACHINERY INSTALLATIONS

(Except where expressly provided otherwise Part C applies to passenger ships and cargo ships)

Regulation 26

General

1 The machinery, boilers and other pressure vessels, associated piping systems and fittings shall be of a design and construction adequate for the service for which they are intended and shall be so installed and protected as to reduce to a minimum any danger to persons on board, due regard being paid to moving parts, hot surfaces and other hazards. The design shall have regard to materials used in construction, the purpose for which the equipment is intended, the working conditions to which it will be subjected and the environmental conditions on board.

2 The Administration shall give special consideration to the reliability of single essential propulsion components and may require a separate source of propulsion power sufficient to give the ship a navigable speed, especially in the case of unconventional arrangements.

3 Means shall be provided whereby normal operation of propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative. Special consideration shall be given to the malfunctioning of:

- .1 a generating set which serves as a main source of electrical power;
- .2 the sources of steam supply;
- .3 the boiler feed water systems;
- .4 the fuel oil supply systems for boilers or engines;
- .5 the sources of lubricating oil pressure;
- .6 the sources of water pressure;

- .7 a condensate pump and the arrangements to maintain vacuum in condensers;
- .8 the mechanical air supply for boilers;
- .9 an air compressor and receiver for starting or control purposes;
- .10 the hydraulic, pneumatic or electrical means for control in main propulsion machinery including controllable pitch propellers.

However, the Administration, having regard to overall safety considerations, may accept a partial reduction in propulsion capability from normal operation.

4 Means shall be provided to ensure that the machinery can be brought into operation from the dead ship condition without external aid.

5 All boilers, all parts of machinery, all steam, hydraulic, pneumatic and other systems and their associated fittings which are under internal pressure shall be subjected to appropriate tests including a pressure test before being put into service for the first time.

6 Main propulsion machinery and all auxiliary machinery essential to the propulsion and the safety of the ship shall, as fitted in the ship, be designed to operate when the ship is upright and when inclined at any angle of list up to and including 15° either way under static conditions and 22.5° under dynamic conditions (rolling) either way and simultaneously inclined dynamically (pitching) 7.5° by bow or stern. The Administration may permit deviation from these angles, taking into consideration the type, size and service conditions of the ship.

7 Provision shall be made to facilitate cleaning, inspection and maintenance of main propulsion and auxiliary machinery including boilers and pressure vessels.

8 Special consideration shall be given to the design, construction and installation of propulsion machinery systems so that any mode of their vibrations shall not cause undue stresses in this machinery in the normal operating ranges.

Regulation 27

Machinery

1 Where risk from overspeeding of machinery exists, means shall be provided to ensure that the safe speed is not exceeded.

2 Where main or auxiliary machinery including pressure vessels or any parts of such machinery are subject to internal pressure and may be subject to dangerous overpressure, means shall be provided where practicable to protect against such excessive pressure.

3 All gearing and every shaft and coupling used for transmission of power to machinery essential for the propulsion and safety of the ship or for the safety of persons on board shall be so designed and constructed that they will withstand the maximum working stresses to which they may be subjected in all service conditions, and due consideration shall be given to the type of engines by which they are driven or of which they form part.

4 Internal combustion engines of a cylinder diameter of 200 mm or a crankcase volume of 0.6 m³ and above shall be provided with crankcase explosion relief valves of a suitable type with sufficient relief area. The relief valves shall be arranged or provided with means to ensure that discharge from them is so directed as to minimize the possibility of injury to personnel.

5 Main turbine propulsion machinery and, where applicable, main internal combustion propulsion machinery and auxiliary machinery shall be provided with automatic shut-off arrangements in the case of failures such as lubricating oil supply failure which could lead rapidly to complete breakdown, serious damage or explosion. The Administration may permit provisions for overriding automatic shut-off devices.

Regulation 28

Means of going astern

1 Sufficient power for going astern shall be provided to secure proper control of the ship in all normal circumstances.

2 The ability of the machinery to reverse the direction of thrust of the propeller in sufficient time, and so to bring the ship to rest within a reasonable distance from maximum ahead service speed, shall be demonstrated and recorded.*

3 The stopping times, ship headings and distances recorded on trials, together with the results of trials to determine the ability of ships having multiple propellers to navigate and manoeuvre with one or more propellers inoperative, shall be available on board for the use of the master or designated personnel.*

4 Where the ship is provided with supplementary means for manoeuvring or stopping, the effectiveness of such means shall be demonstrated and recorded as referred to in paragraphs 2 and 3.

* Reference is made to the Recommendation on Information to be Included in the Manoeuvring Booklets adopted by the Organization by resolution A.209(VII).

Regulation 29

Steering gear

1 Unless expressly provided otherwise, every ship shall be provided with a main steering gear and an auxiliary steering gear to the satisfaction of the Administration. The main steering gear and the auxiliary steering gear shall be so arranged that the failure of one of them will not render the other one inoperative.

2.1 All the steering gear components and the rudder stock shall be of sound and reliable construction to the satisfaction of the Administration. Special consideration shall be given to the suitability of any essential component which is not duplicated. Any such essential component shall, where appropriate, utilize anti-friction bearings such as ball bearings, roller bearings or sleeve bearings which shall be permanently lubricated or provided with lubrication fittings.

2.2 The design pressure for calculations to determine the scantlings of piping and other steering gear components subjected to internal hydraulic pressure shall be at least 1.25 times the maximum working pressure to be expected under the operational conditions specified in paragraph 3.2, taking into account any pressure which may exist in the low pressure side of the system. At the discretion of the Administration, fatigue criteria shall be applied for the design of piping and components, taking into account pulsating pressures due to dynamic loads.

2.3 Relief valves shall be fitted to any part of the hydraulic system which can be isolated and in which pressure can be generated from the power source or from external forces. The setting of the relief valves shall not exceed the design pressure. The valves shall be of adequate size and so arranged as to avoid an undue rise in pressure above the design pressure.

3 The main steering gear and rudder stock shall be:

- .1 of adequate strength and capable of steering the ship at maximum ahead service speed which shall be demonstrated;
- .2 capable of putting the rudder over from 35° on one side to 35° on the other side with the ship at its deepest seagoing draught and running ahead at maximum ahead service speed and, under the same conditions, from 35° on either side to 30° on the other side in not more than 28 seconds;
- .3 operated by power where necessary to meet the requirements of paragraph 3.2 and in any case when the Administration requires a rudder stock of over 120 mm diameter in way of the tiller, excluding strengthening for navigation in ice; and
- .4 so designed that they will not be damaged at maximum astern speed; however, this design requirement need not be proved by trials at maximum astern speed and maximum rudder angle.

- 4 The auxiliary steering gear shall be:
 - .1 of adequate strength and capable of steering the ship at navigable speed and of being brought speedily into action in an emergency;
 - .2 capable of putting the rudder over from 15° on one side to 15° on the other side in not more than 60 seconds with the ship at its deepest seagoing draught and running ahead at one half of the maximum ahead service speed or 7 knots, whichever is the greater; and
 - .3 operated by power where necessary to meet the requirements of paragraph 4.2 and in any case when the Administration requires a rudder stock of over 230 mm diameter in way of the tiller, excluding strengthening for navigation in ice.
- 5 Main and auxiliary steering gear power units shall be:
 - .1 arranged to re-start automatically when power is restored after a power failure; and
 - .2 capable of being brought into operation from a position on the navigating bridge. In the event of a power failure to any one of the steering gear power units, an audible and visual alarm shall be given on the navigating bridge.
- 6.1 Where the main steering gear comprises two or more identical power units, an auxiliary steering gear need not be fitted, provided that:
 - .1 in a passenger ship, the main steering gear is capable of operating the rudder as required by paragraph 3.2 while any one of the power units is out of operation;
 - .2 in a cargo ship, the main steering gear is capable of operating the rudder as required by paragraph 3.2 while operating with all power units;
 - .3 the main steering gear is so arranged that after a single failure in its piping system or in one of the power units the defect can be isolated so that steering capability can be maintained or speedily regained.
- 6.2 The Administration may, until 1 September 1986, accept the fitting of a steering gear which has a proven record of reliability but does not comply with the requirements of paragraph 6.1.3 for a hydraulic system.
- 6.3 Steering gears, other than of the hydraulic type, shall achieve standards equivalent to the requirements of this paragraph to the satisfaction of the Administration.
- 7 Steering gear control shall be provided:
 - .1 for the main steering gear, both on the navigating bridge and in the steering gear compartment;
 - .2 where the main steering gear is arranged in accordance with paragraph 6, by two independent control systems, both operable from the navigating bridge. This does not require duplication of the

steering wheel or steering lever. Where the control system consists of an hydraulic telemotor, a second independent system need not be fitted, except in a tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards;

- .3 for the auxiliary steering gear, in the steering gear compartment and, if power operated, it shall also be operable from the navigating bridge and shall be independent of the control system for the main steering gear.

8 Any main and auxiliary steering gear control system operable from the navigating bridge shall comply with the following:

- .1 if electric, it shall be served by its own separate circuit supplied from a steering gear power circuit from a point within the steering gear compartment, or directly from switchboard busbars supplying that steering gear power circuit at a point on the switchboard adjacent to the supply to the steering gear power circuit;
- .2 means shall be provided in the steering gear compartment for disconnecting any control system operable from the navigating bridge from the steering gear it serves;
- .3 the system shall be capable of being brought into operation from a position on the navigating bridge;
- .4 in the event of a failure of electrical power supply to the control system, an audible and visual alarm shall be given on the navigating bridge; and
- .5 short circuit protection only shall be provided for steering gear control supply circuits.

9 The electric power circuits and the steering gear control systems with their associated components, cables and pipes required by this Regulation and by Regulation 30 shall be separated as far as is practicable throughout their length.

10 A means of communication shall be provided between the navigating bridge and the steering gear compartment.

11 The angular position of the rudder shall:

- .1 if the main steering gear is power operated, be indicated on the navigating bridge. The rudder angle indication shall be independent of the steering gear control system;
- .2 be recognizable in the steering gear compartment.

12 Hydraulic power-operated steering gear shall be provided with the following:

- .1 arrangements to maintain the cleanliness of the hydraulic fluid taking into consideration the type and design of the hydraulic system;

- .2 a low level alarm for each hydraulic fluid reservoir to give the earliest practicable indication of hydraulic fluid leakage. Audible and visual alarms shall be given on the navigating bridge and in the machinery space where they can be readily observed; and
- .3 a fixed storage tank having sufficient capacity to recharge at least one power actuating system including the reservoir, where the main steering gear is required to be power operated. The storage tank shall be permanently connected by piping in such a manner that the hydraulic systems can be readily recharged from a position within the steering gear compartment and shall be provided with a contents gauge.

13 The steering gear compartment shall be:

- .1 readily accessible and, as far as practicable, separated from machinery spaces; and
- .2 provided with suitable arrangements to ensure working access to steering gear machinery and controls. These arrangements shall include handrails and gratings or other non-slip surfaces to ensure suitable working conditions in the event of hydraulic fluid leakage.

14 Where the rudder stock is required to be over 230 mm diameter in way of the tiller, excluding strengthening for navigation in ice, an alternative power supply, sufficient at least to supply the steering gear power unit which complies with the requirements of paragraph 4.2 and also its associated control system and the rudder angle indicator, shall be provided automatically, within 45 seconds, either from the emergency source of electrical power or from an independent source of power located in the steering gear compartment. This independent source of power shall be used only for this purpose. In every ship of 10,000 tons gross tonnage and upwards, the alternative power supply shall have a capacity for at least 30 minutes of continuous operation and in any other ship for at least 10 minutes.

15 In every tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards and in every other ship of 70,000 tons gross tonnage and upwards, the main steering gear shall comprise two or more identical power units complying with the provisions of paragraph 6.

16 Every tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards shall, subject to paragraph 17, comply with the following:

- .1 the main steering gear shall be so arranged that in the event of loss of steering capability due to a single failure in any part of one of the power actuating systems of the main steering gear, excluding the tiller, quadrant or components serving the same purpose, or seizure of the rudder actuators, steering capability shall be regained in not more than 45 seconds after the loss of one power actuating system;
- .2 the main steering gear shall comprise either:
 - .2.1 two independent and separate power actuating systems, each capable of meeting the requirements of paragraph 3.2; or

- .2.2 at least two identical power actuating systems which, acting simultaneously in normal operation, shall be capable of meeting the requirements of paragraph 3.2. Where necessary to comply with this requirement, inter-connexion of hydraulic power actuating systems shall be provided. Loss of hydraulic fluid from one system shall be capable of being detected and the defective system automatically isolated so that the other actuating system or systems shall remain fully operational;
- .3 steering gears other than of the hydraulic type shall achieve equivalent standards.

17 For tankers, chemical tankers or gas carriers of 10,000 tons gross tonnage and upwards, but of less than 100,000 tonnes deadweight, solutions other than those set out in paragraph 16, which need not apply the single failure criterion to the rudder actuator or actuators, may be permitted provided that an equivalent safety standard is achieved and that:

- .1 following loss of steering capability due to a single failure of any part of the piping system or in one of the power units, steering capability shall be regained within 45 seconds; and
- .2 where the steering gear includes only a single rudder actuator, special consideration is given to stress analysis for the design including fatigue analysis and fracture mechanics analysis, as appropriate, to the material used, to the installation of sealing arrangements and to testing and inspection and to the provision of effective maintenance. In consideration of the foregoing, the Administration shall adopt regulations which include the provisions of the Guidelines for Acceptance of Non-Duplicated Rudder Actuators for Tankers, Chemical Tankers and Gas Carriers of 10,000 Tons Gross Tonnage and Above but Less than 100,000 Tonnes Deadweight, adopted by the Organization.*

18 For a tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards, but less than 70,000 tonnes deadweight, the Administration may, until 1 September 1986, accept a steering gear system with a proven record of reliability which does not comply with the single failure criterion required for a hydraulic system in paragraph 16.

19 Every tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards, constructed before 1 September 1984, shall comply, not later than 1 September 1986, with the following:

- .1 the requirements of paragraphs 7.1, 8.2, 8.4, 10, 11, 12.2, 12.3 and 13.2;
- .2 two independent steering gear control systems shall be provided each of which can be operated from the navigating bridge. This does not require duplication of the steering wheel or steering lever;

* Reference is made to the Guidelines for Acceptance of Non-Duplicated Rudder Actuators for Tankers, Chemical Tankers and Gas Carriers of 10,000 Tons Gross Tonnage and Above but Less than 100,000 Tonnes Deadweight, adopted by the Organization by resolution A.467(XII).

- .3 if the steering gear control system in operation fails, the second system shall be capable of being brought into immediate operation from the navigating bridge; and
- .4 each steering gear control system, if electric, shall be served by its own separate circuit supplied from the steering gear power circuit or directly from switchboard busbars supplying that steering gear power circuit at a point on the switchboard adjacent to the supply to the steering gear power circuit.

20 In addition to the requirements of paragraph 19, in every tanker, chemical tanker or gas carrier of 40,000 tons gross tonnage and upwards, constructed before 1 September 1984, the steering gear shall, not later than 1 September 1988, be so arranged that, in the event of a single failure of the piping or of one of the power units, steering capability can be maintained or the rudder movement can be limited so that steering capability can be speedily regained. This shall be achieved by:

- .1 an independent means of restraining the rudder; or
- .2 fast acting valves which may be manually operated to isolate the actuator or actuators from the external hydraulic piping together with a means of directly refilling the actuators by a fixed independent power-operated pump and piping system; or
- .3 an arrangement such that, where hydraulic power systems are interconnected, loss of hydraulic fluid from one system shall be detected and the defective system isolated either automatically or from the navigating bridge so that the other system remains fully operational.

Regulation 30

Additional requirements for electric and electrohydraulic steering gear

1 Means for indicating that the motors of electric and electrohydraulic steering gear are running shall be installed on the navigating bridge and at a suitable main machinery control position.

2 Each electric or electrohydraulic steering gear comprising one or more power units shall be served by at least two exclusive circuits fed directly from the main switchboard; however, one of the circuits may be supplied through the emergency switchboard. An auxiliary electric or electrohydraulic steering gear associated with a main electric or electrohydraulic steering gear may be connected to one of the circuits supplying this main steering gear. The circuits supplying an electric or electrohydraulic steering gear shall have adequate rating for supplying all motors which can be simultaneously connected to them and may be required to operate simultaneously.

3 Short circuit protection and an overload alarm shall be provided for such circuits and motors. Protection against excess current, including starting current, if provided, shall be for not less than twice the full load current of the motor or circuit so protected, and shall be arranged to permit the passage of

the appropriate starting currents. Where a three-phase supply is used an alarm shall be provided that will indicate failure of any one of the supply phases. The alarms required in this paragraph shall be both audible and visual and shall be situated in a conspicuous position in the main machinery space or control room from which the main machinery is normally controlled and as may be required by Regulation 51.

4 When in a ship of less than 1,600 tons gross tonnage an auxiliary steering gear which is required by Regulation 29.4.3 to be operated by power is not electrically powered or is powered by an electric motor primarily intended for other services, the main steering gear may be fed by one circuit from the main switchboard. Where such an electric motor primarily intended for other services is arranged to power such an auxiliary steering gear, the requirement of paragraph 3 may be waived by the Administration if satisfied with the protection arrangement together with the requirements of Regulation 29.5.1 and .2 and 29.7.3 applicable to auxiliary steering gear.

Regulation 31

Machinery controls

1 Main and auxiliary machinery essential for the propulsion and safety of the ship shall be provided with effective means for its operation and control.

2 Where remote control of propulsion machinery from the navigating bridge is provided and the machinery spaces are intended to be manned, the following shall apply:

- .1 the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the navigating bridge under all sailing conditions, including manoeuvring;
- .2 the remote control shall be performed, for each independent propeller, by a control device so designed and constructed that its operation does not require particular attention to the operational details of the machinery. Where multiple propellers are designed to operate simultaneously, they may be controlled by one control device;
- .3 the main propulsion machinery shall be provided with an emergency stopping device on the navigating bridge which shall be independent of the navigating bridge control system;
- .4 propulsion machinery orders from the navigating bridge shall be indicated in the main machinery control room or at the manoeuvring platform as appropriate;
- .5 remote control of the propulsion machinery shall be possible only from one location at a time; at such locations interconnected control positions are permitted. At each location there shall be an indicator showing which location is in control of the propulsion machinery. The transfer of control between the navigating bridge and machinery spaces shall be possible only in the main machinery space or the

main machinery control room. This system shall include means to prevent the propelling thrust from altering significantly when transferring control from one location to another;

- .6 it shall be possible to control the propulsion machinery locally, even in the case of failure in any part of the remote control system;
- .7 the design of the remote control system shall be such that in case of its failure an alarm will be given. Unless the Administration considers it impracticable the preset speed and direction of thrust of the propeller shall be maintained until local control is in operation;
- .8 indicators shall be fitted on the navigating bridge for:
 - .8.1 propeller speed and direction of rotation in the case of fixed pitch propellers;
 - .8.2 propeller speed and pitch position in the case of controllable pitch propellers;
- .9 an alarm shall be provided on the navigating bridge and in the machinery space to indicate low starting air pressure which shall be set at a level to permit further main engine starting operations. If the remote control system of the propulsion machinery is designed for automatic starting, the number of automatic consecutive attempts which fail to produce a start shall be limited in order to safeguard sufficient starting air pressure for starting locally.

3 Where the main propulsion and associated machinery, including sources of main electrical supply, are provided with various degrees of automatic or remote control and are under continuous manual supervision from a control room the arrangements and controls shall be so designed, equipped and installed that the machinery operation will be as safe and effective as if it were under direct supervision; for this purpose Regulations 46 to 50 shall apply as appropriate. Particular consideration shall be given to protect such spaces against fire and flooding.

4 In general, automatic starting, operational and control systems shall include provisions for manually overriding the automatic controls. Failure of any part of such systems shall not prevent the use of the manual override.

Regulation 32

Steam boilers and boiler feed systems

1 Every steam boiler and every unfired steam generator shall be provided with not less than two safety valves of adequate capacity. However, having regard to the output or any other features of any boiler or unfired steam generator, the Administration may permit only one safety valve to be fitted if it is satisfied that adequate protection against overpressure is thereby provided.

2 Each oil-fired boiler which is intended to operate without manual supervision shall have safety arrangements which shut off the fuel supply and give an alarm in the case of low water level, air supply failure or flame failure.

3 Water tube boilers serving turbine propulsion machinery shall be fitted with a high-water-level alarm.

4 Every steam generating system which provides services essential for the safety of the ship, or which could be rendered dangerous by the failure of its feed water supply, shall be provided with not less than two separate feed water systems from and including the feed pumps, noting that a single penetration of the steam drum is acceptable. Unless overpressure is prevented by the pump characteristics means shall be provided which will prevent overpressure in any part of the systems.

5 Boilers shall be provided with means to supervise and control the quality of the feed water. Suitable arrangements shall be provided to preclude, as far as practicable, the entry of oil or other contaminants which may adversely affect the boiler.

6 Every boiler essential for the safety of the ship and designed to contain water at a specified level shall be provided with at least two means for indicating its water level, at least one of which shall be a direct reading gauge glass.

Regulation 33

Steam pipe systems

1 Every steam pipe and every fitting connected thereto through which steam may pass shall be so designed, constructed and installed as to withstand the maximum working stresses to which it may be subjected.

2 Means shall be provided for draining every steam pipe in which dangerous water hammer action might otherwise occur.

3 If a steam pipe or fitting may receive steam from any source at a higher pressure than that for which it is designed a suitable reducing valve, relief valve and pressure gauge shall be fitted.

Regulation 34

Air pressure systems

1 In every ship means shall be provided to prevent overpressure in any part of compressed air systems and wherever water jackets or casings of air compressors and coolers might be subjected to dangerous overpressure due to leakage into them from air pressure parts. Suitable pressure relief arrangements shall be provided for all systems.

2 The main starting air arrangements for main propulsion internal combustion engines shall be adequately protected against the effects of backfiring and internal explosion in the starting air pipes.

3 All discharge pipes from starting air compressors shall lead directly to the starting air receivers, and all starting pipes from the air receivers to main or auxiliary engines shall be entirely separate from the compressor discharge pipe system.

4 Provision shall be made to reduce to a minimum the entry of oil into the air pressure systems and to drain these systems.

Regulation 35

Ventilating systems in machinery spaces

Machinery spaces of category A shall be adequately ventilated so as to ensure that when machinery or boilers therein are operating at full power in all weather conditions including heavy weather, an adequate supply of air is maintained to the spaces for the safety and comfort of personnel and the operation of the machinery. Any other machinery space shall be adequately ventilated appropriate for the purpose of that machinery space.

Regulation 36

*Protection against noise**

Measures shall be taken to reduce machinery noise in machinery spaces to acceptable levels as determined by the Administration. If this noise cannot be sufficiently reduced the source of excessive noise shall be suitably insulated or isolated or a refuge from noise shall be provided if the space is required to be manned. Ear protectors shall be provided for personnel required to enter such spaces, if necessary.

Regulation 37

Communication between navigating bridge and machinery space

At least two independent means shall be provided for communicating orders from the navigating bridge to the position in the machinery space or in the control room from which the engines are normally controlled: one of these shall be an engine room telegraph which provides visual indication of the orders and responses both in the machinery space and on the navigating bridge. Appropriate means of communication shall be provided to any other positions from which the engines may be controlled.

* Reference is made to the Code on Noise Levels on Board Ships, adopted by the Organization by resolution A.468(XII).

Regulation 38

Engineers' alarm

An engineers' alarm shall be provided to be operated from the engine control room or at the manoeuvring platform as appropriate, and shall be clearly audible in the engineers' accommodation.

Regulation 39

Location of emergency installations in passenger ships

Emergency sources of electrical power, fire pumps, bilge pumps except those specifically serving the spaces forward of the collision bulkhead, any fixed fire-extinguishing system required by Chapter II-2 and other emergency installations which are essential for the safety of the ship, except anchor windlasses, shall not be installed forward of the collision bulkhead.

PART D – ELECTRICAL INSTALLATIONS

(Except where expressly provided otherwise Part D applies to passenger ships and cargo ships)

Regulation 40

General

- 1 Electrical installations shall be such that:
 - .1 all electrical auxiliary services necessary for maintaining the ship in normal operational and habitable conditions will be ensured without recourse to the emergency source of electrical power;
 - .2 electrical services essential for safety will be ensured under various emergency conditions; and
 - .3 the safety of passengers, crew and ship from electrical hazards will be ensured.
- 2 The Administration shall take appropriate steps to ensure uniformity in the implementation and application of the provisions of this Part in respect of electrical installations*.

* Reference is made to the Recommendations published by the International Electrotechnical Commission and, in particular, Publication 92 – Electrical Installations in Ships.

Regulation 41

Main source of electrical power and lighting systems

1.1 A main source of electrical power of sufficient capacity to supply all those services mentioned in Regulation 40.1.1 shall be provided. This main source of electrical power shall consist of at least two generating sets.

1.2 The capacity of these generating sets shall be such that in the event of any one generating set being stopped it will still be possible to supply those services necessary to provide normal operational conditions of propulsion and safety. Minimum comfortable conditions of habitability shall also be ensured which include at least adequate services for cooking, heating, domestic refrigeration, mechanical ventilation, sanitary and fresh water.

1.3 The arrangements of the ship's main source of electrical power shall be such that the services referred to in Regulation 40.1.1 can be maintained regardless of the speed and direction of the propulsion machinery or shafting.

1.4 In addition, the generating sets shall be such as to ensure that with any one generator or its primary source of power out of operation, the remaining generating sets shall be capable of providing the electrical services necessary to start the main propulsion plant from a dead ship condition. The emergency source of electrical power may be used for the purpose of starting from a dead ship condition if its capability either alone or combined with that of any other source of electrical power is sufficient to provide at the same time those services required to be supplied by Regulations 42.2.1 to 42.2.3 or 43.2.1 to 43.2.4.

1.5 Where transformers constitute an essential part of the electrical supply system required by this paragraph, the system shall be so arranged as to ensure the same continuity of the supply as is stated in this paragraph.

2.1 A main electric lighting system which shall provide illumination throughout those parts of the ship normally accessible to and used by passengers or crew shall be supplied from the main source of electrical power.

2.2 The arrangement of the main electric lighting system shall be such that a fire or other casualty in spaces containing the main source of electrical power, associated transforming equipment, if any, the main switchboard and the main lighting switchboard, will not render the emergency electric lighting system required by Regulations 42.2.1 and 42.2.2 or 43.2.1, 43.2.2 and 43.2.3 inoperative.

2.3 The arrangement of the emergency electric lighting system shall be such that a fire or other casualty in spaces containing the emergency source of electrical power, associated transforming equipment, if any, the emergency switchboard and the emergency lighting switchboard will not render the main electric lighting system required by this Regulation inoperative.

3 The main switchboard shall be so placed relative to one main generating station that, as far as is practicable, the integrity of the normal electrical supply may be affected only by a fire or other casualty in one space. An

environmental enclosure for the main switchboard, such as may be provided by a machinery control room situated within the main boundaries of the space, is not to be considered as separating the switchboards from the generators.

4 Where the total installed electrical power of the main generating sets is in excess of 3 MW, the main busbars shall be subdivided into at least two parts which shall normally be connected by removable links or other approved means; so far as is practicable, the connexion of generating sets and any other duplicated equipment shall be equally divided between the parts. Equivalent arrangements may be permitted to the satisfaction of the Administration.

Regulation 42

Emergency source of electrical power in passenger ships

1.1 A self-contained emergency source of electrical power shall be provided.

1.2 The emergency source of electrical power, associated transforming equipment, if any, transitional source of emergency power, emergency switchboard and emergency lighting switchboard shall be located above the uppermost continuous deck and shall be readily accessible from the open deck. They shall not be located forward of the collision bulkhead.

1.3 The location of the emergency source of electrical power and associated transforming equipment, if any, the transitional source of emergency power, the emergency switchboard and the emergency electric lighting switchboards in relation to the main source of electrical power, associated transforming equipment, if any, and the main switchboard shall be such as to ensure to the satisfaction of the Administration that a fire or other casualty in spaces containing the main source of electrical power, associated transforming equipment, if any, and the main switchboard or in any machinery space of category A will not interfere with the supply, control and distribution of emergency electrical power. As far as practicable, the space containing the emergency source of electrical power, associated transforming equipment, if any, the transitional source of emergency electrical power and the emergency switchboard shall not be contiguous to the boundaries of machinery spaces of category A or those spaces containing the main source of electrical power, associated transforming equipment, if any, or the main switchboard.

1.4 Provided that suitable measures are taken for safeguarding independent emergency operation under all circumstances, the emergency generator may be used exceptionally, and for short periods, to supply non-emergency circuits.

2 The electrical power available shall be sufficient to supply all those services that are essential for safety in an emergency, due regard being paid to such services as may have to be operated simultaneously. The emergency source of electrical power shall be capable, having regard to starting currents and the transitory nature of certain loads, of supplying simultaneously at least the following services for the periods specified hereinafter, if they depend upon an electrical source for their operation:

- 2.1 For a period of 36 hours, emergency lighting:
- .1 at every embarkation station on deck and over sides as required by Regulations III/19 and III/30;
 - .2 in all service and accommodation alleyways, stairways and exits, personnel lift cars;
 - .3 in the machinery spaces and main generating stations including their control positions;
 - .4 in all control stations, machinery control rooms, and at each main and emergency switchboard;
 - .5 at all stowage positions for firemen's outfits;
 - .6 at the steering gear; and
 - .7 at the fire pump, the sprinkler pump and the emergency bilge pump referred to in paragraph 2.4 and at the starting position of their motors.

2.2 For a period of 36 hours, the navigation lights and other lights required by the International Regulations for Preventing Collisions at Sea in force.

- 2.3 For a period of 36 hours:
- .1 all internal communication equipment required in an emergency;
 - .2 the navigational aids as required by Regulation V/12; where such provision is unreasonable or impracticable the Administration may waive this requirement for ships of less than 5,000 tons gross tonnage;
 - .3 the fire detection and fire alarm system, and the fire door holding and release system; and
 - .4 for intermittent operation of the daylight signalling lamp, the ship's whistle, the manual fire alarms and all internal signals that are required in an emergency;

unless such services have an independent supply for the period of 36 hours from an accumulator battery suitably located for use in an emergency.

- 2.4 For a period of 36 hours:
- .1 one of the fire pumps required by Regulation II-2/4.3.1 and 4.3.3;
 - .2 the automatic sprinkler pump, if any; and
 - .3 the emergency bilge pump and all the equipment essential for the operation of electrically powered remote controlled bilge valves.

2.5 For the period of time required by Regulation 29.14 the steering gear if required to be so supplied by that Regulation.

2.6 For a period of half an hour:

- .1 any watertight doors required by Regulation 15 to be power operated together with their indicators and warning signals. Provided the requirements of Regulation 15.9.2 are complied with, sequential operation of the doors may be permitted providing all doors can be closed in 60 seconds;
- .2 the emergency arrangements to bring the lift cars to deck level for the escape of persons. The passenger lift cars may be brought to deck level sequentially in an emergency.

2.7 In a ship engaged regularly on voyages of short duration, the Administration if satisfied that an adequate standard of safety would be attained may accept a lesser period than the 36 hour period specified in paragraphs 2.1 to 2.5 but not less than 12 hours.

3 The emergency source of electrical power may be either a generator or an accumulator battery, which shall comply with the following:

3.1 Where the emergency source of electrical power is a generator, it shall be:

- .1 driven by a suitable prime-mover with an independent supply of fuel having a flashpoint (closed cup test) of not less than 43°C;
- .2 started automatically upon failure of the electrical supply from the main source of electrical power and shall be automatically connected to the emergency switchboard; those services referred to in paragraph 4 shall then be transferred automatically to the emergency generating set. The automatic starting system and the characteristic of the prime-mover shall be such as to permit the emergency generator to carry its full rated load as quickly as is safe and practicable, subject to a maximum of 45 seconds; unless a second independent means of starting the emergency generating set is provided, the single source of stored energy shall be protected to preclude its complete depletion by the automatic starting system; and
- .3 provided with a transitional source of emergency electrical power according to paragraph 4.

3.2 Where the emergency source of electrical power is an accumulator battery, it shall be capable of:

- .1 carrying the emergency electrical load without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage;
- .2 automatically connecting to the emergency switchboard in the event of failure of the main source of electrical power; and
- .3 immediately supplying at least those services specified in paragraph 4.

4 The transitional source of emergency electrical power required by paragraph 3.1.3 shall consist of an accumulator battery suitably located for use in an emergency which shall operate without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage and be of sufficient capacity and so arranged as to supply automatically in the event of failure of either the main or emergency source of electrical power at least the following services, if they depend upon an electrical source for their operation:

4.1 For half an hour:

- .1 the lighting required by paragraphs 2.1 and 2.2;
- .2 all services required by paragraphs 2.3.1, 2.3.3 and 2.3.4 unless such services have an independent supply for the period specified from an accumulator battery suitably located for use in an emergency.

4.2 Power to close the watertight doors but not necessarily all of them simultaneously, together with their indicators and warning signals as required by paragraph 2.6.1.

5.1 The emergency switchboard shall be installed as near as is practicable to the emergency source of electrical power.

5.2 Where the emergency source of electrical power is a generator, the emergency switchboard shall be located in the same space unless the operation of the emergency switchboard would thereby be impaired.

5.3 No accumulator battery fitted in accordance with this Regulation shall be installed in the same space as the emergency switchboard. An indicator shall be mounted in a suitable place on the main switchboard or in the machinery control room to indicate when the batteries constituting either the emergency source of electrical power or the transitional source of emergency electrical power referred to in paragraph 3.1.3 or 4 are being discharged.

5.4 The emergency switchboard shall be supplied during normal operation from the main switchboard by an interconnector feeder which is to be adequately protected at the main switchboard against overload and short circuit and which is to be disconnected automatically at the emergency switchboard upon failure of the main source of electrical power. Where the system is arranged for feedback operation, the interconnector feeder is also to be protected at the emergency switchboard at least against short circuit.

5.5 In order to ensure ready availability of the emergency source of electrical power, arrangements shall be made where necessary to disconnect automatically non-emergency circuits from the emergency switchboard to ensure that power shall be available to the emergency circuits.

6 The emergency generator and its prime-mover and any emergency accumulator battery shall be so designed and arranged as to ensure that they will function at full rated power when the ship is upright and when inclined at any angle of list up to 22.5° or when inclined up to 10° either in the fore or aft direction, or is in any combination of angles within those limits.

7 Provision shall be made for the periodic testing of the complete emergency system and shall include the testing of automatic starting arrangements.

Regulation 43

Emergency source of electrical power in cargo ships

1.1 A self-contained emergency source of electrical power shall be provided.

1.2 The emergency source of electrical power, associated transforming equipment, if any, transitional source of emergency power, emergency switchboard and emergency lighting switchboard shall be located above the uppermost continuous deck and shall be readily accessible from the open deck. They shall not be located forward of the collision bulkhead, except where permitted by the Administration in exceptional circumstances.

1.3 The location of the emergency source of electrical power, associated transforming equipment, if any, the transitional source of emergency power, the emergency switchboard and the emergency lighting switchboard in relation to the main source of electrical power, associated transforming equipment, if any, and the main switchboard shall be such as to ensure to the satisfaction of the Administration that a fire or other casualty in the space containing the main source of electrical power, associated transforming equipment, if any, and the main switchboard, or in any machinery space of category A will not interfere with the supply, control and distribution of emergency electrical power. As far as practicable the space containing the emergency source of electrical power, associated transforming equipment, if any, the transitional source of emergency electrical power and the emergency switchboard shall not be contiguous to the boundaries of machinery spaces of category A or those spaces containing the main source of electrical power, associated transforming equipment, if any, and the main switchboard.

1.4 Provided that suitable measures are taken for safeguarding independent emergency operation under all circumstances, the emergency generator may be used, exceptionally, and for short periods, to supply non-emergency circuits.

2 The electrical power available shall be sufficient to supply all those services that are essential for safety in an emergency, due regard being paid to such services as may have to be operated simultaneously. The emergency source of electrical power shall be capable, having regard to starting currents and the transitory nature of certain loads, of supplying simultaneously at least the following services for the periods specified hereinafter, if they depend upon an electrical source for their operation:

2.1 For a period of 3 hours, emergency lighting at every embarkation station on deck and over sides as required by Regulations III/19 and III/38.

- 2.2 For a period of 18 hours, emergency lighting:
- .1 in all service and accommodation alleyways, stairways and exits, personnel lift cars and personnel lift trunks;
 - .2 in the machinery spaces and main generating stations including their control positions;
 - .3 in all control stations, machinery control rooms, and at each main and emergency switchboard;
 - .4 at all stowage positions for firemen's outfits;
 - .5 at the steering gear; and
 - .6 at the fire pump referred to in paragraph 2.5, at the sprinkler pump, if any, and at the emergency bilge pump, if any, and at the starting positions of their motors.

2.3 For a period of 18 hours, the navigation lights and other lights required by the International Regulations for Preventing Collisions at Sea in force.

2.4 For a period of 18 hours:

- .1 all internal communication equipment as required in an emergency;
- .2 the navigational aids as required by Regulation V/12; where such provision is unreasonable or impracticable the Administration may waive this requirement for ships of less than 5,000 tons gross tonnage;
- .3 the fire detection and fire alarm system; and
- .4 intermittent operation of the daylight signalling lamp, the ship's whistle, the manual fire alarms, and all internal signals that are required in an emergency;

unless such services have an independent supply for the period of 18 hours from an accumulator battery suitably located for use in an emergency.

2.5 For a period of 18 hours one of the fire pumps required by Regulation II-2/4.3.1 and 4.3.3 if dependent upon the emergency generator for its source of power.

2.6.1 For the period of time required by Regulation 29.14 the steering gear where it is required to be so supplied by that Regulation.

2.6.2 In a ship engaged regularly in voyages of short duration, the Administration if satisfied that an adequate standard of safety would be attained may accept a lesser period than the 18 hour period specified in paragraphs 2.2 to 2.5 but not less than 12 hours.

3 The emergency source of electrical power may be either a generator or an accumulator battery, which shall comply with the following:

3.1 Where the emergency source of electrical power is a generator, it shall be:

- .1 driven by a suitable prime-mover with an independent supply of fuel, having a flashpoint (closed cup test) of not less than 43°C;
- .2 started automatically upon failure of the main source of electrical power supply unless a transitional source of emergency electrical power in accordance with paragraph 3.1.3 is provided; where the emergency generator is automatically started, it shall be automatically connected to the emergency switchboard; those services referred to in paragraph 4 shall then be connected automatically to the emergency generator; and unless a second independent means of starting the emergency generator is provided the single source of stored energy shall be protected to preclude its complete depletion by the automatic starting system; and
- .3 provided with a transitional source of emergency electrical power as specified in paragraph 4 unless an emergency generator is provided capable both of supplying the services mentioned in that paragraph and of being automatically started and supplying the required load as quickly as is safe and practicable subject to a maximum of 45 seconds.

3.2 Where the emergency source of electrical power is an accumulator battery it shall be capable of:

- .1 carrying the emergency electrical load without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage;
- .2 automatically connecting to the emergency switchboard in the event of failure of the main source of electrical power; and
- .3 immediately supplying at least those services specified in paragraph 4.

4 The transitional source of emergency electrical power where required by paragraph 3.1.3 shall consist of an accumulator battery suitably located for use in an emergency which shall operate without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage and be of sufficient capacity and shall be so arranged as to supply automatically in the event of failure of either the main or the emergency source of electrical power for half an hour at least the following services if they depend upon an electrical source for their operation:

- .1 the lighting required by paragraphs 2.1, 2.2 and 2.3. For this transitional phase, the required emergency electric lighting, in respect of the machinery space and accommodation and service spaces may be provided by permanently fixed, individual, automatically charged, relay operated accumulator lamps; and
- .2 all services required by paragraphs 2.4.1, 2.4.3 and 2.4.4 unless such services have an independent supply for the period specified from an accumulator battery suitably located for use in an emergency.

5.1 The emergency switchboard shall be installed as near as is practicable to the emergency source of electrical power.

5.2 Where the emergency source of electrical power is a generator, the emergency switchboard shall be located in the same space unless the operation of the emergency switchboard would thereby be impaired.

5.3 No accumulator battery fitted in accordance with this Regulation shall be installed in the same space as the emergency switchboard. An indicator shall be mounted in a suitable place on the main switchboard or in the machinery control room to indicate when the batteries constituting either the emergency source of electrical power or the transitional source of electrical power referred to in paragraph 3.2 or 4 are being discharged.

5.4 The emergency switchboard shall be supplied during normal operation from the main switchboard by an interconnector feeder which is to be adequately protected at the main switchboard against overload and short circuit and which is to be disconnected automatically at the emergency switchboard upon failure of the main source of electrical power. Where the system is arranged for feedback operation, the interconnector feeder is also to be protected at the emergency switchboard at least against short circuit.

5.5 In order to ensure ready availability of the emergency source of electrical power, arrangements shall be made where necessary to disconnect automatically non-emergency circuits from the emergency switchboard to ensure that electrical power shall be available automatically to the emergency circuits.

6 The emergency generator and its prime-mover and any emergency accumulator battery shall be so designed and arranged as to ensure that they will function at full rated power when the ship is upright and when inclined at any angle of list up to 22.5° or when inclined up to 10° either in the fore or aft direction, or is in any combination of angles within those limits.

7 Provision shall be made for the periodic testing of the complete emergency system and shall include the testing of automatic starting arrangements.

Regulation 44

Starting arrangements for emergency generating sets

1 Emergency generating sets shall be capable of being readily started in their cold condition at a temperature of 0°C. If this is impracticable, or if lower temperatures are likely to be encountered, provision acceptable to the Administration shall be made for the maintenance of heating arrangements, to ensure ready starting of the generating sets.

2 Each emergency generating set arranged to be automatically started shall be equipped with starting devices approved by the Administration with a stored energy capability of at least three consecutive starts. A second source of energy shall be provided for an additional three starts within 30 minutes unless manual starting can be demonstrated to be effective.

- 3 The stored energy shall be maintained at all times, as follows:
- .1 electrical and hydraulic starting systems shall be maintained from the emergency switchboard;
 - .2 compressed air starting systems may be maintained by the main or auxiliary compressed air receivers through a suitable non-return valve or by an emergency air compressor which, if electrically driven, is supplied from the emergency switchboard;
 - .3 all of these starting, charging and energy storing devices shall be located in the emergency generator space; these devices are not to be used for any purpose other than the operation of the emergency generating set. This does not preclude the supply to the air receiver of the emergency generating set from the main or auxiliary compressed air system through the non-return valve fitted in the emergency generator space.
- 4.1 Where automatic starting is not required, manual starting is permissible, such as manual cranking, inertia starters, manually charged hydraulic accumulators, or powder charge cartridges, where they can be demonstrated as being effective.
- 4.2 When manual starting is not practicable, the requirements of paragraphs 2 and 3 shall be complied with except that starting may be manually initiated.

Regulation 45

Precautions against shock, fire and other hazards of electrical origin

- 1.1 Exposed metal parts of electrical machines or equipment which are not intended to be live but which are liable under fault conditions to become live shall be earthed unless the machines or equipment are:
- .1 supplied at a voltage not exceeding 55 V direct current or 55 V, root mean square between conductors; auto-transformers shall not be used for the purpose of achieving this voltage; or
 - .2 supplied at a voltage not exceeding 250 V by safety isolating transformers supplying only one consuming device; or
 - .3 constructed in accordance with the principle of double insulation.
- 1.2 The Administration may require additional precautions for portable electrical equipment for use in confined or exceptionally damp spaces where particular risks due to conductivity may exist.
- 1.3 All electrical apparatus shall be so constructed and so installed as not to cause injury when handled or touched in the normal manner.
- 2 Main and emergency switchboards shall be so arranged as to give easy access as may be needed to apparatus and equipment, without danger to personnel. The sides and the rear and, where necessary, the front of

switchboards shall be suitably guarded. Exposed live parts having voltages to earth exceeding a voltage to be specified by the Administration shall not be installed on the front of such switchboards. Where necessary, non-conducting mats or gratings shall be provided at the front and rear of the switchboard.

3.1 The hull return system of distribution shall not be used for any purpose in a tanker, or for power, heating, or lighting in any other ship of 1,600 tons gross tonnage and upwards.

3.2 The requirement of paragraph 3.1 does not preclude under conditions approved by the Administration the use of:

- .1 impressed current cathodic protective systems;
- .2 limited and locally earthed systems; or
- .3 insulation level monitoring devices provided the circulation current does not exceed 30 mA under the most unfavourable conditions.

3.3 Where the hull return system is used, all final subcircuits, i.e. all circuits fitted after the last protective device, shall be two-wire and special precautions shall be taken to the satisfaction of the Administration.

4.1 Earthed distribution systems shall not be used in a tanker. The Administration may exceptionally permit in a tanker the earthing of the neutral for alternating current power networks of 3,000 V (line to line) and over, provided that any possible resulting current does not flow directly through any of the dangerous spaces.

4.2 When a distribution system, whether primary or secondary, for power, heating or lighting, with no connexion to earth is used, a device capable of continuously monitoring the insulation level to earth and of giving an audible or visual indication of abnormally low insulation values shall be provided.

5.1 Except as permitted by the Administration in exceptional circumstances, all metal sheaths and armour of cables shall be electrically continuous and shall be earthed.

5.2 All electric cables and wiring external to equipment shall be at least of a flame retardant type and shall be so installed as not to impair their original flame retarding properties. Where necessary for particular applications the Administration may permit the use of special types of cables such as radio frequency cables, which do not comply with the foregoing.

5.3 Cables and wiring serving essential or emergency power, lighting, internal communications or signals shall so far as practicable be routed clear of galleys, laundries, machinery spaces of category A and their casings and other high fire risk areas. Cables connecting fire pumps to the emergency switchboard shall be of a fire resistant type where they pass through high fire risk areas. Where practicable all such cables should be run in such a manner as to preclude their being rendered unserviceable by heating of the bulkheads that may be caused by a fire in an adjacent space.

5.4 Where cables which are installed in hazardous areas introduce the risk of fire or explosion in the event of an electrical fault in such areas, special

precautions against such risks shall be taken to the satisfaction of the Administration.

5.5 Cables and wiring shall be installed and supported in such a manner as to avoid chafing or other damage.

5.6 Terminations and joints in all conductors shall be so made as to retain the original electrical, mechanical, flame retarding and, where necessary, fire resisting properties of the cable.

6.1 Each separate circuit shall be protected against short circuit and against overload, except as permitted in Regulations 29 and 30 or where the Administration may exceptionally otherwise permit.

6.2 The rating or appropriate setting of the overload protective device for each circuit shall be permanently indicated at the location of the protective device.

7 Lighting fittings shall be so arranged as to prevent temperature rises which could damage the cables and wiring, and to prevent surrounding material from becoming excessively hot.

8 All lighting and power circuits terminating in a bunker or cargo space shall be provided with a multiple pole switch outside the space for disconnecting such circuits.

9.1 Accumulator batteries shall be suitably housed, and compartments used primarily for their accommodation shall be properly constructed and efficiently ventilated.

9.2 Electrical or other equipment which may constitute a source of ignition of flammable vapours shall not be permitted in these compartments except as permitted in paragraph 10.

9.3 Accumulator batteries shall not be located in sleeping quarters except where hermetically sealed to the satisfaction of the Administration.

10 No electrical equipment shall be installed in any space where flammable mixtures are liable to collect including those on board tankers or in compartments assigned principally to accumulator batteries, in paint lockers, acetylene stores or similar spaces, unless the Administration is satisfied that such equipment is:

- .1 essential for operational purposes;
- .2 of a type which will not ignite the mixture concerned;
- .3 appropriate to the space concerned; and
- .4 appropriately certified for safe usage in the dusts, vapours or gases likely to be encountered.

11 In a passenger ship, distribution systems shall be so arranged that fire in any main vertical zone as is defined in Regulation II-2/3.9 will not interfere with services essential for safety in any other such zone. This requirement will

be met if main and emergency feeders passing through any such zone are separated both vertically and horizontally as widely as is practicable.

PART E - ADDITIONAL REQUIREMENTS FOR PERIODICALLY UNATTENDED MACHINERY SPACES

(Part E applies to cargo ships except that Regulation 54
refers to passenger ships)

Regulation 46

General

- 1 The arrangements provided shall be such as to ensure that the safety of the ship in all sailing conditions, including manoeuvring, is equivalent to that of a ship having the machinery spaces manned.
- 2 Measures shall be taken to the satisfaction of the Administration to ensure that the equipment is functioning in a reliable manner and that satisfactory arrangements are made for regular inspections and routine tests to ensure continuous reliable operation.
- 3 Every ship shall be provided with documentary evidence, to the satisfaction of the Administration, of its fitness to operate with periodically unattended machinery spaces.

Regulation 47

Fire precautions

- 1 Means shall be provided to detect and give alarms at an early stage in case of fires:
 - .1 in boiler air supply casings and exhausts (uptakes); and
 - .2 in scavenging air belts of propulsion machinery,unless the Administration considers this to be unnecessary in a particular case.
- 2 Internal combustion engines of 2250 kW and above or having cylinders of more than 300 mm bore shall be provided with crankcase oil mist detectors or engine bearing temperature monitors or equivalent devices.

Regulation 48

Protection against flooding

1 Bilge wells in periodically unattended machinery spaces shall be located and monitored in such a way that the accumulation of liquids is detected at normal angles of trim and heel, and shall be large enough to accommodate easily the normal drainage during the unattended period.

2 Where the bilge pumps are capable of being started automatically, means shall be provided to indicate when the influx of liquid is greater than the pump capacity or when the pump is operating more frequently than would normally be expected. In these cases, smaller bilge wells to cover a reasonable period of time may be permitted. Where automatically controlled bilge pumps are provided, special attention shall be given to oil pollution prevention requirements.

3 The location of the controls of any valve serving a sea inlet, a discharge below the water-line or a bilge injection system shall be so sited as to allow adequate time for operation in case of influx of water to the space, having regard to the time likely to be required in order to reach and operate such controls. If the level to which the space could become flooded with the ship in the fully loaded condition so requires, arrangements shall be made to operate the controls from a position above such level.

Regulation 49

Control of propulsion machinery from the navigating bridge

1 Under all sailing conditions, including manoeuvring, the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the navigating bridge.

1.1 Such remote control shall be performed by a single control device for each independent propeller, with automatic performance of all associated services, including, where necessary, means of preventing overload of the propulsion machinery.

1.2 The main propulsion machinery shall be provided with an emergency stopping device on the navigating bridge which shall be independent of the navigating bridge control system.

2 Propulsion machinery orders from the navigating bridge shall be indicated in the main machinery control room or at the propulsion machinery control position as appropriate.

3 Remote control of the propulsion machinery shall be possible only from one location at a time; at such locations interconnected control positions are permitted. At each location there shall be an indicator showing which location is in control of the propulsion machinery. The transfer of control between the navigating bridge and machinery spaces shall be possible only in

the machinery space or in the machinery control room. The system shall include means to prevent the propelling thrust from altering significantly when transferring control from one location to another.

4 It shall be possible for all machinery essential for the safe operation of the ship to be controlled from a local position, even in the case of failure in any part of the automatic or remote control systems.

5 The design of the remote automatic control system shall be such that in case of its failure an alarm will be given. Unless the Administration considers it impracticable, the preset speed and direction of thrust shall be maintained until local control is in operation.

6 Indicators shall be fitted on the navigating bridge for:

- .1 propeller speed and direction of rotation in case of fixed pitch propellers; or
- .2 propeller speed and pitch position in case of controllable pitch propellers.

7 The number of consecutive automatic attempts which fail to produce a start shall be limited to safeguard sufficient starting air pressure. An alarm shall be provided to indicate low starting air pressure set at a level which still permits starting operations of the propulsion machinery.

Regulation 50

Communication

A reliable means of vocal communication shall be provided between the main machinery control room or the propulsion machinery control position as appropriate, the navigating bridge and the engineer officers' accommodation.

Regulation 51

Alarm system

1 An alarm system shall be provided indicating any fault requiring attention and shall:

- .1 be capable of sounding an audible alarm in the main machinery control room or at the propulsion machinery control position, and indicate visually each separate alarm function at a suitable position;
- .2 have a connexion to the engineers' public rooms and to each of the engineers' cabins through a selector switch, to ensure connexion to at least one of those cabins. Administrations may permit equivalent arrangements;
- .3 activate an audible and visual alarm on the navigating bridge for any situation which requires action by or attention of the officer on watch;

- .4 as far as is practicable be designed on the fail-to-safety principle; and
- .5 activate the engineers' alarm required by Regulation 38 if an alarm function has not received attention locally within a limited time.

2.1 The alarm system shall be continuously powered and shall have an automatic change-over to a stand-by power supply in case of loss of normal power supply.

2.2 Failure of the normal power supply of the alarm system shall be indicated by an alarm.

3.1 The alarm system shall be able to indicate at the same time more than one fault and the acceptance of any alarm shall not inhibit another alarm.

3.2 Acceptance at the position referred to in paragraph 1 of any alarm condition shall be indicated at the positions where it was shown. Alarms shall be maintained until they are accepted and the visual indications of individual alarms shall remain until the fault has been corrected, when the alarm system shall automatically reset to the normal operating condition.

Regulation 52

Safety systems

A safety system shall be provided to ensure that serious malfunction in machinery or boiler operations, which presents an immediate danger, shall initiate the automatic shut-down of that part of the plant and that an alarm shall be given. Shut-down of the propulsion system shall not be automatically activated except in cases which could lead to serious damage, complete breakdown, or explosion. Where arrangements for overriding the shut-down of the main propelling machinery are fitted, these shall be such as to preclude inadvertent operation. Visual means shall be provided to indicate when the override has been activated.

Regulation 53

Special requirements for machinery, boiler and electrical installations

1 The special requirements for the machinery, boiler and electrical installations shall be to the satisfaction of the Administration and shall include at least the requirements of this Regulation.

2 The main source of electrical power shall comply with the following:

2.1 Where the electrical power can normally be supplied by one generator, suitable load shedding arrangements shall be provided to ensure the integrity of supplies to services required for propulsion and steering as well as the safety of the ship. In the case of loss of the generator in operation, adequate provision shall be made for automatic starting and connecting to the main

switchboard of a stand-by generator of sufficient capacity to permit propulsion and steering and to ensure the safety of the ship with automatic re-starting of the essential auxiliaries including, where necessary, sequential operations. The Administration may dispense with this requirement for a ship of less than 1,600 tons gross tonnage, if it is considered impracticable.

2.2 If the electrical power is normally supplied by more than one generator simultaneously in parallel operation, provision shall be made, for instance by load shedding, to ensure that, in case of loss of one of these generating sets, the remaining ones are kept in operation without overload to permit propulsion and steering, and to ensure the safety of the ship.

3 Where stand-by machines are required for other auxiliary machinery essential to propulsion, automatic change-over devices shall be provided.

4 *Automatic control and alarm system*

4.1 The control system shall be such that the services needed for the operation of the main propulsion machinery and its auxiliaries are ensured through the necessary automatic arrangements.

4.2 An alarm shall be given on the automatic change-over.

4.3 An alarm system complying with Regulation 51 shall be provided for all important pressures, temperatures and fluid levels and other essential parameters.

4.4 A centralized control position shall be arranged with the necessary alarm panels and instrumentation indicating any alarm.

5 Means shall be provided to keep the starting air pressure at the required level where internal combustion engines are used for main propulsion.

Regulation 54

Special consideration in respect of passenger ships

Passenger ships shall be specially considered by the Administration as to whether or not their machinery spaces may be periodically unattended and if so whether additional requirements to those stipulated in these Regulations are necessary to achieve equivalent safety to that of normally attended machinery spaces.

CHAPTER II-2

CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

The existing text of Chapter II-2 is replaced by the following:

PART A – GENERAL

Regulation 1

Application

1.1 Unless expressly provided otherwise, this Chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 September 1984.

1.2 For the purpose of this Chapter the term “a similar stage of construction” means the stage at which:

- .1 construction identifiable with a specific ship begins; and
- .2 assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is less.

1.3 For the purpose of this Chapter:

- .1 the expression “ships constructed” means “ships the keels of which are laid or which are at a similar stage of construction”;
- .2 the expression “all ships” means “ships constructed before, on or after 1 September 1984”;
- .3 a cargo ship, whenever built, which is converted to a passenger ship shall be treated as a passenger ship constructed on the date on which such a conversion commences.

2 Unless expressly provided otherwise:

- .1 for ships constructed before 1 September 1984, the Administration shall ensure that, subject to the provisions of paragraph 2.2, the requirements which are applicable under Chapter II-2 of the International Convention for the Safety of Life at Sea, 1974* to new or existing ships as defined in that Chapter are complied with;
- .2 for tankers constructed before 1 September 1984, the Administration shall ensure that the requirements which are applicable under

* The text as adopted by the International Conference on Safety of Life at Sea, 1974.

Chapter II-2 of the Annex to the Protocol of 1978 relating to the International Convention for the Safety of Life at Sea, 1974, to new or existing ships as defined in that Chapter are complied with.

3 All ships which undergo repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to these ships. Such ships, if constructed before 1 September 1984 shall, as a rule, comply with the requirements for ships constructed on or after that date to at least the same extent as they did before undergoing such repairs, alterations, modifications or outfitting. Repairs, alterations and modifications of a major character and outfitting related thereto shall meet the requirements for ships constructed on or after 1 September 1984 in so far as the Administration deems reasonable and practicable.

4.1 The Administration of a State may, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of this Chapter unreasonable or unnecessary, exempt from those requirements individual ships or classes of ships entitled to fly the flag of that State which, in the course of their voyage, do not proceed more than 20 miles from the nearest land.

4.2 In the case of passenger ships which are employed in special trades for the carriage of large numbers of special trade passengers, such as the pilgrim trade, the Administration of the State whose flag such ships are entitled to fly, if satisfied that it is impracticable to enforce compliance with the requirements of this Chapter, may exempt such ships from those requirements, provided that they comply fully with provisions of:

- .1 the Rules annexed to the Special Trade Passenger Ships Agreement, 1971; and
- .2 the Rules annexed to the Protocol on Space Requirements for Special Trade Passenger Ships, 1973.

Regulation 2

Basic principles

1 The purpose of this Chapter is to require the fullest practicable degree of fire protection, fire detection and fire extinction in ships.

2 The following basic principles underlie the Regulations in this Chapter and are embodied in the Regulations as appropriate, having regard to the type of ships and the potential fire hazard involved:

- .1 division of ship into main vertical zones by thermal and structural boundaries;
- .2 separation of accommodation spaces from the remainder of the ship by thermal and structural boundaries;

- .3 restricted use of combustible materials;
- .4 detection of any fire in the zone of origin;
- .5 containment and extinction of any fire in the space of origin;
- .6 protection of means of escape or access for fire fighting;
- .7 ready availability of fire-extinguishing appliances;
- .8 minimization of possibility of ignition of flammable cargo vapour.

Regulation 3

Definitions

For the purpose of this Chapter, unless expressly provided otherwise:

1 "Non-combustible material" is a material which neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750°C, this being determined to the satisfaction of the Administration by an established test procedure.* Any other material is a combustible material.

2 "A standard fire test" is one in which specimens of the relevant bulkheads or decks are exposed in a test furnace to temperatures corresponding approximately to the standard time-temperature curve. The specimen shall have an exposed surface of not less than 4.65 m² and height (or length of deck) of 2.44 m, resembling as closely as possible the intended construction and including where appropriate at least one joint. The standard time-temperature curve is defined by a smooth curve drawn through the following temperature points measured above the initial furnace temperature:

at the end of the first	5 minutes	556°C
" " " " " "	10 minutes	659°C
" " " " " "	15 minutes	718°C
" " " " " "	30 minutes	821°C
" " " " " "	60 minutes	925°C

3 "'A' class divisions" are those divisions formed by bulkheads and decks which comply with the following:

- .1 they shall be constructed of steel or other equivalent material;
- .2 they shall be suitably stiffened;
- .3 they shall be so constructed as to be capable of preventing the passage of smoke and flame to the end of the one-hour standard fire test;

* Reference is made to Improved Recommendation on Test Method for Qualifying Marine Construction Materials as Non-Combustible, adopted by the Organization by resolution A.472(XII)

- .4 they shall be insulated with approved non-combustible materials such that the average temperature of the unexposed side will not rise more than 139°C above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180°C above the original temperature, within the time listed below:

class "A-60"	60 minutes
class "A-30"	30 minutes
class "A-15"	15 minutes
class "A-0"	0 minutes

- .5 the Administration may require a test of a prototype bulkhead or deck to ensure that it meets the above requirements for integrity and temperature rise.*

4 "B" class divisions" are those divisions formed by bulkheads, decks, ceilings or linings which comply with the following:

- .1 they shall be so constructed as to be capable of preventing the passage of flame to the end of the first half hour of the standard fire test;
- .2 they shall have an insulation value such that the average temperature of the unexposed side will not rise more than 139°C above the original temperature, nor will the temperature at any one point, including any joint, rise more than 225°C above the original temperature, within the time listed below:

class "B-15"	15 minutes
class "B-0"	0 minutes

- .3 they shall be constructed of approved non-combustible materials and all materials entering into the construction and erection of "B" class divisions shall be non-combustible, with the exception that combustible veneers may be permitted provided they meet other requirements of this Chapter;
- .4 the Administration may require a test of a prototype division to ensure that it meets the above requirements for integrity and temperature rise.*

5 "C" class divisions" are divisions constructed of approved non-combustible materials. They need meet neither requirements relative to the passage of smoke and flame nor limitations relative to the temperature rise. Combustible veneers are permitted provided they meet other requirements of this Chapter.

6 "Continuous 'B' class ceilings or linings" are those "B" class ceilings or linings which terminate only at an "A" or "B" class division.

7 "Steel or other equivalent material". Where the words "steel or other equivalent material" occur, "equivalent material" means any non-

* Reference is made to Recommendation for Fire Test Procedures for "A" and "B" Class Divisions, adopted by the Organization by resolutions A.163(ES.IV) and A.215(VII).

combustible material which, by itself or due to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable exposure to the standard fire test (e.g. aluminium alloy with appropriate insulation).

8 "Low flame spread" means that the surface thus described will adequately restrict the spread of flame, this being determined to the satisfaction of the Administration by an established test procedure.

9 "Main vertical zones" are those sections into which the hull, superstructure, and deckhouses are divided by "A" class divisions, the mean length of which on any deck does not in general exceed 40 m.

10 "Accommodation spaces" are those spaces used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, games and hobbies rooms, barber shops, pantries containing no cooking appliances and similar spaces.

11 "Public spaces" are those portions of the accommodation which are used for halls, dining rooms, lounges and similar permanently enclosed spaces.

12 "Service spaces" are those spaces used for galleys, pantries containing cooking appliances, lockers, main and specie rooms, store-rooms, workshops other than those forming part of the machinery spaces, and similar spaces and trunks to such spaces.

13 "Cargo spaces" are all spaces used for cargo (including cargo oil tanks) and trunks to such spaces.

14 "Ro/ro cargo spaces" are spaces not normally subdivided in any way and extending to either a substantial length or the entire length of the ship in which goods (packaged or in bulk, in or on rail or road cars, vehicles (including road or rail tankers), trailers, containers, pallets, demountable tanks or in or on similar stowage units or other receptacles) can be loaded and unloaded normally in a horizontal direction.

15 "Open ro/ro cargo spaces" are ro/ro cargo spaces either open at both ends, or open at one end and provided with adequate natural ventilation effective over their entire length through permanent openings in the side plating or deckhead to the satisfaction of the Administration.

16 "Closed ro/ro cargo spaces" are ro/ro cargo spaces which are neither open ro/ro cargo spaces nor weather decks.

17 "Weather deck" is a deck which is completely exposed to the weather from above and from at least two sides.

18 "Special category spaces" are those enclosed spaces above or below the bulkhead deck intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion, into and from which such vehicles can be driven and to which passengers have access.

19 "Machinery spaces of category A" are those spaces and trunks to such

spaces which contain.

- .1 internal combustion machinery used for main propulsion; or
- .2 internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW; or
- .3 any oil-fired boiler or oil fuel unit.

20 "Machinery spaces" are all machinery spaces of category A and all other spaces containing propulsion machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces.

21 "Oil fuel unit" is the equipment used for the preparation of oil fuel for delivery to an oil-fired boiler, or equipment used for the preparation for delivery of heated oil to an internal combustion engine, and includes any oil pressure pumps, filters and heaters dealing with oil at a pressure of more than 0.18 N/mm².

22 "Control stations" are those spaces in which the ship's radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralized.

23 "Rooms containing furniture and furnishings of restricted fire risk" are, for the purpose of Regulation 26, those rooms containing furniture and furnishings of restricted fire risk (whether cabins, public spaces, offices or other types of accommodation) in which:

- .1 all case furniture such as desks, wardrobes, dressing tables, bureaux, dressers, is constructed entirely of approved non-combustible materials, except that a combustible veneer not exceeding 2 mm may be used on the working surface of such articles;
- .2 all free-standing furniture such as chairs, sofas, tables, is constructed with frames of non-combustible materials;
- .3 all draperies, curtains and other suspended textile materials have, to the satisfaction of the Administration, qualities of resistance to the propagation of flame not inferior to those of wool of mass 0.8 kg/m²;
- .4 all floor coverings have, to the satisfaction of the Administration, qualities of resistance to the propagation of flame not inferior to those of an equivalent woollen material used for the same purpose;
- .5 all exposed surfaces of bulkheads, linings and ceilings have low flame-spread characteristics; and

* Reference is made to Recommendation on Test Method for Determining the Resistance to Flame of Vertically Supported Textiles and Films, adopted by the Organization by resolution A.471(XII).

.6 all upholstered furniture has qualities of resistance to the ignition and propagation of flame to the satisfaction of the Administration.

24 "Bulkhead deck" is the uppermost deck up to which the transverse watertight bulkheads are carried.

25 "Deadweight" is the difference in tonnes between the displacement of a ship in water of a specific gravity of 1.025 at the load water-line corresponding to the assigned summer freeboard and the lightweight of the ship.

26 "Lightweight" is the displacement of a ship in tonnes without cargo, fuel, lubricating oil, ballast water, fresh water and feedwater in tanks, consumable stores, and passengers and crew and their effects.

27 "Combination carrier" is a tanker designed to carry oil or alternatively solid cargoes in bulk.

28 "Crude oil" is any oil occurring naturally in the earth whether or not treated to render it suitable for transportation and includes:

.1 crude oil from which certain distillate fractions may have been removed; and

.2 crude oil to which certain distillate fractions may have been added.

29 "Dangerous goods" are those goods referred to in Regulation VII/2.

30 "Chemical tanker" is a tanker constructed or adapted and used for the carriage in bulk of any liquid product of a flammable nature listed in the summary of minimum requirements of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk to be adopted by the Maritime Safety Committee under the authority of the Assembly of the Organization conferred by resolution A.490(XII), hereinafter referred to as "Bulk Chemical Code", as may be amended by the Organization.

31 "Gas carrier" is a tanker constructed or adapted and used for the carriage in bulk of any liquefied gas or certain other substances of a flammable nature listed in Chapter XIX of the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Organization by resolution A.328(IX), hereinafter referred to as "Gas Carrier Code", as has been or may be amended by the Organization.

Regulation 4

Fire pumps, fire mains, hydrants and hoses

1 Every ship shall be provided with fire pumps, fire mains, hydrants and hoses complying as applicable with the requirements of this Regulation.

2 *Capacity of fire pumps*

2.1 The required fire pumps shall be capable of delivering for fire-fighting

purposes a quantity of water, at the pressure specified in paragraph 4, as follows:

- .1 pumps in passenger ships, not less than two-thirds of the quantity required to be dealt with by the bilge pumps when employed for bilge pumping; and
- .2 pumps in cargo ships, other than any emergency pump, not less than four-thirds of the quantity required under Regulation II-1/21 to be dealt with by each of the independent bilge pumps in a passenger ship of the same dimension when employed in bilge pumping, provided that in no cargo ship need the total required capacity of the fire pumps exceed 180 m³/hour.

2.2 Each of the required fire pumps (other than any emergency pump required in paragraph 3.3.2 for cargo ships) shall have a capacity not less than 80 per cent of the total required capacity divided by the minimum number of required fire pumps but in any case not less than 25 m³/hour and each such pump shall in any event be capable of delivering at least the two required jets of water. These fire pumps shall be capable of supplying the fire main system under the required conditions. Where more pumps than the minimum of required pumps are installed the capacity of such additional pumps shall be to the satisfaction of the Administration.

3 *Arrangements of fire pumps and of fire mains*

3.1 Ships shall be provided with independently driven fire pumps as follows:

- .1 Passenger ships of 4,000 tons gross tonnage and upwards at least three
- .2 Passenger ships of less than 4,000 tons gross tonnage and cargo ships of 1,000 tons gross tonnage and upwards at least two
- .3 Cargo ships of less than 1,000 tons gross tonnage to the satisfaction of the Administration

3.2 Sanitary, ballast, bilge or general service pumps may be accepted as fire pumps, provided that they are not normally used for pumping oil and that if they are subject to occasional duty for the transfer or pumping of oil fuel, suitable change-over arrangements are fitted.

3.3 The arrangement of sea connexions, fire pumps and their sources of power shall be such as to ensure that:

- .1 In passenger ships of 1,000 tons gross tonnage and upwards, in the event of a fire in any one compartment all the fire pumps will not be put out of action.
- .2 In cargo ships of 2,000 tons gross tonnage and upwards if a fire in any one compartment could put all the pumps out of action there shall be an alternative means consisting of a fixed independently driven emergency pump which shall be capable of supplying two jets

of water to the satisfaction of the Administration. The pump and its location shall comply with the following requirements:

- .2.1 The capacity of the pump shall not be less than 40 per cent of the total capacity of the fire pumps required by this Regulation and in any case not less than 25 m³/hour.
- .2.2 When the pump is delivering the quantity of water required by paragraph 3.3.2.1 the pressure at any hydrant shall be not less than the minimum pressures given in paragraph 4.2.
- .2.3 Any diesel driven power source for the pump shall be capable of being readily started in its cold condition down to a temperature of 0°C by hand (manual) cranking. If this is impracticable, or if lower temperatures are likely to be encountered, consideration is to be given to the provision and maintenance of heating arrangements, acceptable to the Administration, so that ready starting will be assured. If hand (manual) starting is impracticable the Administration may permit other means of starting. These means shall be such as to enable the diesel driven power source to be started at least 6 times within a period of 30 minutes, and at least twice within the first 10 minutes.
- .2.4 Any service fuel tank shall contain sufficient fuel to enable the pump to run on full load for at least three hours and sufficient reserves of fuel shall be available outside the main machinery space to enable the pump to be run on full load for an additional 15 hours.
- .2.5 The total suction head of the pump shall not exceed 4.5 m under all conditions of list and trim likely to be encountered in service and the suction piping shall be designed to minimize suction losses.
- .2.6 The boundaries of the space containing the fire pump shall be insulated to a standard of structural fire protection equivalent to that required for a control room in Regulation 44.
- .2.7 No direct access shall be permitted between the machinery space and the space containing the emergency fire pump and its source of power. When this is impracticable an Administration may accept an arrangement where the access is by means of an airlock, each of the two doors being self-closing, or through a watertight door capable of being operated from a space remote from the machinery space and the space containing the emergency fire pump and unlikely to be cut off in the event of fire in those spaces. In such cases a second means of access to the space containing the emergency fire pump and its source of power shall be provided.
- .2.8 Ventilation arrangements to the space containing the independent source of power for the emergency fire pump shall be such as to preclude, as far as practicable, the possibility of smoke from a machinery space fire entering or being drawn into that space.
- .3 In passenger ships of less than 1,000 tons gross tonnage and cargo

ships of less than 2,000 tons gross tonnage, if a fire in any one compartment could put all the pumps out of action the alternative means of providing water for fire-fighting purposes are to the satisfaction of the Administration.

- .4 In addition, in cargo ships where other pumps, such as general service, bilge and ballast, etc., are fitted in a machinery space, arrangements shall be made to ensure that at least one of these pumps, having the capacity and pressure required by paragraphs 2.2 and 4.2, is capable of providing water to the fire main.

3.4 The arrangements for the ready availability of water supply shall be:

- .1 in passenger ships of 1,000 tons gross tonnage and upwards such that at least one effective jet of water is immediately available from any hydrant in an interior location and so as to ensure the continuation of the output of water by the automatic starting of a required fire pump;
- .2 in passenger ships of less than 1,000 tons gross tonnage and in cargo ships to the satisfaction of the Administration;
- .3 in cargo ships with a periodically unattended machinery space or when only one person is required on watch there shall be immediate water delivery from the fire main system at a suitable pressure, either by remote starting of one of the main fire pumps with remote starting from the navigating bridge and fire control station, if any, or permanent pressurization of the fire main system by one of the main fire pumps, except that the Administration may waive this requirement for cargo ships of less than 1,600 tons gross tonnage if the arrangement of the machinery space access makes it unnecessary;
- .4 in passenger ships, if fitted with periodically unattended machinery spaces in accordance with Regulation II-1/54, the Administration shall determine provisions for fixed water fire-extinguishing arrangement for such spaces equivalent to those required for normally attended machinery spaces.

3.5 Relief valves shall be provided in conjunction with all fire pumps if the pumps are capable of developing a pressure exceeding the design pressure of the water service pipes, hydrants and hoses. These valves shall be so placed and adjusted as to prevent excessive pressure in any part of the fire main system.

3.6 In tankers isolation valves shall be fitted in the fire main at poop front in a protected position and on the tank deck at intervals of not more than 40 m to preserve the integrity of the fire main system in case of fire or explosion.

4 *Diameter of and pressure in the fire mains*

4.1 The diameter of the fire main and water service pipes shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously, except that in the case of cargo ships the diameter need only be sufficient for the discharge of 140 m³/hour.

4.2 With the two pumps simultaneously delivering through nozzles specified in paragraph 8 the quantity of water specified in paragraph 4.1, through any adjacent hydrants, the following minimum pressures shall be maintained at all hydrants:

Passenger ships:

4,000 tons gross tonnage and upwards	0.31 N/mm ²
1,000 tons gross tonnage and upwards but under 4,000 tons gross tonnage	0.27 N/mm ²
Under 1,000 tons gross tonnage	To the satisfaction of the Administration

Cargo ships:

6,000 tons gross tonnage and upwards	0.27 N/mm ²
1,000 tons gross tonnage and upwards but under 6,000 tons gross tonnage	0.25 N/mm ²
Under 1,000 tons gross tonnage	To the satisfaction of the Administration

4.3 The maximum pressure at any hydrant shall not exceed that at which the effective control of a fire hose can be demonstrated.

5 *Number and position of hydrants*

5.1 The number and position of hydrants shall be such that at least two jets of water not emanating from the same hydrant, one of which shall be from a single length of hose, may reach any part of the ship normally accessible to the passengers or crew while the ship is being navigated and any part of any cargo space when empty, any ro/ro cargo space or any special category space in which latter case the two jets shall reach any part of such space, each from a single length of hose. Furthermore, such hydrants shall be positioned near the accesses to the protected spaces.

5.2 In the accommodation, service and machinery spaces of passenger ships the number and position of hydrants shall be such that the requirements of paragraph 5.1 may be complied with when all watertight doors and all doors in main vertical zone bulkheads are closed.

5.3 Where, in a passenger ship, access is provided to a machinery space of category A at a low level from an adjacent shaft tunnel, two hydrants shall be provided external to, but near the entrance to that machinery space. Where such access is provided from other spaces, in one of those spaces two hydrants shall be provided near the entrance to the machinery space of category A. Such provision need not be made where the tunnel or adjacent spaces are not part of the escape route.

6 *Pipes and hydrants*

6.1 Materials readily rendered ineffective by heat shall not be used for fire

mains and hydrants unless adequately protected. The pipes and hydrants shall be so placed that the fire hoses may be easily coupled to them. The arrangement of pipes and hydrants shall be such as to avoid the possibility of freezing. In ships where deck cargo may be carried, the positions of the hydrants shall be such that they are always readily accessible and the pipes shall be arranged as far as practicable to avoid risk of damage by such cargo. Unless one hose and nozzle is provided for each hydrant in the ship, there shall be complete interchangeability of hose couplings and nozzles.

6.2 A valve shall be fitted to serve each fire hose so that any fire hose may be removed while the fire pumps are at work.

6.3 Isolating valves to separate the section of the fire main within the machinery space containing the main fire pump or pumps from the rest of the fire main shall be fitted in an easily accessible and tenable position outside the machinery spaces. The fire main shall be so arranged that when the isolating valves are shut all the hydrants on the ship, except those in the machinery space referred to above, can be supplied with water by a fire pump not located in this machinery space through pipes which do not enter this space. Exceptionally, the Administration may permit short lengths of the emergency fire pump suction and discharge piping to penetrate the machinery space if it is impracticable to route it externally provided that the integrity of the fire main is maintained by the enclosure of the piping in a substantial steel casing.

7 *Fire hoses*

7.1 Fire hoses shall be of material approved by the Administration and shall be sufficient in length to project a jet of water to any of the spaces in which they may be required to be used. Their maximum length shall be to the satisfaction of the Administration. Each hose shall be provided with a nozzle and the necessary couplings. Hoses specified in this Chapter as "fire hoses" shall together with any necessary fittings and tools be kept ready for use in conspicuous positions near the water service hydrants or connexions. Additionally in interior locations in passenger ships carrying more than 36 passengers fire hoses shall be connected to the hydrants at all times.

7.2 Ships shall be provided with fire hoses the number and diameter of which shall be to the satisfaction of the Administration.

7.3 In passenger ships there shall be at least one fire hose for each of the hydrants required by paragraph 5 and these hoses shall be used only for the purposes of extinguishing fires or testing the fire-extinguishing apparatus at fire drills and surveys.

7.4.1 In cargo ships of 1,000 tons gross tonnage and upwards the number of fire hoses to be provided shall be one for each 30 m length of the ship and one spare but in no case less than five in all. This number does not include any hoses required in any engine or boiler room. The Administration may increase the number of hoses required so as to ensure that hoses in sufficient number are available and accessible at all times, having regard to the type of ship and the nature of trade in which the ship is employed.

7.4.2 In cargo ships of less than 1,000 tons gross tonnage the number of fire hoses to be provided shall be to the satisfaction of the Administration.

8 *Nozzles*

8.1 For the purposes of this Chapter, standard nozzle sizes shall be 12 mm, 16 mm and 19 mm or as near thereto as possible. Larger diameter nozzles may be permitted at the discretion of the Administration.

8.2 For accommodation and service spaces, a nozzle size greater than 12 mm need not be used.

8.3 For machinery spaces and exterior locations, the nozzle size shall be such as to obtain the maximum discharge possible from two jets at the pressure mentioned in paragraph 4 from the smallest pump, provided that a nozzle size greater than 19 mm need not be used.

8.4 All nozzles shall be of an approved dual purpose type (i.e. spray/jet type) incorporating a shut-off.

9 *Location and arrangement of water pumps, etc., for other fire-extinguishing systems*

Pumps required for the provision of water for other fire-extinguishing systems required by this Chapter, their sources of power and their controls shall be installed outside the space or spaces protected by such systems and shall be so arranged that a fire in the space or spaces protected will not put any such system out of action.

Regulation 5

Fixed gas fire-extinguishing systems

1 *General*

1.1 The use of a fire-extinguishing medium which, in the opinion of the Administration, either by itself or under expected conditions of use gives off toxic gases in such quantities as to endanger persons shall not be permitted.

1.2 The necessary pipes for conveying fire-extinguishing medium into protected spaces shall be provided with control valves so marked as to indicate clearly the spaces to which the pipes are led. Suitable provision shall be made to prevent inadvertent admission of the medium to any space. Where a cargo space fitted with a gas fire-extinguishing system is used as a passenger space the gas connexion shall be blanked during such use.

1.3 The piping for the distribution of fire-extinguishing medium shall be arranged and discharge nozzles so positioned that a uniform distribution of medium is obtained.

1.4 Means shall be provided to close all openings which may admit air to or allow gas to escape from a protected space.

1.5 Where the volume of free air contained in air receivers in any space is such that, if released in such space in the event of fire, such release of air

within that space would seriously affect the efficiency of the fixed fire-extinguishing system, the Administration shall require the provision of an additional quantity of fire-extinguishing medium.

1.6 Means shall be provided for automatically giving audible warning of the release of fire-extinguishing medium into any space in which personnel normally work or to which they have access. The alarm shall operate for a suitable period before the medium is released.

1.7 The means of control of any fixed gas fire-extinguishing system shall be readily accessible and simple to operate and shall be grouped together in as few locations as possible at positions not likely to be cut off by a fire in a protected space. At each location there shall be clear instructions relating to the operation of the system having regard to the safety of personnel.

1.8 Automatic release of fire-extinguishing medium shall not be permitted, except as permitted by paragraph 3.3.5 and in respect of local automatically operated units referred to in paragraphs 3.4 and 3.5.

1.9 Where the quantity of extinguishing medium is required to protect more than one space, the quantity of medium available need not be more than the largest quantity required for any one space so protected.

1.10 Except as otherwise permitted by paragraphs 3.3, 3.4 or 3.5 pressure containers required for the storage of fire-extinguishing medium, other than steam, shall be located outside protected spaces in accordance with paragraph 1.13.

1.11 Means shall be provided for the crew to safely check the quantity of medium in the containers.

1.12 Containers for the storage of fire-extinguishing medium and associated pressure components shall be designed to pressure codes of practice to the satisfaction of the Administration having regard to their locations and maximum ambient temperatures expected in service.

1.13 When the fire-extinguishing medium is stored outside a protected space, it shall be stored in a room which shall be situated in a safe and readily accessible position and shall be effectively ventilated to the satisfaction of the Administration. Any entrance to such a storage room shall preferably be from the open deck and in any case shall be independent of the protected space. Access doors shall open outwards, and bulkheads and decks including doors and other means of closing any opening therein, which form the boundaries between such rooms and adjoining enclosed spaces shall be gastight. For the purpose of the application of the integrity tables in Regulations 26, 27, 44 and 58, such storage rooms shall be treated as control stations.

1.14 Spare parts for the system shall be stored on board and be to the satisfaction of the Administration.

2 *Carbon dioxide systems*

2.1 For cargo spaces the quantity of carbon dioxide available shall, unless

otherwise provided, be sufficient to give a minimum volume of free gas equal to 30 per cent of the gross volume of the largest cargo space so protected in the ship.

2.2 For machinery spaces the quantity of carbon dioxide carried shall be sufficient to give a minimum quantity of free gas equal to the larger of the following quantities, either:

- .1 40 per cent of the gross volume of the largest machinery space so protected, the volume to exclude that part of the casing above the level at which the horizontal area of the casing is 40 per cent or less of the horizontal area of the space concerned taken midway between the tank top and the lowest part of the casing; or
- .2 35 per cent of the gross volume of the largest machinery space protected, including the casing;

provided that the above-mentioned percentages may be reduced to 35 per cent and 30 per cent respectively for cargo ships of less than 2,000 tons gross tonnage; provided also that if two or more machinery spaces are not entirely separate they shall be considered as forming one space.

2.3 For the purpose of this paragraph the volume of free carbon dioxide shall be calculated at 0.56 m³/kg.

2.4 For machinery spaces the fixed piping system shall be such that 85 per cent of the gas can be discharged into the space within 2 minutes.

3 *Halogenated hydrocarbon systems*

3.1 The use of halogenated hydrocarbons as fire-extinguishing media is only permitted in machinery spaces, pumprooms and in cargo spaces intended solely for the carriage of vehicles which are not carrying any cargo.

3.2 When halogenated hydrocarbons are used as the fire-extinguishing media in total flooding systems:

- .1 The system shall be arranged for manual initiation of power release only.
- .2 If the charge of halogenated hydrocarbon is required to supply more than one space, the arrangements for its storage and release shall be such that compliance with paragraphs 3.2.9 or 3.2.10 respectively, is obtained.
- .3 Means shall be provided for automatically stopping all ventilation fans serving the protected space before the medium is released.
- .4 Means shall be provided to manually close all dampers in the ventilation system serving a protected space.
- .5 The discharge arrangements shall be so designed that the minimum quantity of medium required for cargo spaces or machinery spaces in paragraphs 3.2.9 or 3.2.10 respectively can be substantially discharged in a nominal 20 seconds or less based on the discharge of

the liquid phase.

- .6 The system shall be designed to operate within a temperature range to the satisfaction of the Administration.
- .7 The discharge shall not endanger personnel engaged on maintenance of equipment or using the normal access ladders and escapes serving the space.
- .8 Means shall be provided for the crew to safely check the pressure within containers.
- .9 The quantity of extinguishing medium for cargo spaces intended solely for the carriage of vehicles which are not carrying any cargo shall be calculated in accordance with table 5.1. This quantity shall be based on the gross volume of the protected space. In respect of Halon 1301 and 1211, the quantity shall be calculated on a volumetric ratio basis, and in respect of Halon 2402 on a mass per unit volume basis.

TABLE 5.1

Halon	Minimum	Maximum
1301	5 per cent	7 per cent
1211	5 per cent	5.5 per cent
2402	0.23 kg/m ³	0.30 kg/m ³

- .10 The quantity of extinguishing media for machinery spaces shall be calculated in accordance with table 5.2. This quantity shall be based on the gross volume of the space in respect of the minimum concentration and the net volume of the space in respect of the maximum concentration, including the casing. In respect of Halon 1301 and 1211, the quantity shall be calculated on a volumetric ratio basis, and in respect of Halon 2402 on a mass per unit volume basis.

TABLE 5.2

Halon	Minimum	Maximum
1301	4.25 per cent	7 per cent
1211	4.25 per cent	5.5 per cent
2402	0.20 kg/m ³	0.30 kg/m ³

- .11 For the purpose of paragraphs 3.2.9 and 3.2.10, the volume of Halon 1301 shall be calculated at 0.16 m³/kg and the volume of Halon 1211 shall be calculated at 0.14 m³/kg.

3.3 Only Halon 1301 may be stored within a protected machinery space. Containers shall be individually distributed throughout that space and the following requirements shall be complied with:

- .1 A manually initiated power release, located outside the protected space, shall be provided. Duplicate sources of power shall be provided for this release and shall be located outside the protected space and be immediately available except that for machinery spaces, one of the sources of power may be located inside the protected space.
- .2 Electric power circuits connecting the containers shall be monitored for fault conditions and loss of power. Visual and audible alarms shall be provided to indicate this.
- .3 Pneumatic or hydraulic power circuits connecting the containers shall be duplicated. The sources of pneumatic or hydraulic pressure shall be monitored for loss of pressure. Visual and audible alarms shall be provided to indicate this.
- .4 Within the protected space, electrical circuits essential for the release of the system shall be heat resistant e.g. mineral insulated cable or equivalent. Piping systems essential for the release of systems designed to be operated hydraulically or pneumatically shall be of steel or other equivalent heat-resisting material to the satisfaction of the Administration.
- .5 Each pressure container shall be fitted with an automatic over-pressure release device which, in the event of the container being exposed to the effects of fire and the system not being operated, will safely vent the contents of the container into the protected space.
- .6 The arrangement of containers and the electrical circuits and piping essential for the release of any system shall be such that in the event of damage to any one power release line through fire or explosion in a protected space, i.e. a single fault concept, at least two-thirds of the fire-extinguishing charge required by paragraphs 3.2.9 or 3.2.10 for that space can still be discharged having regard to the requirement for uniform distribution of medium throughout the space. The arrangements in respect of systems for spaces requiring only one or two containers shall be to the satisfaction of the Administration.
- .7 Not more than two discharge nozzles shall be fitted to any pressure container and the maximum quantity of agent in each container shall be to the satisfaction of the Administration having regard to the requirement for uniform distribution of medium throughout the space.
- .8 The containers shall be monitored for decrease in pressure due to leakage and discharge. Visual and audible alarms in the protected area and on the navigating bridge or in the space where the fire control equipment is centralized shall be provided to indicate this condition, except that for cargo spaces, alarms are only required on the navigating bridge or the space where the fire control equipment is centralized.

3.4 Local automatically operated fixed fire-extinguishing units containing Halon 1301 or 1211, fitted in enclosed areas of high fire risk within machinery

spaces, in addition to, and independent of, any required fixed fire-extinguishing system may be accepted subject to compliance with the following:

- .1 The space in which such additional local protection is provided shall preferably be on one working level and on the same level as the access. At the discretion of the Administration more than one working level may be permitted subject to an access being provided on each level.
- .2 The size of the space and arrangements of accesses thereto and machinery therein, shall be such that escape from anywhere in the space can be effected in not more than 10 seconds.
- .3 The operation of any unit shall be signalled both visually and audibly outside each access to the machinery space and at the navigating bridge or in the space where the fire control equipment is centralized.
- .4 A notice indicating that the space contains one or more automatically operated fire-extinguishing units and stating which medium is used, shall be displayed outside each access thereto.
- .5 Discharge nozzles shall be so positioned that the discharge does not endanger personnel using the normal access ladders and escapes serving the compartment. Provision shall also be made to protect personnel engaged in maintenance of machinery from inadvertent discharge of the medium.
- .6 The fire-extinguishing units shall be designed to operate within a temperature range to the satisfaction of the Administration.
- .7 Means shall be provided for the crew to safely check the pressure within the containers.
- .8 The total quantity of extinguishing medium provided in the local automatically operated units shall be such that a concentration of 7 per cent in respect of Halon 1301 and 5.5 per cent in respect of Halon 1211 at 20°C based on the net volume of the enclosed space is not exceeded. This requirement applies when either a local automatically operated unit or a fixed system fitted in compliance with paragraph 3.2 has operated, but not when both have operated. The volume of Halon 1301 shall be calculated at 0.16 m³/kg and the volume of Halon 1211 shall be calculated at 0.14 m³/kg.
- .9 The time of discharge of a unit, based on the discharge of the liquid phase, shall be 10 seconds or less.
- .10 The arrangement of local automatically operated fire-extinguishing units shall be such that their release does not result in loss of electrical power or reduction of the manoeuvrability of the ship.

3.5 Automatically operated fire-extinguishing units, as described in paragraph 3.4, fitted in machinery spaces over equipment having a high fire risk, in addition to and independent of any required fixed fire-extinguishing system, may be accepted subject to compliance with paragraphs 3.4.3 to

3.4.6, 3.4.9 and 3.4.10 and with the following:

- 1 The quantity of medium provided in local automatically operated units shall be such that a vapour in air concentration not greater than 1.25 per cent at 20°C based on the gross volume of the machinery space is obtained in the event of their simultaneous operation.
- 2 The volume of Halon 1301 shall be calculated at 0.16 m³/kg and the volume of Halon 1211 shall be calculated at 0.14 m³/kg.

4 *Steam systems*

In general, the Administration shall not permit the use of steam as a fire-extinguishing medium in fixed fire-extinguishing systems. Where the use of steam is permitted by the Administration it shall be used only in restricted areas as an addition to the required fire-extinguishing medium and with the proviso that the boiler or boilers available for supplying steam shall have an evaporation of at least 1.0 kg of steam per hour for each 0.75 m³ of the gross volume of the largest space so protected. In addition to complying with the foregoing requirements the systems in all respects shall be as determined by, and to the satisfaction of, the Administration.

5 *Other gas systems*

5.1 Where gas other than carbon dioxide or halogenated hydrocarbons, or steam as permitted by paragraph 4 is produced on the ship and is used as a fire-extinguishing medium, it shall be a gaseous product of fuel combustion in which the oxygen content, the carbon monoxide content, the corrosive elements and any solid combustible elements have been reduced to a permissible minimum.

5.2 Where such gas is used as the fire-extinguishing medium in a fixed fire-extinguishing system for the protection of machinery spaces it shall afford protection equivalent to that provided by a fixed system using carbon dioxide as the medium.

5.3 Where such gas is used as a fire-extinguishing medium in a fixed fire-extinguishing system for the protection of cargo spaces, a sufficient quantity of such gas shall be available to supply hourly a volume of free gas at least equal to 25 per cent of the gross volume of the largest space protected in this way for a period of 72 hours.

Regulation 6

Fire extinguishers

1 All fire extinguishers shall be of approved types and designs.

1.1 The capacity of required portable fluid extinguishers shall be not more than 13.5 ℓ and not less than 9 ℓ. Other extinguishers shall be at least as portable as the 13.5 ℓ fluid extinguisher and shall have a fire-extinguishing capability at least equivalent to that of a 9 ℓ fluid extinguisher.

1.2 The Administration shall determine the equivalents of fire extinguishers.

2 Spare charges shall be provided in accordance with requirements to be specified by the Administration.

3 Fire extinguishers containing an extinguishing medium which, in the opinion of the Administration, either by itself or under expected conditions of use gives off toxic gases in such quantities as to endanger persons shall not be permitted.

4 A portable foam applicator unit shall consist of an air-foam nozzle of an inductor type capable of being connected to the fire main by a fire hose, together with a portable tank containing at least 20 ℓ of foam-making liquid and one spare tank. The nozzle shall be capable of producing effective foam suitable for extinguishing an oil fire, at the rate of at least 1.5 m³/minute.

5 Fire extinguishers shall be periodically examined and subjected to such tests as the Administration may require.

6 One of the portable fire extinguishers intended for use in any space shall be stowed near the entrance to that space.

7 Accommodation spaces, service spaces and control stations shall be provided with portable fire extinguishers of appropriate types and in sufficient number to the satisfaction of the Administration. Ships of 1,000 tons gross tonnage and upwards shall carry at least five portable fire extinguishers.

Regulation 7

Fire-extinguishing arrangements in machinery spaces

1 Spaces containing oil-fired boilers or oil fuel units

1.1 Machinery spaces of category A containing oil-fired boilers or oil fuel units shall be provided with any one of the following fixed fire-extinguishing systems:

- .1 a gas system complying with the provisions of Regulation 5;
- .2 a high expansion foam system complying with the provisions of Regulation 9;
- .3 a pressure water-spraying system complying with the provisions of Regulation 10.

In each case if the engine and boiler rooms are not entirely separate, or if fuel oil can drain from the boiler room into the engine room, the combined engine and boiler rooms shall be considered as one compartment.

1.2 There shall be in each boiler room at least one set of portable air-foam equipment complying with the provisions of Regulation 6.4.

1.3 There shall be at least two portable foam extinguishers or equivalent in each firing space in each boiler room and in each space in which a part of the oil fuel installation is situated. There shall be not less than one approved foam-type extinguisher of at least 135 ℓ capacity or equivalent in each boiler room. These extinguishers shall be provided with hoses on reels suitable for reaching any part of the boiler room. In the case of domestic boilers of less than 175 kW in cargo ships the Administration may consider relaxing the requirements of this paragraph.

1.4 In each firing space there shall be a receptacle containing sand, sawdust impregnated with soda, or other approved dry material in such quantity as may be required by the Administration. An approved portable extinguisher may be substituted as an alternative.

2 *Spaces containing internal combustion machinery*

Machinery spaces of category A containing internal combustion machinery shall be provided with:

- .1 One of the fire-extinguishing systems required by paragraph 1.1.
- .2 At least one set of portable air-foam equipment complying with the provisions of Regulation 6.4.
- .3 In each such space approved foam type fire extinguishers, each of at least 45 ℓ capacity or equivalent, sufficient in number to enable foam or its equivalent to be directed on to any part of the fuel and lubricating oil pressure systems, gearing and other fire hazards. In addition, there shall be provided a sufficient number of portable foam extinguishers or equivalent which shall be so located that no point in the space is more than 10 m walking distance from an extinguisher and that there are at least two such extinguishers in each such space. For smaller spaces of cargo ships the Administration may consider relaxing this requirement.

3 *Spaces containing steam turbines or enclosed steam engines*

In spaces containing steam turbines or enclosed steam engines used either for main propulsion or for other purposes when such machinery has in the aggregate a total power output of not less than 375 kW there shall be provided:

- .1 Approved foam fire extinguishers each of at least 45 ℓ capacity or equivalent sufficient in number to enable foam or its equivalent to be directed on to any part of the pressure lubrication system, on to any part of the casings enclosing pressure lubricated parts of the turbines, engines or associated gearing, and any other fire hazards. However, such extinguishers shall not be required if protection at least equivalent to that required by this sub-paragraph is provided in such spaces by a fixed fire-extinguishing system fitted in compliance with paragraph 1.1.
- .2 A sufficient number of portable foam extinguishers or equivalent which shall be so located that no point in the space is more than 10 m walking distance from an extinguisher and that there are at

least two such extinguishers in each such space, except that such extinguishers shall not be required in addition to any provided in compliance with paragraph 1.3.

- .3 One of the fire-extinguishing systems required by paragraph 1.1, where such spaces are periodically unattended.

4 *Fire-extinguishing appliances in other machinery spaces*

Where, in the opinion of the Administration, a fire hazard exists in any machinery space for which no specific provisions for fire-extinguishing appliances are prescribed in paragraphs 1, 2 and 3, there shall be provided in, or adjacent to, that space such a number of approved portable fire extinguishers or other means of fire extinction as the Administration may deem sufficient.

5 *Fixed fire-extinguishing systems not required by this Chapter*

Where a fixed fire-extinguishing system not required by this Chapter is installed, such a system shall be to the satisfaction of the Administration.

6 *Machinery spaces of category A in passenger ships*

In passenger ships carrying more than 36 passengers each machinery space of category A shall be provided with at least two suitable water fog applicators.*

Regulation 8

Fixed low-expansion foam fire-extinguishing systems in machinery spaces

1 Where in any machinery space a fixed low-expansion foam fire-extinguishing system is fitted in addition to the requirements of Regulation 7, such system shall be capable of discharging through fixed discharge outlets in not more than five minutes a quantity of foam sufficient to cover to a depth of 150 mm the largest single area over which oil fuel is liable to spread. The system shall be capable of generating foam suitable for extinguishing oil fires. Means shall be provided for effective distribution of the foam through a permanent system of piping and control valves or cocks to suitable discharge outlets, and for the foam to be effectively directed by fixed sprayers on other main fire hazards in the protected space. The expansion ratio of the foam shall not exceed 12 to 1.

2 The means of control of any such systems shall be readily accessible and simple to operate and shall be grouped together in as few locations as possible at positions not likely to be cut off by a fire in the protected space.

* A water fog applicator might consist of a metal "L"-shaped pipe, the long limb being about 2 m in length capable of being fitted to a fire hose and the short limb being about 250 mm in length fitted with a fixed water fog nozzle or capable of being fitted with a water spray nozzle.

Regulation 9

Fixed high-expansion foam fire-extinguishing systems in machinery spaces

1.1 Any required fixed high-expansion foam system in machinery spaces shall be capable of rapidly discharging through fixed discharge outlets a quantity of foam sufficient to fill the greatest space to be protected at a rate of at least 1 m in depth per minute. The quantity of foam-forming liquid available shall be sufficient to produce a volume of foam equal to five times the volume of the largest space to be protected. The expansion ratio of the foam shall not exceed 1,000 to 1.

1.2 The Administration may permit alternative arrangements and discharge rates provided that it is satisfied that equivalent protection is achieved.

2 Supply ducts for delivering foam, air intakes to the foam generator and the number of foam-producing units shall in the opinion of the Administration be such as will provide effective foam production and distribution.

3 The arrangement of the foam generator delivery ducting shall be such that a fire in the protected space will not affect the foam generating equipment.

4 The foam generator, its sources of power supply, foam-forming liquid and means of controlling the system shall be readily accessible and simple to operate and shall be grouped in as few locations as possible at positions not likely to be cut off by a fire in the protected space.

Regulation 10

Fixed pressure water-spraying fire-extinguishing systems in machinery spaces

1 Any required fixed pressure water-spraying fire-extinguishing system in machinery spaces shall be provided with spraying nozzles of an approved type.

2 The number and arrangement of the nozzles shall be to the satisfaction of the Administration and shall be such as to ensure an effective average distribution of water of at least 5 ℓ/m² per minute in the spaces to be protected. Where increased application rates are considered necessary, these shall be to the satisfaction of the Administration. Nozzles shall be fitted above bilges, tank tops and other areas over which oil fuel is liable to spread and also above other specific fire hazards in the machinery spaces.

3 The system may be divided into sections, the distribution valves of which shall be operated from easily accessible positions outside the spaces to be protected and will not be readily cut off by a fire in the protected space.

4 The system shall be kept charged at the necessary pressure and the pump supplying the water for the system shall be put automatically into action

by a pressure drop in the system.

5 The pump shall be capable of simultaneously supplying at the necessary pressure all sections of the system in any one compartment to be protected. The pump and its controls shall be installed outside the space or spaces to be protected. It shall not be possible for a fire in the space or spaces protected by the water-spraying system to put the system out of action.

6 The pump may be driven by independent internal combustion machinery but, if it is dependent upon power being supplied from the emergency generator fitted in compliance with the provisions of Regulation II-1/44 or Regulation II-1/45, as appropriate, that generator shall be so arranged as to start automatically in case of main power failure so that power for the pump required by paragraph 5 is immediately available. When the pump is driven by independent internal combustion machinery it shall be so situated that a fire in the protected space will not affect the air supply to the machinery.

7 Precautions shall be taken to prevent the nozzles from becoming clogged by impurities in the water or corrosion of piping, nozzles, valves and pump.

Regulation 11

Special arrangements in machinery spaces

1 The provisions of this Regulation shall apply to machinery spaces of category A and, where the Administration considers it desirable, to other machinery spaces.

2.1 The number of skylights, doors, ventilators, openings in funnels to permit exhaust ventilation and other openings to machinery spaces shall be reduced to a minimum consistent with the needs of ventilation and the proper and safe working of the ship.

2.2 Skylights shall be of steel and shall not contain glass panels. Suitable arrangements shall be made to permit the release of smoke in the event of fire, from the space to be protected.

2.3 In passenger ships, doors other than power-operated watertight doors, shall be so arranged that positive closure is assured in case of fire in the space, by power-operated closing arrangements or by the provision of self-closing doors capable of closing against an inclination of 3.5° opposing closure and having a fail-safe hook-back facility, provided with a remotely operated release device.

3 Windows shall not be fitted in machinery space boundaries. This does not preclude the use of glass in control rooms within the machinery spaces.

4 Means of control shall be provided for:

- .1 opening and closure of skylights, closure of openings in funnels which normally allow exhaust ventilation, and closure of ventilator dampers;

- .2 permitting the release of smoke;
- .3 closing power-operated doors or actuating release mechanism on doors other than power-operated watertight doors;
- .4 stopping ventilating fans; and
- .5 stopping forced and induced draught fans, oil fuel transfer pumps, oil fuel unit pumps and other similar fuel pumps.

5 The controls required in paragraph 4 and in Regulation 15.2.5 shall be located outside the space concerned, where they will not be cut off in the event of fire in the space they serve. In passenger ships such controls and the controls for any required fire-extinguishing system shall be situated at one control position or grouped in as few positions as possible to the satisfaction of the Administration. Such positions shall have a safe access from the open deck.

6 When access to any machinery space of category A is provided at a low level from an adjacent shaft tunnel, there shall be provided in the shaft tunnel, near the watertight door, a light steel fire-screen door operable from each side.

7 For periodically unattended machinery spaces in cargo ships, the Administration shall give special consideration to maintaining fire integrity of the machinery spaces, the location and centralization of the fire-extinguishing system controls, the required shut-down arrangements (e.g. ventilation, fuel pumps, etc.) and may require additional fire-extinguishing appliances and other fire-fighting equipment and breathing apparatus. In passenger ships these requirements shall be at least equivalent to those of machinery spaces normally attended.

8 An approved automatic fire detection and alarm system complying with the provisions of Regulation 14 shall be fitted in any machinery space:

- .1 where the installation of automatic and remote control systems and equipment has been approved in lieu of continuous manning of the space; and
- .2 where the main propulsion and associated machinery including sources of main electrical supply are provided with various degrees of automatic or remote control and are under continuous manned supervision from a control room.

Regulation 12

Automatic sprinkler, fire detection and fire alarm systems

1.1 Any required automatic sprinkler, fire detection and fire alarm system shall be capable of immediate operation at all times and no action by the crew shall be necessary to set it in operation. It shall be of the wet pipe type but small exposed sections may be of the dry pipe type where in the opinion of the Administration this is a necessary precaution. Any parts of the system which

may be subjected to freezing temperatures in service shall be suitably protected against freezing. It shall be kept charged at the necessary pressure and shall have provision for a continuous supply of water as required in this Regulation.

1.2 Each section of sprinklers shall include means for giving a visual and audible alarm signal automatically at one or more indicating units whenever any sprinkler comes into operation. Such alarm systems shall be such as to indicate if any fault occurs in the system.

1.2.1 In passenger ships such units shall give an indication of any fire and its location in any space served by the system and shall be centralized on the navigating bridge or in the main fire control station, which shall be so manned or equipped as to ensure that any alarm from the system is immediately received by a responsible member of the crew.

1.2.2 In cargo ships such units shall indicate in which section served by the system fire has occurred and shall be centralized on the navigating bridge and in addition, visible and audible alarms from the unit shall be placed in a position other than on the navigating bridge, so as to ensure that the indication of fire is immediately received by the crew.

2.1 Sprinklers shall be grouped into separate sections, each of which shall contain not more than 200 sprinklers. In passenger ships any section of sprinklers shall not serve more than two decks and shall not be situated in more than one main vertical zone. However, the Administration may permit such a section of sprinklers to serve more than two decks or be situated in more than one main vertical zone, if it is satisfied that the protection of the ship against fire will not thereby be reduced.

2.2 Each section of sprinklers shall be capable of being isolated by one stop valve only. The stop valve in each section shall be readily accessible and its location shall be clearly and permanently indicated. Means shall be provided to prevent the operation of the stop valves by any unauthorized person.

2.3 A gauge indicating the pressure in the system shall be provided at each section stop valve and at a central station.

2.4 The sprinklers shall be resistant to corrosion by marine atmosphere. In accommodation and service spaces the sprinklers shall come into operation within the temperature range from 68° to 79°C, except that in locations such as drying rooms, where high ambient temperatures might be expected, the operating temperature may be increased by not more than 30°C above the maximum deckhead temperature.

2.5 A list or plan shall be displayed at each indicating unit showing the spaces covered and the location of the zone in respect of each section. Suitable instructions for testing and maintenance shall be available.

3 Sprinklers shall be placed in an overhead position and spaced in a suitable pattern to maintain an average application rate of not less than 5 ℓ/m² per minute over the nominal area covered by the sprinklers. However, the Administration may permit the use of sprinklers providing such an alternative amount of water suitably distributed as has been shown to the satisfaction of

the Administration to be not less effective.

4.1 A pressure tank having a volume equal to at least twice that of the charge of water specified in this sub-paragraph shall be provided. The tank shall contain a standing charge of fresh water, equivalent to the amount of water which would be discharged in one minute by the pump referred to in paragraph 5.2, and the arrangements shall provide for maintaining an air pressure in the tank such as to ensure that where the standing charge of fresh water in the tank has been used the pressure will be not less than the working pressure of the sprinkler, plus the pressure exerted by a head of water measured from the bottom of the tank to the highest sprinkler in the system. Suitable means of replenishing the air under pressure and of replenishing the fresh water charge in the tank shall be provided. A glass gauge shall be provided to indicate the correct level of the water in the tank.

4.2 Means shall be provided to prevent the passage of sea-water into the tank.

5.1 An independent power pump shall be provided solely for the purpose of continuing automatically the discharge of water from the sprinklers. The pump shall be brought into action automatically by the pressure drop in the system before the standing fresh water charge in the pressure tank is completely exhausted.

5.2 The pump and the piping system shall be capable of maintaining the necessary pressure at the level of the highest sprinkler to ensure a continuous output of water sufficient for the simultaneous coverage of a minimum area of 280 m² at the application rate specified in paragraph 3.

5.3 The pump shall have fitted on the delivery side a test valve with a short open-ended discharge pipe. The effective area through the valve and pipe shall be adequate to permit the release of the required pump output while maintaining the pressure in the system specified in paragraph 4.1.

5.4 The sea inlet to the pump shall wherever possible be in the space containing the pump and shall be so arranged that when the ship is afloat it will not be necessary to shut off the supply of sea-water to the pump for any purpose other than the inspection or repair of the pump.

6 The sprinkler pump and tank shall be situated in a position reasonably remote from any machinery space of category A and shall not be situated in any space required to be protected by the sprinkler system.

7.1 In passenger ships there shall be not less than two sources of power supply for the sea-water pump and automatic alarm and detection system. Where the sources of power for the pump are electrical, these shall be a main generator and an emergency source of power. One supply for the pump shall be taken from the main switchboard, and one from the emergency switchboard by separate feeders reserved solely for that purpose. The feeders shall be so arranged as to avoid galleys, machinery spaces and other enclosed spaces of high fire risk except in so far as it is necessary to reach the appropriate switchboards, and shall be run to an automatic change-over switch situated near the sprinkler pump. This switch shall permit the supply of power from the main switchboard so long as a supply is available therefrom,

and be so designed that upon failure of that supply it will automatically change over to the supply from the emergency switchboard. The switches on the main switchboard and the emergency switchboard shall be clearly labelled and normally kept closed. No other switch shall be permitted in the feeders concerned. One of the sources of power supply for the alarm and detection system shall be an emergency source. Where one of the sources of power for the pump is an internal combustion engine it shall, in addition to complying with the provisions of paragraph 6, be so situated that a fire in any protected space will not affect the air supply to the machinery.

7.2 In cargo ships there shall not be less than two sources of power supply for the sea-water pump and automatic alarm and detection system. If the pump is electrically driven it shall be connected to the main source of electrical power, which shall be capable of being supplied by at least two generators. The feeders shall be so arranged as to avoid galleys, machinery spaces and other enclosed spaces of high fire risk except in so far as it is necessary to reach the appropriate switchboards. One of the sources of power supply for the alarm and detection system shall be an emergency source. Where one of the sources of power for the pump is an internal combustion engine it shall, in addition to complying with the provisions of paragraph 6, be so situated that a fire in any protected space will not affect the air supply to the machinery.

8 The sprinkler system shall have a connexion from the ship's fire main by way of a lockable screw-down non-return valve at the connexion which will prevent a backflow from the sprinkler system to the fire main.

9.1 A test valve shall be provided for testing the automatic alarm for each section of sprinklers by a discharge of water equivalent to the operation of one sprinkler. The test valve for each section shall be situated near the stop valve for that section.

9.2 Means shall be provided for testing the automatic operation of the pump on reduction of pressure in the system.

9.3 Switches shall be provided at one of the indicating positions referred to in paragraph 1.2 which will enable the alarm and the indicators for each section of sprinklers to be tested.

10 Spare sprinkler heads shall be provided for each section of sprinklers to the satisfaction of the Administration.

Regulation 13

Fixed fire detection and fire alarm systems

1 General requirements

1.1 Any required fixed fire detection and fire alarm system with manually operated call points shall be capable of immediate operation at all times.

1.2 Power supplies and electric circuits necessary for the operation of the system shall be monitored for loss of power or fault conditions as appropriate.

Occurrence of a fault condition shall initiate a visual and audible fault signal at the control panel which shall be distinct from a fire signal.

1.3 There shall be not less than two sources of power supply for the electrical equipment used in the operation of the fire detection and fire alarm system, one of which shall be an emergency source. The supply shall be provided by separate feeders reserved solely for that purpose. Such feeders shall run to an automatic change-over switch situated in or adjacent to the control panel for the fire detection system.

1.4 Detectors and manually operated call points shall be grouped into sections. The activation of any detector or manually operated call point shall initiate a visual and audible fire signal at the control panel and indicating units. If the signals have not received attention within two minutes an audible alarm shall be automatically sounded throughout the crew accommodation and service spaces, control stations and machinery spaces of category A. This alarm sounder system need not be an integral part of the detection system.

1.5 The control panel shall be located on the navigating bridge or in the main fire control station.

1.6 Indicating units shall denote the section in which a detector or manually operated call point has operated. At least one unit shall be so located that it is easily accessible to responsible members of the crew at all times, when at sea or in port except when the ship is out of service. One indicating unit shall be located on the navigating bridge if the control panel is located in the main fire control station.

1.7 Clear information shall be displayed on or adjacent to each indicating unit about the spaces covered and the location of the sections.

1.8 No section covering more than one deck within accommodation, service and control stations shall normally be permitted except a section which covers an enclosed stairway. In order to avoid delay in identifying the source of fire, the number of enclosed spaces included in each section shall be limited as determined by the Administration. In no case shall more than fifty enclosed spaces be permitted in any section.

1.9 In passenger ships a section of detectors shall not serve spaces on both sides of the ship nor on more than one deck and neither shall it be situated in more than one main vertical zone except that the Administration, if it is satisfied that the protection of the ship against fire will not thereby be reduced, may permit such a section of detectors to serve both sides of the ship and more than one deck.

1.10 A section of fire detectors which covers a control station, a service space or an accommodation space shall not include a machinery space of category A.

1.11 Detectors shall be operated by heat, smoke or other products of combustion, flame, or any combination of these factors. Detectors operated by other factors indicative of incipient fires may be considered by the Administration provided that they are no less sensitive than such detectors. Flame detectors shall only be used in addition to smoke or heat detectors.

1.12 Suitable instructions and components spares for testing and maintenance shall be provided.

1.13 The function of the detection system shall be periodically tested to the satisfaction of the Administration by means of equipment producing hot air at the appropriate temperature, or smoke or aerosol particles having the appropriate range of density or particle size, or other phenomena associated with incipient fires to which the detector is designed to respond. All detectors shall be of a type such that they can be tested for correct operation and restored to normal surveillance without the renewal of any component.

1.14 The fire detection system shall not be used for any other purpose, except that closing of fire doors and similar functions may be permitted at the control panel.

2 *Installation requirements*

2.1 Manual call points shall be installed throughout the accommodation spaces, service spaces and control stations. One manual call point shall be located at each exit. Manual call points shall be readily accessible in the corridors of each deck such that no part of the corridor is more than 20 m from a manual call point.

2.2 Smoke detectors shall be installed in all stairways, corridors and escape routes within accommodation spaces. Consideration shall be given to the installation of special purpose smoke detectors within ventilation ducting.

2.3 Where a fixed fire detection and fire alarm system is required for the protection of spaces other than those specified in paragraph 2.2, at least one detector complying with paragraph 1.11 shall be installed in each such space.

2.4 Detectors shall be located for optimum performance. Positions near beams and ventilation ducts or other positions where patterns of air flow could adversely affect performance and positions where impact or physical damage is likely shall be avoided. In general, detectors which are located on the overhead shall be a minimum distance of 0.5 m away from bulkheads.

2.5 The maximum spacing of detectors shall be in accordance with the table below:

Type of detector	Maximum floor area per detector	Maximum distance apart between centres	Maximum distance away from bulkheads
Heat	37 m ²	9 m	4.5 m
Smoke	74 m ²	11 m	5.5 m

The Administration may require or permit other spacings based upon test data which demonstrate the characteristics of the detectors.

2.6 Electrical wiring which forms part of the system shall be so arranged as to avoid galleys, machinery spaces of category A, and other enclosed spaces of high fire risk except where it is necessary to provide for fire detection or

fire alarm in such spaces or to connect to the appropriate power supply.

3 *Design requirements*

3.1 The system and equipment shall be suitably designed to withstand supply voltage variation and transients, ambient temperature changes, vibration, humidity, shock, impact and corrosion normally encountered in ships.

3.2 Smoke detectors required by paragraph 2.2 shall be certified to operate before the smoke density exceeds 12.5 per cent obscuration per metre, but not until the smoke density exceeds 2 per cent obscuration per metre. Smoke detectors to be installed in other spaces shall operate within sensitivity limits to the satisfaction of the Administration having regard to the avoidance of detector insensitivity or oversensitivity.

3.3 Heat detectors shall be certified to operate before the temperature exceeds 78°C but not until the temperature exceeds 54°C, when the temperature is raised to those limits at a rate less than 1°C per minute. At higher rates of temperature rise, the heat detector shall operate within temperature limits to the satisfaction of the Administration having regard to the avoidance of detector insensitivity or oversensitivity.

3.4 At the discretion of the Administration, the permissible temperature of operation of heat detectors may be increased to 30°C above the maximum deckhead temperature in drying rooms and similar spaces of a normal high ambient temperature.

Regulation 14

Fixed fire detection and fire alarm systems for periodically unattended machinery spaces

1 A fixed fire detection and fire alarm system in accordance with the relevant provisions of Regulation 13 shall be installed in periodically unattended machinery spaces.

2 This fire detection system shall be so designed and the detectors so positioned as to detect rapidly the onset of fire in any part of those spaces and under any normal conditions of operation of the machinery and variations of ventilation as required by the possible range of ambient temperatures. Except in spaces of restricted height and where their use is specially appropriate, detection systems using only thermal detectors shall not be permitted. The detection system shall initiate audible and visual alarms distinct in both respects from the alarms of any other system not indicating fire, in sufficient places to ensure that the alarms are heard and observed on the navigating bridge and by a responsible engineer officer. When the navigating bridge is unmanned the alarm shall sound in a place where a responsible member of the crew is on duty.

3 After installation the system shall be tested under varying conditions of engine operation and ventilation.

Regulation 15

Arrangements for oil fuel, lubricating oil and other flammable oils

1 *Limitations in the use of oil as fuel*

The following limitations shall apply to the use of oil as fuel:

- .1 Except as otherwise permitted by this paragraph, no oil fuel with a flashpoint of less than 60°C shall be used.
- .2 In emergency generators oil fuel with a flashpoint of not less than 43°C may be used.
- .3 Subject to such additional precautions as it may consider necessary and on condition that the ambient temperature of the space in which such oil fuel is stored or used shall not be allowed to rise to within 10°C below the flashpoint of the oil fuel, the Administration may permit the general use of oil fuel having a flashpoint of less than 60°C but not less than 43°C.
- .4 In cargo ships the use of fuel having a lower flashpoint than otherwise specified in this paragraph, for example crude oil, may be permitted provided that such fuel is not stored in any machinery space and subject to the approval by the Administration of the complete installation.

The flashpoint of oils shall be determined by an approved closed cup method.

2 *Oil fuel arrangements*

In a ship in which oil fuel is used, the arrangements for the storage, distribution and utilization of the oil fuel shall be such as to ensure the safety of the ship and persons on board and shall at least comply with the following provisions:

- .1 As far as practicable, parts of the oil fuel system containing heated oil under pressure exceeding 0.18 N/mm² shall not be placed in a concealed position such that defects and leakage cannot readily be observed. The machinery spaces in way of such parts of the oil fuel system shall be adequately illuminated.
- .2 The ventilation of machinery spaces shall be sufficient under all normal conditions to prevent accumulation of oil vapour.
- .3 As far as practicable, oil fuel tanks shall be part of the ship's structure and shall be located outside machinery spaces of category A. Where oil fuel tanks, other than double bottom tanks, are necessarily located adjacent to or within machinery spaces of category A, at least one of their vertical sides shall be contiguous to the machinery space boundaries, and shall preferably have a common boundary with the double bottom tanks, and the area of the tank boundary common with the machinery spaces shall be kept to a minimum. Where such tanks are situated within the boundaries of machinery spaces of category A they shall not contain oil fuel

having a flashpoint of less than 60°C. In general the use of free standing oil fuel tanks shall be avoided. When such tanks are employed their use shall be prohibited in category A machinery spaces on passenger ships. Where permitted, they shall be placed in an oil-tight spill tray of ample size having a suitable drain pipe leading to a suitably sized spill oil tank.

- .4 No oil fuel tank shall be situated where spillage or leakage therefrom can constitute a hazard by falling on heated surfaces. Precautions shall be taken to prevent any oil that may escape under pressure from any pump, filter or heater from coming into contact with heated surfaces.
- .5 Every oil fuel pipe, which, if damaged, would allow oil to escape from a storage, settling or daily service tank situated above the double bottom shall be fitted with a cock or valve directly on the tank capable of being closed from a safe position outside the space concerned in the event of a fire occurring in the space in which such tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel or similar space, valves on the tank shall be fitted but control in the event of fire may be effected by means of an additional valve on the pipe or pipes outside the tunnel or similar space. If such additional valve is fitted in the machinery space it shall be operated from a position outside this space.
- .6 Safe and efficient means of ascertaining the amount of oil fuel contained in any oil fuel tank shall be provided. Sounding pipes shall not terminate in any space where the risk of ignition of spillage from the sounding pipe might arise. In particular, they shall not terminate in passenger or crew spaces. Other means of ascertaining the amount of oil fuel contained in any oil fuel tank may be permitted:
 - 6.1 in passenger ships, if such means do not require penetration below the top of the tank, and providing their failure or over-filling of the tanks will not permit release of fuel;
 - 6.2 in cargo ships, providing the failure of such means or over-filling of the tanks will not permit release of fuel. The use of cylindrical gauge glasses is prohibited. The Administration may permit the use of oil level gauges with flat glasses and self-closing valves between the gauges and oil tanks.

Such other means shall be acceptable to the Administration and shall be maintained in the proper condition to ensure their continued accurate functioning in service.

- .7 Provision shall be made to prevent overpressure in any oil tank or in any part of the oil fuel system, including the filling pipes. Any relief valves and air or overflow pipes shall discharge to a position which, in the opinion of the Administration, is safe.
- .8 Oil fuel pipes and their valves and fittings shall be of steel or other approved material, except that restricted use of flexible pipes shall be permissible in positions where the Administration is satisfied that

they are necessary. Such flexible pipes and end attachments shall be of approved fire-resisting materials of adequate strength and shall be constructed to the satisfaction of the Administration.

3 *Lubricating oil arrangements*

The arrangements for the storage, distribution and utilization of oil used in pressure lubrication systems shall be such as to ensure the safety of the ship and persons on board, and such arrangements in machinery spaces of category A and whenever practicable in other machinery spaces shall at least comply with the provisions of paragraphs 2.1, 2.4, 2.5, 2.6, 2.7 and 2.8, except that this does not preclude the use of sight flow glasses in lubricating systems provided that they are shown by test to have a suitable degree of fire resistance.

4 *Arrangements for other flammable oils*

The arrangements for the storage, distribution and utilization of other flammable oils employed under pressure in power transmission systems, control and activating systems and heating systems shall be such as to ensure the safety of the ship and persons on board. In locations where means of ignition are present, such arrangements shall at least comply with the provisions of paragraphs 2.4 and 2.6, and with the provisions of paragraphs 2.7 and 2.8 in respect of strength and construction.

5 *Periodically unattended machinery spaces*

In addition to the requirements of paragraphs 1 to 4, the oil fuel and lubricating oil systems shall comply with the following:

- .1 Where necessary, oil fuel and lubricating oil pipelines shall be screened or otherwise suitably protected to avoid as far as practicable oil spray or oil leakages on to hot surfaces or into machinery air intakes. The number of joints in such piping systems shall be kept to a minimum and, where practicable, leakages from high pressure oil fuel pipes shall be collected and arrangements provided for an alarm to be given.
- .2 Where daily service oil fuel tanks are filled automatically, or by remote control, means shall be provided to prevent overflow spillages. Other equipment which treats flammable liquids automatically, e.g. oil fuel purifiers, which, whenever practicable, shall be installed in a special space reserved for purifiers and their heaters, shall have arrangements to prevent overflow spillages.
- .3 Where daily service oil fuel tanks or settling tanks are fitted with heating arrangements, a high temperature alarm shall be provided if the flashpoint of the oil fuel can be exceeded.

Regulation 16

Ventilation systems in ships other than passenger ships carrying more than 36 passengers

1 Ventilation ducts shall be of non-combustible material. Short ducts, however, not generally exceeding 2 m in length and with a cross-section not exceeding 0.02 m² need not be non-combustible, subject to the following conditions:

- .1 these ducts shall be of a material which, in the opinion of the Administration, has a low fire risk;
- .2 they may only be used at the end of the ventilation device;
- .3 they shall not be situated less than 600 mm, measured along the duct, from an opening in an "A" or "B" class division including continuous "B" class ceilings.

2 Where the ventilation ducts with a free-sectional area exceeding 0.02 m² pass through class "A" bulkheads or decks, the opening shall be lined with a steel sheet sleeve unless the ducts passing through the bulkheads or decks are of steel in the vicinity of passage through the deck or bulkhead and the ducts and sleeves shall comply in this part with the following:

- .1 The sleeves shall have a thickness of at least 3 mm and a length of at least 900 mm. When passing through bulkheads, this length shall be divided preferably into 450 mm on each side of the bulkhead. These ducts, or sleeves lining such ducts, shall be provided with fire insulation. The insulation shall have at least the same fire integrity as the bulkhead or deck through which the duct passes. Equivalent penetration protection may be provided to the satisfaction of the Administration.
- .2 Ducts with a free cross-sectional area exceeding 0.075 m² shall be fitted with fire dampers in addition to the requirements of paragraph 2.1. The fire damper shall operate automatically but shall also be capable of being closed manually from both sides of the bulkhead or deck. The damper shall be provided with an indicator which shows whether the damper is open or closed. Fire dampers are not required, however, where ducts pass through spaces surrounded by "A" class divisions, without serving those spaces, provided those ducts have the same fire integrity as the divisions which they pierce.

3 Ducts provided for the ventilation of machinery spaces of category A, galleys, car deck spaces, ro/ro cargo spaces or special category spaces shall not pass through accommodation spaces, service spaces or control stations unless the ducts are either:

- .1.1 constructed of steel having a thickness of at least 3 mm and 5 mm for ducts the widths or diameters of which are up to and including 300 mm and 760 mm and over respectively and, in the case of such ducts, the widths or diameters of which are between 300 mm and 760 mm having a thickness to be obtained by interpolation;

- .1.2 suitably supported and stiffened;
- .1.3 fitted with automatic fire dampers close to the boundaries penetrated; and
- .1.4 insulated to "A-60" standard from the machinery spaces, galleys, car deck spaces, ro/ro cargo spaces or special category spaces to a point at least 5 m beyond each fire damper;

or

- .2.1 constructed of steel in accordance with paragraphs 3.1.1 and 3.1.2; and
- .2.2 insulated to "A-60" standard throughout the accommodation spaces, service spaces or control stations;

except that penetrations of main zone divisions shall also comply with the requirements of paragraph 8.

4 Ducts provided for ventilation to accommodation spaces, service spaces or control stations shall not pass through machinery spaces of category A, galleys, car deck spaces, ro/ro cargo spaces or special category spaces unless either:

- .1.1 the ducts where they pass through a machinery space of category A, galley, car deck space, ro/ro cargo space or special category space are constructed of steel in accordance with paragraphs 3.1.1 and 3.1.2;
- .1.2 automatic fire dampers are fitted close to the boundaries penetrated; and
- .1.3 the integrity of the machinery space, galley, car deck space, ro/ro cargo space or special category space boundaries is maintained at the penetrations;

or

- .2.1 the ducts where they pass through a machinery space of category A, galley, car deck space, ro/ro cargo space or special category space are constructed of steel in accordance with paragraphs 3.1.1 and 3.1.2; and
- .2.2 are insulated to "A-60" standard within the machinery space, galley, car deck space, ro/ro cargo space or special category space;

except that penetrations of main zone divisions shall also comply with the requirements of paragraph 8.

5 Ventilation ducts with a free cross-sectional area exceeding 0.02 m² passing through "B" class bulkheads shall be lined with steel sheet sleeves of 900 mm in length divided preferably into 450 mm on each side of the bulkheads unless the duct is of steel for this length.

6 Such measures as are practicable shall be taken in respect of control

stations outside machinery spaces in order to ensure that ventilation, visibility and freedom from smoke are maintained, so that in the event of fire the machinery and equipment contained therein may be supervised and continue to function effectively. Alternative and separate means of air supply shall be provided; air inlets of the two sources of supply shall be so disposed that the risk of both inlets drawing in smoke simultaneously is minimized. At the discretion of the Administration, such requirements need not apply to control stations situated on, and opening on to, an open deck, or where local closing arrangements would be equally effective.

7 Where they pass through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be constructed of "A" class divisions. Each exhaust duct shall be fitted with:

- .1 a grease trap readily removable for cleaning;
- .2 a fire damper located in the lower end of the duct;
- .3 arrangements, operable from within the galley, for shutting off the exhaust fans; and
- .4 fixed means for extinguishing a fire within the duct.

8 Where in a passenger ship it is necessary that a ventilation duct passes through a main vertical zone division, a fail-safe automatic closing fire damper shall be fitted adjacent to the division. The damper shall also be capable of being manually closed from each side of the division. The operating position shall be readily accessible and be marked in red light-reflecting colour. The duct between the division and the damper shall be of steel or other equivalent material and, if necessary, insulated to comply with the requirements of Regulation 18.1.1. The damper shall be fitted on at least one side of the division with a visible indicator showing whether the damper is in the open position.

9 The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated.

10 Power ventilation of accommodation spaces, service spaces, cargo spaces, control stations and machinery spaces shall be capable of being stopped from an easily accessible position outside the space being served. This position should not be readily cut off in the event of a fire in the spaces served. The means provided for stopping the power ventilation of the machinery spaces shall be entirely separate from the means provided for stopping ventilation of other spaces.

Regulation 17

Fireman's outfit

1 A fireman's outfit shall consist of:

1.1 Personal equipment comprising:

- .1 Protective clothing of material to protect the skin from the heat

radiating from the fire and from burns and scalding by steam. The outer surface shall be water-resistant.

- .2 Boots and gloves of rubber or other electrically non-conducting material.
 - .3 A rigid helmet providing effective protection against impact.
 - .4 An electric safety lamp (hand lantern) of an approved type with a minimum burning period of three hours.
 - .5 An axe to the satisfaction of the Administration.
- 1.2 A breathing apparatus of an approved type which may be either:
- .1 a smoke helmet or smoke mask which shall be provided with a suitable air pump and a length of air hose sufficient to reach from the open deck, well clear of hatch or doorway, to any part of the holds or machinery spaces. If, in order to comply with this sub-paragraph, an air hose exceeding 36 m in length would be necessary, a self-contained breathing apparatus shall be substituted or provided in addition as determined by the Administration; or
 - .2 a self-contained compressed air-operated breathing apparatus, the volume of air contained in the cylinders of which shall be at least 1,200 ℓ, or other self-contained breathing apparatus which shall be capable of functioning for at least 30 minutes. A number of spare charges, suitable for use with the apparatus provided, shall be available on board to the satisfaction of the Administration.
- 2 For each breathing apparatus a fireproof lifeline of sufficient length and strength shall be provided capable of being attached by means of a snaphook to the harness of the apparatus or to a separate belt in order to prevent the breathing apparatus becoming detached when the lifeline is operated.
- 3 All ships shall carry at least two fireman's outfits complying with the requirements of paragraph 1.
- 3.1 In addition, there shall be provided:
- .1 in passenger ships for every 80 m, or part thereof, of the aggregate of the lengths of all passenger spaces and service spaces on the deck which carries such spaces or, if there is more than one such deck, on the deck which has the largest aggregate of such lengths, two fireman's outfits and two sets of personal equipment, each set comprising the items stipulated in paragraphs 1.1.1, 1.1.2 and 1.1.3;
 - .2 in tankers, two fireman's outfits.
- 3.2 In passenger ships carrying more than 36 passengers for each pair of breathing apparatus there shall be provided one water fog applicator which shall be stored adjacent to such apparatus.
- 3.3 The Administration may require additional sets of personal equipment and breathing apparatus, having due regard to the size and type of the ship.

4 The fireman's outfits or sets of personal equipment shall be so stored as to be easily accessible and ready for use and, where more than one fireman's outfit or more than one set of personal equipment is carried, they shall be stored in widely separated positions. In passenger ships at least two fireman's outfits and one set of personal equipment shall be available at any one position.

Regulation 18

Miscellaneous items

1.1 Where "A" class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts, etc., or for girders, beams or other structural members, arrangements shall be made to ensure that the fire resistance is not impaired, subject to the provisions of Regulation 30.5.

1.2 Where "B" class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts, etc., or for the fitting of ventilation terminals, lighting fixtures and similar devices, arrangements shall be made to ensure that the fire resistance is not impaired.

2.1 Pipes penetrating "A" or "B" class divisions shall be of materials approved by the Administration having regard to the temperature such divisions are required to withstand.

2.2 Where the Administration may permit the conveying of oil and combustible liquids through accommodation and service spaces, the pipes conveying oil or combustible liquids shall be of a material approved by the Administration having regard to the fire risk.

2.3 Materials readily rendered ineffective by heat shall not be used for overboard scuppers, sanitary discharges, and other outlets which are close to the water-line and where the failure of the material in the event of fire would give rise to danger of flooding.

3 Electric radiators, if used, shall be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiators shall be fitted with an element so exposed that clothing, curtains, or other similar materials can be scorched or set on fire by heat from the element.

4 Cellulose-nitrate based films shall not be used for cinematograph installations.

5 All waste-receptacles shall be constructed of non-combustible materials with no openings in the sides or bottom.

6 In spaces where penetration of oil products is possible, the surface of insulation shall be impervious to oil or oil vapours.

Regulation 19

*International shore connexion**

1 Ships of 500 tons gross tonnage and upwards shall be provided with at least one international shore connexion, complying with provisions of paragraph 3.

2 Facilities shall be available enabling such a connexion to be used on either side of the ship.

3 Standard dimensions of flanges for the international shore connexion shall be in accordance with the following table:

Description	Dimension
Outside diameter	178 mm
Inside diameter	64 mm
Bolt circle diameter	132 mm
Slots in flange	4 holes 19 mm in diameter spaced equidistantly on a bolt circle of the above diameter, slotted to the flange periphery
Flange thickness	14.5 mm minimum
Bolts and nuts	4, each of 16 mm diameter, 50 mm in length

4 The connexion shall be of steel or other suitable material and shall be designed for 1.0 N/mm² services. The flange shall have a flat face on one side and on the other shall be permanently attached to a coupling that will fit the ship's hydrant and hose. The connexion shall be kept aboard the ship together with a gasket of any material suitable for 1.0 N/mm² services, together with four 16 mm bolts, 50 mm in length and eight washers.

Regulation 20

Fire control plans

1 In all ships general arrangement plans shall be permanently exhibited for the guidance of the ship's officers, showing clearly for each deck the control stations, the various fire sections enclosed by "A" class divisions, the sections enclosed by "B" class divisions together with particulars of the fire detection and fire alarm systems, the sprinkler installation, the fire-extinguishing appliances, means of access to different compartments, decks, etc. and the ventilating system including particulars of the fan control positions, the position of dampers and identification numbers of the

* Reference is made to the recommendation contained in resolution A.470(XII) adopted by the Organization entitled "International Shore Connexion (shore side)".

ventilating fans serving each section. Alternatively, at the discretion of the Administration, the aforementioned details may be set out in a booklet, a copy of which shall be supplied to each officer, and one copy shall at all times be available on board in an accessible position. Plans and booklets shall be kept up to date, any alterations being recorded thereon as soon as practicable. Description in such plans and booklets shall be in the national language. If the language is neither English nor French, a translation into one of those languages shall be included. In addition, instructions concerning the maintenance and operation of all the equipment and installations on board for the fighting and containment of fire shall be kept under one cover, readily available in an accessible position.

2 In all ships a duplicate set of fire control plans or a booklet containing such plans shall be permanently stored in a prominently marked weathertight enclosure outside the deckhouse for the assistance of shoreside fire-fighting personnel.

Regulation 21

Ready availability of fire-extinguishing appliances

In all ships, fire-extinguishing appliances shall be kept in good order and available for immediate use at all times during the voyage.

Regulation 22

Acceptance of substitutes

1 This Regulation applies to all ships.

2 Where in this Chapter any special type of appliance, apparatus, extinguishing medium or arrangement is specified in any ship, any other type of appliance etc., may be allowed, provided the Administration is satisfied that it is not less effective.

PART B – FIRE SAFETY MEASURES FOR PASSENGER SHIPS

Regulation 23

Structure

1 The hull, superstructure, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material. For the purpose of applying the definition of steel or other equivalent material as given in Regulation 3.7 the “applicable fire exposure” shall be according to the integrity and insulation standards given in the tables of Regulations 26 and 27. For example where divisions such as decks or sides and ends of deckhouses

are permitted to have "B-0" fire integrity, the "applicable fire exposure" shall be half an hour.

2 However, in cases where any part of the structure is of aluminium alloy, the following shall apply:

- .1 The insulation of aluminium alloy components of "A" or "B" class divisions, except structure which, in the opinion of the Administration, is non-load-bearing, shall be such that the temperature of the structural core does not rise more than 200°C above the ambient temperature at any time during the applicable fire exposure to the standard fire test.
- .2 Special attention shall be given to the insulation of aluminium alloy components of columns, stanchions and other structural members required to support lifeboat and liferaft stowage, launching and embarkation areas, and "A" and "B" class divisions to ensure:
 - .2.1 that for such members supporting lifeboat and liferaft areas and "A" class divisions, the temperature rise limitation specified in paragraph 2.1 shall apply at the end of one hour; and
 - .2.2 that for such members required to support "B" class divisions, the temperature rise limitation specified in paragraph 2.1 shall apply at the end of half an hour.

3 Crowns and casings of machinery spaces of category A shall be of steel construction adequately insulated and openings therein, if any, shall be suitably arranged and protected to prevent the spread of fire.

Regulation 24

Main vertical zones and horizontal zones

1.1 For ships carrying more than 36 passengers, the hull, superstructure and deckhouses shall be subdivided into main vertical zones by "A" class divisions. Steps and recesses shall be kept to a minimum, but where they are necessary they shall also be "A" class divisions. These divisions shall have insulation values in accordance with tables in Regulation 26.

1.2 For ships carrying not more than 36 passengers, the hull, superstructure and deckhouses in way of accommodation and service spaces shall be subdivided into main vertical zones by "A" class divisions. These divisions shall have insulation values in accordance with tables in Regulation 27.

2 As far as practicable, the bulkheads forming the boundaries of the main vertical zones above the bulkhead deck shall be in line with watertight subdivision bulkheads situated immediately below the bulkhead deck.

3 Such bulkheads shall extend from deck to deck and to the shell or other boundaries.

4 Where a main vertical zone is subdivided by horizontal "A" class

divisions into horizontal zones for the purpose of providing an appropriate barrier between sprinklered and non-sprinklered zones of the ship, the divisions shall extend between adjacent main vertical zone bulkheads and to the shell or exterior boundaries of the ship and shall be insulated in accordance with the fire insulation and integrity values given in table 26.3 or in table 27.2.

5.1 On ships designed for special purposes, such as automobile or railroad car ferries, where the provision of main vertical zone bulkheads would defeat the purpose for which the ship is intended, equivalent means for controlling and limiting a fire shall be substituted and specifically approved by the Administration.

5.2 However, in a ship with special category spaces, any such space shall comply with the applicable provisions of Regulation 37 and in so far as such compliance would be inconsistent with compliance with other requirements of this Part, the requirements of Regulation 37 shall prevail.

Regulation 25

Bulkheads within a main vertical zone

1.1 For ships carrying more than 36 passengers all bulkheads which are not required to be "A" class divisions shall be at least "B" class or "C" class divisions as prescribed in the tables in Regulation 26.

1.2 For ships carrying not more than 36 passengers all bulkheads within accommodation and service spaces which are not required to be "A" class divisions shall be at least "B" class or "C" class divisions as prescribed in the tables in Regulation 27.

1.3 All such divisions may be faced with combustible materials in accordance with the provisions of Regulation 34.

2 All corridor bulkheads where not required to be "A" class shall be "B" class divisions which shall extend from deck to deck except:

- .1 when continuous "B" class ceilings or linings are fitted on both sides of the bulkhead, the portion of the bulkhead behind the continuous ceiling or lining shall be of material which, in thickness and composition, is acceptable in the construction of "B" class divisions but which shall be required to meet "B" class integrity standards only in so far as is reasonable and practicable in the opinion of the Administration;
- .2 in the case of a ship protected by an automatic sprinkler system complying with the provisions of Regulation 12 the corridor bulkheads of "B" class materials may terminate at a ceiling in the corridor provided such a ceiling is of material which, in thickness and composition, is acceptable in the construction of "B" class divisions. Notwithstanding the requirements of Regulations 26 and 27 such bulkheads and ceilings shall be required to meet "B" class integrity standards only in so far as is reasonable and practicable in

the opinion of the Administration. All doors and frames in such bulkheads shall be of non-combustible materials and shall be so constructed and erected as to provide substantial fire resistance to the satisfaction of the Administration.

3 All bulkheads required to be "B" class divisions, except corridor bulkheads, shall extend from deck to deck and to the shell or other boundaries unless continuous "B" class ceilings or linings are fitted on both sides of the bulkhead, in which case the bulkhead may terminate at the continuous ceiling or lining.

Regulation 26

Fire integrity of bulkheads and decks in ships carrying more than 36 passengers

1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this Part, the minimum fire integrity of all bulkheads and decks shall be as prescribed in tables 26.1 to 26.4. Where, due to any particular structural arrangements in the ship, difficulty is experienced in determining from the tables the minimum fire integrity value of any divisions, such values shall be determined to the satisfaction of the Administration.

2 The following requirements shall govern application of the tables:

.1 Table 26.1 shall apply to bulkheads bounding main vertical zones or horizontal zones.

Table 26.2 shall apply to bulkheads not bounding either main vertical zones or horizontal zones.

Table 26.3 shall apply to decks forming steps in main vertical zones or bounding horizontal zones.

Table 26.4 shall apply to decks not forming steps in main vertical zones nor bounding horizontal zones.

.2 for the purpose of determining the appropriate fire integrity standards to be applied to boundaries between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (14) below. Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this Regulation, it shall be treated as a space within the relevant category having the most stringent boundary requirements. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row number in the tables.

(1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.

Spaces containing the ship's radio equipment.

Fire-extinguishing rooms, fire control and recording stations.
Control room for propulsion machinery when located outside the propulsion machinery space.
Spaces containing centralized fire alarm equipment.
Spaces containing centralized emergency public address system stations and equipment.

(2) *Stairways*

Interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) for passengers and crew and enclosures thereto.

In this connexion a stairway which is enclosed at only one level shall be regarded as part of the space from which it is not separated by a fire door.

(3) *Corridors*

Passenger and crew corridors and lobbies.

(4) *Lifeboat and liferaft handling and embarkation stations*

Open deck spaces and enclosed promenades forming lifeboat and liferaft embarkation and lowering stations.

(5) *Open deck spaces*

Open deck spaces and enclosed promenades clear of lifeboat and liferaft embarkation and lowering stations.

Air space (the space outside superstructures and deckhouses).

(6) *Accommodation spaces of minor fire risk*

Cabins containing furniture and furnishings of restricted fire risk.

Offices and dispensaries containing furniture and furnishings of restricted fire risk.

Public spaces containing furniture and furnishings of restricted fire risk and having a deck area of less than 50 m².

(7) *Accommodation spaces of moderate fire risk*

Spaces as in category (6) above but containing furniture and furnishings of other than restricted fire risk.

Public spaces containing furniture and furnishings of restricted fire risk and having a deck area of 50 m² or more.

Isolated lockers and small store-rooms in accommodation spaces.

Sale shops.

Motion picture projection and film stowage rooms.

Diet kitchens (containing no open flame).

Cleaning gear lockers (in which flammable liquids are not stowed).

- Laboratories (in which flammable liquids are not stowed).
Pharmacies.
Small drying rooms (having a deck area of 4 m² or less).
Specie rooms.
- (8) *Accommodation spaces of greater fire risk*
Public spaces containing furniture and furnishings of other than restricted fire risk and having a deck area of 50 m² or more.
Barber shops and beauty parlours.
- (9) *Sanitary and similar spaces*
Communal sanitary facilities, showers, baths, water closets, etc.
Small laundry rooms.
Indoor swimming, pool area.
Operating rooms.
Isolated pantries containing no cooking appliances in accommodation spaces.
Private sanitary facilities shall be considered a portion of the space in which they are located.
- (10) *Tanks, voids and auxiliary machinery spaces having little or no fire risk*
Water tanks forming part of the ship's structure.
Voids and cofferdams.
Auxiliary machinery spaces which do not contain machinery having a pressure lubrication system and where storage of combustibles is prohibited, such as:
ventilation and air-conditioning rooms; windlass room; steering gear room; stabilizer equipment room; electrical propulsion motor room; rooms containing section switchboards and purely electrical equipment other than oil-filled electrical transformers (above 10 kVA); shaft alleys and pipe tunnels; spaces for pumps and refrigeration machinery (not handling or using flammable liquids).
Closed trunks serving the spaces listed above.
Other closed trunks such as pipe and cable trunks.
- (11) *Auxiliary machinery spaces, cargo spaces, special category spaces, cargo and other oil tanks and other similar spaces of moderate fire risk*
Cargo oil tanks.
Cargo holds, trunkways and hatchways.
Refrigerated chambers.
Oil fuel tanks (where installed in a separate space with no machinery).

Shaft alleys and pipe tunnels allowing storage of combustibles.

Auxiliary machinery spaces as in category (10) which contain machinery having a pressure lubrication system or where storage of combustibles is permitted.

Oil fuel filling stations.

Spaces containing oil-filled electrical transformers (above 10 kVA).

Spaces containing turbine and reciprocating steam engine driven auxiliary generators and small internal combustion engines of power output up to 110 kW driving emergency generators, sprinkler, drencher or fire pumps, bilge pumps, etc.

Special category spaces (tables 26.1 and 26.3 only apply).

Closed trunks serving the spaces listed above.

(12) *Machinery spaces and main galleys*

Main propulsion machinery rooms (other than electric propulsion motor rooms) and boiler rooms.

Auxiliary machinery spaces other than those in categories (10) and (11) which contain internal combustion machinery or other oil-burning, heating or pumping units.

Main galleys and annexes.

Trunks and casings to the spaces listed above.

(13) *Store-rooms, workshops, pantries, etc.*

Main pantries not annexed to galleys.

Main laundry.

Large drying rooms (having a deck area of more than 4 m²).

Miscellaneous stores.

Mail and baggage rooms.

Garbage rooms.

Workshops (not part of machinery spaces, galleys, etc.)

(14) *Other spaces in which flammable liquids are stowed*

Lamp rooms.

Paint rooms.

Store-rooms containing flammable liquids (including dyes, medicines, etc.).

Laboratories (in which flammable liquids are stowed).

.3 Where a single value is shown for the fire integrity of a boundary between two spaces, that value shall apply in all cases.

.4 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is not protected by an automatic sprinkler system complying

TABLE 26.1 – BULKHEADS BOUNDING MAIN VERTICAL ZONES OR HORIZONTAL ZONES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations (1)	A-60	A-30	A-30	A-0	A-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60
Stairways (2)		A-0	A-0	A-0	A-0	A-15 A-0	A-30 A-0	A-60 A-15	A-0	A-0	A-30	A-60	A-15 A-0	A-60
Corridors (3)			A-0	A-0	A-0	A-0	A-30 A-0	A-30 A-0	A-0	A-0	A-30	A-60	A-15 A-0	A-60
Lifeboat and liferaft handling and embarkation stations (4)				-	-	A-0	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-60
Open deck spaces (5)					-	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of minor fire risk (6)						A-15 A-0	A-30 A-0	A-30 A-0	A-0	A-0	A-15 A-0	A-30	A-15 A-0	A-30
Accommodation spaces of moderate fire risk (7)							A-30 A-0	A-60 A-15	A-0	A-0	A-30 A-0	A-60	A-30 A-0	A-60
Accommodation spaces of greater fire risk (8)								A-60 A-15	A-0	A-0	A-60 A-15	A-60	A-30 A-0	A-60
Sanitary and similar spaces (9)									A-0	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk (10)										A-0	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, special category spaces, cargo and other oil tanks and other similar spaces of moderate fire risk (11)											A-0	A-60	A-0	A-60
Machinery spaces and main galleys (12)												A-60	A-30 ^{b/} A-15	A-60
Store-rooms, workshops, pantries etc. (13)													A-0	A-30
Other spaces in which flammable liquids are stowed (14)														A-60

See notes under table 26.4

TABLE 26.2 – BULKHEADS NOT BOUNDING EITHER MAIN VERTICAL ZONES OR HORIZONTAL ZONES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations (1)	B-0 ^{a/}	A-0	A-0	A-0	A-0 B-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60
Stairways (2)		A-0 ^{a/}	A-0	A-0	A-0	A-0	A-15 A-0	A-30 A-0	A-0	A-0	A-15	A-30	A-15 A-0	A-30
Corridors (3)			C	A-0	A-0 B-0	B-0	B-15 B-0	B-15 B-0	B-0	A-0	A-15	A-30	A-0	A-30 A-0
Lifeboat and liferaft handling and embarkation stations (4)				–	–	A-0	A-0	A-0	A-0	A-0	A-0	A-15	A-0	A-15 A-0
Open deck space (5)					–	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-0	A-0 B-0	A-0 B-0
Accommodation spaces of minor fire risk (6)						B-0 C	B-15 C	B-15 C	B-0 C	A-0	A-15 A-0	A-30	A-0	A-30 A-0
Accommodation spaces of moderate fire risk (7)							B-15 C	B-15 C	B-0 C	A-0	A-15 A-0	A-60	A-15 A-0	A-60 A-15
Accommodation spaces of greater fire risk (8)								B-15 C	B-0 C	A-0	A-30 A-0	A-60	A-15 A-0	A-60 A-15
Sanitary and similar spaces (9)									C	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk (10)										A-0 ^{a/}	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk (11)											A-0 ^{a/}	A-0	A-0	A-30 ^{b/} A-15
Machinery spaces and main galleys (12)												A-0 ^{a/}	A-0	A-60
Store-rooms, workshops, pantries, etc (13)													A-0 ^{a/}	A-0
Other spaces in which flammable liquids are stowed (14)														A-30 ^{b/} A-15

See notes under table 26.4

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TABLE 26.3 – DECKS FORMING STEPS IN MAIN VERTICAL ZONES OR BOUNDING HORIZONTAL ZONES

Space below ↓	Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations	(1)	A-60	A-60	A-30	A-0	A-0	A-15	A-30	A-60	A-0	A-0	A-30	A-60	A-15	A-60
Stairways	(2)	A-15	A-0	A-0	A-0	A-0	A-0	A-15 A-0	A-15 A-0	A-0	A-0	A-0	A-60	A-0	A-60
Corridors	(3)	A-30	A-0	A-0	A-0	A-0	A-0	A-15 A-0	A-15 A-0	A-0	A-0	A-0	A-60	A-0	A-60
Lifeboat and liferaft handling and embarkation stations	(4)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Open deck spaces	(5)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of minor fire risk	(6)	A-60	A-30 A-0	A-15 A-0	A-0	A-0	A-0	A-15 A-0	A-30 A-0	A-0	A-0	A-15 A-0	A-15	A-0	A-15
Accommodation spaces of moderate fire risk	(7)	A-60	A-60 A-15	A-30 A-0	A-15 A-0	A-0	A-15 A-0	A-30 A-0	A-60 A-15	A-0	A-0	A-30 A-0	A-30	A-0	A-30
Accommodation spaces of greater fire risk	(8)	A-60	A-60 A-15	A-60 A-15	A-60 A-15	A-0	A-30 A-0	A-60 A-15	A-60 A-15	A-0	A-0	A-30 A-0	A-60	A-15 A-0	A-60
Sanitary and similar spaces	(9)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk	(10)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, special category spaces, cargo and other oil tanks and other similar spaces of moderate fire risk	(11)	A-60	A-60	A-60	A-60	A-0	A-30 A-0	A-60 A-15	A-60 A-15	A-0	A-0	A-0	A-30	A-30 ^{b/} A-0	A-30
Machinery spaces and main galleys	(12)	A-60	A-60	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60
Store-rooms, workshops, pantries, etc.	(13)	A-60	A-60 A-15	A-30 A-0	A-15	A-0	A-15 A-0	A-30 A-0	A-60 A-15	A-0	A-0	A-0	A-30	A-0	A-30
Other spaces in which flammable liquids are stowed	(14)	A-60	A-60	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60

See notes under table 26.4

TABLE 26.4 – DECKS NOT FORMING STEPS IN MAIN VERTICAL ZONES NOR BOUNDING HORIZONTAL ZONES

Space below ↙	Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations	(1)	A-30 A-0	A-30 A-0	A-15 A-0	A-0	A-0 B-0	A-0	A-15 A-0	A-30 A-0	A-0	A-0	A-0	A-60	A-0	A-60 A-15
Stairways	(2)	A-0	A-0	A-0	A-0	A-0 B-0	A-0	A-0	A-0	A-0	A-0	A-0	A-30	A-0	A-30 A-0
Corridors	(3)	A-15 A-0	A-0	A-0 ^{a/} B-0 ^{b/}	A-0	A-0 B-0	A-0 B-0	A-15 B-0	A-15 B-0	A-0 B-0	A-0	A-0	A-30	A-0	A-30 A-0
Lifeboat and liferaft handling and embarkation stations	(4)	A-0	A-0	A-0	A-0	–	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-0	A-0	A-0
Open deck spaces	(5)	A-0	A-0	A-0 B-0	A-0	–	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-0	A-0 B-0	A-0
Accommodation spaces of minor fire risk	(6)	A-60	A-15 A-0	A-0	A-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-15 A-0	A-0	A-15 A-0
Accommodation spaces of moderate fire risk	(7)	A-60	A-30 A-0	A-15 A-0	A-15 A-0	A-0 B-0	A-0 B-0	A-15 B-0	A-30 B-0	A-0 B-0	A-0	A-15 A-0	A-30 A-0	A-0	A-30 A-0
Accommodation spaces of greater fire risk	(8)	A-60	A-60 A-15	A-60 A-0	A-30 A-0	A-0 B-0	A-15 B-0	A-30 B-0	A-60 B-0	A-0 B-0	A-0	A-30 A-0	A-30 A-0	A-0	A-30 A-0
Sanitary spaces and similar spaces	(9)	A-0	A-0	A-0 B-0	A-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk	(10)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0 ^{a/}	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk	(11)	A-60	A-60 A-15	A-60 A-15	A-30 A-0	A-0	A-0	A-15 A-0	A-30 A-0	A-0	A-0	A-0 ^{a/}	A-0	A-0	A-30 ^{b/} A-15
Machinery spaces and main galleys	(12)	A-60	A-60	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0	A-30	A-30 ^{a/}	A-0	A-60
Store-rooms, workshops, pantries, etc.	(13)	A-60	A-30 A-0	A-15 A-0	A-15 A-0	A-0 B-0	A-15 A-0	A-30 A-0	A-30 A-0	A-0 B-0	A-0	A-0	A-0	A-0	A-15 ^{b/} A-0
Other spaces in which flammable liquids are stowed	(14)	A-60	A-60 A-30	A-60 A-30	A-60	A-0	A-30 A-0	A-60 A-15	A-60 A-15	A-0	A-0	A-30 ^{b/} A-0	A-30 ^{b/} A-0	A-0	A-30 ^{b/} A-0

Notes. To be applied to tables 26.1 to 26.4, as appropriate.

a/ Where adjacent spaces are in the same numerical category and superscript *a/* appears, a bulkhead or deck between such spaces need not be fitted if deemed unnecessary by the Administration. For example, in category (12) a bulkhead need not be required between a galley and its annexed pantries provided the pantry bulkheads and decks maintain the integrity of the galley boundaries. A bulkhead is, however, required between a galley and a machinery space even though both spaces are in category (12).

b/ Where superscript *b/* appears the lesser insulation value may be permitted only if at least one of the adjoining spaces is protected by an automatic sprinkler system complying with the provisions of Regulation 12.

with the provisions of Regulation 12 or between such zones neither of which is so protected, the higher of the two values given in the tables shall apply.

- .5 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is protected by an automatic sprinkler system complying with the provisions of Regulation 12 or between such zones both of which are so protected, the lesser of the two values given in the tables shall apply. Where a sprinklered zone and a non-sprinklered zone meet within accommodation and service spaces, the higher of the two values given in the tables shall apply to the division between the zones.
- .6 Notwithstanding the provisions of Regulation 35 there are no special requirements for material or integrity of boundaries where only a dash appears in the tables.
- .7 The Administration shall determine in respect of category (5) spaces whether the insulation values in table 26.1 or 26.2 shall apply to ends of deckhouses and superstructures, and whether the insulation values in table 26.3 or 26.4 shall apply to weather decks. In no case shall the requirements of category (5) of tables 26.1 to 26.4 necessitate enclosure of spaces which in the opinion of the Administration need not be enclosed.

3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing wholly or in part, to the required insulation and integrity of a division.

4 In approving structural fire protection details, the Administration shall have regard to the risk of heat transmission at intersections and terminal points of required thermal barriers.

Regulation 27

Fire integrity of bulkheads and decks in ships carrying not more than 36 passengers

- 1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this Part, the minimum fire integrity of bulkheads and decks shall be as prescribed in table 27.1 and table 27.2.
- 2 The following requirements shall govern application of the tables:
 - .1 Tables 27.1 and 27.2 shall apply respectively to the bulkheads and decks separating adjacent spaces.
 - .2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) below. The title of each category is intended to be typical

rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

(1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.

Spaces containing the ship's radio equipment.

Fire-extinguishing rooms, fire control stations and fire-recording stations.

Control room for propulsion machinery when located outside the machinery space.

Spaces containing centralized fire alarm equipment.

(2) *Corridors*

Passenger and crew corridors and lobbies.

(3) *Accommodation spaces*

Spaces as defined in Regulation 3.10 excluding corridors.

(4) *Stairways*

Interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connexion, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(5) *Service spaces (low risk)*

Lockers and store-rooms having areas of less than 2 m², drying rooms and laundries.

(6) *Machinery spaces of category A*

Spaces as defined in Regulation 3.19.

(7) *Other machinery spaces*

Spaces as defined in Regulation 3.20 excluding machinery spaces of category A.

(8) *Cargo spaces*

All spaces used for cargo (including cargo oil tanks) and trunkways and hatchways to such spaces, other than special category spaces.

(9) *Service spaces (high risk)*

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 2 m² or more and workshops other than those forming part of the machinery spaces.

TABLE 27.1 – FIRE INTEGRITY OF BULKHEADS SEPARATING ADJACENT SPACES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0 ^{c/}	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*	A-60
Corridors (2)		C ^{e/}	B-0 ^{e/}	B-0 ^{e/} A-0 ^{a/}	B-0 ^{e/}	A-60	A-0	A-0	A-15 A-0 ^{d/}	*	A-15
Accommodation spaces (3)			C ^{e/}	B-0 ^{e/} A-0 ^{a/}	B-0 ^{e/}	A-60	A-0	A-0	A-15 A-0 ^{d/}	*	A-30 A-0 ^{d/}
Stairways (4)				B-0 ^{e/} A-0 ^{a/}	B-0 ^{e/} A-0 ^{a/}	A-60	A-0	A-0	A-15 A-0 ^{d/}	*	A-15
Service spaces (low risk) (5)					C ^{e/}	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces (6) of category A						*	A-0	A-0	A-60	*	A-60
Other machinery spaces (7)							A-0 ^{b/}	A-0	A-0	*	A-0
Cargo spaces (8)								*	A-0	*	A-0
Service spaces (high risk) (9)									A-0 ^{b/}	*	A-30
Open decks (10)										--	A-0
Special category (11) spaces											A-0

Notes: To be applied to both tables 27.1 and 27.2, as appropriate.

- a/ For clarification as to which applies see Regulations 25 and 29.
- b/ Where spaces are of the same numerical category and superscript b appears, a bulkhead or deck of the ratings shown in the tables is only required when the adjacent spaces are for a different purpose, e.g. in category (9). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.
- c/ Bulkheads separating the wheelhouse and chartroom from each other may be "B-0" rating.
- d/ See 2.3 and 2.4 of this Regulation.
- e/ For the application of Regulation 24.1.2, "B-0" and "C", where appearing in table 27.1, shall be read as "A-0".
- f/ Fire insulation need not be fitted if the machinery space of category (7), in the opinion of the Administration, has little or no fire risk.
- * Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material but is not required to be of "A" class standard. For the application of Regulation 24.1.2 an asterisk, where appearing in table 27.2, except for categories (8) and (10), shall be read as "A-0".

TABLE 27.2 – FIRE INTEGRITY OF DECKS SEPARATING ADJACENT SPACES

Space below ↓ Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*	A-30
Corridors (2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Accommodation spaces (3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30 A-0d/
Stairways (4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*	A-0
Service spaces (low risk) (5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A (6)	A-60	A-60	A-60	A-60	A-60	*	A-60 f/	A-30	A-60	*	A-60
Other machinery spaces (7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*	A-0
Cargo spaces (8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*	A-0
Service spaces (high risk) (9)	A-60	A-30 A-0d/	A-30 A-0d/	A-30 A-0d/	A-0	A-60	A-0	A-0	A-0	*	A-30
Open decks (10)	*	*	*	*	*	*	*	*	*	--	A-0
Special category spaces (11)	A-60	A-15	A-30 A-0d/	A-15	A-0	A-30	A-0	A-0	A-30	A-0	A-0

(10) *Open decks*

Open deck spaces and enclosed promenades having no fire risk. Air spaces (the space outside superstructures and deck-houses).

(11) *Special category spaces*

Spaces as defined in Regulation 3.18.

- 3 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is not protected by an automatic sprinkler system complying with the provisions of Regulation 12 or between such zones neither of which is so protected, the higher of the two values given in the tables shall apply.
- 4 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone

which is protected by an automatic sprinkler system complying with the provisions of Regulation 12 or between such zones both of which are so protected, the lesser of the two values given in the tables shall apply. Where a sprinklered zone and a non-sprinklered zone meet within accommodation and service spaces, the higher of the two values given in the tables shall apply to the division between the zones.

3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

4 External boundaries which are required in Regulation 23.1 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries to have "A" class integrity elsewhere in this Chapter. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be of materials to the satisfaction of the Administration.

Regulation 28

Means of escape

1 Stairways and ladders shall be arranged to provide ready means of escape to the lifeboat and liferaft embarkation deck from all passenger and crew spaces and from spaces in which the crew is normally employed, other than machinery spaces. In particular, the following provisions shall be complied with:

- .1 Below the bulkhead deck two means of escape, at least one of which shall be independent of watertight doors, shall be provided from each watertight compartment or similarly restricted space or group of spaces. Exceptionally, the Administration may dispense with one of the means of escape, due regard being paid to the nature and location of spaces and to the number of persons who might normally be accommodated or employed there.
- .2 Above the bulkhead deck there shall be at least two means of escape from each main vertical zone or similarly restricted space or group of spaces at least one of which shall give access to a stairway forming a vertical escape.
- .3 If a radiotelegraph station has no direct access to the open deck, two means of escape from or access to such station shall be provided, one of which may be a porthole or window of sufficient size or another means to the satisfaction of the Administration.
- .4 A corridor or part of a corridor from which there is only one route of escape shall not exceed:
 - 13 m in length for ships carrying more than 36 passengers, and
 - 7 m in length for ships carrying not more than 36 passengers.
- .5 At least one of the means of escape required by paragraphs 1.1 and

1.2 shall consist of a readily accessible enclosed stairway, which shall provide continuous fire shelter from the level of its origin to the appropriate lifeboat and liferaft embarkation decks or the highest level served by the stairway, whichever level is the highest. However, where the Administration has granted dispensation under the provisions of paragraph 1.1 the sole means of escape shall provide safe escape to the satisfaction of the Administration. The width, number and continuity of the stairways shall be to the satisfaction of the Administration.

- .6 Protection of access from the stairway enclosures to the lifeboat and liferaft embarkation areas shall be to the satisfaction of the Administration.
- .7 Stairways serving only a space and a balcony in that space shall not be considered as forming one of the required means of escape.

2.1 In special category spaces the number and disposition of the means of escape both below and above the bulkhead deck shall be to the satisfaction of the Administration and in general the safety of access to the embarkation deck shall be at least equivalent to that provided for under paragraphs 1.1, 1.2, 1.5 and 1.6.

2.2 One of the escape routes from the machinery spaces where the crew is normally employed shall avoid direct access to any special category space.

3.1 Two means of escape shall be provided from each machinery space. In particular, the following provisions shall be complied with:

- .1 Where the space is below the bulkhead deck the two means of escape shall consist of either:
 - .1.1 two sets of steel ladders as widely separated as possible, leading to doors in the upper part of the space similarly separated and from which access is provided to the appropriate lifeboat and liferaft embarkation decks. One of these ladders shall provide continuous fire shelter from the lower part of the space to a safe position outside the space; or
 - .1.2 one steel ladder leading to a door in the upper part of the space from which access is provided to the embarkation deck and additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the embarkation deck.
- .2 Where the space is above the bulkhead deck, the two means of escape shall be as widely separated as possible and the doors leading from such means of escape shall be in a position from which access is provided to the appropriate lifeboat and liferaft embarkation decks. Where such means of escape require the use of ladders, these shall be of steel.

3.2 In a ship of less than 1,000 tons gross tonnage, the Administration may

dispense with one of the means of escape, due regard being paid to the width and disposition of the upper part of the space; and in a ship of 1,000 tons gross tonnage and above, the Administration may dispense with one means of escape from any such space so long as either a door or a steel ladder provides a safe escape route to the embarkation deck, due regard being paid to the nature and location of the space and whether persons are normally employed in that space.

4 In no case shall lifts be considered as forming one of the required means of escape.

Regulation 29

Protection of stairways and lifts in accommodation and service spaces

1 All stairways shall be of steel frame construction except where the Administration sanctions the use of other equivalent material, and shall be within enclosures formed of "A" class divisions, with positive means of closure at all openings, except that:

- .1 a stairway connecting only two decks need not be enclosed, provided the integrity of the deck is maintained by proper bulkheads or doors in one 'tweendeck space. When a stairway is closed in one 'tweendeck space, the stairway enclosure shall be protected in accordance with the tables for decks in Regulations 26 or 27;
- .2 stairways may be fitted in the open in a public space, provided they lie wholly within such public space.

2 Stairway enclosures shall have direct communication with the corridors and be of sufficient area to prevent congestion, having in view the number of persons likely to use them in an emergency. In so far as is practicable, stairway enclosures shall not give direct access to cabins, service lockers, or other enclosed spaces containing combustibles in which a fire is likely to originate.

3 Lift trunks shall be so fitted as to prevent the passage of smoke and flame from one 'tweendeck to another and shall be provided with means of closing so as to permit the control of draught and smoke.

Regulation 30

Openings in "A" class divisions

1 Except for hatches between cargo, special category, store, and baggage spaces, and between such spaces and the weather decks, all openings shall be provided with permanently attached means of closing which shall be at least as effective for resisting fires as the divisions in which they are fitted.

2 The construction of all doors and door frames in "A" class divisions,

with the means of securing them when closed, shall provide resistance to fire as well as to the passage of smoke and flame, as far as practicable, equivalent to that of the bulkheads in which the doors are situated. Such doors and door frames shall be constructed of steel or other equivalent material. Watertight doors need not be insulated.

3 It shall be possible for each door to be opened and closed from each side of the bulkhead by one person only.

4 Fire doors in main vertical zone bulkheads and stairway enclosures, other than power-operated watertight doors and those which are normally locked, shall be of the self-closing type capable of closing against an inclination of 3.5° opposing closure. The speed of door closure shall, if necessary, be controlled so as to prevent undue danger to persons. All such doors, except those that are normally closed, shall be capable of release from a control station, either simultaneously or in groups, and also individually from a position at the door. The release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system; however, approved power-operated watertight doors will be considered acceptable for this purpose. Hold-back hooks not subject to control station release will not be permitted. When double swing doors are permitted, they shall have a latch arrangement which is automatically engaged by the operation of the door release system.

5 Where a space is protected by an automatic sprinkler system complying with the provisions of Regulation 12 or fitted with a continuous "B" class ceiling, openings in decks not forming steps in main vertical zones nor bounding horizontal zones shall be closed reasonably tight and such decks shall meet the "A" class integrity requirements in so far as is reasonable and practicable in the opinion of the Administration.

6 The requirements for "A" class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles. Similarly, the requirements for "A" class integrity shall not apply to exterior doors in superstructures and deckhouses.

Regulation 31

Openings in "B" class divisions

1 Doors and door frames in "B" class divisions and means of securing them shall provide a method of closure which shall have resistance to fire as far as practicable equivalent to that of the divisions except that ventilation openings may be permitted in the lower portion of such doors. Where such opening is in or under a door the total net area of any such opening or openings shall not exceed 0.05 m². When such opening is cut in a door it shall be fitted with a grill made of non-combustible material. Doors shall be non-combustible.

2 The requirements for "B" class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles. Similarly, the requirements for "B" class integrity shall not apply to exterior doors in

superstructures and deckhouses. For ships carrying not more than 36 passengers, the Administration may permit the use of combustible materials in doors separating cabins from the individual interior sanitary spaces such as showers.

3 Where an automatic sprinkler system complying with the provisions of Regulation 12 is fitted:

- .1 openings in decks not forming steps in main vertical zones nor bounding horizontal zones shall be closed reasonably tight and such decks shall meet the "B" class integrity requirements in so far as is reasonable and practicable in the opinion of the Administration; and
- .2 openings in corridor bulkheads of "B" class materials shall be protected in accordance with the provisions of Regulation 25.

Regulation 32

Ventilation systems

1 *Passenger ships carrying more than 36 passengers*

1.1 The ventilation system of a passenger ship carrying more than 36 passengers shall, in addition to this part of this Regulation, also be in compliance with the requirements of Regulation 16.2 to 16.9.

1.2 In general, the ventilation fans shall be so disposed that the ducts reaching the various spaces remain within the main vertical zone.

1.3 Where ventilation systems penetrate decks, precautions shall be taken, in addition to those relating to the fire integrity of the deck required by Regulations 18.1.1 and 30.5, to reduce the likelihood of smoke and hot gases passing from one 'tweendeck space to another through the system. In addition to insulation requirements contained in this Regulation, vertical ducts shall, if necessary, be insulated as required by the appropriate tables in Regulation 26.

1.4 Except in cargo spaces, ventilation ducts shall be constructed of the following materials:

- .1 ducts not less than 0.075 m² in sectional area and all vertical ducts serving more than a single 'tweendeck space shall be constructed of steel or other equivalent material;
- .2 ducts less than 0.075 m² in sectional area other than the vertical ducts referred to in paragraph 1.4.1, shall be constructed of non-combustible materials. Where such ducts penetrate "A" or "B" class divisions due regard shall be given to ensuring the fire integrity of the division;
- .3 short lengths of duct, not in general exceeding 0.02 m² in sectional area nor 2 m in length, need not be non-combustible provided that

all of the following conditions are met:

- .3.1 the duct is constructed of a material of restricted fire risk to the satisfaction of the Administration;
- .3.2 the duct is used only at the terminal end of the ventilation system; and
- .3.3 the duct is not located closer than 600 mm measured along its length to a penetration of an "A" or "B" class division, including continuous "B" class ceilings.

1.5 Where a stairway enclosure is ventilated, the duct or ducts shall be taken from the fan room independently of other ducts in the ventilation system and shall not serve any other space.

1.6 All power ventilation, except machinery space and cargo space ventilation and any alternative system which may be required under Regulation 16.6, shall be fitted with controls so grouped that all fans may be stopped from either of two separate positions which shall be situated as far apart as practicable. Controls provided for the power ventilation serving machinery spaces shall also be grouped so as to be operable from two positions, one of which shall be outside such spaces. Fans serving power ventilation systems to cargo spaces shall be capable of being stopped from a safe position outside such spaces.

2 *Passenger ships carrying not more than 36 passengers*

2.1 The ventilation system of passenger ships carrying not more than 36 passengers shall be in compliance with Regulation 16.

Regulation 33

Windows and sidescuttles

1 All windows and sidescuttles in bulkheads within accommodation and service spaces and control stations other than those to which the provisions of Regulation 30.6 and of Regulation 31.2 apply, shall be so constructed as to preserve the integrity requirements of the type of bulkheads in which they are fitted.

2 Notwithstanding the requirements of the tables in Regulations 26 and 27:

- .1 all windows and sidescuttles in bulkheads separating accommodation and service spaces and control stations from weather shall be constructed with frames of steel or other suitable material. The glass shall be retained by a metal glazing bead or angle;
- .2 special attention shall be given to the fire integrity of windows facing open or enclosed lifeboat and liferaft embarkation areas and to the fire integrity of windows situated below such areas in such a position that their failure during a fire would impede the launching of, or embarkation into, lifeboats or liferafts.

Regulation 34

Restricted use of combustible materials

1 Except in cargo spaces, mail rooms, baggage rooms, or refrigerated compartments of service spaces, all linings, grounds, ceilings and insulations shall be of non-combustible materials. Partial bulkheads or decks used to subdivide a space for utility or artistic treatment shall also be of non-combustible material.

2 Vapour barriers and adhesives used in conjunction with insulation, as well as insulation of pipe fittings, for cold service systems need not be non-combustible, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have qualities of resistance to the propagation of flame to the satisfaction of the Administration.

3 The following surfaces shall have low flame-spread characteristics:*

- .1 exposed surfaces in corridors and stairway enclosures, and of bulkheads, wall and ceiling linings in all accommodation and service spaces and control stations;
- .2 concealed or inaccessible spaces in accommodation, service spaces and control stations.

4 The total volume of combustible facings, mouldings, decorations and veneers in any accommodation and service space shall not exceed a volume equivalent to 2.5 mm veneer on the combined area of the walls and ceilings. In the case of ships fitted with an automatic sprinkler system complying with the provisions of Regulation 12, the above volume may include some combustible material used for erection of "C" class divisions.

5 Veneers used on surfaces and linings covered by the requirements of paragraph 3 shall have a calorific value not exceeding 45 MJ/m² of the area for the thickness used.

6 Furniture in the corridors and stairway enclosures shall be kept to a minimum.

7 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke and toxic products.

8 Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of approved material which will not readily ignite, or give rise to toxic or explosive hazards at elevated temperatures.**

* Reference is made to Guidelines on the Evaluation of Fire Hazard Properties of Materials, adopted by the Organization by resolution A.166(ES.IV).

** Reference is made to Improved Provisional Guidelines on Test Procedures for Primary Deck Coverings, adopted by the Organization by resolution A.214(VII).

Regulation 35

Details of construction

- 1 In accommodation and service spaces, control stations, corridors and stairways:
 - .1 air spaces enclosed behind ceilings, panelling or linings shall be suitably divided by close-fitting draught stops not more than 14 m apart;
 - .2 in the vertical direction, such enclosed air spaces, including those behind linings of stairways, trunks, etc. shall be closed at each deck.
- 2 The construction of ceiling and bulkheading shall be such that it will be possible, without impairing the efficiency of the fire protection, for the fire patrols to detect any smoke originating in concealed and inaccessible places, except where in the opinion of the Administration there is no risk of fire originating in such places.

Regulation 36

Automatic sprinkler, fire detection and fire alarm systems or automatic fire detection and fire alarm systems

- 1 In any ship to which this Part applies there shall be installed throughout each separate zone, whether vertical or horizontal, in all accommodation and service spaces and, where it is considered necessary by the Administration, in control stations, except spaces which afford no substantial fire risk (such as void spaces, sanitary spaces, etc.) either:
 - .1 an automatic sprinkler, fire detection and fire alarm system of an approved type, complying with the provisions of Regulation 12 and so installed and arranged as to protect such spaces; or
 - .2 a fixed fire detection and fire alarm system of an approved type, complying with the provisions of Regulation 13 and so installed and arranged as to detect the presence of fire in such spaces, except that the smoke detectors required by Regulation 13.2.2 need not be provided.

Regulation 37

Protection of special category spaces

- 1 *Provisions applicable to special category spaces whether above or below the bulkhead deck*
 - 1.1 General
 - 1.1.1 The basic principle underlying the provisions of this Regulation is that as normal main vertical zoning may not be practicable in special category

spaces, equivalent protection must be obtained in such spaces on the basis of a horizontal zone concept and by the provision of an efficient fixed fire-extinguishing system. Under this concept a horizontal zone for the purpose of this Regulation may include special category spaces on more than one deck provided that the total overall clear height for vehicles does not exceed 10 m.

1.1.2 The requirements of Regulations 16, 18, 30 and 32 for maintaining the integrity of vertical zones shall be applied equally to decks and bulkheads forming the boundaries separating horizontal zones from each other and from the remainder of the ship.

1.2 Structural protection

1.2.1 Boundary bulkheads of special category spaces shall be insulated as required for category (11) spaces in table 26.1 or in table 27.1 and the horizontal boundaries as required for category (11) spaces in table 26.3 or in table 27.2.

1.2.2 Indicators shall be provided on the navigating bridge which shall indicate when any fire door leading to or from the special category spaces is closed.

1.3 Fixed fire-extinguishing system*

Each special category space shall be fitted with an approved fixed pressure water-spraying system for manual operation which shall protect all parts of any deck and vehicle platform in such space, provided that the Administration may permit the use of any other fixed fire-extinguishing system that has been shown by full-scale test in conditions simulating a flowing petrol fire in a special category space to be not less effective in controlling fires likely to occur in such a space.

1.4 Patrols and detection

1.4.1 An efficient patrol system shall be maintained in special category spaces. In any such space in which the patrol is not maintained by a continuous fire watch at all times during the voyage there shall be provided an automatic fire detection system of an approved type.

1.4.2 Manually operated call points shall be provided as necessary throughout the special category spaces and one shall be placed close to each exit from such spaces.

1.5 Fire-extinguishing equipment

There shall be provided in each special category space:

- .1 at least three water fog applicators;
- .2 one portable foam applicator unit complying with the provisions of Regulation 6.4, provided that at least two such units are available in

* Reference is made to Recommendation on Fixed Fire-Extinguishing Systems for Special Category Spaces, adopted by the Organization by resolution A.123(V).

the ship for use in such spaces; and

- .3 such number of portable fire extinguishers as the Administration may deem sufficient, provided that at least one portable extinguisher is located at each access to such spaces.

1.6 Ventilation system

1.6.1 There shall be provided an effective power ventilation system for the special category spaces sufficient to give at least 10 air changes per hour. The system for such spaces shall be entirely separated from other ventilation systems and shall be operating at all times when vehicles are in such spaces. The Administration may require an increased number of air changes when vehicles are being loaded and unloaded. Ventilation ducts serving special category spaces capable of being effectively sealed shall be separated for each such space. The system shall be capable of being controlled from a position outside such spaces.

1.6.2 The ventilation shall be such as to prevent air stratification and the formation of air pockets.

1.6.3 Means shall be provided to indicate on the navigating bridge any loss or reduction of the required ventilating capacity.

1.6.4 Arrangements shall be provided to permit a rapid shut-down and effective closure of the ventilation system in case of fire, taking into account the weather and sea conditions.

1.6.5 Ventilation ducts, including dampers, shall be made of steel and their arrangement shall be to the satisfaction of the Administration.

2 *Additional provisions applicable only to special category spaces above the bulkhead deck*

2.1 Scuppers

In view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or decks consequent on the operation of the fixed pressure water-spraying system, scuppers shall be fitted so as to ensure that such water is rapidly discharged directly overboard.

2.2 Precautions against ignition of flammable vapours

2.2.1 On any deck on which vehicles are carried and on which explosive vapours might be expected to accumulate, equipment which may constitute a source of ignition of flammable vapours and, in particular, electrical equipment and wiring, shall be installed at least 450 mm above the deck. Electrical equipment installed at more than 450 mm above the deck shall be of a type so enclosed and protected as to prevent the escape of sparks. However, if the Administration is satisfied that the installation of electrical equipment and wiring at less than 450 mm above the deck is necessary for the safe operation of the ship, such electrical equipment and wiring may be installed provided that it is of a type approved for use in an explosive petrol and air mixture.

2.2.2 Electrical equipment and wiring, if installed in an exhaust ventilation duct, shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

3 *Additional provisions applicable only to special category spaces below the bulkhead deck*

3.1 Bilge pumping and drainage

In view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or tank top consequent on the operation of the fixed pressure water-spraying system, the Administration may require pumping and drainage facilities to be provided additional to the requirements of Regulation II-1/21.

3.2 Precautions against ignition of flammable vapours

3.2.1 Electrical equipment and wiring, if fitted, shall be of a type suitable for use in explosive petrol and air mixtures. Other equipment which may constitute a source of ignition of flammable vapours shall not be permitted.

3.2.2 Electrical equipment and wiring, if installed in an exhaust ventilation duct, shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

Regulation 38

*Protection of cargo spaces, other than special category spaces,
intended for the carriage of motor vehicles with
fuel in their tanks for their own propulsion*

In any cargo space (other than special category spaces) containing motor vehicles with fuel in their tanks for their own propulsion, the following provisions shall be complied with.

1 *Fire detection*

There shall be provided an approved automatic fire detection and fire alarm system. The design and arrangements of this system shall be considered in conjunction with the ventilation requirements referred to in paragraph 3.

2 *Fire-extinguishing arrangements*

2.1 There shall be fitted a fixed fire-extinguishing system which shall comply with the provisions of Regulation 5, except that, if a carbon dioxide system is fitted, the quantity of gas available shall be at least sufficient to give a minimum volume of free gas equal to 45 per cent of the gross volume of the largest such cargo space which is capable of being sealed, and the arrangements shall be such as to ensure that at least two thirds of the gas required for the relevant space shall be introduced during 10 minutes. Any

other fixed gas fire-extinguishing system or fixed high expansion foam fire-extinguishing system may be fitted provided it gives equivalent protection. Furthermore, any cargo space designated only for vehicles which are not carrying any cargo may be fitted with fixed halogenated hydrocarbon fire-extinguishing systems which shall comply with the provisions of Regulation 5.

2.2 As an alternative, a system meeting the requirements of Regulation 37.1.3 may be fitted, provided that Regulation 37.2.1 or 37.3.1, as appropriate, is also complied with.

2.3 There shall be provided for use in any such space such number of portable fire extinguishers as the Administration may deem sufficient. At least one portable extinguisher shall be located at each access to such spaces.

3 *Ventilation system*

3.1 There shall be provided an effective power ventilation system sufficient to give at least 10 air changes per hour for ships carrying more than 36 passengers, and 6 air changes per hour for ships carrying not more than 36 passengers. The system for such cargo spaces shall be entirely separate from other ventilation systems and shall be operating at all times when vehicles are in such spaces. Ventilation ducts serving such cargo spaces capable of being effectively sealed shall be separated for each such space. The system shall be capable of being controlled from a position outside such spaces.

3.2 The ventilation shall be such as to prevent air stratification and the formation of air pockets.

3.3 Means shall be provided to indicate on the navigating bridge any loss or reduction of the required ventilating capacity.

3.4 Arrangements shall be provided to permit a rapid shut-down and effective closure of the ventilation system in case of fire, taking into account the weather and sea conditions.

3.5 Ventilation ducts, including dampers, shall be made of steel and their arrangement shall be to the satisfaction of the Administration.

4 *Precautions against ignition of flammable vapours*

4.1 Electrical equipment and wiring, if fitted, shall be of a type suitable for use in explosive petrol and air mixtures. Other equipment which may constitute a source of ignition of flammable vapours shall not be permitted.

4.2 Electrical equipment and wiring, if installed in an exhaust ventilation duct, shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

4.3 Scuppers shall not be led to machinery or other spaces where sources of ignition may be present.

Regulation 39

Fixed fire-extinguishing arrangements in cargo spaces

1 Except as provided for in paragraph 3, the cargo spaces of ships of 1,000 tons gross tonnage and upwards shall be protected by a fixed gas fire-extinguishing system complying with the provisions of Regulation 5, or by a fixed high expansion foam fire-extinguishing system which gives equivalent protection.

2 Where it is shown to the satisfaction of the Administration that a ship is engaged on voyages of such short duration that it would be unreasonable to apply the requirements of paragraph 1 and also in ships of less than 1,000 tons gross tonnage, the arrangements in cargo spaces shall be to the satisfaction of the Administration.

3 A ship engaged in the carriage of dangerous goods shall be provided in any cargo spaces with a fixed gas fire-extinguishing system complying with the provisions of Regulation 5 or with a fire-extinguishing system which in the opinion of the Administration gives equivalent protection for the cargoes carried.

Regulation 40

Fire patrols, detection, alarms and public address systems

1 Manual alarms shall be fitted throughout the accommodation and service spaces to transmit an alarm immediately to the navigating bridge or main fire control station.

2 An approved fire detection or fire alarm system shall be provided which will automatically indicate at one or more suitable points or stations the presence or indication of fire and its location in any cargo space which, in the opinion of the Administration, is not accessible except where it is shown to the satisfaction of the Administration that the ship is engaged on voyages of such short duration that it would be unreasonable to apply this requirement.

3 All ships shall at all times when at sea, or in port (except when out of service), be so manned or equipped as to ensure that any initial fire alarm is immediately received by a responsible member of the crew.

4 A special alarm, operated from the navigating bridge or fire control station, shall be fitted to summon the crew. This alarm may be part of the ship's general alarm system but it shall be capable of being sounded independently of the alarm to the passenger spaces.

5 A public address system or other effective means of communication shall be available throughout the accommodation and service spaces and control stations.

6 For ships carrying more than 36 passengers an efficient patrol system shall be maintained so that an outbreak of fire may be promptly detected. Each member of the fire patrol shall be trained to be familiar with the

arrangements of the ship as well as the location and operation of any equipment he may be called upon to use.

Regulation 41

Special requirements for ships carrying dangerous goods

The requirements of Regulation 54 shall apply, as appropriate, to passenger ships carrying dangerous goods.

PART C – FIRE SAFETY MEASURES FOR CARGO SHIPS

(Regulation 54 of this Part also applies to passenger ships as appropriate).

Regulation 42

Structure

1 Subject to the provisions of paragraph 4, the hull, superstructure, structural bulkheads, deck and deckhouses shall be constructed of steel or other equivalent material.

2 The insulation of aluminium alloy components of "A" or "B" class divisions, except structure which in the opinion of the Administration is non-load-bearing, shall be such that the temperature of the structural core does not rise more than 200°C above the ambient temperature at any time during the applicable exposure to the standard fire test.

3 Special attention shall be given to the insulation of aluminium alloy components of columns, stanchions and other structural members required to support lifeboat and liferaft stowage, launching and embarkation areas, and "A" and "B" class divisions, to ensure:

- .1 that for such members supporting lifeboat and liferaft areas and "A" class divisions, the temperature rise limitation specified in paragraph 2 shall apply at the end of one hour;
and
- .2 that for such members required to support "B" class divisions, the temperature rise limitation specified in paragraph 2 shall apply at the end of half an hour.

4 Crowns and casings of machinery spaces of category A shall be of steel construction adequately insulated and openings therein, if any, shall be suitably arranged and protected to prevent the spread of fire.

5 One of the following methods of protection shall be adopted in accommodation and service areas:

- .1 *Method IC* – The construction of all internal divisional bulkheading of non-combustible “B” or “C” class divisions generally without the installation of an automatic sprinkler, fire detection and fire alarm system in the accommodation and service spaces, except as required by Regulation 52.1; or
- .2 *Method IIC* – The fitting of an automatic sprinkler, fire detection and fire alarm system as required by Regulation 52.2 for the detection and extinction of fire in all spaces in which fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheading; or
- .3 *Method IIIC* – The fitting of a fixed fire detection and fire alarm system, as required by Regulation 52.3, in all spaces in which a fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheading, except that in no case must the area of any accommodation space or spaces bounded by an “A” or “B” class division exceed 50 m². Consideration may be given by the Administration to increasing this area for public spaces.

6 The requirements for the use of non-combustible materials in construction and insulation of the boundary bulkheads of machinery spaces, control stations, service spaces, etc., and the protection of stairway enclosures and corridors will be common to all three methods outlined in paragraph 5.

Regulation 43

Bulkheads within the accommodation and service spaces

1 All bulkheads required to be “B” class divisions shall extend from deck to deck and to the shell or other boundaries, unless continuous “B” class ceilings or linings are fitted on both sides of the bulkhead in which case the bulkhead may terminate at the continuous ceiling or lining.

2 *Method IC* – All bulkheads not required by this or other Regulations of this Part to be “A” or “B” class divisions, shall be of at least “C” class construction.

3 *Method IIC* – There shall be no restriction on the construction of bulkheads not required by this or other regulations of this Part to be “A” or “B” class divisions except in individual cases where “C” class bulkheads are required in accordance with table 44.1.

4 *Method IIIC* – There shall be no restriction on the construction of bulkheads not required by this Part to be “A” or “B” class divisions except that the area of any accommodation space or spaces bounded by a continuous “A” or “B” class division must in no case exceed 50 m² except in individual cases where “C” class bulkheads are required in accordance with table 44.1. Consideration may be given by the Administration to increasing this area for public space.

Regulation 44

Fire integrity of bulkheads and decks

1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this Part, the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 44.1 and 44.2.

2 The following requirements shall govern application of the tables:

.1 Tables 44.1 and 44.2 shall apply respectively to the bulkheads and decks separating adjacent spaces.

.2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) below. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

(1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.

Spaces containing the ship's radio equipment.

Fire-extinguishing rooms, fire control rooms and fire-recording stations.

Control room for propulsion machinery when located outside the machinery space.

Spaces containing centralized fire alarm equipment.

(2) *Corridors*

Corridors and lobbies.

(3) *Accommodation spaces*

Spaces as defined in Regulation 3.10, excluding corridors.

(4) *Stairways*

Interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connexion, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(5) *Service spaces (low risk)*

Lockers and store-rooms having an area of less than 2 m², drying rooms and laundries.

(6) *Machinery spaces of category A*

Spaces as defined in Regulation 3.19.

TABLE 44.1 – FIRE INTEGRITY OF BULKHEADS SEPARATING ADJACENT SPACES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0 ^{e/}	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*	A-60
Corridors (2)		C	B-0	B-0 A-0 ^{c/}	B-0	A-60	A-0	A-0	A-0	*	A-30
Accommodation spaces (3)			Ca,b/	B-0 A-0 ^{c/}	B-0	A-60	A-0	A-0	A-0	*	A-30
Stairways (4)				B-0 A-0 ^{c/}	B-0 A-0 ^{c/}	A-60	A-0	A-0	A-0	*	A-30
Service spaces (low risk) (5)					C	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces (6) of category A						*	A-0	A-0 ^{d/}	A-60	*	A-60 ^{f/}
Other machinery spaces (7)							A-0 ^{d/}	A-0	A-0	*	A-0
Cargo spaces (8)								*	A-0	*	A-0
Service spaces (high risk) (9)									A-0 ^{d/}	*	A-30
Open decks (10)										-	A-0
Ro/ro cargo spaces (11)											*h/

Notes: To be applied to tables 44.1 and 44.2, as appropriate.

- a/ No special requirements are imposed upon bulkheads in methods IIC and IIIC fire protection.
- b/ In case of method IIIC "B" class bulkheads of "B-0" rating shall be provided between spaces or groups of spaces of 50 m² and over in area.
- c/ For clarification as to which applies, see Regulations 43 and 46.
- d/ Where spaces are of the same numerical category and superscript d appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose, e.g. in category (3). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.
- e/ Bulkheads separating the wheelhouse, chartroom and radio room from each other may be "B-0" rating.
- f/ A-0 rating may be used if no dangerous goods are intended to be carried or if such goods are stowed not less than 3 m horizontally from such bulkhead.
- g/ For cargo spaces in which dangerous goods are intended to be carried, Regulation 54.2.8 applies.
- h/ Bulkheads and decks separating ro/ro cargo spaces shall be capable of being closed reasonably gastight and such divisions shall have "A" class integrity in so far as is reasonable and practicable in the opinion of the Administration.
- i/ Fire insulation need not be fitted if the machinery space in category (7), in the opinion of the Administration, has little or no fire risk.
- * Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material but is not required to be of "A" class standard.

TABLE 44.2 – FIRE INTEGRITY OF DECKS SEPARATING ADJACENT SPACES

Space below ↓ Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*	A-60
Corridors (2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30
Accommodation spaces (3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30
Stairways (4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*	A-30
Service spaces (low risk) (5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A (6)	A-60	A-60	A-60	A-60	A-60	*	A-60 i/	A-30	A-60	*	A-60
Other machinery spaces (7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*	A-0
Cargo spaces (8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*	A-0
Service spaces (high risk) (9)	A-60	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0 ^{d/}	*	A-30
Open decks (10)	*	*	*	*	*	*	*	*	*	—	*
Ro/ro cargo spaces (11)	A-60	A-30	A-30	A-30	A-0	A-60	A-0	A-0	A-30	*	* ^{h/}

(7) *Other machinery spaces*

Spaces as defined in Regulation 3.20 excluding machinery spaces of category A.

(8) *Cargo spaces*

All spaces used for cargo (including cargo oil tanks) and trunkways and hatchways to such spaces.

(9) *Service spaces (high risk)*

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having an area of 2 m² or more, workshops other than those forming part of the machinery spaces.

(10) *Open decks*

Open deck spaces and enclosed promenades having no fire risk. Air spaces (the space outside superstructures and deck-houses).

(11) *Rolro cargo spaces*

Spaces as defined in Regulation 3.14. Cargo spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion.

3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

4 External boundaries which are required in Regulation 42.1 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries to have "A" class integrity elsewhere in this Part. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be of materials to the satisfaction of the Administration.

Regulation 45

Means of escape

1 Stairways and ladders shall be so arranged as to provide, from all accommodation spaces and from spaces in which the crew is normally employed, other than machinery spaces, ready means of escape to the open deck and thence to the lifeboats and liferafts. In particular the following general provisions shall be complied with:

- .1 At all levels of accommodation there shall be provided at least two widely separated means of escape from each restricted space or group of spaces.
- .2.1 Below the lowest open deck the main means of escape shall be a stairway and the second escape may be a trunk or a stairway.

- .2.2 Above the lowest open deck the means of escape shall be stairways or doors to an open deck or a combination thereof.
 - .3 Exceptionally the Administration may dispense with one of the means of escape, due regard being paid to the nature and location of spaces and to the numbers of persons who normally might be quartered or employed there.
 - .4 No dead-end corridors having a length of more than 7 m shall be accepted. A dead-end corridor is a corridor or part of a corridor from which there is only one escape route.
 - .5 The width and continuity of the means of escape shall be to the satisfaction of the Administration.
 - .6 If a radiotelegraph station has no direct access to the open deck, two means of access to or egress from such station shall be provided, one of which may be a porthole or window of sufficient size or other means to the satisfaction of the Administration, to provide an emergency escape.
- 2 In all ro/ro cargo spaces where the crew is normally employed the number and locations of escape routes to the open deck shall be to the satisfaction of the Administration, but shall in no case be less than two and shall be widely separated.
- 3 Except as provided in paragraph 4, two means of escape shall be provided from each machinery space of category A. In particular, one of the following provisions shall be complied with:
- .1 two sets of steel ladders as widely separated as possible leading to doors in the upper part of the space similarly separated and from which access is provided to the open deck. In general, one of these ladders shall provide continuous fire shelter from the lower part of the space to a safe position outside the space. However, the Administration may not require the shelter if, due to the special arrangement or dimensions of the machinery space, a safe escape route from the lower part of this space is provided. This shelter shall be of steel, insulated, where necessary, to the satisfaction of the Administration and be provided with a self-closing steel door at the lower end; or
 - .2 one steel ladder leading to a door in the upper part of the space from which access is provided to the open deck and additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the open deck.
- 4 In a ship of less than 1,000 tons gross tonnage, the Administration may dispense with one of the means of escape required under paragraph 3, due regard being paid to the dimension and disposition of the upper part of the space.
- 5 From machinery spaces other than those of category A, escape routes

shall be provided to the satisfaction of the Administration having regard to the nature and location of the space and whether persons are normally employed in that space.

6 Lifts shall not be considered as forming one of the required means of escape as required by this Regulation.

Regulation 46

Protection of stairways and lift trunks in accommodation spaces, service spaces and control stations

1 Stairways which penetrate only a single deck shall be protected at least at one level by at least "B-0" class divisions and self-closing doors. Lifts which penetrate only a single deck shall be surrounded by "A-0" class divisions with steel doors at both levels. Stairways and lift trunks which penetrate more than a single deck shall be surrounded by at least "A-0" class divisions and be protected by self-closing doors at all levels.

2 On ships having accommodation for 12 persons or less, where stairways penetrate more than a single deck and where there are at least two escape routes direct to the open deck at every accommodation level, consideration may be given by the Administration to reducing the "A-0" requirements of paragraph 1 to "B-0".

3 All stairways shall be of steel frame construction except where the Administration sanctions the use of other equivalent material.

Regulation 47

Doors in fire resisting divisions

1 The fire resistance of doors shall, as far as practicable, be equivalent to that of the division in which they are fitted. Doors and door frames in "A" class divisions shall be constructed of steel. Doors in "B" class divisions shall be non-combustible. Doors fitted in boundary bulkheads of machinery spaces of category A shall be reasonably gastight and self-closing. In ships constructed according to method IC, an Administration may permit the use of combustible materials in doors separating cabins from individual interior sanitary accommodation such as showers.

2 Doors required to be self-closing shall not be fitted with hold-back hooks. However, hold-back arrangements fitted with remote release devices of the fail-safe type may be utilized.

3 In corridor bulkheads ventilation openings may be permitted only in and under the doors of cabins and public spaces. The openings shall be provided only in the lower half of a door. Where such opening is in or under a door the total net area of any such opening or openings shall not exceed 0.05 m². When such opening is cut in a door it shall be fitted with a grille made of non-combustible material.

- 4 Watertight doors need not be insulated.

Regulation 48

Ventilation systems

The ventilation systems of cargo ships shall be in compliance with the provisions of Regulation 16, except paragraph 8.

Regulation 49

Restricted use of combustible materials

- 1 All exposed surfaces in corridors and stairway enclosures and surfaces including grounds in concealed or inaccessible spaces in accommodation and service spaces and control stations shall have low flame-spread characteristics.* Exposed surfaces of ceilings in accommodation and service spaces and control stations shall have low flame-spread characteristics.
- 2 Paints, varnishes and other finishes used on exposed interior surfaces shall not offer an undue fire hazard in the judgement of the Administration and shall not be capable of producing excessive quantities of smoke.
- 3 Primary deck coverings, if applied, in accommodation and service spaces and control stations shall be of an approved material which will not readily ignite.**

Regulation 50

Details of construction

- 1 *Method IC* – In accommodation and service spaces and control stations all linings, draught stops, ceilings and their associated grounds shall be of non-combustible materials.
- 2 *Methods IIC and IIIC* – In corridors and stairway enclosures serving accommodation and service spaces and control stations, ceilings, linings, draught stops and their associated grounds shall be of non-combustible materials.
- 3 *Methods IC, IIC and IIIC*
 - 3.1 Except in cargo spaces or refrigerated compartments of service spaces, insulating materials shall be non-combustible. Vapour barriers and adhesives used in conjunction with insulation, as well as the insulation of pipe fittings,

* Reference is made to Guidelines on the Evaluation of Fire Hazard Properties of Materials, adopted by the Organization by resolution A.166(ES.IV).

** Reference is made to Improved Provisional Guidelines on Test Procedures for Primary Deck Coverings, adopted by the Organization by resolution A.214(VII).

for cold service systems, need not be of non-combustible materials, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have qualities of resistance to the propagation of flame to the satisfaction of the Administration.

3.2 Where non-combustible bulkheads, linings and ceilings are fitted in accommodation and service spaces they may have a combustible veneer not exceeding 2.0 mm in thickness within any such space except corridors, stairway enclosures and control stations, where the veneer shall not exceed 1.5 mm in thickness.

3.3 Air spaces enclosed behind ceilings, panellings, or linings, shall be divided by close-fitting draught stops spaced not more than 14 m apart. In the vertical direction, such air spaces, including those behind linings of stairways, trunks, etc., shall be closed at each deck.

Regulation 51

Arrangements for gaseous fuel for domestic purposes

Where gaseous fuel is used for domestic purposes the arrangements, storage, distribution and utilization of the fuel shall be such that, having regard to the hazards of fire and explosion which the use of such fuel may entail, the safety of the ship and the persons on board is preserved.

Regulation 52

Fixed fire detection and fire alarm systems Automatic sprinkler, fire detection and fire alarm systems

1 In ships in which method IC is adopted, a smoke detection system in accordance with the relevant provisions of Regulation 13 shall be so installed and arranged as to protect all corridors, stairways and escape routes within accommodation spaces.

2 In ships in which method IIC is adopted, an automatic sprinkler, fire detection and fire alarm system of an approved type and complying with the relevant provisions of Regulation 12 shall be so installed and arranged as to protect accommodation spaces, galleys and other service spaces, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc. In addition, a smoke detection system in accordance with the relevant provisions of Regulation 13 shall be so arranged and installed as to protect corridors, stairways and escape routes within accommodation spaces.

3 In ships in which method IIIC is adopted, a fixed fire detection and fire alarm system of an approved type and complying with the relevant provisions of Regulation 13 shall be so installed and arranged as to detect the presence of fire in all accommodation spaces and service spaces, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc.

4 Notwithstanding the provisions of the above, the Administration need

not require the installation of detectors required in accordance with the provisions of Regulation 13.2.2 until 1 September 1985.

Regulation 53

Fire protection arrangements in cargo spaces

1 General

1.1 Except for cargo spaces covered in paragraphs 2 and 3, cargo spaces of ships of 2,000 tons gross tonnage and upwards shall be protected by a fixed gas fire-extinguishing system complying with the provisions of Regulation 5 or by a fire-extinguishing system which gives equivalent protection.

1.2 The Administration may exempt from the requirements of paragraph 1.1 cargo spaces of any ship if constructed and solely intended for carrying ore, coal, grain, unseasoned timber and non-combustible cargoes or cargoes which, in the opinion of the Administration, constitute a low fire risk. Such exemptions may be granted only if the ship is fitted with steel hatch covers and effective means of closing all ventilators and other openings leading to the cargo spaces.

1.3 Notwithstanding the provisions of paragraph 1.1, any ship engaged in the carriage of dangerous goods shall be provided in any cargo spaces with a fixed gas fire-extinguishing system complying with the provisions of Regulation 5 or by a fire-extinguishing system which in the opinion of the Administration give equivalent protection for the cargoes carried.

2 Ro/ro cargo spaces

2.1 Fire detection

There shall be provided an approved automatic fire detection and fire alarm system. The design and arrangements of this system shall be considered in conjunction with the ventilation requirements referred to in 2.3.

2.2 Fire-extinguishing arrangements

2.2.1 Ro/ro cargo spaces capable of being sealed shall be fitted with a fixed gas fire-extinguishing system which shall comply with the provisions of Regulation 5, except that:

- .1 if a carbon dioxide system is fitted, the quantity of gas available shall be at least sufficient to give a minimum volume of free gas equal to 45 per cent of the gross volume of the largest such cargo space which is capable of being sealed, and the arrangements shall be such as to ensure that at least two thirds of the gas required for the relevant space shall be introduced during 10 minutes;
- .2 a halogenated hydrocarbon system may be used only for spaces designated only for vehicles which are not carrying any cargo;
- .3 any other fixed gas fire-extinguishing system or fixed high expansion

foam fire-extinguishing system may be fitted provided the Administration is satisfied that an equivalent protection is achieved;

- .4 as an alternative, a system meeting the requirements of Regulation 37.1.3 may be fitted. However, the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. If this is not possible the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information.* Such information shall be included in the stability information supplied to the master as required by Regulation II-1/22.

2.2.2 Ro/ro cargo spaces not capable of being sealed shall be fitted with a system meeting the requirements of Regulation 37.1.3. However, the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. If this is not possible the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information*. Such information shall be included in the stability information supplied to the master as required by Regulation II-1/22.

2.2.3 There shall be provided for use in any ro/ro cargo space such number of portable fire extinguishers as the Administration may deem sufficient. At least one portable extinguisher shall be located at each access to such a cargo space.

2.2.4 Each ro/ro cargo space intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion shall be provided with:

- .1 at least three water fog applicators;
- .2 one portable foam applicator unit complying with the provisions of Regulation 6.4 provided that at least two such units are available in the ship for use in such ro/ro cargo spaces.

2.3 Ventilation system

2.3.1 Closed ro/ro cargo spaces shall be provided with an effective power ventilation system sufficient to provide at least six air changes per hour based on an empty hold. Ventilation fans shall normally be run continuously whenever vehicles are on board. Where this is impracticable, they shall be operated for a limited period daily as weather permits and in any case for a reasonable period prior to discharge, after which period the ro/ro cargo space shall be proved gas free. One or more portable combustible gas detecting instruments shall be carried for this purpose. The system shall be entirely separate from other ventilating systems. Ventilation ducts serving ro/ro cargo spaces capable of being effectively sealed shall be separated for each cargo space. The Administration may require an increased number of air changes when vehicles are being loaded or unloaded. The system shall be capable of being controlled from a position outside such spaces.

* Reference is made to Recommendation on Fixed Fire-Extinguishing Systems for Special Category Spaces, adopted by the Organization by resolution A.123(V).

2.3.2 The ventilation shall be so arranged as to prevent air stratification and the formation of air pockets.

2.3.3 Means shall be provided to indicate any loss of the required ventilating capacity on the navigating bridge.

2.3.4 Arrangements shall be provided to permit a rapid shut-down and effective closure of the ventilation system in case of fire, taking into account the weather and sea conditions.

2.3.5 Ventilation ducts, including dampers, shall be made of steel and their arrangement shall be to the satisfaction of the Administration.

2.4 Precautions against ignition of flammable vapours

Closed ro/ro cargo spaces carrying motor vehicles with fuel in their tanks for their own propulsion shall comply with the following additional provisions:

- .1 Except as provided in paragraph 2.4.2, electrical equipment and wiring shall be of a type suitable for use in explosive petrol and air mixtures.
 - .2 Above a height of 450 mm from the deck, electrical equipment of a type so enclosed and protected as to prevent the escape of sparks shall be permitted as an alternative on condition that the ventilating system is so designed and operated as to provide continuous ventilation of the cargo spaces at the rate of at least ten air changes per hour whenever vehicles are on board.
 - .3 Other equipment which may constitute a source of ignition of flammable vapours shall not be permitted.
 - .4 Electrical equipment and wiring in an exhaust ventilation duct shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.
 - .5 Scuppers shall not be led to machinery or other spaces where sources of ignition may be present.
- 3 *Cargo spaces, other than ro/ro cargo spaces, intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion*

Spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion shall comply with requirements of paragraph 2, except that paragraph 2.2.4 need not be complied with.

Regulation 54

Special requirements for ships carrying dangerous goods

1 *General*

1.1 In addition to complying with the requirements of Regulation 53 for cargo ships and with the requirements of Regulations 38 and 39 for passenger ships as appropriate, ship types and cargo spaces, referred to in paragraph 1.2, intended for the carriage of dangerous goods shall comply with the requirements of this Regulation, as appropriate, except when carrying dangerous goods in limited quantities* unless such requirements have already been met by compliance with the requirements elsewhere in this Chapter. The types of ships and modes of carriage of dangerous goods are referred to in paragraph 1.2 and in table 54.1, where the numbers appearing in paragraph 1.2 are referred to in the top line.

1.2 The following ship types and cargo spaces shall govern the application of tables 54.1 and 54.2:

- .1 Ships and cargo spaces not specifically designed for the carriage of freight containers but intended for the carriage of dangerous goods in packaged form including goods in freight containers and portable tanks.
- .2 Purpose built container ships and cargo spaces intended for the carriage of dangerous goods in freight containers and portable tanks.
- .3 Ro/ro ships and ro/ro cargo spaces intended for the carriage of dangerous goods.
- .4 Ships and cargo spaces intended for the carriage of solid dangerous goods in bulk.
- .5 Ships and cargo spaces intended for carriage of dangerous goods other than liquids and gases in bulk in shipborne barges.

2 *Special requirements*

Unless otherwise specified the following requirements shall govern the application of tables 54.1, 54.2 and 54.3 to both "on deck" and "under deck" stowage of dangerous goods where the numbers of the following paragraphs are indicated in the first column.

2.1 Water supplies

2.1.1 Arrangements shall be made to ensure immediate availability of a supply of water from the fire main at the required pressure either by permanent pressurization or by suitably placed remote starting arrangements for the fire pumps.

* Reference is made to Section 18 of the General Introduction to the International Maritime Dangerous Goods Code (the IMDG Code) for a definition of the term "limited quantities"

TABLE 54.1 – APPLICATION OF THE REQUIREMENTS TO DIFFERENT MODES OF CARRIAGE OF DANGEROUS GOODS IN SHIPS AND CARGO SPACES

Wherever "x" appears in table 54.1 it means that this requirement is applicable to all classes of dangerous goods as given in the appropriate line of table 54.3, except as indicated by the notes.

Regulation 54.1.2 Regulation 54.2	.1 Not specifically designed	.2 Container cargo spaces	.3			.4 Solid dangerous goods in bulk	.5 Shipborne barges
			Closed ro/ro cargo spaces	Open ro/ro cargo spaces	Weather decks		
.1.1	x	x	x	x	x	For application of requirements of Regulation 54 to different classes of dangerous goods – see Table 54.2	x
.1.2	x	x	x	x	x		—
.1.3	x	x	x	x	—		x
.1.4	x	x	x	x	—		x
.2	x	x	x	x	—		x ^{d/}
.3	x	x	x	—	—		x ^{d/}
.4.1	x	x ^{a/}	x	—	—		x ^{d/}
.4.2	x	x ^{a/}	x	—	—		x ^{d/}
.5	x	x	x	—	—		—
.6.1	x	x	x	x	x		—
.6.2	x	x	x	x	x		—
.7	x	—	—	x	x		—
.8	x	x ^{b/}	x	x	x		—
.9	—	—	x ^{c/}	x	—	—	

Notes

- a/ For classes 4 and 5.1 not applicable to closed freight containers. For classes 2, 3, 6.1 and 8 when carried in closed freight containers the ventilation rate may be reduced to not less than two air changes. For the purpose of this requirement a portable tank is a closed freight container.
- b/ Applicable to decks only.
- c/ Applies only to closed ro/ro cargo spaces, not capable of being sealed.
- d/ In the special case where the barges are capable of containing flammable vapours or alternatively if they are capable of discharging flammable vapours to a safe space outside the barge carrier compartment by means of ventilation ducts connected to the barges, these requirements may be reduced or waived to the satisfaction of the Administration.

TABLE 54.2 – APPLICATION OF THE REQUIREMENTS TO DIFFERENT CLASSES OF DANGEROUS GOODS FOR SHIPS AND CARGO SPACES CARRYING SOLID DANGEROUS GOODS IN BULK

Class – Chapter VII Regulation 54.2	4.1	4.2	4.3 ^{f/}	5.1	6.1	8	9
.1.1	x	x	–	x	x ^{g/}	x ^{g/}	x
.1.2 ^{e/}	x	x	–	x	–	–	x
.2	x	x ^{g/}	x	x ^{g/}	–	–	x ^{g/}
.4.1 ^{h/}	x ^{g/}	x ^{g/}	x	x ^{g/}	–	–	x ^{g/}
.4.2 ^{h/}	x	x ^{g/}	x	x ^{g/}	–	–	x ^{g/}
.6	x	x	x	x	x	x	x
.8	x	x	x	x ^{g/}	x ^{g/}	x ^{g/}	x

Notes

- ^{e/} This requirement is applicable when the characteristics of the substance call for large quantities of water for fire fighting.
- ^{f/} The hazards of substances in this class which may be carried in bulk are such that special consideration must be given by the Administration to the construction and equipment of the ships involved in addition to those enumerated in this table.
- ^{g/} Reference is made to the International Maritime Dangerous Goods Code (resolution A.81(IV) as amended) or the Code of Safe Practice for Solid Bulk Cargoes (resolution A.434(XI) as amended), as appropriate.
- ^{h/} At least natural ventilation is required in enclosed cargo spaces intended for carriage of solid dangerous goods in bulk. In cases where power ventilation is required in the Code of Safe Practice for Solid Bulk Cargoes (resolution A.434(XI) as amended), the use of portable ventilation units (equipment) to the satisfaction of the Administration may suffice.

TABLE 54.3 – APPLICATION OF THE REQUIREMENTS TO DIFFERENT CLASSES OF DANGEROUS GOODS EXCEPT SOLID DANGEROUS GOODS IN BULK

Class -- Chapter VII Regulation 54.2	1	2	3	4	5.1	5.2	6.1	8
.1.1	x	x	x	x ^{p/}	x	x ^{p/}	x	x
.1.2 ^{i/}	x	x	x	x ^{p/}	x	x ^{p/}	—	—
.1.3	x ^{k/}	—	—	—	—	—	—	—
.1.4	x ^{k/}	—	—	—	—	—	—	—
.2	x ^{k/}	x ^{l/}	x ^{m/}	—	—	—	x ^{m/} x ^{p/}	x ^{m/} x ^{p/}
.3	x	x	x	x	x	—	x	x
.4.1	—	x ^{j/}	x ^{m/}	x ^{p/}	x ^{p/}	—	x ^{m/} x ^{p/}	x ^{m/} x ^{p/}
.4.2	—	x ^{l/}	x ^{m/}	—	—	—	x ^{m/} x ^{p/}	x ^{m/} x ^{p/}
.5	—	—	x ^{m/}	—	—	—	x ^{n/}	x ^{m/}
.6	—	x	x	x	x	x ^{p/}	x	x
.7	—	—	x	x	x	x ^{p/}	x ^{p/}	x ^{p/}
.8	x ^{k/} o/	x	x	x	x ^{p/}	—	x ^{p/}	x ^{p/}
.9	x	x	x ^{m/}	x ^{p/}	x	—	x ^{m/}	x ^{m/}

Notes

- i/ This requirement is applicable when the characteristics of the substance call for large quantities of water for fire fighting.
- j/ Applicable to flammable or poisonous gases.
- k/ Except goods of class 1 in division 1.4, compatibility group S.
- l/ All flammable gases.
- m/ All liquids having a flashpoint below 23°C (closed cup test).
- n/ Liquids only.
- o/ Goods of class 1 shall be stowed 3 m horizontally away from the machinery space boundaries in all cases.
- p/ Reference is made to the International Maritime Dangerous Goods Code (resolution A.81(IV) as amended), or the Code of Safe Practice for Solid Bulk Cargoes (resolution A.434(XI) as amended), as appropriate.

2.1.2 The quantity of water delivered shall be capable of supplying four nozzles of a size and at pressures as specified in Regulation 4, capable of being trained on any part of the cargo space when empty. This amount of water may be applied by equivalent means to the satisfaction of the Administration.

2.1.3 Means of effectively cooling the designated under deck cargo space by copious quantities of water, either by a fixed arrangement of spraying nozzles, or flooding the cargo space with water, shall be provided. Hoses may be used for this purpose in small cargo spaces and in small areas of larger cargo spaces at the discretion of the Administration. In any event the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. If this is not possible the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information.*

2.1.4 Provision to flood a designated under deck cargo space with suitable specified media may be substituted for the requirements in paragraph 2.1.3.

2.2 Sources of ignition

Electrical equipment and wiring shall not be fitted in enclosed cargo spaces, closed vehicle deck spaces, or open vehicle deck spaces unless it is essential for operational purposes in the opinion of the Administration. However, if electrical equipment is fitted in such spaces, it shall be of a certified safe type** for use in the dangerous environments to which it may be exposed unless it is possible to completely isolate the electrical system (by removal of links in the system, other than fuses). Cable penetrations of the decks and bulkheads shall be sealed against the passage of gas or vapour. Through runs of cables and cables within the cargo spaces shall be protected against damage from impact. Any other equipment which may constitute a source of ignition of flammable vapour shall not be permitted.

2.3 Detection system

An approved fire detection and fire alarm system shall be fitted to all enclosed cargo spaces including closed vehicle deck spaces. Where the detection system utilizes samples of atmosphere drawn from such cargo spaces provision shall be made to prevent, in the event of cargo leakage, the discharge of contaminated atmosphere through the sampling system into the space in which the detection apparatus is situated. A notice stating that the samples shall be discharged to the open air when cargoes giving off toxic fumes are being carried shall be permanently exhibited at the equipment.

2.4 Ventilation

2.4.1 Adequate power ventilation shall be provided in enclosed cargo spaces. The arrangement shall be such as to provide for at least six air changes per

* Reference is made to Recommendation on Fixed Fire-Extinguishing Systems for Special Category Spaces, adopted by the Organization by resolution A.123(V).

** Reference is made to Recommendations published by the International Electrotechnical Commission and, in particular, Publication 92 - Electrical Installations in Ships.

hour in the cargo space based on an empty cargo space and for removal of vapours from the upper or lower parts of the cargo space, as appropriate.

2.4.2 The fans shall be such as to avoid the possibility of ignition of flammable gas air mixtures. Suitable wire mesh guards shall be fitted over inlet and outlet ventilation openings.

2.5 Bilge pumping

Where it is intended to carry flammable or toxic liquids in enclosed cargo spaces the bilge pumping system shall be designed to ensure against inadvertent pumping of such liquids through machinery space piping or pumps. Where large quantities of such liquids are carried, consideration shall be given to the provision of additional means of draining those cargo spaces. These means shall be to the satisfaction of the Administration.

2.6 Personnel protection

2.6.1 Four sets of full protective clothing resistant to chemical attack shall be provided in addition to the fireman's outfits required by Regulation 17. The protective clothing shall cover all skin, so that no part of the body is unprotected.

2.6.2 At least two self-contained breathing apparatuses additional to those required by Regulation 17 shall be provided.

2.7 Portable fire extinguishers

Portable fire extinguishers with a total capacity of at least 12 kg of dry powder or equivalent shall be provided for the cargo spaces. These extinguishers shall be in addition to any portable fire extinguishers required elsewhere in this Chapter.

2.8 Insulation of machinery space boundaries

Bulkheads forming boundaries between cargo spaces and machinery spaces of category A shall be insulated to "A-60" standard, unless the dangerous goods are stowed at least 3 m horizontally away from such bulkheads. Other boundaries between such spaces shall be insulated to "A-60" standard.

2.9 Water spray system

Each open ro/ro cargo space having a deck above it and each space deemed to be a closed ro/ro cargo space not capable of being sealed shall be fitted with an approved fixed pressure water-spraying system for manual operation which shall protect all parts of any deck and vehicle platform in such space, except that the Administration may permit the use of any other fixed fire-extinguishing system that has been shown by full-scale test to be no less effective. In any event the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. If this is not possible the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information.*

* Reference is made to Recommendation on Fixed Fire-Extinguishing Systems for Special Category Spaces, adopted by the Organisation by resolution A.123(V).

3 *Document of compliance*

The Administration shall provide the ship with an appropriate document as evidence of compliance of construction and equipment with the requirements of this Regulation.

PART D – FIRE SAFETY MEASURES FOR TANKERS

(The requirements of this Part are additional to those of Part C except for Regulations 53 and 54 which do not apply to tankers and except as provided otherwise in Regulations 57 and 58)

Regulation 55

Application

1 Unless expressly provided otherwise, this Part shall apply to tankers carrying crude oil and petroleum products having a flashpoint not exceeding 60°C (closed cup test), as determined by an approved flashpoint apparatus, and a Reid vapour pressure which is below atmospheric pressure and other liquid products having a similar fire hazard.

2 Where liquid cargoes other than those referred to in paragraph 1 or liquefied gases which introduce additional fire hazards are intended to be carried, additional safety measures shall be required to the satisfaction of the Administration, having due regard to the provisions of the Bulk Chemical Code and the Gas Carrier Code.

3 This paragraph applies to all ships which are combination carriers. Such ships shall not carry solid cargoes unless all cargo tanks are empty of oil and gas freed or unless the arrangements provided in each case are to the satisfaction of the Administration and in accordance with the relevant operational requirements contained in the Guidelines for Inert Gas Systems*.

4 Tankers carrying petroleum products having a flashpoint exceeding 60°C (closed cup test) as determined by an approved flashpoint apparatus shall comply with the provisions of Part C, except that in lieu of the fixed fire-extinguishing system required in Regulation 53 they shall be fitted with a fixed deck foam system which shall comply with the provisions of Regulation 61.

5 The requirements for inert gas systems of Regulation 60 need not be applied to all chemical tankers or gas carriers when carrying cargoes described in paragraph 1, provided that alternative arrangements, to be developed by the Organization, are fitted.**

* Reference is made to Guidelines for Inert Gas Systems, adopted by the Maritime Safety Committee at its forty-second session in May 1980 (MSC/Circ.282).

** Reference is made to Interim Regulation for Inert Gas Systems on Chemical Tankers Carrying Petroleum Products, adopted by the Organization by resolution A.473(XII).

6 Chemical tankers and gas carriers shall comply with the requirements of this Part, except where alternative and supplementary arrangements are provided to the satisfaction of the Administration, having due regard to the provisions of the Bulk Chemical Code and the Gas Carrier Code.

Regulation 56

Location and separation of spaces

1 Machinery spaces of category A other than such spaces for bow thrusters and their associated equipment shall be positioned aft of cargo tanks and slop tanks; they shall also be situated aft of cargo pump rooms and cofferdams, but not necessarily aft of the oil fuel bunker tanks. Any machinery space of category A shall be isolated from cargo tanks and slop tanks by a cofferdam, a cargo pump room, or an oil fuel bunker tank. However, the lower portion of the pump room may be recessed into machinery spaces of category A to accommodate pumps provided that the deckhead of the recess is in general not more than one third of the moulded depth above the keel except that in the case of ships of not more than 25,000 tonnes deadweight, where it can be demonstrated that for reasons of access and satisfactory piping arrangements this is impracticable, the Administration may permit a recess in excess of such height, but not exceeding one half of the moulded depth above the keel.

2 Accommodation spaces, main cargo control stations, control stations and service spaces (excluding isolated cargo handling gear lockers) shall be positioned aft of all cargo tanks, slop tanks, cargo pump rooms and cofferdams which isolate cargo or slop tanks from machinery spaces of category A. Any common bulkheads separating a cargo pump room, including the cargo pump room entrance, from accommodation and service spaces and control stations shall be constructed to "A-60" standard. Where deemed necessary, accommodation spaces, control stations, machinery spaces other than those of category A, and service spaces may be permitted forward of all cargo tanks, slop tanks, cargo pump rooms and cofferdams subject to an equivalent standard of safety and appropriate availability of fire-extinguishing arrangements being provided to the satisfaction of the Administration.

3 Where the fitting of a navigation position above the cargo tank area is shown to be necessary it shall be for navigation purposes only and it shall be separated from the cargo tank deck by means of an open space with a height of at least 2 m. The fire protection of such navigation position shall in addition be as required for control spaces as set forth in Regulation 58.1 and 58.2 and other provisions, as applicable, of this Part.

4 Means shall be provided to keep deck spills away from the accommodation and service areas. This may be accomplished by provision of a permanent continuous coaming of a suitable height extending from side to side. Special consideration shall be given to the arrangements associated with stern loading.

5 Exterior boundaries of superstructures and deckhouses enclosing accommodation and service spaces and including any overhanging decks which support such accommodation, shall be insulated to "A-60" standard for the whole of the portions which face cargo oil tanks and for 3 m aft of the front boundary. In the case of the sides of these superstructures and deckhouses, such insulation shall be carried as high as is deemed necessary by the Administration.

6.1 Entrances, air inlets and openings to accommodation spaces, service spaces and control stations shall not face the cargo area. They shall be located on the end bulkhead not facing the cargo area and/or on the outboard side of the superstructure or deckhouse at a distance of at least 25 per cent of the length of the ship but not less than 3 m from the end of the superstructure or deckhouse facing the cargo area. This distance, however, need not exceed 5 m.

6.2 No doors shall be permitted within the limits mentioned in paragraph 6.1, except that doors to those spaces not having access to accommodation spaces, service spaces and control stations, such as cargo control stations, provision rooms and store-rooms may be permitted by the Administration. Where such doors are fitted, the boundaries of the space shall be insulated to "A-60" standard. Bolted plates for removal of machinery may be fitted within the limits specified in paragraph 6.1. Navigating bridge doors and wheelhouse windows may be located within the limits specified in paragraph 6.1 so long as they are so designed that a rapid and efficient gas and vapour tightening of the navigating bridge can be ensured.

6.3 Port lights facing the cargo area and on the sides of the superstructures and deckhouses within the limits specified in paragraph 6.1 shall be of the fixed (non-opening) type. Such port lights in the first tier on the main deck shall be fitted with inside covers of steel or other equivalent material.

Regulation 57

Structure, bulkheads within accommodation and service spaces and details of construction

1 For the application of the requirements of Regulations 42, 43 and 50 to tankers, only method IC as defined in Regulation 42.5.1 shall be used.

2 Skylights to cargo pump rooms shall be of steel, shall not contain any glass and shall be capable of being closed from outside the pump room.

Regulation 58

Fire integrity of bulkheads and decks

1 In lieu of Regulation 44 and in addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this Part the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 58.1 and 58.2.

TABLE 58.1 – FIRE INTEGRITY OF BULKHEADS SEPARATING ADJACENT SPACES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Control stations (1)	A-0 ^{c/}	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*
Corridors (2)		C	B-0	B-0 A-0 ^{a/}	B-0	A-60	A-0	A-60	A-0	*
Accommodation spaces (3)			C	B-0 A-0 ^{a/}	B-0	A-60	A-0	A-60	A-0	*
Stairways (4)				B-0 A-0 ^{a/}	B-0 A-0 ^{a/}	A-60	A-0	A-60	A-0	*
Service spaces (low risk) (5)					C	A-60	A-0	A-60	A-0	*
Machinery spaces of category A (6)						*	A-0	A-0 ^{d/}	A-60	*
Other machinery spaces (7)							A-0 ^{b/}	A-0	A-0	*
Cargo pump rooms (8)								*	A-60	*
Service spaces (high risk) (9)									A-0 ^{b/}	*
Open decks (10)										—

Notes: To be applied to tables 58.1 and 58.2, as appropriate.

a/ For clarification as to which applies, see Regulations 43 and 46 of this Chapter.

b/ Where spaces are of the same numerical category and superscript b appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose, e.g. in category (9). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.

c/ Bulkheads separating the wheelhouse, chartroom and radio room from each other may be "B-0" rating.

d/ Bulkheads and decks between cargo pump rooms and machinery spaces of category A may be penetrated by cargo pump shaft glands and similar glanded penetrations, provided that gastight seals with efficient lubrication or other means of ensuring the permanence of the gas seal are fitted in way of the bulkhead or deck.

e/ Fire insulation need not be fitted if the machinery space in category (7), in the opinion of the Administration, has little or no fire risk.

* Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material but is not required to be of "A" class standard.

TABLE 58.2 – FIRE INTEGRITY OF DECKS SEPARATING ADJACENT SPACES

Space below ↓	Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Control stations	(1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	–	A-0	*
Corridors	(2)	A-0	*	*	A-0	*	A-60	A-0	–	A-0	*
Accommodation spaces	(3)	A-60	A-0	*	A-0	*	A-60	A-0	–	A-0	*
Stairways	(4)	A-0	A-0	A-0	*	A-0	A-60	A-0	–	A-0	*
Service spaces (low risk)	(5)	A-15	A-0	A-0	A-0	*	A-60	A-0	–	A-0	*
Machinery spaces of category A	(6)	A-60	A-60	A-60	A-60	A-60	*	A-50 ^{e/}	A-0	A-60	*
Other machinery spaces	(7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*
Cargo pump rooms	(8)	–	–	–	–	–	A-0 ^{d/}	A-0	*	–	*
Service spaces (high risk)	(9)	A-60	A-0	A-0	A-0	A-0	A-60	A-0	–	A-0 ^{b/}	*
Open decks	(10)	*	*	*	*	*	*	*	*	*	–

- 2 The following requirements shall govern application of the tables:
- .1 Tables 58.1 and 58.2 shall apply respectively to the bulkhead and decks separating adjacent spaces.
 - .2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (10) below. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.
 - (1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.
Spaces containing the ship's radio equipment.
Fire-extinguishing rooms, fire control rooms and fire-recording stations.
Control room for propulsion machinery when located outside the machinery space.
Spaces containing centralized fire alarm equipment.
 - (2) *Corridors*

Corridors and lobbies.
 - (3) *Accommodation spaces*

Spaces as defined in Regulation 3.10, excluding corridors.
 - (4) *Stairways*

Interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connexion, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.
 - (5) *Service spaces (low risk)*

Lockers and store-rooms having areas of less than 2 m², drying rooms and laundries.
 - (6) *Machinery spaces of category A*

Spaces as defined in Regulation 3.19.
 - (7) *Other machinery spaces*

Spaces as defined in Regulation 3.20 excluding machinery spaces of category A.
 - (8) *Cargo pump rooms*

Spaces containing cargo pumps and entrances and trunks to such spaces.

(9) *Service spaces (high risk)*

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having an area of 2 m² or more, workshops other than those forming part of the machinery spaces.

(10) *Open decks*

Open deck spaces and enclosed promenades having no fire risk. Air spaces (the space outside superstructures and deck-houses).

3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

4 External boundaries which are required in Regulation 57.1 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries to have "A" class integrity elsewhere in these Requirements. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be of materials to the satisfaction of the Administration.

5 Permanent approved gastight lighting enclosures for illuminating cargo pump rooms may be permitted in bulkheads and decks separating cargo pump rooms and other spaces provided they are of adequate strength and the integrity and gastightness of the bulkhead or deck is maintained.

Regulation 59

Venting, purging, gas freeing and ventilation

1 *Cargo tank venting*

1.1 The venting systems of cargo tanks are to be entirely distinct from the air pipes of the other compartments of the ship. The arrangements and position of openings in the cargo tank deck from which emission of flammable vapours can occur shall be such as to minimize the possibility of flammable vapours being admitted to enclosed spaces containing a source of ignition, or collecting in the vicinity of deck machinery and equipment which may constitute an ignition hazard. In accordance with this general principle the criteria in paragraphs 1.2 to 1.10 will apply.

1.2 The venting arrangements shall be so designed and operated as to ensure that neither pressure nor vacuum in cargo tanks shall exceed design parameters and be such as to provide for:

- .1 the flow of the small volumes of vapour, air or inert gas mixtures caused by thermal variations in a cargo tank in all cases through pressure/vacuum valves; and
- .2 the passage of large volumes of vapour, air or inert gas mixtures during cargo loading and ballasting, or during discharging.

1.3.1 The venting arrangements in each cargo tank may be independent or combined with other cargo tanks and may be incorporated into the inert gas piping.

1.3.2 Where the arrangements are combined with other cargo tanks either stop valves or other acceptable means shall be provided to isolate each cargo tank. Where stop valves are fitted, they shall be provided with locking arrangements which shall be under the control of the responsible ship's officer. Any isolation must continue to permit the flow caused by thermal variations in a cargo tank in accordance with paragraph 1.2.1.

1.4 The venting arrangements shall be connected to the top of each cargo tank and shall be self-draining to the cargo tanks under all normal conditions of trim and list of the ship. Where it may not be possible to provide self-draining lines permanent arrangements shall be provided to drain the vent lines to a cargo tank.

1.5 The venting system shall be provided with devices to prevent the passage of flame into the cargo tanks. The design, testing and locating of these devices shall comply with the requirements established by the Administration which shall contain at least the standards adopted by the Organization.

1.6 Provision shall be made to guard against liquid rising in the venting system to a height which would exceed the design head of cargo tanks. This shall be accomplished by high level alarms or overflow control systems or other equivalent means, together with gauging devices and cargo tank filling procedures.

1.7 Openings for pressure release required by paragraph 1.2.1 shall:

- .1 have as great a height as is practicable above the cargo tank deck to obtain maximum dispersal of flammable vapours but in no case less than 2 m above the cargo tank deck;
- .2 be arranged at the furthest distance practicable but not less than 5 m from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery and equipment which may constitute an ignition hazard.

1.8 Pressure/vacuum valves required by paragraph 1.2.1 may be provided with a by-pass arrangement when they are located in a vent main or masthead riser. Where such an arrangement is provided there shall be suitable indicators to show whether the by-pass is open or closed.

1.9 Vent outlets for cargo loading, discharging and ballasting required by paragraph 1.2.2 shall:

- .1.1 permit the free flow of vapour mixtures; or
- .1.2 permit the throttling of the discharge of the vapour mixtures to achieve a velocity of not less than 30 m/sec;
- .2 be so arranged that the vapour mixture is discharged vertically upwards;

- .3 where the method is by free flow of vapour mixtures, be such that the outlet shall be not less than 6 m above the cargo tank deck or fore and aft gangway if situated within 4 m of the gangway and located not less than 10 m measured horizontally from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery and equipment which may constitute an ignition hazard;
- .4 where the method is by high velocity discharge, be located at a height not less than 2 m above the cargo tank deck and not less than 10 m measured horizontally from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery and equipment which may constitute an ignition hazard. These outlets shall be provided with high velocity devices of an approved type;
- .5 be designed on the basis of the maximum designed loading rate multiplied by a factor of at least 1.25 to take account of gas evolution, in order to prevent the pressure in any cargo tank from exceeding the design pressure. The master shall be provided with information regarding the maximum permissible loading rate for each cargo tank and in the case of combined venting systems, for each group of cargo tanks.

1.10 In combination carriers, the arrangement to isolate slop tanks containing oil or oil residues from other cargo tanks shall consist of blank flanges which will remain in position at all times when cargoes other than liquid cargoes referred to in Regulation 55.1 are carried.

2 *Cargo tank purging and/or gas freeing*

Arrangements for purging and/or gas freeing shall be such as to minimize the hazards due to the dispersal of flammable vapours in the atmosphere and to flammable mixtures in a cargo tank. Accordingly:

- .1 When the ship is provided with an inert gas system the cargo tanks shall first be purged in accordance with the provisions of Regulation 62.13 until the concentration of hydrocarbon vapours in the cargo tanks has been reduced to less than 2 per cent by volume. Thereafter, venting may be at the cargo tank deck level.
- .2 When the ship is not provided with an inert gas system, the operation shall be such that the flammable vapour is initially discharged:
 - .2.1 through the vent outlets as specified in paragraph 1.9; or
 - .2.2 with a vertical exit velocity of at least 20 m/sec through outlets at least 2 m above the cargo tank deck level and which are protected by suitable devices to prevent the passage of flame.

When the flammable gas concentration in the outlet has been reduced to 30 per cent of the lower flammable limit the discharge of the gas mixture may be at the cargo tank deck level.

3 *Ventilation*

3.1 Cargo pump rooms shall be mechanically ventilated and discharges from the exhaust fans shall be led to a safe place on the open deck. The ventilation of these rooms shall have sufficient capacity to minimize the possibility of accumulation of flammable vapours. The number of changes of air shall be at least 20 per hour, based upon the gross volume of the space. The air ducts shall be arranged so that all of the space is effectively ventilated. The ventilation shall be of the suction type using fans of the non-sparking type.

3.2 The arrangement of ventilation inlets and outlets and other deckhouse and superstructure boundary space openings shall be such as to complement the provisions of paragraph 1. Such vents especially for machinery spaces shall be situated as far aft as practicable. Due consideration in this regard should be given when the ship is equipped to load or discharge at the stern. Sources of ignition such as electrical equipment shall be so arranged as to avoid an explosion hazard.

3.3 In combination carriers all cargo spaces and any enclosed spaces adjacent to cargo spaces shall be capable of being mechanically ventilated. The mechanical ventilation may be provided by portable fans. An approved fixed gas warning system capable of monitoring flammable vapours shall be provided in cargo pump rooms and pipe ducts and cofferdams referred to in Regulation 56.1 adjacent to slop tanks. Suitable arrangements shall be made to facilitate measurement of flammable vapours in all other spaces within the cargo tank area. Such measurements shall be made possible from open deck or easily accessible positions.

Regulation 60

Cargo tank protection

1 For tankers of 20,000 tonnes deadweight and upwards the protection of the cargo tanks deck area and cargo tanks shall be achieved by a fixed deck foam system and a fixed inert gas system in accordance with the requirements of Regulations 61 and 62, except that, in lieu of the above installations, the Administration, after having given consideration to the ship's arrangement and equipment, may accept other combinations of fixed installations if they afford protection equivalent to the above, in accordance with Regulation I/5.

2 To be considered equivalent, the system proposed in lieu of the deck foam system shall:

- .1 be capable of extinguishing spill fires and also preclude ignition of spilled oil not yet ignited; and
- .2 be capable of combating fires in ruptured tanks.

3 To be considered equivalent, the system proposed in lieu of the fixed inert gas system shall:

- .1 be capable of preventing dangerous accumulations of explosive mixtures in intact cargo tanks during normal service throughout the

ballast voyage and necessary in-tank operations; and

- .2 be so designed as to minimize the risk of ignition from the generation of static electricity by the system itself.

4 Tankers of 20,000 tonnes deadweight and upwards constructed before 1 September 1984 which are engaged in the trade of carrying crude oil shall be fitted with an inert gas system, complying with the requirements of paragraph 1, not later than:

- .1 for a tanker of 70,000 tonnes deadweight and upwards 1 September 1984 or the date of delivery of the ship, whichever occurs later; and
- .2 for a tanker of less than 70,000 tonnes deadweight 1 May 1985 or the date of delivery of the ship, whichever occurs later except that for tankers of less than 40,000 tonnes deadweight not fitted with tank washing machines having an individual throughput of greater than 60 m³/hour the Administration may exempt such tankers from the requirements of this paragraph, if it would be unreasonable and impracticable to apply these requirements, taking into account the ship's design characteristics.

5 Tankers of 40,000 tonnes deadweight and upwards constructed before 1 September 1984 which are engaged in the trade of carrying oil other than crude oil and any such tanker of 20,000 tonnes deadweight and upwards engaged in the trade of carrying oil other than crude oil fitted with tank washing machines having an individual throughput of greater than 60 m³/hour shall be fitted with an inert gas system, complying with the requirements of paragraph 1, not later than:

- .1 for a tanker of 70,000 tonnes deadweight and upwards 1 September 1984 or the date of delivery of the ship, whichever occurs later; and
- .2 for a tanker of less than 70,000 tonnes deadweight 1 May 1985 or the date of delivery of the ship, whichever occurs later.

6 All tankers operating with a cargo tank cleaning procedure using crude oil washing shall be fitted with an inert gas system complying with the requirements of Regulation 62 and with fixed tank washing machines.

7 All tankers fitted with a fixed inert gas system shall be provided with a closed ullage system.

8 Tankers of less than 20,000 tonnes deadweight shall be provided with a deck foam system complying with the requirements of Regulation 61.

Regulation 61

Fixed deck foam systems

1 The arrangements for providing foam shall be capable of delivering foam to the entire cargo tank area as well as into any cargo tank the deck of which has been ruptured.

2 The deck foam system shall be capable of simple and rapid operation. The main control station for the system shall be suitably located outside the cargo tank area, adjacent to the accommodation spaces and readily accessible and operable in the event of fire in the areas protected.

3 The rate of supply of foam solution shall be not less than the greatest of the following:

- .1 0.6 ℓ/minute per square metre of cargo deck area, where cargo deck area means the maximum breadth of the ship multiplied by the total longitudinal extent of the cargo tank spaces;
- .2 6 ℓ/minute per square metre of the horizontal sectional area of the single tank having the largest such area; or
- .3 3 ℓ/minute per square metre of the area protected by the largest monitor, such area being entirely forward of the monitor, but not less than 1,250 ℓ/minute.

4 Sufficient foam concentrate shall be supplied to ensure at least 20 minutes of foam generation in tankers fitted with an inert gas installation or 30 minutes of foam generation in tankers not fitted with an inert gas installation when using solution rates stipulated in paragraphs 3.1, 3.2 or 3.3, whichever is the greatest. The foam expansion ratio (i.e. the ratio of the volume of foam produced to the volume of the mixture of water and foam-making concentrate supplied) shall not generally exceed 12 to 1. Where systems essentially produce low expansion foam but at an expansion ratio slightly in excess of 12 to 1 the quantity of foam solution available shall be calculated as for 12 to 1 expansion ratio systems. When medium expansion ratio foam (between 50 to 1 and 150 to 1 expansion ratio) is employed the application rate of the foam and the capacity of a monitor installation shall be to the satisfaction of the Administration.

5 Foam from the fixed foam system shall be supplied by means of monitors and foam applicators. At least 50 per cent of the foam solution supply rate required in paragraphs 3.1 and 3.2 shall be delivered from each monitor. On tankers of less than 4,000 tonnes deadweight the Administration may not require installation of monitors but only applicators. However, in such a case the capacity of each applicator shall be at least 25 per cent of the foam solution supply rate required in paragraphs 3.1 or 3.2.

6.1 The number and position of monitors shall be such as to comply with paragraph 1. The capacity of any monitor shall be at least 3 ℓ/minute of foam solution per square metre of deck area protected by that monitor, such area being entirely forward of the monitor. Such capacity shall be not less than 1,250 ℓ/minute.

6.2 The distance from the monitor to the farthest extremity of the protected area forward of that monitor shall not be more than 75 per cent of the monitor throw in still air conditions.

7 A monitor and hose connexion for a foam applicator shall be situated both port and starboard at the front of the poop or accommodation spaces facing the cargo deck. On tankers of less than 4,000 tonnes deadweight a hose

connexion for a foam applicator shall be situated both port and starboard at the front of the poop or accommodation spaces facing the cargo deck.

8 Applicators shall be provided to ensure flexibility of action during fire-fighting operations and to cover areas screened from the monitors. The capacity of any applicator shall be not less than 400 ℓ and the applicator throw in still air conditions shall be not less than 15 m. The number of foam applicators provided shall be not less than four. The number and disposition of foam main outlets shall be such that foam from at least two applicators can be directed on to any cargo tank deck area.

9 Valves shall be provided in the foam main, and in the fire main when this is an integral part of the deck foam system, immediately forward of any monitor position to isolate damaged sections of those mains.

10 Operation of a deck foam system at its required output shall permit the simultaneous use of the minimum required number of jets of water at the required pressure from the fire main.

Regulation 62

Inert gas systems

1 The inert gas system referred to in Regulation 60 shall be designed, constructed and tested to the satisfaction of the Administration. It shall be so designed and operated as to render and maintain the atmosphere of the cargo tanks* non-flammable at all times, except when such tanks are required to be gas free. In the event that the inert gas system is unable to meet the operational requirement set out above and it has been assessed that it is impractical to effect a repair, then cargo discharge, deballasting and necessary tank cleaning shall only be resumed when the "emergency conditions" laid down in the Guidelines on Inert Gas Systems** are complied with.

2 The system shall be capable of:

- .1 inerting empty cargo tanks by reducing the oxygen content of the atmosphere in each tank to a level at which combustion cannot be supported;
- .2 maintaining the atmosphere in any part of any cargo tank with an oxygen content not exceeding 8 per cent by volume and at a positive pressure at all times in port and at sea except when it is necessary for such a tank to be gas free;
- .3 eliminating the need for air to enter a tank during normal operations except when it is necessary for such a tank to be gas free;
- .4 purging empty cargo tanks of hydrocarbon gas, so that subsequent

* Throughout this Regulation the term "cargo tank" includes also "slop tanks".

** Reference is made to Guidelines for Inert Gas Systems, adopted by the Maritime Safety Committee at its forty-second session in May 1980 (MSC/Circ.282).

gas freeing operations will at no time create a flammable atmosphere within the tank.

3.1 The system shall be capable of delivering inert gas to the cargo tanks at a rate of at least 125 per cent of the maximum rate of discharge capacity of the ship expressed as a volume.

3.2 The system shall be capable of delivering inert gas with an oxygen content of not more than 5 per cent by volume in the inert gas supply main to the cargo tanks at any required rate of flow.

4 The inert gas supply may be treated flue gas from main or auxiliary boilers. The Administration may accept systems using flue gases from one or more separate gas generators or other sources or any combination thereof, provided that an equivalent standard of safety is achieved. Such systems should, as far as practicable, comply with the requirements of this Regulation. Systems using stored carbon dioxide shall not be permitted unless the Administration is satisfied that the risk of ignition from generation of static electricity by the system itself is minimized.

5 Flue gas isolating valves shall be fitted in the inert gas supply mains between the boiler uptakes and the flue gas scrubber. These valves shall be provided with indicators to show whether they are open or shut, and precautions shall be taken to maintain them gastight and keep the seatings clear of soot. Arrangements shall be made to ensure that boiler soot blowers cannot be operated when the corresponding flue gas valve is open.

6.1 A flue gas scrubber shall be fitted which will effectively cool the volume of gas specified in paragraph 3 and remove solids and sulphur combustion products. The cooling water arrangements shall be such that an adequate supply of water will always be available without interfering with any essential services on the ship. Provision shall also be made for an alternative supply of cooling water.

6.2 Filters or equivalent devices shall be fitted to minimize the amount of water carried over to the inert gas blowers.

6.3 The scrubber shall be located aft of all cargo tanks, cargo pump rooms and cofferdams separating these spaces from machinery spaces of category A.

7.1 At least two blowers shall be fitted which together shall be capable of delivering to the cargo tanks at least the volume of gas required by paragraph 3. In the system with gas generator the Administration may permit only one blower if that system is capable of delivering the total volume of gas required by paragraph 3 to the protected cargo tanks, provided that sufficient spares for the blower and its prime mover are carried on board to enable any failure of the blower and its prime mover to be rectified by the ship's crew.

7.2 Two fuel oil pumps shall be fitted to the inert gas generator. The Administration may permit only one fuel oil pump on condition that sufficient spares for the fuel oil pump and its prime mover are carried on board to enable any failure of the fuel oil pump and its prime mover to be rectified by the ship's crew.

7.3 The inert gas system shall be so designed that the maximum pressure which it can exert on any cargo tank will not exceed the test pressure of any cargo tank. Suitable shut-off arrangements shall be provided on the suction and discharge connexions of each blower. Arrangements shall be provided to enable the functioning of the inert gas plant to be stabilized before commencing cargo discharge. If the blowers are to be used for gas freeing, their air inlets shall be provided with blanking arrangements.

7.4 The blowers shall be located aft of all cargo tanks, cargo pump rooms and cofferdams separating these spaces from machinery spaces of category A.

8.1 Special consideration shall be given to the design and location of scrubber and blowers with relevant piping and fittings in order to prevent flue gas leakages into enclosed spaces.

8.2 To permit safe maintenance, an additional water seal or other effective means of preventing flue gas leakage shall be fitted between the flue gas isolating valves and scrubber or incorporated in the gas entry to the scrubber.

9.1 A gas regulating valve shall be fitted in the inert gas supply main. This valve shall be automatically controlled to close as required in paragraphs 19.2 and 19.3. It shall also be capable of automatically regulating the flow of inert gas to the cargo tanks unless means are provided to automatically control the speed of the inert gas blowers required in paragraph 7.

9.2 The valve referred to in paragraph 9.1 shall be located at the forward bulkhead of the forwardmost gas safe space* through which the inert gas supply main passes.

10.1 At least two non-return devices, one of which shall be a water seal, shall be fitted in the inert gas supply main, in order to prevent the return of hydrocarbon vapour to the machinery space uptakes or to any gas safe spaces under all normal conditions of trim, list and motion of the ship. They shall be located between the automatic valve required by paragraph 9.1 and the aftermost connexion to any cargo tank or cargo pipeline.

10.2 The devices referred to in paragraph 10.1 shall be located in the cargo tank area on deck.

10.3 The water seal referred to in paragraph 10.1 shall be capable of being supplied by two separate pumps, each of which shall be capable of maintaining an adequate supply at all times.

10.4 The arrangement of the seal and its associated fittings shall be such that it will prevent backflow of hydrocarbon vapours and will ensure the proper functioning of the seal under operating conditions.

10.5 Provision shall be made to ensure that the water seal is protected against freezing, in such a way that the integrity of seal is not impaired by overheating.

* Gas safe space is a space in which the entry of hydrocarbon gases would produce hazards with regard to flammability or toxicity.

10.6 A water loop or other approved arrangement shall also be fitted to each associated water supply and drain pipe and each venting or pressure-sensing pipe leading to gas safe spaces. Means shall be provided to prevent such loops from being emptied by vacuum.

10.7 The deck water seal and all loop arrangements shall be capable of preventing return of hydrocarbon vapours at a pressure equal to the test pressure of the cargo tanks.

10.8 The second device shall be a non-return valve or equivalent capable of preventing the return of vapours or liquids and fitted forward of the deck water seal required in paragraph 10.1. It shall be provided with positive means of closure. As an alternative to positive means of closure, an additional valve having such means of closure may be provided forward of the non-return valve to isolate the deck water seal from the inert gas main to the cargo tanks.

10.9 As an additional safeguard against the possible leakage of hydrocarbon liquids or vapours back from the deck main, means shall be provided to permit this section of the line between the valve having positive means of closure referred to in paragraph 10.8 and the valve referred to in paragraph 9 to be vented in a safe manner when the first of these valves is closed.

11.1 The inert gas main may be divided into two or more branches forward of the non-return devices required by paragraph 10.

11.2.1 The inert gas supply mains shall be fitted with branch piping leading to each cargo tank. Branch piping for inert gas shall be fitted with either stop valves or equivalent means of control for isolating each tank. Where stop valves are fitted, they shall be provided with locking arrangements, which shall be under the control of a responsible ship's officer.

11.2.2 In combination carriers, the arrangement to isolate the slop tanks containing oil or oil residues from other tanks shall consist of blank flanges which will remain in position at all times when cargoes other than oil are being carried except as provided for in the relevant section of the Guidelines on Inert Gas Systems.

11.3 Means shall be provided to protect cargo tanks against the effect of overpressure or vacuum caused by thermal variations when the cargo tanks are isolated from the inert gas mains.

11.4 Piping systems shall be so designed as to prevent the accumulation of cargo or water in the pipelines under all normal conditions.

11.5 Suitable arrangements shall be provided to enable the inert gas main to be connected to an external supply of inert gas.

12 The arrangements for the venting of all vapours displaced from the cargo tanks during loading and ballasting shall comply with Regulation 59.1 and shall consist of either one or more mast risers, or a number of high velocity vents. The inert gas supply mains may be used for such venting.

13 The arrangements for inerting, purging or gas freeing of empty tanks as

required in paragraph 2 shall be to the satisfaction of the Administration and shall be such that the accumulation of hydrocarbon vapours in pockets formed by the internal structural members in a tank is minimized and that:

- .1 on individual cargo tanks the gas outlet pipe, if fitted, shall be positioned as far as practicable from the inert gas/air inlet and in accordance with Regulation 59.1. The inlet of such outlet pipes may be located either at deck level or at not more than 1 m above the bottom of the tank;
- .2 the cross sectional area of such gas outlet pipe referred to in paragraph 13.1 shall be such that an exit velocity of at least 20 m/sec can be maintained when any three tanks are being simultaneously supplied with inert gas. Their outlets shall extend not less than 2 m above deck level;
- .3 each gas outlet referred to in paragraph 13.2 shall be fitted with suitable blanking arrangements;
- .4.1 if a connexion is fitted between the inert gas supply mains and the cargo piping system, arrangements shall be made to ensure an effective isolation having regard to the large pressure difference which may exist between the systems. This shall consist of two shut-off valves with an arrangement to vent the space between the valves in a safe manner or an arrangement consisting of a spool-piece with associated blanks;
- .4.2 the valve separating the inert gas supply main from the cargo main and which is on the cargo main side shall be a non-return valve with a positive means of closure.

14.1 One or more pressure-vacuum breaking devices shall be provided on the inert gas supply main to prevent the cargo tanks from being subject to:

- .1 a positive pressure in excess of the test pressure of the cargo tank if the cargo were to be loaded at the maximum specified rate and all other outlets were left shut; or
- .2 a negative pressure in excess of 700 mm water gauge if cargo were to be discharged at the maximum rated capacity of the cargo pumps and the inert gas blowers were to fail.

14.2 The location and design of the devices referred to in paragraph 14.1 shall be in accordance with Regulation 59.1.

15 Means shall be provided for continuously indicating the temperature and pressure of the inert gas at the discharge side of the gas blowers, whenever the gas blowers are operating.

16.1 Instrumentation shall be fitted for continuously indicating and permanently recording, when the inert gas is being supplied:

- .1 the pressure of the inert gas supply mains forward of the non-return devices required by paragraph 10.1; and
- .2 the oxygen content of the inert gas in the inert gas supply mains on

the discharge side of the gas blowers.

16.2 The devices referred to in paragraph 16.1 shall be placed in the cargo control room where provided. But where no cargo control room is provided, they shall be placed in a position easily accessible to the officer in charge of cargo operations.

16.3 In addition, meters shall be fitted:

- .1 in the navigating bridge to indicate at all times the pressure referred to in paragraph 16.1.1 and the pressure in the slop tanks of combination carriers, whenever those tanks are isolated from the inert gas supply main; and
- .2 in the machinery control room or in the machinery space to indicate the oxygen content referred to in paragraph 16.1.2.

17 Portable instruments for measuring oxygen and flammable vapour concentration shall be provided. In addition, suitable arrangement shall be made on each cargo tank such that the condition of the tank atmosphere can be determined using these portable instruments.

18 Suitable means shall be provided for the zero and span calibration of both fixed and portable gas concentration measurement instruments, referred to in paragraphs 16 and 17.

19.1 Audible and visual alarms shall be provided to indicate:

- .1 low water pressure or low water flow rate to the flue gas scrubber as referred to in paragraph 6.1;
- .2 high water level in the flue gas scrubber as referred to in paragraph 6.1;
- .3 high gas temperature as referred to in paragraph 15;
- .4 failure of the inert gas blowers referred to in paragraph 7;
- .5 oxygen content in excess of 8 per cent by volume as referred to in paragraph 16.1.2;
- .6 failure of the power supply to the automatic control system for the gas regulating valve and to the indicating devices as referred to in paragraphs 9 and 16.1;
- .7 low water level in the water seal as referred to in paragraph 10.1;
- .8 gas pressure less than 100 mm water gauge as referred to in paragraph 16.1.1. The alarm arrangement shall be such as to ensure that the pressure in slop tanks in combination carriers can be monitored at all times; and
- .9 high gas pressure as referred to in paragraph 16.1.1.

19.2 In the system with gas generators audible and visual alarms shall be provided in accordance with 19.1.1, 19.1.3, 19.1.5 to 19.1.9 and additional

alarms to indicate:

- .1 insufficient fuel oil supply;
- .2 failure of the power supply to the generator;
- .3 failure of the power supply to the automatic control system for the generator.

19.3 Automatic shut-down of the inert gas blowers and gas regulating valve shall be arranged on predetermined limits being reached in respect of paragraphs 19.1.1, 19.1.2 and 19.1.3.

19.4 Automatic shut-down of the gas regulating valve shall be arranged in respect of paragraph 19.1.4.

19.5 In respect of paragraph 19.1.5, when the oxygen content of the inert gas exceeds 8 per cent by volume, immediate action shall be taken to improve the gas quality. Unless the quality of the gas improves, all cargo tank operations shall be suspended so as to avoid air being drawn in to the tanks and the isolation valve referred to in paragraph 10.8 shall be closed.

19.6 The alarms required in paragraphs 19.1.5, 19.1.6 and 19.1.8 shall be fitted in the machinery space and cargo control room, where provided, but in each case in such a position that they are immediately received by responsible members of the crew.

19.7. In respect of paragraph 19.1.7 the Administration shall be satisfied as to the maintenance of an adequate reserve of water at all times and the integrity of the arrangements to permit the automatic formation of the water seal when the gas flow ceases. The audible and visual alarm on the low level of water in the water seal shall operate when the inert gas is not being supplied.

19.8 An audible alarm system independent of that required in paragraph 19.1.8 or automatic shut-down of cargo pumps shall be provided to operate on predetermined limits of low pressure in the inert gas mains being reached.

20 . Tankers constructed before 1 September 1984 which are required to have an inert gas system shall at least comply with the requirements of Regulation 62 of Chapter II-2 of the International Convention for the Safety of Life at Sea, 1974*. In addition they shall comply with the requirements of this Regulation, except that:

- .1 inert gas systems fitted on board such tankers before 1 June 1981 need not comply with the following paragraphs: 3.2, 6.3, 7.4, 8, 9.2, 10.2, 10.7, 10.9, 11.3, 11.4, 13.2, 13.4.2 and 19.8;
- .2 inert gas systems fitted on board such tankers on or after 1 June 1981 need not comply with the following paragraphs: 3.2, 6.3, 7.4 and 13.2.

21 Detailed instruction manuals shall be provided on board, covering the

* The text as adopted by the International Conference on Safety of Life at Sea, 1974.

operations, safety and maintenance requirements and occupational health hazards relevant to the inert gas system and its application to the cargo tank system*. The manuals shall include guidance on procedures to be followed in the event of a fault or failure of the inert gas system.

Regulation 63

Cargo pump rooms

1 Each cargo pump room shall be provided with one of the following fixed fire-extinguishing systems operated from a readily accessible position outside the pump room. Cargo pump rooms should be provided with a system suitable for machinery spaces of category A.

1.1 Either a carbon dioxide or a halogenated hydrocarbon system complying with the provisions of Regulation 5 and with the following:

- .1 the alarms referred to in Regulation 5.1.6 shall be safe for use in a flammable cargo vapour/air mixture;
- .2 a notice shall be exhibited at the controls stating that due to the electrostatic ignition hazard, the system is to be used only for fire extinguishing and not for inerting purposes.

1.2 A high expansion foam system complying with the provisions of Regulation 9, provided that the foam concentrate supply is suitable for extinguishing fires involving the cargoes carried.

1.3 A fixed pressure water-spraying system complying with the provisions of Regulation 10.

2 Where the extinguishing medium used in the cargo pump room system is also used in systems serving other spaces, the quantity of medium provided or its delivery rate need not be more than the maximum required for the largest compartment.

* Reference is made to Guidelines for Inert Gas Systems, adopted by the Maritime Safety Committee at its forty-second session in May 1980 (MSC/Circ.282)

CHAPTER III

LIFE-SAVING APPLIANCES, ETC.

Regulation 1

Application

The existing text of sub-paragraph (c)(iii)(2) is replaced by the following:

(2) Regulations II-2/28.1.5 and II-2/28.1.6; and

Regulation 27

Lifeboats, liferafts and buoyant apparatus

In sub-paragraph (c)(iii), reference to "paragraph (d) of Regulation 1 of Chapter II-1" is amended to read:

Regulation II-1/1.5

In sub-paragraph (c)(vii), the reference to "paragraph (d) of Regulation 1 of Chapter II-1" is amended to read:

Regulation II-1/1.5

Regulation 30

Lighting for deck, lifeboats, liferafts, etc.

In paragraph (a), the reference to "Regulation 25 of Chapter II-1" is amended to read:

Regulation II-1/42

Regulation 38

Emergency lighting

The reference to "Regulation 26 of Chapter II-1" is amended to read:

Regulation II-1/43

CHAPTER IV

RADIOTELEGRAPHY AND RADIOTELEPHONY

The following new Regulation is added:

Regulation 4-1

VHF radiotelephone installation

- (a) Passenger ships irrespective of size and cargo ships of 300 tons gross tonnage and upwards shall be fitted with a VHF radiotelephone installation complying with the provisions of Regulation 17.
- (b) The provisions of Regulation 17 shall also apply for VHF radiotelephone installations required by a Contracting Government for all ships to which Chapter V applies navigating in an area under its jurisdiction and for which a VHF radiotelephone installation is not made compulsory by paragraph (a).

The existing text of Regulation 7 is replaced by the following:

Regulation 7

Watches – radiotelephone

- (a) Each ship which is fitted with a radiotelephone station in accordance with Regulation 4 shall, for safety purposes while at sea, maintain continuous watch on the radiotelephone distress frequency in the place on board from which the ship is usually navigated, by use of a radiotelephone distress frequency watch receiver, using a loudspeaker, a filtered loudspeaker or radiotelephone auto alarm.
- (b) Each ship referred to in paragraph (a) shall carry qualified radiotelephone operators (who may be the master, an officer or a member of the crew) as follows:
- (i) if of 300 tons gross tonnage and upwards but less than 500 tons gross tonnage, at least one operator;
 - (ii) if of 500 tons gross tonnage and upwards but less than 1,600 tons gross tonnage, at least two operators. If such a ship carries one

radiotelephone operator exclusively employed for duties related to radiotelephony, a second operator is not obligatory.

(c) Each ship which in accordance with Regulation 3 or Regulation 4 is fitted with a radiotelegraph station shall, while at sea, maintain continuous watch on the radiotelephone distress frequency in a place to be determined by the Administration, by use of a radiotelephone distress frequency watch receiver, using a loudspeaker, a filtered loudspeaker or radiotelephone auto alarm.

The existing text of Regulation 8 is replaced by the following:

Regulation 8

Watches – VHF radiotelephone

Each ship which is fitted with a VHF radiotelephone installation in accordance with Regulation 4-1 shall at sea maintain a continuous listening watch on the navigating bridge:

- (i) on 156.8 MHz (channel 16) when practicable; and/or
- (ii) for such periods and on such channels as may be required by the Contracting Government referred to in Regulation 4-1(b).

Regulation 10

Radiotelegraph installations

The existing text of paragraph (g) is replaced by the following:

(g-1) The main and reserve transmitters shall, when connected to the main antenna, have a minimum normal range as specified below, that is to say, they must be capable of transmitting clearly perceptible signals from ship to ship by day and under normal conditions and circumstances over the specified

	Minimum normal range in miles	
	Main transmitter	Reserve transmitter
All passenger ships and cargo ships of 1,600 tons gross tonnage and upwards	150	100
Cargo ships below 1,600 tons gross tonnage	100	75

ranges.* (Clearly perceptible signals will normally be received if the R.M.S. value of the field strength at the receiver is at least 50 microvolts per metre.)

(g-2) The radiotelegraph installation shall include facilities for radiotelephone transmission and reception on the radiotelephone distress frequency. This requirement may be fulfilled by including such facilities in the main or reserve installation or other installed equipment. The transmitter power and receiver sensitivity of the radiotelephony part of the installation shall comply with Regulation 16(c)(i) and (f) respectively if that part is fitted after 1 September 1986. For installations fitted prior to that date, such transmitter power and receiver sensitivity shall be as determined by the Administration. The location and other conditions of the radiotelephony facilities required by this Regulation shall be as determined by the Administration, except when they form part of the main or reserve radiotelegraph installation.

* In the absence of a direct measurement of the field strength the following data may be used as a guide for approximately determining the normal range:

A. In the case of antennae other than self-supporting types.

Normal range in miles	Metre-amperes ^{1/}
200	128
175	102
150	76
125	58
100	45
75	34

^{1/} The product of the distance (in metres) from the highest part of the antenna to the deepest load water-line and the antenna current (in amperes).

The values given in the second column of the table correspond to an average value of the ratio

$$\frac{\text{effective antenna height}}{\text{maximum antenna height}} = 0.47$$

This ratio varies with local conditions of the antenna and may vary between about 0.3 and 0.7.

B. In the case of self-supporting transmitting antennae:

Normal range in miles	Metre-amperes ^{2/}
200	305
175	215
150	150
125	110
100	85
75	55

^{2/} The product of the distance (in metres) from the highest part of the antenna to the deepest load water-line and the current (in amperes) measured at the base of the radiating portion of the antenna. The values given in the second column are based on the propagation curves given in CCIR Recommendation 368-2 and also the method, experimental results and calculations in CCIR Report 502-1 and Opinion 43-1. The necessary value of metre-amperes varies considerably with local conditions of the antenna.

The existing text of sub-paragraph (h)(iv) is replaced by the following:

- (h)(iv)(1) The radiotelephone transmitting facility required by paragraph (g-2) shall be fitted with an automatic device for generating the radiotelephone alarm signal, so designed as to prevent actuation by mistake, and complying with the requirements of Regulation 16(e). The device shall be capable of being taken out of operation at any time in order to permit the immediate transmission of a distress message. For installations fitted prior to 1 September 1986, the fitting of automatic devices for generating the radiotelephone alarm signal shall be as determined by the Administration.
- (2) Arrangements shall be made to check periodically the proper functioning of the automatic device for generating the radiotelephone alarm signal on frequencies other than the radiotelephone distress frequency using a suitable artificial antenna. An exception shall be made for radiotelephone emergency equipment having only the radiotelephone distress frequency in which case a suitable artificial antenna shall be employed.

Note: While all reasonable steps shall be taken to maintain the apparatus in an efficient condition, malfunction of the radiotelephone transmitting facilities required by this Regulation shall not be considered as making the ship unseaworthy or as a reason for delaying the ship in ports where repair facilities are not readily available.

The existing text of sub-paragraph (1)(ii) is deleted.

The existing text of sub-paragraph (m)(iv) is replaced by the following:

- (m)(iv) the VHF installation in accordance with the provisions of Regulation 17(c);

Regulation 16

Radiotelephone installations

The existing text of paragraph (b) is amended by deleting A3H, A3A and A3J.

The existing text of paragraph (c) is replaced by the following:

- (c) (i) In the case of cargo ships of 300 tons gross tonnage and upwards but less than 1,600 tons gross tonnage the transmitter shall have a minimum normal range of 150 miles, i.e. it shall be capable of transmitting clearly perceptible signals from ship to ship by day and under normal conditions and circumstances over this range.*

* In the absence of field strength measurements, it may be assumed that this range will be obtained by a power in the antenna of 15 watts (unmodulated carrier) with an antenna efficiency of 27 per cent for double sideband emissions or 60 watts peak envelope power for single sideband full carrier emissions when 100 per cent modulated by a single sinusoidal oscillation.

(Clearly perceptible signals will normally be received if the R.M.S. value of the field strength produced at the receiver by an unmodulated carrier is at least 25 microvolts per metre for double sideband and single sideband full carrier emissions.)

- (ii) In the case of existing installations using double sideband emissions on cargo ships of 300 tons gross tonnage and upwards but less than 500 tons gross tonnage, the transmitter shall have a minimum normal range of at least 75 miles.

The existing text of sub-paragraph (j)(iv) is replaced by:

- (iv) the VHF installation in accordance with the provisions of Regulation 17(c).

The existing text of Regulation 17 is replaced by the following:

Regulation 17

VHF radiotelephone installation

- (a) The VHF radiotelephone installation shall be in the upper part of the ship complying with the provisions of this Regulation and comprising a transmitter and receiver, a source of energy capable of actuating them at their rated power levels, and an antenna suitable for efficient radiating and receiving signals at the operating frequencies.
- (b) On board passenger ships irrespective of size and cargo ships of 500 tons gross tonnage and upwards it shall be possible to operate the VHF radiotelephone installation from a source of energy which is situated in the upper part of the ship and has sufficient capacity for at least six hours of operation.
- (c) The Administration may authorize the use of the reserve source of energy of the radiotelegraph installation or the radiotelephone installation respectively referred to in Regulation 10(m) and Regulation 16(j) to supply the VHF radiotelephone installation. In this case the reserve source of energy is required to be of a capacity sufficient to operate simultaneously the VHF radiotelephone installation and:
 - (i) the reserve radiotelegraph transmitter and receiver for at least six hours unless a switching device is fitted to ensure alternate operation only; or
 - (ii) the radiotelephone transmitter and receiver for at least six hours unless a switching device is fitted to ensure alternate operation only.
- (d) The VHF radiotelephone installation shall conform to the requirements laid down in the Radio Regulations for equipment used in the VHF maritime mobile radiotelephone service and shall be capable of operation on those channels specified by the Radio Regulations and as may be required by the Contracting Government referred to in Regulation 4-1(b).

(e) The Contracting Government referred to in Regulation 4-1(b) shall not require the transmitter R.F. carrier power output to be greater than 10 watts. The antenna shall, in so far as is practicable, have an unobstructed view in all directions.*

(f) Control of the channels required for navigational safety shall be immediately available on the navigating bridge convenient to the conning position and, where necessary, facilities should be available to permit radiocommunications from the wings of the navigating bridge.

Regulation 19

Radio logs

The following paragraph is added to the existing text and the existing paragraph (c) is relettered as paragraph (d):

(c) On each ship fitted with a VHF radiotelephone installation in accordance with Regulation 4-1:

- (i) the entries required by the Radio Regulations shall be recorded in the radio log in accordance with the requirements of the Administration;
- (ii) a summary of all communications relating to distress, urgency and safety traffic shall be recorded in the ship's log.

* For guidance purposes, it is assumed that each ship is fitted with a vertically polarized unity gain antenna at a nominal height of 9.15 m above water, a transmitter R.F. power output of 10 watts, and a receiver sensitivity of 2 microvolts across the input terminals for 20 dB signal-to-noise ratio.

CHAPTER V

SAFETY OF NAVIGATION

The existing text of Regulation 12 is replaced by the following:

Regulation 12

Shipborne navigational equipment

- (a) For the purpose of this Regulation "constructed" in respect of a ship means a stage of construction where:
- (i) the keel is laid; or
 - (ii) construction identifiable with a specific ship begins; or
 - (iii) assembly of that ship has commenced comprising at least 50 tonnes or 1 per cent of the estimated mass of all structural material, whichever is less.
- (b) (i) Ships of 150 tons gross tonnage and upwards shall be fitted with:
- (1) a standard magnetic compass, except as provided in sub-paragraph (iv);
 - (2) a steering magnetic compass, unless heading information provided by the standard compass required under (1) is made available and is clearly readable by the helmsman at the main steering position;
 - (3) adequate means of communication between the standard compass position and the normal navigation control position to the satisfaction of the Administration; and
 - (4) means for taking bearings as nearly as practicable over an arc of the horizon of 360°.
- (ii) Each magnetic compass referred to in sub-paragraph (i) shall be properly adjusted and its table or curve of residual deviations shall be available at all times.
- (iii) A spare magnetic compass, interchangeable with the standard compass, shall be carried, unless the steering compass mentioned in sub-paragraph (i)(2) or a gyro compass is fitted.
- (iv) The Administration, if it considers it unreasonable or unnecessary to require a standard magnetic compass, may exempt individual ships or classes of ships from these requirements if the nature of the voyage, the ship's proximity to land or the type of ship does not warrant a standard compass, provided that a suitable steering compass is in all cases carried.

(c) Ships of less than 150 tons gross tonnage shall, as far as the Administration considers it reasonable and practicable, be fitted with a steering compass and have means for taking bearings.

(d) Ships of 500 tons gross tonnage and upwards constructed on or after 1 September 1984 shall be fitted with a gyro compass complying with the following requirements:

- (i) the master gyro compass or a gyro repeater shall be clearly readable by the helmsman at the main steering position;
- (ii) on ships of 1,600 tons gross tonnage and upwards a gyro repeater or gyro repeaters shall be provided and shall be suitably placed for taking bearings as nearly as practicable over an arc of the horizon of 360°.

(e) Ships of 1,600 tons gross tonnage and upwards, constructed before 1 September 1984 when engaged on international voyages, shall be fitted with a gyro compass complying with the requirements of paragraph (d).

(f) On ships provided with emergency steering positions, arrangements shall be made to supply heading information to such positions.

(g) Ships of 500 tons gross tonnage and upwards constructed on or after 1 September 1984 and ships of 1,600 tons gross tonnage and upwards constructed before 1 September 1984 shall be fitted with a radar installation.

(h) Ships of 10,000 tons gross tonnage and upwards shall be fitted with two radar installations, each capable of being operated independently* of the other.

(i) Facilities for plotting radar readings shall be provided on the navigating bridge of ships required by paragraph (g) or (h) to be fitted with a radar installation. In ships of 1,600 tons gross tonnage and upwards constructed on or after 1 September 1984 the plotting facilities shall be at least as effective as a reflection plotter.

(j) (i) An automatic radar plotting aid shall be fitted on:

- (1) ships of 10,000 tons gross tonnage and upwards, constructed on or after 1 September 1984;
- (2) tankers constructed before 1 September 1984 as follows:
 - (aa) if of 40,000 tons gross tonnage and upwards by 1 January 1985;
 - (bb) if of 10,000 tons gross tonnage and upwards but less than 40,000 tons gross tonnage, by 1 January 1986;

* Reference is made to section 4 of the Recommendation on Performance Standards for Radar Equipment, adopted by the Organization by resolution A.477(XII).

- (3) ships constructed before 1 September 1984, that are not tankers, as follows:
- (aa) if of 40,000 tons gross tonnage and upwards by 1 September 1986;
 - (bb) if of 20,000 tons gross tonnage and upwards, but less than 40,000 tons gross tonnage, by 1 September 1987;
 - (cc) if of 15,000 tons gross tonnage and upwards, but less than 20,000 tons gross tonnage, by 1 September 1988.
- (ii) Automatic radar plotting aids fitted prior to 1 September 1984 which do not fully conform to the performance standards adopted by the Organization may, at the discretion of the Administration, be retained until 1 January 1991.
- (iii) The Administration may exempt ships from the requirements of this paragraph, in cases where it considers it unreasonable or unnecessary for such equipment to be carried, or when the ships will be taken permanently out of service within two years of the appropriate implementation date.
- (k) When engaged on international voyages ships of 1,600 tons gross tonnage and upwards constructed before 25 May 1980 and ships of 500 tons gross tonnage and upwards constructed on or after 25 May 1980 shall be fitted with an echo-sounding device.
- (l) When engaged on international voyages ships of 500 tons gross tonnage and upwards constructed on or after 1 September 1984 shall be fitted with a device to indicate speed and distance. Ships required by paragraph (j) to be fitted with an automatic radar plotting aid shall be fitted with a device to indicate speed and distance through the water.
- (m) Ships of 1,600 tons gross tonnage and upwards constructed before 1 September 1984 and all ships of 500 tons gross tonnage and upwards constructed on or after 1 September 1984 shall be fitted with indicators showing the rudder angle, the rate of revolution of each propeller and in addition, if fitted with variable pitch propellers or lateral thrust propellers, the pitch and operational mode of such propellers. All these indicators shall be readable from the conning position.
- (n) Ships of 100,000 tons gross tonnage and upwards constructed on or after 1 September 1984 shall be fitted with a rate-of-turn indicator.
- (o) Except as provided in Regulations I/7(b)(ii), I/8 and I/9, while all reasonable steps shall be taken to maintain the apparatus referred to in paragraphs (d) to (n) in efficient working order, malfunctions of the equipment shall not be considered as making a ship unseaworthy or as a reason for delaying the ship in ports where repair facilities are not readily available.
- (p) When engaged on international voyages ships of 1,600 tons gross tonnage and upwards shall be fitted with a radio direction-finding apparatus complying with the provisions of Regulation IV/12(a). The Administration

may, in areas where it considers it unreasonable or unnecessary for such apparatus to be carried, exempt any ship of less than 5,000 tons gross tonnage from this requirement, due regard being had to the fact that radio direction-finding apparatus is of value both as a navigational instrument and as an aid to locating ships, aircraft or survival craft.

(q) When engaged on international voyages ships of 1,600 tons gross tonnage and upwards constructed on or after 25 May 1980 shall be fitted with radio equipment for homing on the radiotelephone distress frequency, complying with the relevant provisions of Regulation IV/12(b).

(r) All equipment fitted in compliance with this Regulation shall be of a type approved by the Administration. Equipment installed on board ships on or after 1 September 1984 shall conform to appropriate performance standards not inferior to those adopted by the Organization. Equipment fitted prior to the adoption of related performance standards may be exempted from full compliance with those standards at the discretion of the Administration, having due regard to the recommended criteria which the Organization might adopt in connexion with the standards concerned.

(s) A rigidly connected composite unit of a pushing vessel and associated pushed vessel, when designed as a dedicated and integrated tug and barge combination, shall be regarded as a single ship for the purpose of this Regulation.

(t) If the application of the requirements of this Regulation necessitates structural alterations to a ship constructed before 1 September 1984, the Administration may allow extension of the time limit for fitting the required equipment not later than 1 September 1989, taking into account the first scheduled dry-docking of such a ship required by the present Regulations.

(u) Except as provided elsewhere in this Regulation, the Administration may grant to individual ships exemptions of a partial or conditional nature, when any such ship is engaged on a voyage where the maximum distance of the ship from the shore, the length and nature of the voyage, the absence of general navigation hazards, and other conditions affecting safety are such as to render the full application of this Regulation unreasonable or unnecessary. When deciding whether or not to grant exemptions to an individual ship, the Administration shall have regard to the effect that an exemption may have upon the safety of all other ships.

Regulation 16

Life-saving signals

The existing text of paragraph (d) is replaced by the following:

(d) Signals used by aircraft engaged on search and rescue operations to direct ships towards an aircraft, ship or person in distress:

(i) The following manoeuvres performed in sequence by an aircraft

mean that the aircraft wishes to direct a surface craft towards an aircraft or a surface craft in distress:

- (1) circling the surface craft at least once;
- (2) crossing the projected course of the surface craft close ahead at low altitude, and:
 - rocking the wings; or
 - opening and closing the throttle; or
 - changing the propeller pitch;(Due to high noise level on board surface craft, the sound signals may be less effective than the visual signal and are regarded as alternative means of attracting attention.)
- (3) heading in the direction in which the surface craft is to be directed.

Repetition of such manoeuvres has the same meaning.

- (ii) The following manoeuvre by an aircraft means that the assistance of the surface craft to which the signal is directed is no longer required:

crossing the wake of the surface craft close astern at a low altitude, and:

- rocking the wings; or
- opening and closing the throttle; or
- changing the propeller pitch.

(Due to high noise level on board surface craft, the sound signals may be less effective than the visual signal and are regarded as an alternative means of attracting attention.)

Note: Advance notification of changes in these signals will be given by the Organization as necessary.

Regulation 18

VHF radiotelephones

The existing text of this Regulation is deleted (see Regulation IV/4-1(b)).

Regulation 19

Use of the automatic pilot

The following paragraph is added to the existing text:

- (d) The manual steering shall be tested after prolonged use of the automatic pilot, and before entering areas where navigation demands special caution.

The following Regulations are added to this Chapter:

Regulation 19-1

Operation of steering gear

In areas where navigation demands special caution, ships shall have more than one steering gear power unit in operation when such units are capable of simultaneous operation.

Regulation 19-2

Steering gear – testing and drills

- (a) Within 12 hours before departure, the ship's steering gear shall be checked and tested by the ship's crew. The test procedure shall include, where applicable, the operation of the following:
- (i) the main steering gear;
 - (ii) the auxiliary steering gear;
 - (iii) the remote steering gear control systems;
 - (iv) the steering positions located on the navigating bridge;
 - (v) the emergency power supply;
 - (vi) the rudder angle indicators in relation to the actual position of the rudder;
 - (vii) the remote steering gear control system power failure alarms;
 - (viii) the steering gear power unit failure alarms; and
 - (ix) automatic isolating arrangements and other automatic equipment.
- (b) The checks and tests shall include:
- (i) the full movement of the rudder according to the required capabilities of the steering gear;
 - (ii) a visual inspection of the steering gear and its connecting linkage; and
 - (iii) the operation of the means of communication between the navigating bridge and steering gear compartment.
- (c) (i) Simple operating instructions with a block diagram showing the change-over procedures for remote steering gear control systems and steering gear power units shall be permanently displayed on the navigating bridge and in the steering gear compartment.
- (ii) All ships' officers concerned with the operation or maintenance of steering gear shall be familiar with the operation of the steering systems fitted on the ship and with the procedures for changing from one system to another.

(d) In addition to the routine checks and tests prescribed in paragraphs (a) and (b), emergency steering drills shall take place at least once every three months in order to practise emergency steering procedures. These drills shall include direct control from within the steering gear compartment, the communications procedure with the navigating bridge and, where applicable, the operation of alternative power supplies.

(e) The Administration may waive the requirement to carry out the checks and tests prescribed in paragraphs (a) and (b) for ships which regularly engage on voyages of short duration. Such ships shall carry out these checks and tests at least once every week.

(f) The date upon which the checks and tests prescribed in paragraphs (a) and (b) are carried out and the date and details of emergency steering drills carried out under paragraph (d), shall be recorded in the log book as may be prescribed by the Administration.

CHAPTER VI

CARRIAGE OF GRAIN

PART A – GENERAL PROVISIONS

The existing text of Regulation 1 is replaced by the following:

Regulation 1

Application

Unless expressly provided otherwise this Chapter applies to the carriage of grain in all ships to which the present Regulations apply and in cargo ships of less than 500 tons gross tonnage.

PART B – CALCULATION OF ASSUMED HEELING MOMENTS

SECTION V – ALTERNATIVE LOADING ARRANGEMENTS FOR EXISTING SHIPS

(A) GENERAL

Amend the second paragraph to read:

For the purpose of this Part the term “Existing Ship” means “a ship, the keel of which is laid before 25 May 1980.”

(B) STOWAGE OF SPECIALLY SUITABLE SHIPS

The existing text of sub-paragraph (a)(ii)(2) is replaced by the following:

- (2) in partly filled compartments or holds free grain surfaces settle and shift as in sub-paragraph (1) or to such larger angle as may be deemed necessary by the Administration, or by a Contracting Government on behalf of the Administration, and grain surfaces, if overstowed, with the bulk grain levelled and topped off with bagged grain or other suitable cargo tightly stowed and extending to a height of not less than 1.22 m above the top of the bulk grain within spaces divided by a longitudinal bulkhead or shifting board, and not less than 1.52 m within spaces not so divided and the bagged grain or other suitable cargo supported on suitable platforms laid over the whole surface of the bulk grain, such platforms consisting of bearers spaced not more than 1.22 m apart and 25 mm boards laid thereon spaced not more than 0.10 m apart or of strong separation cloths with adequate overlapping, will shift to an angle of 8 degrees with the original levelled surfaces. For the purpose of this paragraph shifting boards, if fitted, will be considered to limit the transverse shift of the surface of the grain.

RESOLUTION MSC.1(XLV)
adopted on 20 November 1981

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.13(57)
(adopted on 11 April 1989)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL
CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.13(57)
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RESOLUTION MSC.13(57)
(adopted on 11 April 1989)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION
FOR THE SAFETY OF LIFE AT SEA, 1974

THE MARITIME SAFETY COMMITTEE,

NOTING Article 28(b) of the Convention of the International Maritime Organization concerning the functions of the Committee,

NOTING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea, 1974, hereafter referred to as "the Convention" concerning the procedures for amending the Annex to the Convention, other than the provisions of chapter I,

HAVING CONSIDERED at its fifty-seventh session amendments to the Convention proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, the amendments to the Convention, the text of which is set out in the Annex to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 31 July 1991 unless prior to that date more than one third of the Contracting Governments to the Convention, or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;
3. INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 February 1992 upon their acceptance in accordance with paragraph 2 above;

RESOLUTION MSC.13(57)
(adopted on 11 April 1989)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL
CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

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4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annex to all Contracting Governments to the International Convention for the Safety of Life at Sea, 1974;

5. FURTHER REQUESTS the Secretary-General to transmit copies of the resolution to Members of the Organization which are not Contracting Governments to the Convention.

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ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE
SAFETY OF LIFE AT SEA, 1974, AS AMENDED

Chapter II-1

CONSTRUCTION - SUBDIVISION AND STABILITY
MACHINERY AND ELECTRICAL INSTALLATIONS

Regulation 11

The existing heading is replaced by the following:

"Peak and machinery space bulkheads and stern tubes in cargo ships".

The following text is inserted after the heading:

"(Paragraphs 8 and 9 of this regulation apply to ships constructed on or
after 1 February 1992)".

The following new paragraphs 8 and 9 are added after paragraph 7:

"8 Bulkheads shall be fitted separating the machinery space from cargo and
passenger spaces forward and aft and made watertight up to the freeboard deck.

9 Stern tubes shall be enclosed in a watertight space (or spaces) of
moderate volume. Other measures to minimize the danger of water penetrating
into the ship in case of damage to stern tube arrangements may be taken at the
discretion of the Administration".

Regulation 12

Double bottoms in passenger ships

In paragraph 5 the words "regulation III/2" in the third line is replaced by
"regulation III/3.16".

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Regulation 12-1

The following new regulation II-1/12-1 is added after regulation 12:

"Double bottoms in cargo ships other than tankers"

(This regulation applies to ships constructed on or after 1 February 1992)

1 A double bottom shall be fitted extending from the collision bulkhead to the afterpeak bulkhead, as far as this is practicable and compatible with the design and proper working of the ship.

2 Where a double bottom is required to be fitted, its depth shall be to the satisfaction of the Administration and the inner bottom shall be continued out to the ship's side in such a manner as to protect the bottom to the turn of the bilge.

3 Small wells constructed in the double bottom, in connection with the drainage arrangements of holds, shall not extend in depth more than necessary. A well extending to the outer bottom, may, however, be permitted at the after end of the shaft tunnel of the ship. Other wells may be permitted by the Administration if it is satisfied that the arrangements give protection equivalent to that afforded by a double bottom complying with this regulation.

4 A double bottom need not be fitted in way of watertight compartments used exclusively for the carriage of liquids, provided the safety of the ship in the event of bottom damage is not, in the opinion of the Administration, thereby impaired".

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Regulation 15

The existing text of this regulation is replaced by the following:

"Openings in watertight bulkheads in passenger ships

(This regulation applies to ships constructed on or after 1 February 1992)

1 The number of openings in watertight bulkheads shall be reduced to the minimum compatible with the design and proper working of the ship; satisfactory means shall be provided for closing these openings.

2.1 Where pipes, scuppers, electric cables, etc., are carried through watertight subdivision bulkheads, arrangements shall be made to ensure the watertight integrity of the bulkheads.

2.2 Valves not forming part of a piping system shall not be permitted in watertight subdivision bulkheads.

2.3 Lead or other heat sensitive materials shall not be used in systems which penetrate watertight subdivision bulkheads, where deterioration of such systems in the event of fire would impair the watertight integrity of the bulkheads.

3.1 No doors, manholes, or access openings are permitted:

.1 in the collision bulkhead below the margin line;

.2 in watertight transverse bulkheads dividing a cargo space from an adjoining cargo space or from a permanent or reserve bunker, except as provided in paragraph 10.1 and in regulation 16.

3.2 Except as provided in paragraph 3.3, the collision bulkhead may be pierced below the margin line by not more than one pipe for dealing with fluid in the forepeak tank, provided that the pipe is fitted with a screwdown valve capable of being operated from above the bulkhead deck, the valve chest being secured inside the forepeak to the collision bulkhead. The Administration

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may, however, authorize the fitting of this valve on the after side of the collision bulkhead provided that the valve is readily accessible under all service conditions and the space in which it is located is not a cargo space.

3.3 If the forepeak is divided to hold two different kinds of liquids the Administration may allow the collision bulkhead to be pierced below the margin line by two pipes, each of which is fitted as required by paragraph 3.2, provided the Administration is satisfied that there is no practical alternative to the fitting of such a second pipe and that, having regard to the additional subdivision provided in the forepeak, the safety of the ship is maintained.

4.1 Watertight doors fitted in bulkheads between permanent and reserve bunkers shall always be accessible, except as provided in paragraph 9.4 for between-deck bunker doors.

4.2 Satisfactory arrangements shall be made by means of screens or otherwise to prevent the coal from interfering with the closing of watertight bunker doors.

5 Subject to paragraph 11, not more than one door, apart from the doors to bunkers and shaft tunnels, may be fitted in each main transverse bulkhead within spaces containing the main and auxiliary propulsion machinery including boilers serving the needs of propulsion and all permanent bunkers. Where two or more shafts are fitted, the tunnels shall be connected by an intercommunicating passage. There shall be only one door between the machinery space and the tunnel spaces where two shafts are fitted and only two doors where there are more than two shafts. All these doors shall be of the sliding type and shall be so located as to have their sills as high as practicable. The hand gear for operating these doors from above the bulkhead deck shall be situated outside the spaces containing the machinery.

6.1 Watertight doors, except as provided in paragraph 10.1 or regulation 16, shall be power-operated sliding doors complying with the requirements of paragraph 7 capable of being closed simultaneously from the central operating console at the navigating bridge in not more than 60 seconds with the ship in the upright position.

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6.2 The means of operation whether by power or by hand of any power-operated sliding watertight door shall be capable of closing the door with the ship listed to 15° either way. Consideration shall also be given to the forces which may act on either side of the door as may be experienced when water is flowing through the opening applying a static head equivalent to a water height of at least 1 m above the sill on the centreline of the door.

6.3 Watertight door controls, including hydraulic piping and electric cables, shall be kept as close as practicable to the bulkhead in which the doors are fitted, in order to minimize the likelihood of them being involved in any damage which the ship may sustain. The positioning of watertight doors and their controls shall be such that if the ship sustains damage within one fifth of the breadth of the ship, as defined in regulation 2, such distance being measured at right angles to the centreline at the level of the deepest subdivision load line, the operation of the watertight doors clear of the damaged portion of the ship is not impaired.

6.4 All power-operated sliding watertight doors shall be provided with means of indication which will show at all remote operating positions whether the doors are open or closed. Remote operating positions shall only be at the navigating bridge as required by paragraph 7.1.5 and, at the location where hand operation above the bulkhead deck is required by paragraph 7.1.4.

7.1 Each power-operated sliding watertight door:

- .1 shall have a vertical or horizontal motion;
- .2 shall, subject to paragraph 11, be normally limited to a maximum clear opening width of 1.2 m. The Administration may permit larger doors only to the extent considered necessary for the effective operation of the ship provided that other safety measures, including the following, are taken into consideration:
 - .1 special consideration shall be given to the strength of the door and its closing appliances in order to prevent leakages;
 - .2 the door shall be located outside the damage zone B/5;

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- .3 the door shall be kept closed when the ship is at sea, except for limited periods when absolutely necessary as determined by the Administration;
- .3 shall be fitted with the necessary equipment to open and close the door using electric power, hydraulic power, or any other form of power that is acceptable to the Administration;
- .4 shall be provided with an individual hand-operated mechanism. It shall be possible to open and close the door by hand at the door itself from either side, and in addition, close the door from an accessible position above the bulkhead deck with an all round crank motion or some other movement providing the same degree of safety acceptable to the Administration. Direction of rotation or other movement is to be clearly indicated at all operating positions. The time necessary for the complete closure of the door, when operating by hand gear, shall not exceed 90 seconds with the ship in the upright position;
- .5 shall be provided with controls for opening and closing the door by power from both sides of the door and also for closing the door by power from the central operating console at the navigating bridge;
- .6 shall be provided with an audible alarm, distinct from any other alarm in the area, which will sound whenever the door is closed remotely by power and which shall sound for at least five seconds but no more than ten seconds before the door begins to move and shall continue sounding until the door is completely closed. In the case of remote hand operation it is sufficient for the audible alarm to sound only when the door is moving. Additionally, in passenger areas and areas of high ambient noise the Administration may require the audible alarm to be supplemented by an intermittent visual signal at the door; and
- .7 shall have an approximately uniform rate of closure under power. The closure time, from the time the door begins to move to the time it reaches the completely closed position, shall in no case be less than 20 seconds or more than 40 seconds with the ship in the upright position.

7.2 The electrical power required for power-operated sliding watertight doors shall be supplied from the emergency switchboard either directly or by a dedicated distribution board situated above the bulkhead deck. The associated control, indication and alarm circuits shall be supplied from the emergency switchboard either directly or by a dedicated distribution board situated above the bulkhead deck and be capable of being automatically supplied by the transitional source of emergency electrical power required by regulation 42.3.1.3 in the event of failure of either the main or emergency source of electrical power.

7.3 Power-operated sliding watertight doors shall have either:

- .1 a centralized hydraulic system with two independent power sources each consisting of a motor and pump capable of simultaneously closing all doors. In addition, there shall be for the whole installation hydraulic accumulators of sufficient capacity to operate all the doors at least three times, i.e. closed-open-closed, against an adverse list of 15°. This operating cycle shall be capable of being carried out when the accumulator is at the pump cut-in pressure. The fluid used shall be chosen considering the temperatures liable to be encountered by the installation during its service. The power operating system shall be designed to minimize the possibility of having a single failure in the hydraulic piping adversely affect the operation of more than one door. The hydraulic system shall be provided with a low-level alarm for hydraulic fluid reservoirs serving the power-operated system and a low gas pressure alarm or other effective means of monitoring loss of stored energy in hydraulic accumulators. These alarms are to be audible and visual and shall be situated on the central operating console at the navigating bridge; or
- .2 an independent hydraulic system for each door with each power source consisting of a motor and pump capable of opening and closing the door. In addition, there shall be a hydraulic accumulator of sufficient capacity to operate the door at least three times, i.e. closed-open-closed, against an adverse list of 15°. This

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operating cycle shall be capable of being carried out when the accumulator is at the pump cut-in pressure. The fluid used shall be chosen considering the temperatures liable to be encountered by the installation during its service. A low gas pressure group alarm or other effective means of monitoring loss of stored energy in hydraulic accumulators shall be provided at the central operating console on the navigating bridge. Loss of stored energy indication at each local operating position shall also be provided; or

- .3 an independent electrical system and motor for each door with each power source consisting of a motor capable of opening and closing the door. The power source shall be capable of being automatically supplied by the transitional source of emergency electrical power as required by regulation 42.4.2 - in the event of failure of either the main or emergency source of electrical power and with sufficient capacity to operate the door at least three times, i.e. closed-open-closed against an adverse list of 15°.

For the systems specified in 7.3.1, 7.3.2 and 7.3.3, provision should be made as follows:

Power systems for power-operated watertight sliding doors shall be separate from any other power system. A single failure in the electric or hydraulic power-operated systems excluding the hydraulic actuator shall not prevent the hand operation of any door.

7.4 Control handles shall be provided at each side of the bulkhead at a minimum height of 1.6 m above the floor and shall be so arranged as to enable persons passing through the doorway to hold both handles in the open position without being able to set the power closing mechanism in operation accidentally. The direction of movement of the handles in opening and closing the door shall be in the direction of door movement and shall be clearly indicated.

7.5 As far as practicable, electrical equipment and components for watertight doors shall be situated above the bulkhead deck and outside hazardous areas and spaces.

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7.6 The enclosures of electrical components necessarily situated below the bulkhead deck shall provide suitable protection against the ingress of water.*

7.7 Electric power, control, indication and alarm circuits shall be protected against fault in such a way that a failure in one door circuit will not cause a failure in any other door circuit. Short circuits or other faults in the alarm or indicator circuits of a door shall not result in a loss of power operation of that door. Arrangements shall be such that leakage of water into the electrical equipment located below the bulkhead deck will not cause the door to open.

7.8 A single electrical failure in the power operating or control system of a power-operated sliding watertight door shall not result in a closed door opening. Availability of the power supply should be continuously monitored at a point in the electrical circuit as near as practicable to each of the motors required by paragraph 7.3. Loss of any such power supply should activate an audible and visual alarm at the central operating console at the navigating bridge.

* Reference is made to the following IEC publication 529 : 1976:

- .1 electrical motors, associated circuits and control components; protected to IP x 7 standard;
- .2 door position indicators and associated circuit components; protected to IP x 8 standard; and
- .3 door movement warning signals; protected to IP x 6 standard.

Other arrangements for the enclosures of electrical components may be fitted provided the Administration is satisfied that an equivalent protection is achieved. The water pressure testing of the enclosures protected to IP x 8 shall be based on the pressure that may occur at the location of the component during flooding for a period of 36 hours.

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8.1 The central operating console at the navigating bridge shall have a "master mode" switch with two modes of control: a "local control" mode which shall allow any door to be locally opened and locally closed after use without automatic closure, and a "doors closed" mode which shall automatically close any door that is open. The "doors closed" mode shall permit doors to be opened locally and shall automatically reclose the doors upon release of the local control mechanism. The "master mode" switch shall normally be in the "local control" mode. The "doors closed" mode shall only be used in an emergency or for testing purposes. Special consideration shall be given to the reliability of the "master mode" switch.

8.2 The central operating console at the navigating bridge shall be provided with a diagram showing the location of each door, with visual indicators to show whether each door is open or closed. A red light shall indicate a door is fully open and a green light shall indicate a door is fully closed. When the door is closed remotely the red light shall indicate the intermediate position by flashing. The indicating circuit shall be independent of the control circuit for each door.

8.3 It shall not be possible to remotely open any door from the central operating console.

9.1 All watertight doors shall be kept closed during navigation except that they may be opened during navigation as specified in paragraphs 9.2, 9.3 and 9.4. Watertight doors of width of more than 1.2 m permitted by paragraph 11 may only be opened in the circumstances detailed in that paragraph. Any door which is opened in accordance with this paragraph shall be ready to be immediately closed.

9.2 A watertight door may be opened during navigation to permit the passage of passengers or crew, or when work in the immediate vicinity of the door necessitates it being opened. The door must be immediately closed when transit through the door is complete or when the task which necessitated it being open is finished.

9.3 Certain watertight doors may be permitted to remain open during navigation only if considered absolutely necessary; that is, being open is determined essential to the safe and effective operation of the ship's

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machinery or to permit passengers normally unrestricted access throughout the passenger area. Such determination shall be made by the Administration only after careful consideration of the impact on ship operations and survivability. A watertight door permitted to remain thus open shall be clearly indicated in the ship's stability information and shall always be ready to be immediately closed.

9.4 Sliding watertight doors fitted between bunkers in the between-decks below the bulkhead deck may sometimes be open at sea for the purpose of trimming coal. The opening and closing of these doors shall be recorded in such log book as may be prescribed by the Administration.

10.1 If the Administration is satisfied that such doors are essential, watertight doors of satisfactory construction may be fitted in watertight bulkheads dividing cargo between deck spaces. Such doors may be hinged, rolling or sliding doors but shall not be remotely controlled. They shall be fitted at the highest level and as far from the shell plating as practicable, but in no case shall the outboard vertical edges be situated at a distance from the shell plating which is less than one fifth of the breadth of the ship, as defined in regulation 2, such distance being measured at right angles to the centreline at the level of the deepest subdivision load line.

10.2 Such doors shall be closed before the voyage commences and shall be kept closed during navigation; the time of opening such doors in port and of closing them before the ship leaves port shall be entered in the log book. Should any of the doors be accessible during the voyage, they shall be fitted with a device which prevents unauthorized opening. When it is proposed to fit such doors, the number and arrangements shall receive the special consideration of the Administration.

11 Portable plates on bulkheads shall not be permitted except in machinery spaces. Such plates shall always be in place before the ship leaves port, and shall not be removed during navigation except in case of urgent necessity at the discretion of the master. The times of removal and replacement of any such portable plates shall be recorded in the log book, and the necessary precautions shall be taken in replacing them to ensure that the joints are

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watertight. The Administration may permit not more than one power-operated sliding watertight door in each main transverse bulkhead larger than those specified in paragraph 7.1.2 to be substituted for these portable plates, provided these doors are closed before the ship leaves port and remain closed during navigation except in case of urgent necessity at the discretion of the master. These doors need not meet the requirements of paragraph 7.1.4 regarding complete closure by hand-operated gear in 90 seconds. The time of opening and closing these doors, whether the ship is at sea or in port, shall be recorded in the log book.

12.1 Where trunkways or tunnels for access from crew accommodation to the stokehold, for piping, or for any other purpose are carried through main transverse watertight bulkheads, they shall be watertight and in accordance with the requirements of regulation 19. The access to at least one end of each such tunnel or trunkway, if used as a passage at sea, shall be through a trunk extending watertight to a height sufficient to permit access above the margin line. The access to the other end of the trunkway or tunnel may be through a watertight door of the type required by its location in the ship. Such trunkways or tunnels shall not extend through the first subdivision bulkhead abaft the collision bulkhead.

12.2 Where it is proposed to fit tunnels piercing main transverse watertight bulkheads, these shall receive the special consideration of the Administration.

12.3 Where trunkways in connection with refrigerated cargo and ventilation or forced draught trunks are carried through more than one watertight bulkhead, the means of closure at such openings shall be operated by power and be capable of being closed from a central position situated above the bulkhead deck".

Regulation 16

Passenger ships carrying goods vehicles and accompanying personnel

The reference to "regulation 15.12" in paragraph 2 is replaced by reference to "regulation 15.10".

Regulation 21

Bilge pumping arrangements

The following text is inserted after the heading:

"(Paragraphs 1.6 and 2.9 of this regulation apply to ships constructed on or after 1 February 1992)".

The following new paragraph 1.6 is added after paragraph 1.5:

"1.6 Provisions shall be made for the drainage of enclosed cargo spaces situated on the bulkhead deck of a passenger ship and on the freeboard deck of a cargo ship, provided that the Administration may permit the means of drainage to be dispensed with in any particular compartment of any ship or class of ship if it is satisfied that by reason of size or internal subdivision of those spaces the safety of the ship is not thereby impaired.

1.6.1 Where the freeboard to the bulkhead deck or the freeboard deck, respectively, is such that the deck edge is immersed when the ship heels more than 5°, the drainage shall be by means of a sufficient number of scuppers of suitable size discharging directly overboard, fitted in accordance with the requirements of regulation 17 in the case of a passenger ship and the requirements for scuppers, inlets and discharges of the International Convention on Load Lines in force in the case of a cargo ship.

1.6.2 Where the freeboard is such that the edge of the bulkhead deck or the edge of the freeboard deck, respectively, is immersed when the ship heels 5° or less, the drainage of the enclosed cargo spaces on the bulkhead deck or on the freeboard deck, respectively, shall be led to a suitable space, or spaces, of adequate capacity, having a high water level alarm and provided with suitable arrangements for discharge overboard. In addition it shall be ensured that:

- .1 the number, size and disposition of the scuppers are such as to prevent unreasonable accumulation of free water;

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- .2 the pumping arrangements required by this regulation for passenger ships or cargo ships, as applicable, take account of the requirements for any fixed pressure water-spraying fire-extinguishing system;
- .3 water contaminated with petrol or other dangerous substances is not drained to machinery spaces or other spaces where sources of ignition may be present; and
- .4 where the enclosed cargo space is protected by a carbon dioxide fire-extinguishing system the deck scuppers are fitted with means to prevent the escape of the smothering gas".

The definition of "D" in paragraph 2.9 is replaced by the following:

"D is the moulded depth of the ship to the bulkhead deck (metres) provided that, in a ship having an enclosed cargo space on the bulkhead deck which is internally drained in accordance with the requirements of paragraph 1.6.2 and which extends for the full length of the ship, D shall be measured to the next deck above the bulkhead deck. Where the enclosed cargo spaces cover a lesser length, D shall be taken as the moulded depth to the bulkhead deck plus lh/L where l and h are the aggregate length and height respectively of the enclosed cargo spaces (metres)".

Regulation 23-1

The following new regulation 23-1 is added after regulation 23:

"Damage control in dry cargo ships

(This regulation applies to ships constructed on or after 1 February 1992)

1 There shall be permanently exhibited or readily available on the navigating bridge, for the guidance of the officer in charge of the ship, a plan showing clearly for each deck and hold the boundaries of the watertight compartments, the openings therein with the means of closure and position of any controls thereof, and the arrangements for the correction of any list due to flooding. In addition, booklets containing the aforementioned information shall be made available to the officers of the ship.

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2 Indicators shall be provided for all sliding doors and for hinged doors in watertight bulkheads. Indication showing whether the doors are open or closed shall be given on the navigating bridge. In addition, shell doors and other openings which, in the opinion of the Administration, could lead to major flooding if left open or not properly secured, shall be provided with such indicators.

3.1 General precautions shall consist of a listing of equipment, conditions and operational procedures, considered by the Administration to be necessary to maintain watertight integrity under normal ship operations.

3.2 Specific precautions shall consist of a listing of elements (i.e. closures, security of cargo, sounding of alarms, etc.) considered by the Administration to be vital to the survival of the ship and its crew".

Regulation 42

Emergency sources of electrical power in passenger ships

The following text is inserted after the heading:

"(Paragraphs 2.6.1 and 4.2 of this regulation apply to ships constructed on or after 1 February 1992)".

The second sentence in paragraph 2.6.1 is deleted.

The existing text of paragraph 4.2 is replaced by the following:

"4.2 Power to operate the watertight doors, as required by regulation 15.7.3.3, but not necessarily all of them simultaneously, unless an independent temporary source of stored energy is provided. Power to the control, indication and alarm circuits as required by regulation 15.7.2 for half an hour".

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CHAPTER II-2

CONSTRUCTION - FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

Regulation 4

Fire pumps, fire mains, hydrants and hoses

The following text is inserted after the heading:

"(Paragraph 3.3.2.5 of this regulation applies to ships constructed on or after 1 February 1992)".

The existing text of paragraph 3.3.2.5 is replaced by the following:

"2.5 The total suction head and the net positive suction head of the pump shall be such that the requirements of paragraphs 3.3.2, 3.3.2.1, 3.3.2.2 and 4.2 of this regulation shall be obtained under all conditions of list, trim, roll and pitch likely to be encountered in service".

In paragraph 7.1 between "of" and "material" in the first line the word "non-perishable" is inserted.

In paragraph 7.1, the following new sentence is inserted after the first sentence:

"Fire hoses of non-perishable material shall be provided in ships constructed on or after 1 February 1992, and on ships constructed before 1 February 1992 when the existing fire hoses are replaced".

Regulation 13-1

The following new regulation 13-1 is added after regulation 13:

"Sample extraction smoke detection systems

(This regulation applies to ships constructed on or after 1 February 1992)

1 General requirements

1.1 Wherever in the text of this regulation the word "system" appears, it shall mean "sample extraction smoke detection system".

1.2 Any required system shall be capable of continuous operation at all times except that systems operating on a sequential scanning principle may be accepted, provided that the interval between scanning the same position twice gives an overall response time to the satisfaction of the Administration.

1.3 Power supplies necessary for the operation of the system shall be monitored for loss of power. Any loss of power shall initiate a visual and audible signal at the control panel and the navigating bridge which shall be distinct from a signal indicating smoke detection.

1.4 An alternative power supply for the electrical equipment used in the operation of the system shall be provided.

1.5 The control panel shall be located on the navigating bridge or in the main fire control station.

1.6 The detection of smoke or other products of combustion shall initiate a visual and audible signal at the control panel and the navigating bridge.

1.7 Clear information shall be displayed on or adjacent to the control panel designating the spaces covered.

1.8 The sampling pipe arrangements shall be such that the location of the fire can be readily identified.

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1.9 Suitable instructions and component spares shall be provided for the testing and maintenance of the system.

1.10 The functioning of the system shall be periodically tested to the satisfaction of the Administration. The system shall be of a type that can be tested for correct operation and restored to normal surveillance without the renewal of any component.

1.11 The system shall be designed, constructed and installed so as to prevent the leakage of any toxic or flammable substances or fire-extinguishing media into any accommodation and service space, control station or machinery space.

2 Installation requirements

2.1 At least one smoke accumulator shall be located in every enclosed space for which smoke detection is required. However, where a space is designed to carry oil or refrigerated cargo alternatively with cargoes for which a smoke sampling system is required, means may be provided to isolate the smoke accumulators in such compartments for the system. Such means shall be to the satisfaction of the Administration.

2.2 Smoke accumulators shall be located for optimum performance and shall be spaced so that no part of the overhead deck area is more than 12 m measured horizontally from an accumulator. Where systems are used in spaces which may be mechanically ventilated, the position of the smoke accumulators shall be considered having regard to the effects of ventilation.

2.3 Smoke accumulators shall be positioned where impact or physical damage is unlikely to occur.

2.4 Not more than four accumulators shall be connected to each sampling point.

2.5 Smoke accumulators from more than one enclosed space shall not be connected to the same sampling point.

2.6 Sampling pipes shall be self-draining and suitably protected from impact or damage from cargo working.

3 Design requirements

3.1 The system and equipment shall be suitably designed to withstand supply voltage variations and transients, ambient temperature changes, vibration, humidity, shock, impact and corrosion normally encountered in ships and to avoid the possibility of ignition of flammable gas air mixture.

3.2 The sensing unit shall be certified to operate before the smoke density within the sensing chamber exceeds 6.65% obscuration per metre.

3.3 Duplicate sample extraction fans shall be provided. The fans shall be of sufficient capacity to operate with the normal conditions or ventilation in the protected area and shall give an overall response time to the satisfaction of the Administration.

3.4 The control panel shall permit observation of smoke in the individual sampling pipe.

3.5 Means shall be provided to monitor the airflow through the sampling pipes so designed as to ensure that as far as practicable equal quantities are extracted from each interconnected accumulator.

3.6 Sampling pipes shall be a minimum of 12 mm internal diameter except when used in conjunction with fixed gas fire-extinguishing systems when the minimum size of pipe should be sufficient to permit the fire-extinguishing gas to be discharged within the appropriate time.

3.7 Sampling pipes shall be provided with an arrangement for periodically purging with compressed air".

Regulation 15

Arrangements for oil fuel, lubricating oil and other flammable oils

The following text is inserted after the heading:

"(Paragraphs 2.6 and 3 of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of paragraph 2.6 is replaced by the following:

".6 Safe and efficient means of ascertaining the amount of oil fuel contained in any oil fuel tank shall be provided.

.6.1 Where sounding pipes are used, they shall not terminate in any space where the risk of ignition of spillage from the sounding pipe might arise. In particular, they shall not terminate in passenger or crew spaces. As a general rule, they shall not terminate in machinery spaces. However, where the Administration considers that these latter requirements are impracticable, it may permit termination of sounding pipes in machinery spaces on condition that all the following requirements are met:

.6.1.1 in addition, an oil-level gauge is provided meeting the requirements of subparagraph .6.2;

.6.1.2 the sounding pipes terminate in locations remote from ignition hazards unless precautions are taken such as the fitting of effective screens to prevent the oil fuel in the case of spillage through the terminations of the sounding pipes from coming into contact with a source of ignition;

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- .6.1.3 the termination of sounding pipes are fitted with self-closing blanking devices and with a small-diameter self-closing control cock located below the blanking device for the purpose of ascertaining before the blanking device is opened that oil fuel is not present. Provision shall be made so as to ensure that any spillage of oil fuel through the control cock involves no ignition hazard.

- .6.2 Other oil-level gauges may be used in place of sounding pipes. Such means, like the means provided in subparagraph .6.1.1, are subject to the following conditions:
 - .6.2.1 in passenger ships, such means shall not require penetration below the top of the tank and their failure or overfilling of the tanks shall not permit release of fuel;

 - .6.2.2 in cargo ships, the failure of such means or overfilling of the tank shall not permit release of fuel into the space. The use of cylindrical gauge glasses is prohibited. The Administration may permit the use of oil-level gauges with flat glasses and self-closing valves between the gauges and fuel tanks.

- 6.3 Means prescribed in .6.2.1 or .6.2.2 which are acceptable to the Administration shall be maintained in the proper condition to ensure their continued accurate functioning in service".

The existing text of paragraph 3 is replaced by the following:

"3 The arrangements for the storage, distribution and utilization of oil used in pressure lubrication systems shall be such as to ensure the safety of the ship and persons on board. The arrangements made in machinery spaces of category A, and whenever practicable in other machinery spaces, shall at least comply with the provisions of paragraphs 2.1, 2.4, 2.5, 2.6, 2.7 and 2.8, except that:

- .1 this does not preclude the use of sight-flow glasses in lubricating systems provided that they are shown by test to have a suitable degree of fire resistance;

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- .2 sounding pipes may be authorized in machinery spaces; the requirements of paragraphs 2.6.1.1 and 2.6.1.3 need not be applied on condition that the sounding pipes are fitted with appropriate means of closure".

Regulation 18

Miscellaneous items

The following text is inserted after the heading:

"(Paragraphs 2.4 and 8 of this regulation apply to ships constructed on or after 1 February 1992. Paragraph 7 of this regulation applies to all ships)".

The following new paragraph 2.4 is added after paragraph 2.3:

"2.4 For the protection of cargo tanks carrying crude oil and petroleum products having a flashpoint not exceeding 60°C, materials readily rendered ineffective by heat shall not be used for valves, fittings, tank opening covers, cargo vent piping, and cargo piping so as to prevent the spread of fire to the cargo".

The following new paragraphs 7 and 8 are added after paragraph 6:

"7 Paint lockers and flammable liquid lockers shall be protected by an appropriate fire-extinguishing arrangement approved by the Administration.

8 Helicopter decks shall be of a steel or steel equivalent fire-resistant construction. If the space below the helicopter deck is a high fire risk space, the insulation standard shall be to the satisfaction of the Administration. Each helicopter facility shall have an operations manual, including a description and a checklist of safety precautions, procedures, and equipment requirements. If the Administration permits aluminium or other low melting metal construction that is not made equivalent to steel, the following provisions shall be satisfied:

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- .1 If the platform is cantilevered over the side of the ship, after each fire on the ship or on the platform, the platform shall undergo a structural analysis to determine its suitability for further use.
- .2 If the platform is located above the ship's deckhouse or similar structure, the following conditions shall be satisfied:
 - .2.1 the deckhouse top and bulkheads under the platform shall have no openings;
 - .2.2 all windows under the platform shall be provided with steel shutters;
 - .2.3 the required fire-fighting equipment shall be to the satisfaction of the Administration;
 - .2.4 after each fire on the platform or in close proximity, the platform shall undergo a structural analysis to determine its suitability for further use".

Regulation 26

Fire integrity of bulkheads and decks in ships
carrying more than 36 passengers

The following text is inserted after the heading:

"(Paragraphs 2.2(7) and 2.2(13) of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of the third sentence in paragraph 2.2(7) is replaced by the following:

"Isolated lockers and small store-rooms in accommodation spaces having areas less than 4 m² (in which flammable liquids are not stowed)".

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The following sentence is added at the end of paragraph 2.2(13):

"Lockers and store-rooms having areas greater than 4 m², other than those spaces that have provisions for the storage of flammable liquids".

Regulation 27

Fire integrity of bulkheads and decks in ships
carrying not more than 36 passengers

The following text is inserted after the heading:

"(Paragraph 2.(5) and 2.(9) of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of paragraphs 2.(5) and 2.(9) are replaced by the following:

"(5) Service spaces (low risk)

Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m² and drying rooms and laundries".

"(9) Service spaces (high risk)

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces".

Regulation 38

Protection of cargo spaces, other than special category
spaces, intended for the carriage of motor vehicles
with fuel in their tanks for their own propulsion

The following text is inserted after the heading:

"(Paragraph 1 of this regulation applies to ships constructed on or after 1 February 1992)".

The existing text of paragraph 1 is replaced by the following:

"1 Fixed Fire Detection

There shall be provided a fixed fire detection and fire alarm system complying with the requirements of regulation 13 or a sample extraction smoke detection system complying with the requirements of regulation 13-1. The design and arrangements of this system shall be considered in conjunction with the ventilation requirements referred to in paragraph 3".

Regulation 40

Fire patrols, detection, alarms and public address systems

The following text is inserted after the heading:

"(Paragraph 2 of this regulation applies to ships constructed on or after 1 February 1992)".

The existing text of paragraph 2 is replaced by the following:

"2 A fixed fire detection and fire alarm system complying with the requirements of regulation 13 or a sample extraction smoke detection system complying with the requirements of regulation 13-1 shall be provided in any cargo space which, in the opinion of the Administration, is not accessible, except where it is shown to the satisfaction of the Administration that the ship is engaged on voyages of such short duration that it would be unreasonable to apply this requirement".

Regulation 44

Fire integrity of bulkheads and decks

The following text is inserted after the heading:

"(Paragraphs 2.(5) and 2.(9) of this regulation apply to ships constructed on or after 1 February 1992)".

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The existing text of paragraphs 2.(5) and 2.(9) is replaced by the following:

"(5) Service spaces (low risk)

Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m^2 and drying rooms and laundries".

"(9) Service spaces (high risk)

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 4 m^2 or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces".

Regulation 50

Details of construction

The following text is inserted after the heading:

"(Paragraphs 3.2 and 3.3 of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of paragraph 3.2 is replaced by the following:

"3.2 Where non-combustible bulkheads, linings and ceilings are fitted in accommodation and service spaces they may have a combustible veneer with a calorific value not exceeding 45 MJ/m^2 of the area for the thickness used".

The following new paragraph 3.3 is added after paragraph 3.2:

"3.3 The total volume of combustible facings, mouldings, decorations and veneers in any accommodation and service space bounded by non-combustible bulkheads, ceilings and linings shall not exceed a volume equivalent to a 2.5 mm veneer on the combined area of the walls and ceilings".

The existing paragraph 3.3 is renumbered paragraph 3.4.

Regulation 53

Fire protection arrangements in cargo spaces

The following text is inserted after the heading:

(Paragraphs 2.1 and 3 of this regulation apply to ships constructed on or after 1 February 1992)".

In paragraph 1.2 the word "and" between "timber" and "non-combustible" in the third line is replaced by ",,".

An asterisk is added at the end of paragraph 1.2 and the following text of a footnote is inserted:

"* Reference is made to the Code of Safe Practice for Solid Bulk Cargoes - Emergency Schedule B14, entry for coal".

The existing text of paragraph 2.1 is replaced by the following:

"2.1 There shall be provided a fixed fire detection and fire alarm system complying with the requirements of regulation 13. The fixed fire detection system shall be capable of rapidly detecting the onset of fire. The type of detectors and their spacing and location shall be to the satisfaction of the Administration taking into account the effects of ventilation and other relevant factors. After being installed, the system shall be tested under normal ventilation conditions and shall give an overall response time to the satisfaction of the Administration".

The existing text of paragraph 3 is replaced by the following:

"3 Cargo spaces, other than ro-ro cargo spaces, intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion

Cargo spaces, other than ro-ro spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion shall comply with the requirements of paragraph 2 except that in lieu of the requirements of

paragraph 2.1 a sample extraction smoke detection system complying with the requirements of regulation 13-1 may be permitted and paragraph 2.2.4 need not be complied with".

Regulation 54

Special requirements for ships carrying dangerous goods

The following text is inserted after the heading:

"(Paragraph 2.3 of this regulation applies to ships constructed on or after 1 February 1992)".

The existing text of paragraph 1.1 and footnote is replaced by the following:

"1.1 In addition to complying with the requirements of regulation 53 for cargo ships and with the requirements of regulations 37*, 38 and 39 for passenger ships as appropriate, ship-types and cargo spaces, referred to in paragraph 1.2, intended for the carriage of dangerous goods shall comply with the requirements of this regulation, as appropriate, except when carrying dangerous goods in limited quantities** unless such requirements have already been met by compliance with the requirements elsewhere in this chapter. The types of ships and modes of carriage of dangerous goods are referred to in paragraph 1.2 and in table 54.1, where the numbers appearing in paragraph 1.2 are referred to in the top line. Cargo ships of less than 500 tons gross tonnage constructed on or after 1 February 1992 shall comply with this regulation, but Administrations may reduce the requirements and such reduced requirements shall be recorded in the document of compliance referred to in paragraph 3.

* Reference is made to section 17 of the General Introduction to the International Maritime Dangerous Goods Code (IMDG Code) for operational measures in association with the requirements of this regulation.

** Reference is made to section 18 of the General Introduction to the International Maritime Dangerous Goods Code (IMDG Code) for a definition of the term 'limited quantities'".

The existing text of paragraph 2.3 is replaced by the following:

"2.3 Detection system

Ro-ro cargo spaces shall be fitted with a fixed fire detection and fire alarm system complying with the requirements of regulation 13. All other types of cargo spaces shall be fitted with either a fixed fire detection and fire alarm system complying with the requirements of regulation 13 or a sample extraction smoke detection system complying with the requirements of regulation 13-1. If a sample extraction smoke detection system is fitted, particular attention shall be made to regulation 13-1.1.11 in order to prevent the leakage of toxic fumes into occupied areas".

Regulation 55

Application

The existing text of paragraph 5 is replaced by the following:

"5 The requirements for inert gas systems of regulation 60 need not be applied to:

- .1 chemical tankers constructed before, on or after 1 July 1986 when carrying cargoes described in paragraph 1, provided that they comply with the requirements for inert gas systems on chemical tankers developed by the Organization*; or
- .2 chemical tankers constructed before 1 July 1986, when carrying crude oil or petroleum products, provided that they comply with the requirements for inert gas systems on chemical tankers carrying petroleum products developed by the Organization**; or
- .3 gas carriers constructed before, on or after 1 July 1986 when carrying cargoes described in paragraph 1, provided that they are fitted with cargo tank inerting arrangements equivalent to those specified in paragraph 5.1 or 5.2; or

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- .4 chemical tankers and gas carriers when carrying flammable cargoes other than crude oil or petroleum products such as cargoes listed in chapters VI and VII of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk or chapters 17 and 18 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk:
- .4.1 if constructed before 1 July 1986; or
- .4.2 if constructed on or after 1 July 1986, provided that the capacity of tanks used for their carriage does not exceed 3,000 m³ and the individual nozzle capacities of tank washing machines do not exceed 17.5 m³/h and the total combined throughput from the number of machines in use in a cargo tank at any one time does not exceed 110 m³/h.

* Reference is made to Regulation for Inert Gas Systems on Chemical Tankers adopted by the Organization by resolution A.567(14).

** Reference is made to Interim Regulation for Inert Gas Systems on Chemical Tankers Carrying Petroleum Products, adopted by the Organization by resolution A.473(XII)".

Regulation 56

Location and separation of spaces

The existing text of this regulation is replaced by the following:

"(This regulation applies to ships constructed on or after 1 February 1992)

1 Machinery spaces shall be positioned aft of cargo tanks and slop tanks; they shall also be situated aft of cargo pump-rooms and cofferdams, but not necessarily aft of the oil fuel bunker tanks. Any machinery space shall be

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isolated from cargo tanks and slop tanks by cofferdams, cargo pump-rooms, oil fuel bunker tanks or ballast tanks. Pump-rooms containing pumps and their accessories for ballasting those spaces situated adjacent to cargo tanks and slop tanks and pumps for oil fuel transfer shall be considered as equivalent to a cargo pump-room within the context of this regulation, provided that such pump-rooms have the same safety standard as that required for cargo pump-rooms. However, the lower portion of the pump-room may be recessed into machinery spaces of category A to accommodate pumps, provided that the deck head of the recess is in general not more than one third of the moulded depth above the keel, except that in the case of ships of not more than 25,000 tonnes deadweight, where it can be demonstrated that for reasons of access and satisfactory piping arrangements this is impracticable, the Administration may permit a recess in excess of such height, but not exceeding one half of the moulded depth above the keel.

2 Accommodation spaces, main cargo control stations, control stations and service spaces (excluding isolated cargo handling gear lockers) shall be positioned aft of all cargo tanks, slop tanks, and spaces which isolate cargo or slop tanks from machinery spaces but not necessarily aft of the oil fuel bunker tanks and ballast tanks, but shall be arranged in such a way that a single failure of a deck or bulkhead shall not permit the entry of gas or fumes from the cargo tanks into an accommodation space, main cargo control stations, control station, or service spaces. A recess provided in accordance with paragraph 1 need not be taken into account when the position of these spaces is being determined.

3 However, where deemed necessary, the Administration may permit accommodation spaces, main cargo control stations, control stations, and service spaces forward of the cargo tanks, slop tanks and spaces which isolate cargo and slop tanks from machinery spaces, but not necessarily forward of oil fuel bunker tanks or ballast tanks. Machinery spaces, other than those of category A, may be permitted forward of the cargo tanks and slop tanks provided they are isolated from the cargo tanks and slop tanks by cofferdams, cargo pump-rooms, oil fuel bunker tanks or ballast tanks. All of the above spaces shall be subject to an equivalent standard of safety and appropriate

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availability of fire-extinguishing arrangements being provided to the satisfaction of the Administration. Accommodation spaces, main cargo control spaces, control stations and service spaces shall be arranged in such a way that a single failure of a deck or bulkhead shall not permit the entry of gas or fumes from the cargo tanks into such spaces. In addition, where deemed necessary for the safety or navigation of the ship, the Administration may permit machinery spaces containing internal combustion machinery not being main propulsion machinery having an output greater than 375 kW to be located forward of the cargo area provided the arrangements are in accordance with the provisions of this paragraph.

4 In combination carriers only:

- .1 The slop tanks shall be surrounded by cofferdams except where the boundaries of the slop tanks where slop may be carried on dry cargo voyages are the hull, main cargo deck, cargo pump-room bulkhead or oil fuel bunker tank. These cofferdams shall not be open to a double bottom, pipe tunnel, pump-room or other enclosed space. Means shall be provided for filling the cofferdams with water and for draining them. Where the boundary of a slop tank is the cargo pump-room bulkhead the pump-room shall not be open to the double bottom, pipe tunnel or other enclosed space; however, openings provided with gastight bolted covers may be permitted.
- .2 Means shall be provided for isolating the piping connecting the pump-room with the slop tanks referred to in paragraph 4.1. The means of isolation shall consist of a valve followed by a spectacle flange or a spool piece with appropriate blank flanges. This arrangement shall be located adjacent to the slop tanks, but where this is unreasonable or impracticable, it may be located within the pump-room directly after the piping penetrates the bulkhead. A separate pumping and piping arrangement incorporating a manifold shall be provided for discharging the contents of the slop tanks directly to the open deck for disposal to shore reception facilities when the ship is in the dry cargo mode.

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- .3 Hatches and tank cleaning openings to slop tanks shall only be permitted on the open deck and shall be fitted with closing arrangements. Except where they consist of bolted plates with bolts at watertight spacing, these closing arrangements shall be provided with locking arrangements which shall be under the control of the responsible ship's officer.
- .4 Where cargo wing tanks are provided, cargo oil lines below deck shall be installed inside these tanks. However, the Administration may permit cargo oil lines to be placed in special ducts which shall be capable of being adequately cleaned and ventilated and be to the satisfaction of the Administration. Where cargo wing tanks are not provided cargo oil lines below deck shall be placed in special ducts.
- 5 Where the fitting of a navigation position above the cargo area is shown to be necessary, it shall be for navigation purposes only and it shall be separated from the cargo tank deck by means of an open space with a height of at least 2 m. The fire protection of such a navigation position shall in addition be as required for control spaces in regulation 58.1 and 58.2 and other provisions, as applicable, of this part.
- 6 Means shall be provided to keep deck spills away from the accommodation and service areas. This may be accomplished by provision of a permanent continuous coaming of a suitable height extending from side to side. Special consideration shall be given to the arrangements associated with stern loading.
- 7 Exterior boundaries of superstructures and deckhouses enclosing accommodation and including any overhanging decks which support such accommodation, shall be insulated to "A-60" standard for the whole of the portions which face the cargo area and on the outward sides for a distance of 3 m from the end boundary facing the cargo area. In the case of the sides of those superstructures and deckhouses, such insulation shall be carried as high as is deemed necessary by the Administration.
- 8.1 Except as permitted in paragraph 8.2 below, access doors, air inlets and openings to accommodation spaces, service spaces, control stations and machinery spaces shall not face the cargo area. They shall be located on the

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transverse bulkhead not facing the cargo area or on the outboard side of the superstructure or deckhouse at a distance of at least 4% of the length of the ship but not less than 3 m from the end of the superstructure or deckhouse facing the cargo area. This distance need not exceed 5 m.

8.2 The Administration may permit access doors in boundary bulkheads facing the cargo area or within the 5 m limits specified in paragraph 8.1, to main cargo control stations and to such service spaces as provision rooms, store rooms and lockers, provided they do not give access directly or indirectly, to any other space containing or provided for accommodation, control stations or service spaces such as galleys, pantries or workshops, or similar spaces containing sources of vapour ignition. The boundary of such a space shall be insulated to "A-60" standard, with the exception of the boundary facing the cargo area. Bolted plates for the removal of machinery may be fitted within the limits specified in paragraph 8.1. Wheelhouse doors and wheelhouse windows may be located within the limits specified in paragraph 8.1 so long as they are designed to ensure that the wheelhouse can be made rapidly and efficiently gas and vapour tight.

8.3 Windows and sidescuttles facing the cargo area and on the sides of the superstructures and deckhouses within the limits specified in paragraph 8.1 shall be of the fixed (non-opening) type. Such windows and sidescuttles in the first tier on the main deck shall be fitted with inside covers of steel or other equivalent material".

Regulation 58

Fire integrity of bulkheads and decks

The following text is inserted after the heading:

"(Paragraph 2.(5) and 2.(9) of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of paragraphs 2.(5) and 2.(9) is replaced by the following:

"(5) Service spaces (low risk)

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Lockers and store-rooms not having provision for the storage of flammable liquids and having areas less than 4 m² and drying rooms and laundries".

"(9) Service spaces (high risk)

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces".

Regulation 59

Venting, purging, gas-freeing and ventilation

The following text is inserted after the heading:

"(Paragraph 2 of this regulation applies to ships constructed on or after 1 February 1992)".

The existing text of paragraph 2 is replaced by the following:

"2 Cargo tank purging and/or gas-freeing*

Arrangements for purging and/or gas-freeing shall be such as to minimize the hazards due to the dispersal of flammable vapours in the atmosphere and to flammable mixtures in a cargo tank. Accordingly:

- .1 When the ship is provided with an inert gas system, the cargo tanks shall first be purged in accordance with the provisions of regulation 62.13 until the concentration of hydrocarbon vapours in the cargo tanks has been reduced to less than 2% by volume. Thereafter, gas-freeing may take place at the cargo tank deck level.
- .2 When the ship is not provided with an inert gas system, the operation shall be such that the flammable vapour is discharged initially:

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- .2.1 through the vent outlets as specified in paragraph 1.9; or
- .2.2 through outlets at least 2 m above the cargo tank deck level with a vertical efflux velocity of at least 30 m/sec maintained during the gas-freeing operation; or
- .2.3 through outlets at least 2 m above the cargo tank deck level with a vertical efflux velocity of at least 20 m/sec and which are protected by suitable devices to prevent the passage of flame.

When the flammable vapour concentration at the outlet has been reduced to 30% of the lower flammable limit, gas-freeing may thereafter be continued at cargo tank deck level.

* Reference is made to the Revised Standards for the Design, Testing and Locating of Devices to Prevent the Passage of Flame into Cargo Tanks in Tankers (MSC/Circ.373/Rev.1) and to Revised Factors to be taken into Consideration when Designing Cargo Tank Venting and Gas-Freeing Arrangements (MSC/Circ.450/Rev.1)".

Regulation 62

Inert gas systems

The following text is inserted after the heading:

"(Paragraphs 19.1 and 19.2 of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of the first line of paragraph 19.1 is replaced by the following:

"For inert gas systems of both the flue, gas type and the inert gas generator type, audible and visual alarms shall be provided to indicate:".

The existing text of the first three lines of paragraph 19.2 is replaced by the following:

"For inert gas systems of the inert gas generator type, additional visual and audible alarms shall be provided to indicate:".

CHAPTER III

LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Regulation 41

General requirements for lifeboats

The existing text of paragraph 8.18 is replaced by the following:

"One copy of the life-saving signals referred to in regulation V/16 on a waterproof card or in a waterproof container;"

Regulation 48

Launching and embarkation appliances

For the existing text of paragraph 1.4 "o" is replaced by "y" (Spanish text only).

CHAPTER IV

Regulation 13

Radiotelegraph installations for fitting in motor lifeboats

The existing title is replaced by "Radiotelegraph installations for lifeboats".

In paragraph (a), first line, the existing words "Regulation 14 of Chapter III" are replaced by "regulation III/6.2.2".

In paragraph (h), second line, the existing words "Regulation 14 of Chapter III" are replaced by "regulation III/41.8.29".

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Regulation 14

Portable radio apparatus for survival craft

In paragraph (a), first line, the existing words "Regulation 13 of Chapter III" are replaced by "regulation III/6.2.1".

CHAPTER V

SAFETY OF NAVIGATION

Regulation 3

Information required in danger messages

The reference to "Greenwich Mean Time" in subparagraph (a)(iii), (b)(ii) and (e)(i) is replaced by reference to "Universal Co-ordinated Time".

The references to "GMT" under "Examples" is replaced by "UTC".

Regulation 9

Misuse of distress signals

The existing text of this regulation is replaced by the following:

"The use of an international distress signal, except for the purpose of indicating that a ship, aircraft or person is in distress, and the use of any signal which may be confused with an international distress signal, are prohibited".

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Regulation 12

Shipborne navigational equipment

The existing text of paragraph (f) is replaced by the following:

"(f) Ships with emergency steering positions shall at least be provided with a telephone or other means of communication for relaying heading information to such positions. In addition, ships of 500 tons gross tonnage and upwards constructed on or after 1 February 1992, shall be provided with arrangements for supplying visual compass readings to the emergency steering position".

Regulation 13

Manning

The existing text of regulation V/13 is renumbered as paragraph (a).

The following new paragraph (b) is added:

"(b) Every ship to which chapter I of this Convention applies shall be provided with an appropriate safe manning document or equivalent issued by the Administration as evidence of the minimum safe manning considered necessary to comply with the provisions of paragraph (a)".

Regulation 16

Life-saving signals

The existing text of this regulation is replaced by the following:

"Life-saving signals* shall be used by life-saving stations, maritime rescue units and aircraft engaged in search and rescue operations when communicating with ships or persons in distress or to direct ships, and by ships or persons in distress when communicating with life-saving stations, maritime rescue units and aircraft engaged in search and rescue operations. An illustrated table describing the life-saving signals shall be readily available to the officer of the watch of every ship to which this chapter applies.

* Such life-saving signals are described in the Merchant Ship Search and Rescue Manual (MERSAR) (resolution A.229(VII), as amended), the IMO Search and Rescue Manual (IMOSAR) (resolution A.439(XI), as amended) and illustrated in the International Code of Signals as amended pursuant to resolution A.80(IV)".

CHAPTER VII

CARRIAGE OF DANGEROUS GOODS

Regulation 7

The existing text of regulation is replaced by the following:

"Explosives in passenger ships"

1 Explosives in division 1.4, compatibility group S may be carried in any amount in passenger ships. No other explosives may be carried except any one of the following:

- .1 explosive articles for life-saving purposes, if the total net explosives mass of such articles does not exceed 50 kg per ship; or

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- .2 explosives in compatibility groups C, D and E, if the total net explosives mass does not exceed 10 kg per ship; or
 - .3 explosive articles in compatibility group G other than those requiring special stowage, if the total net explosives mass does not exceed 10 kg per ship; or
 - .4 explosive articles in compatibility group B, if the total net explosives mass does not exceed 5 kg per ship.
- 2 Notwithstanding the provisions of paragraph 1, additional quantities or types of explosives may be carried in passenger ships in which special safety measures approved by the Administration are taken.

* Reference is made to class 1 of the International Maritime Dangerous Goods Code (IMDG Code)".

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CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

ANNEX 34

RESOLUTION MSC.22(59)

(adopted on 23 May 1991)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION
FOR THE SAFETY OF LIFE AT SEA, 1974

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING article VIII(b) of the International Convention for the Safety of Life at Sea, 1974, hereinafter referred to as "the Convention" concerning the procedures for amending the Annex to the Convention, other than the provisions of chapter I,

HAVING CONSIDERED, at its fifty-ninth session, amendments to the Convention proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, the amendments to the Convention, the texts of which are set out in the Annex to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 1 July 1993 unless, prior to that date, more than one third of the Contracting Governments to the Convention, or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;
3. INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 1994 upon their acceptance in accordance with paragraph 2 above;
4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annex to all Contracting Governments to the International Convention for the Safety of Life at Sea, 1974;
5. FURTHER REQUESTS the Secretary-General to transmit copies of the resolution to Members of the Organization which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE
SAFETY OF LIFE AT SEA, 1974, AS AMENDED

Chapter II-2

CONSTRUCTION - FIRE PROTECTION, FIRE DETECTION
AND FIRE EXTINCTION

Regulation 20

Fire control plans

The existing heading is replaced by the following:

"Fire control plans and fire drills".

The following text is inserted after the heading:

"(This regulation applies to all ships)".

The following new paragraph 3 is added after paragraph 2:

"3 Fire drills shall be conducted in accordance with the provisions of regulation III/18".

Regulation 21

Ready availability of fire-extinguishing appliances

The following text is added after the heading:

"(This regulation applies to all ships)".

The existing text of this regulation is replaced by the following:

"Fire-extinguishing appliances shall be kept in good order and be available for immediate use at all times".

Regulation 28

Means of escape

The following text is inserted after the heading:

"(Paragraph 1.8 of this regulation applies to ships constructed on or after 1 January 1994)".

The following new subparagraph 1.8 is added after existing subparagraph 1.7:

"1.8 Where public spaces span three or more decks and contain combustibles such as furniture and enclosed spaces such as shops, offices and restaurants, each level within the space shall have two means of escape, one of which shall give direct access to an enclosed vertical means of escape meeting the requirements of paragraph 5".

Regulation 32

Ventilation systems

The following text is inserted after the heading:

"(Paragraph 1.7 of this regulation applies to ships constructed on or after 1 January 1994)".

The following new paragraph 1.7 is inserted between existing paragraphs 1.6 and 2:

"1.7 Where public spaces span three or more open decks and contain combustibles such as furniture and enclosed spaces such as shops, offices and restaurants, the space shall be equipped with a smoke extraction system. The smoke extraction system shall be activated by the required smoke detection system and be capable of manual control. The fans shall be sized such that the entire volume within the space can be exhausted in 10 min or less".

Regulation 36

Fixed fire detection and fire alarm systems Automatic sprinkler, fire detection and fire alarm systems

The following text is inserted after the heading:

"(Paragraph 2 applies to ships constructed on or after 1 January 1994)".

The existing paragraph is numbered as paragraph 1, and the following new paragraph 2 is added after new paragraph 1:

"2 Where public spaces span three or more open decks and contain combustibles such as furniture and enclosed spaces such as shops, offices and restaurants, the entire main vertical zone containing the space shall be protected throughout with an automatic sprinkler system in compliance with regulation 12".

Regulation 40

Fire patrols, detection, alarms and public address systems

The following text is inserted after the heading:

"(Paragraph 7 applies to ships constructed on or after 1 January 1994)".

The following new paragraph 7 is added after existing paragraph 6:

"7 Where public spaces span three or more open decks and contain combustibles such as furniture and enclosed spaces such as shops, offices and restaurants, the entire main vertical zone containing the space shall be protected throughout with a smoke detection system complying with regulation 13, with the exception of paragraph 1.9".

Chapter III

LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Regulation 18

Abandon ship training and drills

The existing heading and text of this regulation are replaced by the following:

"Emergency training and drills

1 This regulation applies to all ships.

2 Manuals

A training manual complying with the requirements of regulation 51 shall be provided in each crew messroom and recreation room or in each crew cabin.

3 Practice musters and drills

3.1 Each member of the crew shall participate in at least one abandon ship drill and one fire drill every month. The drills of the crew shall take place within 24 h of the ship leaving a port if more than 25% of the crew have not participated in abandon ship and fire drills on board that particular ship in the previous month. The Administration may accept other arrangements that are at least equivalent for those classes of ship for which this is impracticable.

3.2 On a ship engaged on an international voyage which is not a short international voyage, musters of the passengers shall take place within 24 h after their embarkation. Passengers shall be instructed in the use of the lifejackets and the action to take in an emergency. If only a small number of passengers embark at a port after the muster has been held it shall be sufficient, instead of holding another muster, to draw the attention of these passengers to the emergency instructions required by regulations 8.2 and 8.4.

3.3 On a ship engaged on a short international voyage, if a muster of the passengers is not held on departure, the attention of the passengers shall be drawn to the emergency instructions required by regulations 8.2 and 8.4.

3.4 Each abandon ship drill shall include:

- .1 summoning of passengers and crew to muster stations with the alarm required by regulation 6.4.2 and ensuring that they are made aware of the order to abandon ship specified in the muster list;
- .2 reporting to stations and preparing for the duties described in the muster list;
- .3 checking that passengers and crew are suitably dressed;
- .4 checking that lifejackets are correctly donned;
- .5 lowering of at least one lifeboat after any necessary preparation for launching;
- .6 starting and operating the lifeboat engine;
- .7 operation of davits used for launching liferafts.

3.5 Different lifeboats shall, as far as practicable, be lowered in compliance with the requirements of paragraph 3.4.5 at successive drills.

3.6 Each lifeboat shall be launched with its assigned operating crew aboard and manoeuvred in the water at least once every 3 months during an abandon ship drill. The Administration may allow ships operating on short international voyages not to launch the lifeboats on one side if their berthing arrangements in port and their trading patterns do not permit launching of lifeboats on that side. However, all such lifeboats shall be lowered at least once every 3 months and launched at least annually.

3.7 As far as is reasonable and practicable, rescue boats other than lifeboats which are also rescue boats, shall be launched each month with their assigned crew aboard and manoeuvred in the water. In all cases this requirement shall be complied with at least once every 3 months.

3.8 If lifeboat and rescue boat launching drills are carried out with the ship making headway, such drills shall, because of the dangers involved, be practised in sheltered waters only and under the supervision of an officer experienced in such drills.

3.9 Emergency lighting for mustering and abandonment shall be tested at each abandon ship drill.

3.10 Each fire drill shall include:

- .1 reporting to stations and preparing for the duties described in the muster list required by regulation 8.3;
- .2 starting a fire pump using at least the two required jets of water to show that the system is in proper working order;

- .3 checking fireman's outfits and other personal rescue equipment;
- .4 checking the relevant communication equipment;
- .5 checking the operation of watertight doors, fire doors, and fire dampers;
- .6 checking the necessary arrangements for subsequent abandonment of the ship.

3.11 Fire drills should be planned in such a way that due consideration is given to regular practice in the various emergencies that may occur depending on the type of ship and its cargo.

3.12 The equipment used during drills shall immediately be brought back to its fully operational condition, and any faults and defects discovered during the drills shall be remedied as soon as possible.

3.13 Drills shall, as far as practicable, be conducted as if there were an actual emergency.

4 On-board training and instructions

4.1 On-board training and instructions in the use of the ship's life-saving appliances, including survival craft equipment, and in the use of the ship's fire-extinguishing appliances shall be given as soon as possible but not later than 2 weeks after a crew member joins the ship. However, if the crew member is on a regularly scheduled rotating assignment to the ship, such training shall be given not later than 2 weeks after the time of first joining the ship. Individual instruction may cover different parts of the ship's life-saving and fire-extinguishing appliances, but all the ship's life-saving and fire-extinguishing appliances shall be covered within any period of 2 months.

4.2 Each member of the crew shall be given instructions which shall include but not necessarily be limited to:

- .1 operation and use of the ship's inflatable liferafts;
- .2 problems of hypothermia, first-aid treatment of hypothermia and other appropriate first-aid procedures;
- .3 special instructions necessary for use of the ship's life-saving appliances in severe weather and severe sea conditions;
- .4 operation and use of fire-extinguishing appliances.

4.3 On-board training in the use of davit-launched liferafts shall take place at intervals of not more than 4 months on every ship fitted with such appliances. Whenever practicable this shall include the inflation and lowering of a liferaft. This liferaft may be a special liferaft intended for training purposes only, which is not part of the ship's life-saving equipment: such a special liferaft shall be conspicuously marked.

5 Records

The date when musters are held, details of abandon ship drills and fire drills, drills of other life-saving appliances and on-board training shall be recorded in such log-book as may be prescribed by the Administration. If a full muster, drill or training session is not held at the appointed time, an entry shall be made in the log-book stating the circumstances and the extent of the muster, drill or training session held."

CHAPTER V

SAFETY OF NAVIGATION

Regulation 17

Pilot ladders and mechanical pilot hoists

The existing heading and text of this regulation are replaced by the following:

"Pilot transfer arrangements

(a) Application

- (i) Ships engaged on voyages in the course of which pilots are likely to be employed shall be provided with pilot transfer arrangements.
- (ii) Equipment and arrangements for pilot transfer which are installed on or after 1 January 1994 shall comply with the requirements of this regulation and due regard shall be paid to the standards adopted by the Organization.*
- (iii) Equipment and arrangements for pilot transfer which are provided on ships before 1 January 1994 shall at least comply with the requirements of regulation 17 in force prior to that date and due regard shall be paid to the standards adopted by the Organization prior to that date.**
- (iv) Equipment and arrangements which are replaced after 1 January 1994 shall, in so far as is reasonable and practicable, comply with the requirements of this regulation.

* Reference is made to the Recommendation on Pilot Transfer Arrangements adopted by the Organization by resolution A.667(16).

** Reference is made to the Recommendation on Performance Standards for Mechanical Pilot Hoists adopted by the Organization by resolution A.275(VIII) and to the Recommendation on Arrangements for Embarking and Disembarking Pilots in Very Large Ships adopted by the Organization by resolution A.426(XI).

(b) General

- (i) All arrangements used for pilot transfer shall efficiently fulfil their purpose of enabling pilots to embark and disembark safely. The appliances shall be kept clean, properly maintained and stowed and shall be regularly inspected to ensure that they are safe to use. They shall be used solely for the embarkation and disembarkation of personnel.
- (ii) The rigging of the pilot transfer arrangements and the embarkation and disembarkation of a pilot shall be supervised by a responsible officer having means of communication with the navigating bridge who shall also arrange for the escort of the pilot by a safe route to and from the navigating bridge. Personnel engaged in rigging and operating any mechanical equipment shall be instructed in the safe procedures to be adopted and the equipment shall be tested prior to use.

(c) Transfer arrangements

- (i) Arrangements shall be provided to enable the pilot to embark and disembark safely on either side of the ship.
- (ii) In all ships where the distance from sea level to the point of access to, or egress from, the ship exceeds 9 m, and when it is intended to embark and disembark pilots by means of the accommodation ladder, or by means of mechanical pilot hoists or other equally safe and convenient means in conjunction with a pilot ladder, the ship shall carry such equipment on each side, unless the equipment is capable of being transferred for use on either side.
- (iii) Safe and convenient access to, and egress from, the ship shall be provided by either:
 - (1) a pilot ladder requiring a climb of not less than 1.5 m and not more than 9 m above the surface of the water so positioned and secured that:
 - (aa) it is clear of any possible discharges from the ship;
 - (bb) it is within the parallel body length of the ship and, as far as is practicable, within the mid-ship half length of the ship;
 - (cc) each step rests firmly against the ship's side; where constructional features, such as rubbing bands, would prevent the implementation of this provision, special arrangements shall, to the satisfaction of the Administration, be made to ensure that persons are able to embark and disembark safely;

(dd) the single length of pilot ladder is capable of reaching the water from the point of access to, or egress from, the ship and due allowance is made for all conditions of loading and trim of the ship, and for an adverse list of 15°; the securing strongpoints, shackles and securing ropes shall be at least as strong as the side ropes;

(2) an accommodation ladder in conjunction with the pilot ladder, or other equally safe and convenient means, whenever the distance from the surface of the water to the point of access to the ship is more than 9 m. The accommodation ladder shall be sited leading aft. When in use, the lower end of the accommodation ladder shall rest firmly against the ship's side within the parallel body length of the ship and, as far as is practicable, within the mid-ship half length and clear of all discharges; or

(3) a mechanical pilot hoist so located that it is within the parallel body length of the ship and, as far as is practicable, within the mid-ship half length of the ship and clear of all discharges.

(d) Access to the ship's deck

Means shall be provided to ensure safe, convenient and unobstructed passage for any person embarking on, or disembarking from, the ship between the head of the pilot ladder, or of any accommodation ladder or other appliance, and the ship's deck. Where such passage is by means of:

(i) a gateway in the rails or bulwark, adequate handholds shall be provided;

(ii) a bulwark ladder, two handhold stanchions rigidly secured to the ship's structure at or near their bases and at higher points shall be fitted. The bulwark ladder shall be securely attached to the ship to prevent overturning.

(e) Shipside doors

Shipside doors used for pilot transfer shall not open outwards.

(f) Mechanical pilot hoists

(i) The mechanical pilot hoist and its ancillary equipment shall be of a type approved by the Administration. The pilot hoist shall be designed to operate as a moving ladder to lift and lower one person on the side of the ship, or as a platform to lift and lower one or more persons on the side of the ship. It shall be of such design and construction as to ensure that the pilot can be embarked and disembarked in a safe manner, including a safe access from the hoist to the deck and vice versa. Such access shall be gained directly by a platform securely guarded by handrails.

- (ii) Efficient hand gear shall be provided to lower or recover the person or persons carried, and kept ready for use in the event of power failure.
- (iii) The hoist shall be securely attached to the structure of the ship. Attachment shall not be solely by means of the ship's side rails. Proper and strong attachment points shall be provided for hoists of the portable type on each side of the ship.
- (iv) If belting is fitted in the way of the hoist position, such belting shall be cut back sufficiently to allow the hoist to operate against the ship's side.
- (v) A pilot ladder shall be rigged adjacent to the hoist and available for immediate use so that access to it is available from the hoist at any point of its travel. The pilot ladder shall be capable of reaching the sea level from its own point of access to the ship.
- (vi) The position on the ship's side where the hoist will be lowered shall be indicated.
- (vii) An adequate protected stowage position shall be provided for the portable hoist. In very cold weather, to avoid the danger of ice formation, the portable hoist shall not be rigged until its use is imminent.

(g) Associated equipment

- (i) The following associated equipment shall be kept at hand ready for immediate use when persons are being transferred:
 - (1) two man-ropes of not less than 28 mm in diameter properly secured to the ship if required by the pilot;
 - (2) a lifebuoy equipped with a self-igniting light;
 - (3) a heaving line.
- (ii) When required by paragraph (d), stanchions and bulwark ladders shall be provided.

(h) Lighting

Adequate lighting shall be provided to illuminate the transfer arrangements overside, the position on deck where a person embarks or disembarks and the controls of the mechanical pilot hoist."

CHAPTER VI

The title and text of chapter VI are replaced by the following:

"CARRIAGE OF CARGOES

PART A

GENERAL PROVISIONS

Regulation 1

Application

1 This chapter applies to the carriage of cargoes (except liquids in bulk, gases in bulk and those aspects of carriage covered by other chapters) which, owing to their particular hazards to ships or persons on board, may require special precautions in all ships to which the present regulations apply and in cargo ships of less than 500 tons gross tonnage. However, for cargo ships of less than 500 tons gross tonnage, the Administration, if it considers that the sheltered nature and conditions of voyage are such as to render the application of any specific requirements of part A or B of this chapter unreasonable or unnecessary, may take other effective measures to ensure the required safety for these ships.

2 To supplement the provisions of parts A and B of this chapter, each Contracting Government shall ensure that appropriate information on cargo and its stowage and securing is provided, specifying, in particular, precautions necessary for the safe carriage of such cargoes*.

* Reference is made to:

- .1 the Code of Safe Practice for Cargo Stowage and Securing adopted by the Organization;
- .2 the Code of Safe Practice for Ships Carrying Timber Deck Cargoes adopted by the Organization; and
- .3 the Code of Safe Practice for Solid Bulk Cargoes (BC Code) adopted by the Organization by resolution A.434(XI), as amended.

Regulation 2

Cargo information

1 The shipper shall provide the master or his representative with appropriate information on the cargo sufficiently in advance of loading to enable the precautions which may be necessary for proper stowage and safe carriage of the cargo to be put into effect. Such information shall be confirmed in writing* and by appropriate shipping documents prior to loading the cargo on the ship.

2 The cargo information shall include:

- .1 in the case of general cargo, and of cargo carried in cargo units, a general description of the cargo, the gross mass of the cargo or of the cargo units, and any relevant special properties of the cargo;
- .2 in the case of a bulk cargo, information on the stowage factor of the cargo, the trimming procedures and, in the case of a concentrate or other cargo which may liquefy, additional information in the form of a certificate on the moisture content of the cargo and its transportable moisture limit;
- .3 in the case of a bulk cargo not classified in accordance with the provisions of regulation VII/2, but which has chemical properties that may create a potential hazard, in addition to the information required by the preceding subparagraphs, information on its chemical properties.

3 Prior to loading cargo units on board ships, the shipper shall ensure that the gross mass of such units is in accordance with the gross mass declared on the shipping documents.

Regulation 3

Oxygen analysis and gas detection equipment

1 When transporting a bulk cargo which is liable to emit a toxic or flammable gas, or cause oxygen depletion in the cargo space, an appropriate instrument for measuring the concentration of gas or oxygen in the air shall be provided together with detailed instructions for its use. Such an instrument shall be to the satisfaction of the Administration.

2 The Administration shall take steps to ensure that crews of ships are trained in the use of such instruments.

* Reference to documents in this regulation does not preclude the use of electronic data processing (EDP) and electronic data interchange (EDI) transmission techniques as an aid to paper documentation.

Regulation 4

The use of pesticides in ships*

Appropriate precautions shall be taken in the use of pesticides in ships, in particular for the purposes of fumigation.

Regulation 5

Stowage and securing

- 1 Cargo and cargo units carried on or under deck shall be so loaded, stowed and secured as to prevent as far as is practicable, throughout the voyage, damage or hazard to the ship and the persons on board, and loss of cargo overboard.
- 2 Cargo carried in a cargo unit shall be so packed and secured within the unit as to prevent, throughout the voyage, damage or hazard to the ship and the persons on board.
- 3 Appropriate precautions shall be taken during loading and transport of heavy cargoes or cargoes with abnormal physical dimensions to ensure that no structural damage to the ship occurs and to maintain adequate stability throughout the voyage.
- 4 Appropriate precautions shall be taken during loading and transport of cargo units on board ro-ro ships, especially with regard to the securing arrangements on board such ships and on the cargo units and with regard to the strength of the securing points and lashings.
- 5 Containers shall not be loaded to more than the maximum gross weight indicated on the Safety Approval Plate under the International Convention for Safe Containers (CSC).

* Reference is made to the IMO Recommendation on the Safe Use of Pesticides in Ships, as amended.

PART B

SPECIAL PROVISIONS FOR BULK CARGOES OTHER THAN GRAIN

Regulation 6

Acceptability for shipment

- 1 Prior to loading a bulk cargo, the master shall be in possession of comprehensive information on the ship's stability and on the distribution of cargo for the standard loading conditions. The method of providing such information shall be to the satisfaction of the Administration*.
- 2 Concentrates or other cargoes which may liquefy shall only be accepted for loading when the actual moisture content of the cargo is less than its transportable moisture limit. However, such concentrates and other cargoes may be accepted for loading even when their moisture content exceeds the above limit, provided that safety arrangements to the satisfaction of the Administration are made to ensure adequate stability in the case of cargo shifting and further provided that the ship has adequate structural integrity.
- 3 Prior to loading a bulk cargo which is not a cargo classified in accordance with the provisions of regulation VII/2 but which has chemical properties that may create a potential hazard, special precautions for its safe carriage shall be taken.

* Reference is made to:

- .1 the Recommendation on Intact Stability for Passenger and Cargo Ships under 100 Metres in Length, adopted by the Organization by resolution A.167(ES.IV) and amendments to this Recommendation, adopted by the Organization by resolution A.206(VII); and
- .2 the Recommendation on a Severe Wind and Rolling Criterion (Weather Criterion) for the Intact Stability of Passenger and Cargo Ships of 24 Metres in Length and Over, adopted by the Organization by resolution A.562(14).

Regulation 7

Stowage of bulk cargo

1 Bulk cargoes shall be loaded and trimmed reasonably level, as necessary, to the boundaries of the cargo space so as to minimize the risk of shifting and to ensure that adequate stability will be maintained throughout the voyage.

2 When bulk cargoes are carried in 'tween-decks, the hatchways of such 'tween-decks shall be closed in those cases where the loading information indicates an unacceptable level of stress of the bottom structure if the hatchways are left open. The cargo shall be trimmed reasonably level and shall either extend from side to side or be secured by additional longitudinal divisions of sufficient strength. The safe load-carrying capacity of the 'tween-decks shall be observed to ensure that the deck-structure is not overloaded.

PART C

CARRIAGE OF GRAIN

Regulation 8

Definitions

For the purposes of this part, unless expressly provided otherwise:

1 "International Grain Code" means the International Code for the Safe Carriage of Grain in Bulk adopted by the Maritime Safety Committee of the Organization by resolution MSC.23(59) as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I.

2 The term "grain" includes wheat, maize (corn), oats, rye, barley, rice, pulses, seeds and processed forms thereof whose behaviour is similar to that of grain in its natural state.

Regulation 9

Requirements for cargo ships carrying grain

1 In addition to any other applicable requirements of the present regulations, a cargo ship carrying grain shall comply with the requirements of the International Grain Code, and hold a document of authorization as required by that Code. For the purpose of this regulation, the requirements of the Code shall be treated as mandatory.

2 A ship without such a document shall not load grain until the master satisfies the Administration, or the Contracting Government of the port of loading on behalf of the Administration, that the ship will comply with the requirements of the International Grain Code in its proposed loaded condition."

CHAPTER VII

CARRIAGE OF DANGEROUS GOODS

Regulation 5

Documents*

The existing text of of paragraph 3 of this regulation is replaced by the following paragraphs 3, 4, and 5:

"3 The persons responsible for the packing of dangerous goods in a freight container or road vehicle shall provide a signed container packing certificate or vehicle packing declaration stating that the cargo in the unit has been properly packed and secured and that all applicable transport requirements have been met. Such a certificate or declaration may be combined with the document referred to in paragraph 2.

4 Where there is due cause to suspect that a freight container or road vehicle in which dangerous goods are packed is not in compliance with the requirements of paragraph 2 or 3, or where a container packing certificate or vehicle packing declaration is not available, the freight container or vehicle shall not be accepted for shipment.

5 Each ship carrying dangerous goods shall have a special list or manifest setting forth, in accordance with the classification set out in regulation 2, the dangerous goods on board and the location thereof. A detailed stowage plan, which identifies by class and sets out the location of all dangerous goods on board, may be used in place of such a special list or manifest. A copy of one of these documents shall be made available before departure to the person or organization designated by the port State authority".

* Reference to documents in this regulation does not preclude the use of electronic data processing (EDP) and electronic data interchange (EDI) transmission techniques as an aid to paper documentation.

The following new regulation 7-1 is inserted after regulation 7:

"Regulation 7-1

Reporting of incidents involving dangerous goods

1 When an incident takes place involving the loss or likely loss overboard of packaged dangerous goods into the sea, the master, or other person having charge of the ship, shall report the particulars of such an incident without delay and to the fullest extent possible to the nearest coastal State. The report shall be based on the guidelines and general principles adopted by the Organization*.

2 In the event of the ship referred to in paragraph 1 being abandoned, or in the event of a report from such a ship being incomplete or unobtainable, the owner, charterer, manager or operator of the ship, or their agents shall, to the fullest extent possible, assume the obligations placed upon the master by this regulation.

* Reference is made to "General principles for ship reporting systems and ship reporting requirements, including guidelines for reporting incidents involving dangerous goods, harmful substances and/or marine pollutants" adopted by the Organization by resolution A.648(16)."

RESOLUTION MSC.24(60)

(adopted on 10 April 1992)

ADOPTION OF AMENDMENTS TO CHAPTER II-2 OF THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974 FIRE SAFETY MEASURES FOR EXISTING PASSENGER SHIPS

RESOLUTION MSC.24(60)
(adopted on 10 April 1992)

ADOPTION OF AMENDMENTS TO CHAPTER II-2 OF THE INTERNATIONAL
CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

FIRE SAFETY MEASURES FOR EXISTING PASSENGER SHIPS

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea, 1974, hereinafter referred to as "the Convention", concerning the procedures for amending the Annex to the Convention, other than the provisions of chapter I,

BEING CONCERNED about recent serious fire casualties resulting in the loss of human life,

RECOGNIZING that there is a compelling and urgent need to improve the fire safety measures for existing passenger ships,

HAVING CONSIDERED at its sixtieth session amendments to the Convention proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, the amendments to the Convention, the text of which is set out in the Annex to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 1 April 1994 unless, prior to that date, more than one third of the Contracting Governments to the Convention, or Contracting Governments the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;
3. INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 October 1994 upon their acceptance in accordance with paragraph 2 above;
4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annex to all Contracting Governments to the Convention;
5. FURTHER REQUESTS the Secretary-General to transmit copies of the resolution to Members of the Organization which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO CHAPTER II-2 OF THE INTERNATIONAL CONVENTION
FOR THE SAFETY OF LIFE AT SEA, 1974

Regulation 1 - Application

1 Existing paragraph 3 is renumbered as paragraph 3.1 and the following new paragraph 3.2 is inserted after paragraph 3.1:

"3.2 Notwithstanding the provisions of paragraph 3.1, passenger ships carrying more than 36 passengers when undergoing repairs, alterations, modifications and outfitting related thereto shall comply with the following:

- .1 all materials introduced to these ships shall comply with the requirements with regard to material applicable to ships constructed on or after 1 October 1994; and
- .2 all repairs, alterations, modifications and outfitting related thereto involving the replacement of material of 50 tonnes or above, other than that required by regulation 41-1, shall comply with the requirements applicable to such ships constructed on or after 1 October 1994."

Regulation 3 - Definitions

2 The following new paragraphs 22-1 and 22-2 are inserted after existing paragraph 22:

"22-1 "Central control station" is a control station in which the following control and indicator functions are centralized:

- .1 fixed fire detection and alarm system;
- .2 automatic sprinklers, fire detection and alarm system;
- .3 fire door indicator panel;
- .4 fire door closure;
- .5 watertight door indicator panel;
- .6 watertight door opening and closing;
- .7 ventilation fans;
- .8 general/fire alarm;
- .9 communication systems including telephones; and
- .10 microphone to public address system.

22-2 "Continuously manned central control station" is a central control station which is continuously manned by a responsible member of the crew."

Regulation 17 - Fireman's outfit

3 The following sentence is added at the end of existing paragraph 1.2.2:

"In passenger ships carrying more than 36 passengers, at least two spare charges for each breathing apparatus shall be provided, and all air cylinders for breathing apparatus shall be interchangeable".

4 The following sentence is added at the end of existing paragraph 3.1.1:

"In passenger ships carrying more than 36 passengers, two additional fireman's outfit shall be provided for each main vertical zone".

5 The following sentence is added at the end of existing paragraph 4:

"At least two fireman's outfits shall be stored in each main vertical zone".

6 The following new regulations 41-1 and 41-2 are inserted after existing regulation 41:

"Regulation 41-1

Upgrading of passenger ships carrying more than 36 passengers
constructed before 1 October 1994

1 This regulation shall apply to passenger ships carrying more than 36 passengers constructed before 1 October 1994.

2 Passenger ships which do not comply with all the requirements of chapter II-2 applicable to ships constructed on or after 25 May 1980 (requirements of chapter II-2 of the International Convention for the Safety of Life at Sea, 1974, as adopted by the International Conference on Safety of Life at Sea, 1974, applicable to new passenger ships) shall comply with the following:

- .1 paragraph 1 of regulation 41-2 not later than 1 October 1994; and
- .2 paragraphs 2, 3, 4 and 5 of regulation 41-2, not later than 1 October 1997; and
- .3 paragraph 6 of regulation 41-2 not later than 1 October 2000; and
- .4 all the requirements of chapter II-2 applicable to ships constructed on or after 25 May 1980 (requirements of chapter II-2 of the International Convention for the Safety of Life at Sea, 1974, as adopted by the International Conference on Safety of Life at Sea, 1974, applicable to new passenger ships), not later than 1 October 2010.

3 Passenger ships which comply with all the requirements applicable to ships constructed on or after 25 May 1980 (applicable requirements of chapter II-2 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolutions MSC.1(XLV), MSC.6(48), MSC.11(55), MSC.12(56), MSC.13(57) and MSC.22(59)) shall comply with the following:

- .1 paragraph 1 of regulation 41-2 not later than 1 October 1994; and
- .2 paragraphs 2 and 4 of regulation 41-2 not later than 1 October 1997; and
- .3 paragraph 6 of regulation 41-2 not later than 1 October 2000; and
- .4 paragraph 5 of regulation 41-2 not later than 1 October 2005 or 15 years after the date of construction of the ships, whichever is later.

4 For the purpose of this regulation, passenger ships complying in their entirety with all the requirements of part H of chapter II contained in amendments to the International Convention for the Safety of Life at Sea, 1960, adopted by the Assembly of the Organization by resolution A.122(V), may be regarded as passenger ships complying with the requirements applicable to passenger ships constructed on or after 25 May 1980 (requirements of chapter II-2 of the International Convention for the Safety of Life at Sea, 1974, as adopted by the International Conference on Safety of Life at Sea, 1974, applicable to new passenger ships).

Regulation 41-2

Requirements for passenger ships carrying more than 36 passengers constructed before 1 October 1994

- 1.1 Plans and booklets required by regulation 20 shall provide the information regarding fire protection, fire detection and fire extinction based on the guidelines developed by the Organization.
 - 1.2 Each member of the fire patrol shall be provided with a two-way portable radiotelephone apparatus.
 - 1.3 Water fog applicators shall be provided as required in regulations 7.6, 17.3.2 and 37.1.5.1.
 - 1.4 Portable foam applicators shall be provided as required in regulations 7.1.2, 7.2.2 and 37.1.5.2.
 - 1.5 All hose nozzles provided shall be of an approved dual-purpose type (i.e. spray/jet type) incorporating a shutoff.
- 2 All accommodation and service spaces, stairway enclosures and corridors shall be equipped with a smoke detection and alarm system of an approved type and complying with the requirements of regulation 13. Such system need not be fitted in private bathrooms, and spaces having little or no fire risk such as voids and similar spaces. Detectors operated by heat instead of smoke shall be installed in galleys.
- 3 Smoke detectors connected to the smoke detection and alarm system shall also be fitted above ceilings in stairways and corridors in the areas where ceilings are of combustible construction.
- 4.1 Hinged fire doors in stairway enclosures, main vertical zone bulkheads and galley boundaries which are normally kept open shall be self-closing and be capable of release from a central control station and from a position at the door.
 - 4.2 A panel shall be placed in a continuously manned central control station to indicate whether the fire doors on stairway enclosures, main vertical zone bulkheads and galley boundaries are closed.
 - 4.3 Exhaust ducts from galley ranges where grease or fat is likely to accumulate and which pass through accommodation spaces or spaces containing combustible materials shall be constructed of "A" class divisions. Each galley range exhaust duct shall be fitted with:

- .1 a grease trap readily removable for cleaning, unless an alternative grease removal process is fitted;
- .2 a fire damper located in the lower end of the duct;
- .3 arrangements operable from within the galley for shutting off the exhaust fans;
- .4 fixed means for extinguishing a fire within the duct; and
- .5 suitably located hatches for inspection and cleaning.

4.4 Only public toilets, lifts, lockers of non-combustible materials providing storage for safety equipment and open information counters may be located within the stairway enclosure boundaries. Other existing spaces within the stairway enclosure:

- .1 shall be emptied, permanently closed and disconnected from the electrical system; or
- .2 shall be separated from the stairway enclosure by the provision of "A" class divisions in accordance with regulation 26. Such spaces may have direct access to stairway enclosures by the provision of "A" class doors in accordance with regulation 26, and subject to a sprinkler system being provided in these spaces. However, cabins shall not directly open into the stairway enclosure.

4.5 Spaces other than public spaces, corridors, public toilets, special category spaces, other stairways required by regulation 28.1.5, open deck spaces and spaces covered by paragraph 4.4.2 are not permitted to have direct access to stairway enclosures.

4.6 Existing machinery spaces of category (10) described in regulation 26.2.2 and existing back offices for information counters which open directly into the stairway enclosure may be retained, provided that they are protected by smoke detectors and that back offices for information counters contain only furniture of restricted fire risk.

4.7 In addition to the emergency lighting required by regulations II-1/42 and III/11.5, the means of escape route including stairways and exits shall be marked, at all points of the escape route including angles and intersections, by lighting or photoluminescent strip indicators placed not more than 0.3 m above the deck. The marking must enable passengers to identify all routes of escape and readily identify the escape exits. If electric illumination is used, it shall be supplied by the emergency source of power and it shall be so arranged that the failure of any single light, or cut in a lighting strip, will not result in the marking being ineffective. Additionally, all escape route signs and fire equipment location markings shall be of photoluminescent material. The Administration shall ensure that such lighting or photoluminescent equipment has been evaluated, tested and applied in accordance with the guidelines developed by the Organization.

4.8 A general emergency alarm system shall be provided. The alarm shall be audible throughout all the accommodation and normal crew working spaces and

open decks, and its sound pressure level shall comply with the standard developed by the Organization. The alarm shall continue to function after it has been triggered until it is manually turned off or is temporarily interrupted by a message on the public address system.

4.9 A public address system or other effective means of communication shall be available and audible throughout the accommodation, public and service spaces, control stations and open decks.

4.10 Furniture in stairway enclosures shall be limited to seating. It shall be fixed, limited to six seats on each deck in each stairway enclosure, be of restricted fire risk, and shall not restrict the passenger escape route. The Administration may permit additional seating in the main reception area within stairway enclosures, if it is fixed, non-combustible, and does not restrict the passenger escape route. Furniture shall not be permitted in passenger and crew corridors forming escape routes in cabin areas. In addition to the above, lockers of non-combustible material, providing storage for safety equipment required by regulations, may be permitted.

5 Accommodation and service spaces, stairway enclosures and corridors shall be fitted with an automatic sprinkler, fire detection and fire alarm system complying with the requirements of regulation 12 or the guidelines developed by the Organization for an approved equivalent sprinkler system. A sprinkler system need not be fitted in private bathrooms and spaces having little or no fire risk such as voids and similar spaces.

6.1 All stairways in accommodation and service spaces shall be of steel frame construction except where the Administration sanctions the use of other equivalent material, and shall be within enclosures formed of "A" class divisions, with positive means of closure at all openings, except that:

- .1 a stairway connecting only two decks need not be enclosed, provided the integrity of the deck is maintained by proper bulkheads or doors in one 'tween-deck space. When a stairway is closed in one 'tween-deck space, the stairway enclosure shall be protected in accordance with the tables for decks in regulation 26;
- .2 stairways may be fitted in the open in a public space, provided they lie wholly within such public space.

6.2 Machinery spaces of category A shall be fitted with a fixed fire-extinguishing system complying with the requirements of regulation 7.

6.3 Ventilation ducts passing through divisions between main vertical zones shall be equipped with a fail-safe automatic closing fire damper which shall also be capable of being manually closed from each side of the division. In addition, fail-safe automatic closing fire dampers with manual operation from within the enclosure shall be fitted to all ventilation ducts serving both accommodation and service spaces and stairway enclosures where they pierce such enclosures. Ventilation ducts passing through a main fire zone division without serving spaces on both sides or passing through a stairway enclosure

without serving that enclosure need not be fitted with dampers provided that the ducts are constructed and insulated to A-60 standard and have no openings within the stairway enclosure or in the trunk on the side which is not directly served.

6.4 Special category spaces and ro-ro cargo spaces shall comply with the requirements of regulations 37 and 38, respectively.

6.5 All fire doors in stairway enclosures, main vertical zone bulkheads and galley boundaries which are normally kept open shall be capable of release from a central control station and from a position at the door."

RESOLUTION MSC.24(60)

(adopted on 10 April 1992)

ADOPTION OF AMENDMENTS TO CHAPTER II-2 OF THE INTERNATIONAL CONVENTION FOR THE
SAFETY OF LIFE AT SEA, 1974 FIRE SAFETY MEASURES FOR EXISTING PASSENGER SHIPS

RESOLUTION MSC.27(61)
(adopted on 11 December 1992)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION
FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.27(61)
(adopted on 11 December 1992)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION
FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.27(61)
(adopted on 11 December 1992)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION
FOR THE SAFETY OF LIFE AT SEA, 1974

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea, 1974, hereinafter referred to as "the Convention", concerning the procedures for amending the Annex to the Convention, other than the provisions of chapter I thereof,

HAVING CONSIDERED, at its sixty-first session, amendments to the Convention proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, the amendments to the Convention, the text of which is set out in the annex to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 1 April 1994 unless, prior to the date, more than one third of the Contracting Governments to the Convention, or Contracting Governments the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;
3. INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 October 1994 upon their acceptance in accordance with paragraph 2 above;
4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;
5. FURTHER REQUESTS the Secretary-General to transmit copies of the resolution to Members of the Organization which are not Contracting Governments to the Convention.

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(adopted on 11 December 1992)
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ANNEX

AMENDMENTS TO THE 1974 SOLAS CONVENTION

Access to spaces in the cargo area of oil tankers

- 1 Add the following after paragraph 11 of regulation II-1/2:

"12 An oil tanker is the oil tanker defined in regulation 1 of Annex I of the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973."

- 2 Add a new regulation II-1/12-2:

"Regulation 12-2

Access to spaces in the cargo area of oil tankers

- 1 This regulation applies to oil tankers constructed on or after 1 October 1994.

2 Access to cofferdams, ballast tanks, cargo tanks and other spaces in the cargo area shall be direct from the open deck and such as to ensure their complete inspection. Access to double bottom spaces may be through a cargo pump-room, pump-room, deep cofferdam, pipe tunnel or similar compartments, subject to consideration of ventilation aspects.

3 For access through horizontal openings, hatches or manholes, the dimensions shall be sufficient to allow a person wearing a self-contained air-breathing apparatus and protective equipment to ascend or descend any ladder without obstruction and also to provide a clear opening to facilitate the hoisting of an injured person from the bottom of the space. The minimum clear opening should be not less than 600 mm by 600 mm.

4 For access through vertical openings, or manholes providing passage through the length and breadth of the space, the minimum clear opening should be not less than 600 mm by 800 mm at a height of not more than 600 mm from the bottom shell plating unless gratings or other footholds are provided.

5 For oil tankers of less than 5,000 tonnes deadweight smaller dimensions may be approved by the Administration in special circumstances, if the ability to traverse such openings or to remove an injured person can be proved to the satisfaction of the Administration."

Regulation II-1/37 - Communication between navigating bridge and machinery space

- 3 Number the present paragraph as paragraph 1 and add the following:

"2. For ships constructed on or after 1 October 1994 the following requirements apply in lieu of the provisions of paragraph 1:

At least two independent means shall be provided for communicating orders from the navigating bridge to the position in the machinery space or in

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the control room from which the speed and direction of thrust of the propellers are normally controlled; one of these shall be an engine-room telegraph which provides visual indication of the orders and responses both in the machinery spaces and on the navigating bridge. Appropriate means of communication shall be provided from the navigating bridge and the engine-room to any other position from which the speed or direction of thrust of the propellers may be controlled."

Regulation II-1/42 - Emergency source of electric power in passenger ships

- 4 Insert the following paragraph after paragraph 3.2 of regulation II-1/42:

"3.3 The following provision in paragraph 3.1.2 shall not apply to ships constructed on or after 1 October 1994:

unless a second independent means of starting the emergency generating set is provided, the single source of stored energy shall be protected to preclude its complete depletion by the automatic starting system."

Regulation II-1/43 - Emergency source of electric power in cargo ships

- 5 Insert the following paragraph after paragraph 3.2 of regulation II-1/43:

"3.3 The following provision in paragraph 3.1.2 shall not apply to ships constructed on or after 1 October 1994:

unless a second independent means of starting the emergency generating set is provided, the single source of stored energy shall be protected to preclude its complete depletion by the automatic starting system."

Regulation II-1/44 - Starting arrangements for emergency generating sets

- 6 Insert the following paragraph after paragraph 2 of regulation II-1/44:

"2.1 Ships constructed on or after 1 October 1994, in lieu of the provision of the second sentence of paragraph 2, shall comply with the following requirements:

The source of stored energy shall be protected to preclude critical depletion by the automatic starting system, unless a second independent means of starting is provided. In addition, a second source of energy shall be provided for an additional three starts within 30 minutes unless manual starting can be demonstrated to be effective."

Regulation II-1/45 - Precautions against shock, fire and other hazards of electrical origin

- 7 Insert the following after paragraph 3.2 of regulation II-1/45:

"3.2-1 For ships constructed on or after 1 October 1994, the requirement of paragraph 3.1 does not preclude the use of limited and locally earthed systems, provided that any possible resulting current does not flow directly through any dangerous spaces."

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8 Insert the following after paragraph 4.2:

"4.3 Ships constructed on or after 1 October 1994, in lieu of the provisions of paragraph 4.1, shall comply with the following requirements:

- .1 Except as permitted by paragraph 4.3.2, earthed distribution systems shall not be used in a tanker.
- .2 The requirement of paragraph 4.3.1 does not preclude the use of earthed intrinsically safe circuits and in addition, under conditions approved by the Administration, the use of the following earthed systems:
 - .2.1 power supplied, control circuits and instrumentation circuits where technical or safety reasons preclude the use of a system with no connection to earth, provided the current in the hull is limited to not more than 5 amps in both normal and fault conditions; or
 - .2.2 limited and locally earthed systems, provided that any possible resulting current does not flow directly through any of the dangerous spaces; or
 - .2.3 alternating current power networks of 1,000 V root mean square (line to line) and over, provided that any possible resulting current does not flow directly through any of the dangerous spaces."

Amendments to chapter II-2 dealing with fire-protection requirements of new ships

Regulation II-2/1 - Application

9 Amend paragraph 1.1 to read:

"1.1 Unless expressly provided otherwise, parts A, C and D of this chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 July 1986, and part B of this chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 October 1994."

10 Add the following to the present sentence of paragraph 2:

"and for ships constructed before 1 October 1994 the Administration shall ensure that the requirements which are applicable under part B of chapter II-2 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolutions MSC.1(XLV), MSC.6(48), MSC.13(57), MSC.22(59) and MSC.24(60) are complied with."

Regulation II-2/3 - Definitions

11 Add a new paragraph 33 as follows:

"33 For ships constructed on or after 1 October 1994, in lieu of the definition of main vertical zones provided in paragraph 9, the following definition shall be applied:

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Main vertical zones are those sections into which the hull, superstructure and deckhouses are divided by "A" class divisions, the mean length and width of which on any deck does not in general exceed 40 m."

Fire main and fire pump sizing

Regulation II-2/4.4.2

- 12 Add the following after paragraph 4.2:

"4.2.1 Passenger ships constructed on or after 1 October 1994, in lieu of the provisions of paragraph 4.2, shall comply with the following requirements:

With the two pumps simultaneously delivering through the nozzles specified in paragraph 8 and sufficient hydrants to provide for the quantity of water specified in paragraph 4.1, a minimum pressure of 0.4 N/mm² for ships of 4,000 tons gross tonnage and above and 0.3 N/mm² for ships of less than 4,000 tons gross tonnage shall be maintained at all hydrants."

Regulation II-2/4.3.3.3

- 13 Add the following after paragraph 3.3.3:

"3.3.3.1 For ships constructed on or after 1 October 1994, the alternative means to be provided in accordance with the provisions of paragraph 3.3.3 shall be an independently driven, power-operated emergency fire pump and with its source of power and sea connection located outside the machinery space."

Regulation II-2/4.3.3.2.9

- 14 Add the following after paragraph 3.3.2.8:

"3.3.2.9 Ships constructed on or after 1 October 1994, in lieu of the provisions of paragraph 3.3.2.6, shall comply with the following requirements:

The space containing the fire pump shall not be contiguous to the boundaries of machinery spaces of category A or those spaces containing main fire pumps. Where this is not practicable, the common bulkhead between the two spaces shall be insulated to a standard of structural fire protection equivalent to that required for a control station in regulation 44."

Release mechanism of CO₂

- 15 The following paragraphs are added after paragraph 2.4 of regulation II-2/5:

"2.5 Carbon dioxide systems installed on or after 1 October 1994 shall comply with the following requirements:

- .1 Two separate controls shall be provided for releasing carbon dioxide into a protected space and to ensure the activities of the alarm.

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One control shall be used to discharge the gas from its storage containers. A second control shall be used for opening the valve of the piping which conveys the gas into the protected space.

- .2 The two controls shall be located inside a release box clearly identified for the particular space. If the box containing the controls is to be locked, a key to the box shall be in a break-glass type enclosure conspicuously located adjacent to the box."

Prohibition of new installations of halon system

- 16 Replace paragraph 3.1 of regulation II-2/5 by the following:

"3.1 The use of halogenated hydrocarbons as fire-extinguishing media is only permitted in machinery spaces, pump-rooms and in cargo spaces intended solely for the carriage of vehicles which are not carrying any cargo. New installations of halogenated hydrocarbon systems shall be prohibited on all ships."

Regulation II-2/13 - Fixed fire detection and fire alarm systems

- 17 Replace paragraph 1.6 by the following:

"1.6 Indicating units shall, as a minimum, denote the section in which a detector or manually operated call point has operated. At least one unit shall be so located that it is easily accessible to responsible members of the crew at all times, when at sea or in port, except when the ship is out of service. One indicating unit shall be located on the navigating bridge if the control panel is located in the main fire control station."

- 18 Replace paragraph 1.8 by the following:

"1.8 Where the fire detection system does not include means of remotely identifying each detector individually, no section covering more than one deck within accommodation, service and control stations shall normally be permitted except a section which covers an enclosed stairway. In order to avoid delay in identifying the source of fire, the number of enclosed spaces included in each section shall be limited as determined by the Administration. In no case shall more than fifty enclosed spaces be permitted in any section. If the detection system is fitted with remotely and individually identifiable fire detectors, the sections may cover several decks and serve any number of enclosed spaces."

- 19 Replace paragraph 1.9 by the following:

"1.9 In passenger ships, if there is no fire detection system capable of remotely and individually identifying each detector, a section of detectors shall not serve spaces on both sides of the ship nor on more than one deck and neither shall it be situated in more than one main vertical zone except that the Administration, if it is satisfied that the protection of the ship against fire will not thereby be reduced, may permit such a section of detectors to serve both sides of the ship and more than one deck. In passenger ships fitted with individually identifiable fire detectors, a section may serve spaces on both sides of the ship and on several decks but may not be situated in more than one main vertical zone."

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20 Add the following paragraph 1.15:

"1.15 Fire detection systems with a zone address identification capability fitted on or after 1 October 1994 shall be so arranged that:

- a loop cannot be damaged at more than one point by a fire;
- means are provided to ensure that any fault (e.g. power break; short circuit; earth) occurring in the loop will not render the whole loop ineffective;
- all arrangements are made to enable the initial configuration of the system to be restored in the event of failure (electrical, electronic, informatic);
- the first initiated fire alarm will not prevent any other detector from initiating further fire alarms."

Regulation 20

Fire control plans and fire drills

21 A new regulation 20.4 is added as follows:

"In ships carrying more than 36 passengers, plans and booklets required by this regulation shall provide the information regarding fire protection, fire detection and fire extinction based on the guidelines issued by the Organization".

Regulation II-2/24 - Main vertical zones and horizontal zones

22 Amend paragraph 1.1 to read:

"1.1 In ships carrying more than 36 passengers, the hull, superstructure and deckhouses shall be subdivided into main vertical zones by A-60 class divisions. Steps and recesses shall be kept to a minimum but where they are necessary they shall also be A-60 class divisions. Where a category 26.2.2(5), 26.2.2(9) or 26.2.2(10) space is on one side of the division the standard may be reduced to A-0."

23 Amend paragraph 2 to read:

"2 As far as practicable, the bulkheads forming the boundaries of the main vertical zones above the bulkhead deck shall be in line with watertight subdivision bulkheads situated immediately below the bulkhead deck. The length and width of main vertical zones may be extended to a maximum of 48 m in order to bring the ends of main vertical zones to coincide with subdivision watertight bulkheads or in order to accommodate a large public space extending for the whole length of the main vertical zone provided that the total area of the main vertical zone is not greater than 1,600 m² on any deck. The length or width of a main vertical zone is the maximum distance between the furthestmost points of the bulkheads bounding it."

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24 Delete the reference to table 26.3.

Regulation II-2/25 - Bulkheads within a main vertical zone

25 Add the following at the beginning of the first sentence of paragraph 2:

"In ships carrying not more than 36 passengers,".

26 Replace paragraph 3 by the following:

"3 All bulkheads required to be "B" class divisions, except corridor bulkheads prescribed in paragraph 2, shall extend from deck to deck and to the shell or other boundaries unless the continuous "B" class ceilings or linings fitted on both sides of the bulkheads are at least of the same fire resistance as the bulkhead, in which case the bulkhead may terminate at the continuous ceiling or lining."

Regulation II-2/26 - Fire integrity of bulkheads and decks in ships carrying more than 36 passengers

27 Amend paragraph 2.1 as follows:

"2.1 Table 26.1 shall apply to bulkheads not bounding either main vertical zones or horizontal zones. Table 26.2 shall apply to decks not forming steps in main vertical zones nor bounding horizontal zones."

28 In paragraph 2.2(3), delete the words "and lobbies".

29 Amend paragraph 2.2(4) to read:

"(4) Evacuation stations and external escape routes.

Survival craft stowage area.

Open deck spaces and enclosed promenades forming lifeboat and liferaft embarkation and lowering stations.

Muster stations, internal and external.

External stairs and open decks used for escape routes.

The ship's side to the waterline in the lightest seagoing condition, superstructure and deckhouse sides situated below and adjacent to the liferaft and evacuation slide embarkation areas."

30 In paragraph 2.2(7), add "Operating rooms" at the end.

31 Delete "Operating rooms" from paragraph 2.2(9).

32 In paragraph 2.2(11), delete the word "emergency" between "driving" and "generators", and delete reference to "special category spaces" on the first, second and twentieth lines.

33 Delete paragraph 2.4 and 2.5, and renumber the present paragraph 2.6 as new paragraph 2.4.

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34 Delete the present paragraph 2.7, and add a new paragraph 2.5 as follows:

"5 The Administration shall determine in respect of category (5) spaces whether the insulation values in table 26.1 shall apply to ends of deckhouses and superstructures, and whether the insulation values in table 26.2 shall apply to weather decks. In no case shall the requirements of category (5) of table 26.1 or 26.2 necessitate enclosure of spaces which in the opinion of the Administration need not be enclosed."

35 Replace tables 26.1 and 26.2 by the following:

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- a Where adjacent spaces are in the same numerical category and superscript ^a appears, a bulkhead or deck between such spaces need not be fitted if deemed unnecessary by the Administration. For example, in category (12) a bulkhead need not be required between a galley and its annexed pantries provided the pantry bulkhead and decks maintain the integrity of the galley boundaries. A bulkhead is, however, required between a galley and a machinery space even though both spaces are in category (12).
- b The ship's side, to the waterline in the lightest seagoing condition, superstructure and deckhouse sides situated below and adjacent to the liferafts and evacuation slides may be reduced to A-30.
- c Where public toilets are installed completely within the stairway enclosure, the public toilet bulkhead within the stairway enclosure can be of "B" class integrity."

36 Delete tables 26.3 and 26.4.

Regulation II-2/28 - Means of escape

37 Delete "accommodated or" from the last sentence of paragraph 1.1.

38 Replace paragraph 1.4 by the following:

"1.4 A corridor, lobby, or part of a corridor from which there is only one route of escape shall be prohibited."

39 Replace paragraph 1.5 by the following:

"1.5 At least one of the means of escape required by paragraphs 1.1 and 1.2 shall consist of a readily accessible enclosed stairway, which shall provide continuous fire shelter from the level of its origin to the appropriate lifeboat and liferaft embarkation decks, or to the uppermost weather deck if the embarkation deck does not extend to the main vertical zone being considered. In the latter case, direct access to the embarkation deck by way of external open stairways and passageways shall be provided and shall have emergency lighting in accordance with regulation III/11.5 and slip-free surfaces under foot. Boundaries facing external open stairways and passageways forming part of an escape route and boundaries in such a position that their failure during a fire would impede escape to the embarkation deck shall have fire integrity, including insulation values, in accordance with the tables in regulation II-2/26. The widths, number and continuity of escapes shall be as follows:

.5.1 Stairways shall not be less than 900 mm in clear width. Stairways shall be fitted with handrails on each side. The minimum clear width of stairways shall be increased by 10 mm for every one person provided for in excess of 90 persons. The maximum clear width between handrails where stairways are wider than 900 mm shall be 1,800 mm. The total number of persons to be evacuated by such stairways shall be assumed to be two thirds of the crew and the total number of passengers in the areas served by such stairways. The width of the stairways

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shall conform to standards not inferior to those adopted by the Organization.

- .5.2 All stairways sized for more than 90 persons shall be aligned fore and aft.
 - .5.3 Doorways and corridors and intermediate landings included in means of escape shall be sized in the same manner as stairways.
 - .5.4 Stairways shall not exceed 3.5 m in vertical rise without the provision of a landing and shall not have an angle of inclination greater than 45°.
 - .5.5 Landings at each deck level shall be not less than 2 m² in area and shall increase by 1 m² for every 10 persons provided for in excess of 20 persons but need not exceed 16 m², except for those landings servicing public spaces having direct access onto the stairway enclosure.
- 40 Add new paragraphs 1.9 and 1.10 as follows:
- "1.9 Where the Administration has granted dispensation under the provisions of paragraph 1.1, the sole means of escape shall provide safe escape. However, stairways shall not be less than 800 mm in clear width with handrails on both sides.
 - 1.10 In addition to the emergency lighting required by regulations II-1/42 and III/11.5, the means of escape, including stairways and exits, shall be marked by lighting or photoluminescent strip indicators placed not more than 0.3 m above the deck at all points of the escape route including angles and intersections. The marking must enable passengers to identify all the routes of escape and readily identify the escape exits. If electric illumination is used, it shall be supplied by the emergency source of power and it shall be so arranged that the failure of any single light or cut in a lighting strip, will not result in the marking being ineffective. Additionally, all escape route signs and fire equipment location markings shall be of photoluminescent material or marked by lighting. The Administration shall ensure that such lighting or photoluminescent equipment have been evaluated, tested and applied in accordance with the guidelines developed by the Organization."
- 41 Add a new paragraph 3.3 as follows:

"3.3 Two means of escape shall be provided from a machinery control room located within a machinery space, at least one of which will provide continuous fire shelter to a safe position outside the machinery space."

Regulation II-2/29 - Protection of stairways and lifts in accommodation and service spaces

- 42 Replace paragraph 2 by the following:

"2 Stairway enclosures shall have direct access to the corridors and be of a sufficient area to prevent congestion, having in view the number of persons likely to use them in an emergency. Within the perimeter of

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such stairway enclosures, only public toilets, lockers of non-combustible material providing storage for safety equipment and open information counters are permitted. Only public spaces, corridors, public toilets, special category spaces, other escape stairways required by 28.1.5 and external areas are permitted to have direct access to these stairway enclosures."

Regulation II-2/30 - Openings in "A" class division

43 Replace paragraph 4 by the following:

"4 Fire doors in main vertical zone bulkheads and stairway enclosures shall satisfy the following requirements:

- .1 The doors shall be self-closing and be capable of closing with an angle of inclination of up to 3.5° opposing closure, and shall have an approximately uniform rate of closure of no more than 40 s and no less than 10 s with the ship in the upright position.
- .2 Remote-controlled sliding or power-operated doors shall be equipped with an alarm that sounds at least 5 s but no more than 10 s before the door begins to move and continue sounding until the door is completely closed. Doors designed to reopen upon contacting an object in its path shall reopen sufficiently to allow a clear passage of at least 0.75 m, but no more than 1 m.
- .3 All doors shall be capable of remote and automatic release from a continuously manned central control station, either simultaneously or in groups, and also individually from a position at both sides of the door. Indication must be provided at the fire control panel in the continuously manned central control station whether each of the remote-controlled doors are closed. The release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system or central power supply. Release switches shall have an on-off function to prevent automatic resetting of the system. Hold-back hooks not subject to central control station release are prohibited.
- .4 Local power accumulators for power-operated doors shall be provided in the immediate vicinity of the doors to enable the doors to be operated at least ten times (fully opened and closed) using the local controls.
- .5 Double-leaf doors equipped with a latch necessary to their fire integrity shall have a latch that is automatically activated by the operation of the doors when released by the system.
- .6 Doors giving direct access to special category spaces which are power-operated and automatically closed need not be equipped with alarms and remote-release mechanisms required in .2 and .3."

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- 44 In paragraph 5, add the following words at the beginning:

"In ships carrying not more than 36 passengers,".

- 45 In paragraph 6, add the following words at the end of the first sentence:

"provided that there is no requirement for such boundaries to have "A" class integrity in regulation 33.3".

- 46 Insert a new paragraph 7 as follows:

"7 All "A" class doors located in stairways, public spaces and main vertical zone bulkheads in escape routes shall be equipped with a self-closing hose port of material, construction and fire resistance which is equivalent to the door into which it is fitted, and shall be a 150 mm square clear opening with the door closed and shall be inset into the lower edge of the door, opposite the door hinges, or in the case of sliding doors, nearest the opening."

Regulation II-2/31 - Openings in "B" class division

- 47 Renumber paragraph 1 as paragraph 1.1 and amend the first sentence to read:

"Doors and door frames in "B" class divisions and means of securing them shall provide a method of closure which shall have resistance to fire equivalent to that of the divisions* except that ventilation openings may be permitted in the lower portion of such doors."

* Reference is made to the Recommendation on Fire Test Procedures for "A", "B" and "F" class divisions, adopted by resolution A.517(13)."

- 48 Add a new paragraph 1.2 to read:

"1.2 Cabin doors in "B" class divisions shall be of a self-closing type. Hold-backs are not permitted."

- 49 In paragraph 3, add the following at the beginning:

"In ships carrying not more than 36 passengers".

Regulation II-2/32 - Ventilation systems

Paragraph 1.1 is revised by deleting "16.2 to 16.9" at the end of the sentence and replacing it with "16.2 to 16.6, 16.8 and 16.9".

- 50 Replace paragraph 1.5 by the following:

"1.5 Stairway enclosures shall be ventilated and shall be served only by an independent fan and duct system which shall not serve any other spaces in the ventilation system."

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The following new paragraphs 1.8 and 1.9 are inserted:

- "1.8 Ventilation ducts shall be provided with suitably located hatches for inspection and cleaning, where reasonable and practicable.
- 1.9 Exhaust ducts from galley ranges in which grease or fat is likely to accumulate shall meet requirements of regulation II-2/16.3.2.1 and 16.3.2.2 and shall be fitted with:
- .1 a grease trap readily removable for cleaning unless an alternative approved grease removal system is fitted;
 - .2 a fire damper located in the lower end of the duct which is automatically and remotely operated, and in addition a remotely operated fire damper located in the upper end of the duct;
 - .3 a fixed means for extinguishing a fire within the duct;
 - .4 remote control arrangements for shutting off the exhaust fans and supply fans, for operating the fire dampers mentioned in .2 and for operating the fire-extinguishing system, which shall be placed in a position close to the entrance to the galley. Where a multi-branch system is installed, means shall be provided to close all branches exhausting through the same main duct before an extinguishing medium is released into the system; and
 - .5 suitably located hatches for inspection and cleaning."

Regulation II-2/33 - Windows and sidescuttles

51 Amend paragraph 2 to read:

"2 Notwithstanding the requirements of the tables in regulations 26 and 27, all windows and sidescuttles in bulkheads separating accommodation and service spaces and control stations from weather shall be constructed with frames of steel or other suitable material. The glass shall be retained by a metal glazing bead or angle."

52 Add new paragraph 3 as follows:

"3 Windows facing life-saving appliances, embarkation and muster areas, external stairs and open decks used for escape routes, and windows situated below liferaft and escape slide embarkation areas shall have the fire integrity as required in the tables in regulation II-2/26. Where automatic dedicated sprinkler heads are provided for windows, A-0 windows may be accepted as equivalent. Windows located in the ship's side below the lifeboat embarkation areas shall have the fire integrity at least equal to "A-0" class."

Regulation II-2/34 - Restricted use of combustibile material

53 Insert the words "draught stops" between "grounds" and "ceilings" in the first sentence of paragraph 1.

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54 Amend paragraph 6 to read:

"6 Furniture in stairway enclosures shall be limited to seating. It shall be fixed, limited to six seats on each deck in each stairway enclosure, be of restricted fire risk, and shall not restrict the passenger escape route. The Administration may permit additional seating in the main reception area within a stairway enclosure if it is fixed, non-combustible and does not restrict the passenger escape route. Furniture shall not be permitted in passenger and crew corridors forming escape routes in cabin areas". In addition to the above, lockers of non-combustible material, providing storage for safety equipment required by regulations, may be permitted.

Regulation II-2/36 - Fixed fire detection and fire alarm systems, automatic sprinkler, fire detection and fire alarm systems

55 Replace regulation 36 by the following:

"Fixed fire detection and fire alarm systems and automatic
sprinkler, fire detection and fire alarm systems

1 In passenger ships carrying not more than 36 passengers there shall be installed throughout each separate zone, whether vertical or horizontal, in all accommodation and service spaces and, where it is considered necessary by the Administration, in control stations, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc., either:

- .1 a fixed fire detection and fire alarm system of an approved type and complying with the requirements of regulation 13 and so installed and arranged as to detect the presence of fire in such spaces; or
- .2 an automatic sprinkler, fire detection and fire alarm system of an approved type and complying with the requirements of regulation 12 or the guidelines developed by the Organization for an approved equivalent sprinkler system and so installed and arranged as to protect such spaces and, in addition, a fixed fire detection and fire alarm system of an approved type complying with the requirements of regulation 13 so installed and arranged as to provide smoke detection in corridors, stairways and escape routes within accommodation spaces.

2 Passenger ships carrying more than 36 passengers shall be equipped with an automatic sprinkler, fire detection and fire alarm system of an approved type complying with the requirements of regulation 12, or the guidelines developed by the Organization for an approved equivalent sprinkler system in all service spaces, control stations and accommodation spaces, including corridors and stairways. Alternatively, control stations where water may cause damage to essential equipment may be fitted with an approved fixed fire-extinguishing system of another type. A fixed fire detection and fire alarm system of an approved type shall be installed, complying with the requirements of regulation 13 so

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installed and arranged as to provide smoke detection in service spaces, control stations and accommodation spaces, including corridors and stairways. Smoke detectors need not be fitted in private bathrooms and galleys. Spaces having little or no fire risk such as voids, public toilets and similar spaces need not be fitted with an automatic sprinkler system, or fixed fire detection and alarm system."

Regulation II-2/37 - Protection of special category spaces

56 Amend paragraph 1.2.1 as follows:

"1.2.1 In passenger ships carrying more than 36 passengers the boundary bulkheads and decks of special category spaces shall be insulated to A-60 class standard. However, where a category 26.2.2(5), 26.2.2(9) or 26.2.2(10) space is on one side of the division the standard may be reduced to A-0.

57 Renumber existing paragraph 1.2.2 as 1.2.3 and insert a new paragraph 1.2.2 to read:

"1.2.2 In passenger ships carrying not more than 36 passengers the boundary bulkheads of special category spaces shall be insulated as required for category (11) spaces in table 27.1 and the horizontal boundaries as required for category (11) spaces in table 27.2."

Regulation II-2/40 - Fire patrols, detection, alarms and public address systems

58 Add the words "and open decks" at the end of paragraph 5.

59 Paragraph 5 is amended to add after the last sentence:

"Each member of the fire patrol shall be provided with a two-way portable radio telephone apparatus".

60 Add new paragraphs 7.1 to 7.2:

"7.1 Passenger ships carrying more than 36 passengers shall have the detection alarms for the systems required by regulation 36.2 centralized in a continuously manned central control station. In addition, controls for remote closing of the fire doors and shutting down the ventilation fans, shall be centralized in the same location. The ventilation fans shall be capable of reactivation by the crew at the continuously manned control station. The control panels in the central control station shall be capable of indicating open or closed positions of fire doors, closed or off status of the detectors, alarms and fans. The control panel shall be continuously powered and should have an automatic change-over to stand-by power supply in case of loss of normal power supply. The control panel shall be powered from the main source of electrical power and the emergency source of electrical power defined by regulation II-1/42 unless other arrangements are permitted by the regulations, as applicable.

7.2 The control panel shall be designed on the fail-safe principle, e.g. an open detector circuit shall cause an alarm condition, as noted in regulations II-2/13.1.3 and II-1/51.1.4."

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Regulation 59 - Venting, purging, gas-freeing and ventilation

60-1 The following new paragraph 4 should be inserted after the existing paragraph 3:

"4 Inerting, Ventilation and gas measurement

- 4.1 This paragraph shall apply to oil tankers constructed on or after 1 October 1994.
- 4.2 Double hull and double bottom spaces shall be fitted with suitable connections for the supply of air.
- 4.3 On tankers required to be fitted with inert gas systems:
 - .1 double hull spaces shall be fitted with suitable connections for the supply of inert gas;
 - .2 where hull spaces are connected to a permanently fitted inert gas distribution system, means shall be provided to prevent hydrocarbon gases from the cargo tanks entering the double hull spaces through the system;
 - .3 where such spaces are not permanently connected to an inert gas distribution system, appropriate means shall be provided to allow connection to the inert gas main.
- 4.4.1 Suitable portable instruments for measuring oxygen and flammable vapour concentrations shall be provided. In selecting these instruments, due attention shall be given for their use in combination with the fixed gas sampling line systems referred to in paragraph 4.4.2.
- 4.4.2 Where atmosphere in double hull spaces cannot be reliably measured using flexible gas sampling hoses, such spaces shall be fitted with permanent gas sampling lines. The configuration of such line systems shall be adapted to the design of such spaces.
- 4.4.3 The materials of construction and the dimensions of gas sampling lines shall be such as to prevent restriction. Where plastic materials are used, they should be electrically conductive."

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Chapter III

Regulation 50

General emergency alarm system

61 Delete the full stop at the end of the regulation and add the following:

"and open decks, and its sound pressure level shall comply with the standard developed by the Organization. The alarm shall continue to function after it has been triggered until it is manually turned off or is temporarily interrupted by a message on the public address system".

Approved amendments to chapter IV

Regulation IV/13 - Sources of energy

62 Replace the existing text of paragraphs 2.1 to 2.3 by:

.1 one hour on ships provided with an emergency source of electrical power, if such source of power complies fully with all relevant provisions of regulation II-1/42 or 43, including the supply of such power to the radio installations; and

.2 six hours on ships not provided with an emergency source of electrical power complying fully with all relevant provisions of regulation II-1/42 or 43, including the supply of such power to the radio installations."

63 Delete the reference in regulation IV/13.4 to paragraph 2.3.

Regulation IV/14 - Performance standards

64 Replace "by prescribed" in regulation IV/14.2 by "prescribed by".

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THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea (SOLAS), 1974, hereinafter referred to as "the Convention", concerning the procedures for amending the Annex to the Convention, other than the provisions of chapter I,

HAVING CONSIDERED, at its sixty-third session, amendments to the Convention proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, the amendments to the Convention, the text of which is set out in the Annexes to the present resolution;

2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that:

- (a) the amendments set out in Annex 1 shall be deemed to have been accepted on 1 July 1995; and
- (b) the amendments set out in Annex 2 shall be deemed to have been accepted on 1 January 1998;

unless, prior to these dates, more than one third of the Contracting Governments to the Convention, or Contracting Governments the combined merchant fleets of which constitute not less than fifty per cent of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3. INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention:

- (a) the amendments set out in Annex 1 shall enter into force on 1 January 1996; and
- (b) the amendments set out in Annex 2 shall enter into force on 1 July 1998;

upon their acceptance in accordance with paragraph 2 above;

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4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annexes to all Contracting Governments to the Convention;

5. FURTHER REQUESTS the Secretary-General to transmit copies of the resolution and its Annexes to Members of the Organization which are not Contracting Governments to the Convention.

ANNEX 1

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE
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Regulation V/8-1 - Ship reporting systems

1 The following new regulation V/8-1 is added:

"Regulation 8-1

Ship reporting systems

- (a) Ship reporting systems contribute to safety of life at sea, safety and efficiency of navigation, and protection of the marine environment. A ship reporting system, when adopted and implemented in accordance with the guidelines and criteria developed by the Organization pursuant to this regulation, shall be used by all ships, or certain categories of ships or ships carrying certain cargoes, in accordance with the provisions of each system so adopted.
- (b) The Organization is recognized as the only international body for developing guidelines, criteria and regulations on an international level for ship reporting systems. Contracting Governments shall refer proposals for the adoption of ship reporting systems to the Organization. The Organization will collate and disseminate to Contracting Governments all relevant information with regard to any adopted ship reporting system.
- (c) This regulation and its associated guidelines and criteria do not apply to any warship, naval auxiliary or other vessel owned or operated by a Contracting Government and used, for the time being, only on government non-commercial service; however, such ships are encouraged to participate in ship reporting systems that have been adopted in accordance with this regulation.
- (d) The initiation of action for establishing a ship reporting system is the responsibility of the Government or Governments concerned. In developing such systems, provisions of the guidelines and criteria developed by the Organization shall be taken into account.
- (e) Ship reporting systems not submitted to the Organization for adoption do not necessarily need to comply with this regulation. However, Governments implementing such systems are encouraged to follow, wherever possible, the guidelines and criteria developed by the Organization. Contracting Governments may submit such systems to the Organization for recognition.
- (f) Where two or more Governments have a common interest in a particular area, they should formulate proposals for a co-ordinated ship reporting system on the basis of agreement between them. Before proceeding with a proposal for adoption of a ship reporting system, the Organization shall disseminate details of the proposal to those Governments which have a common interest in the area covered by the proposed system. Where a co-ordinated ship reporting system is adopted and established, it shall have uniform procedures and operations.

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(g) After adoption of a ship reporting system in accordance with this regulation, the Government or Governments concerned shall take all measures necessary for the promulgation of any information needed for the efficient and effective use of the system. Any adopted ship reporting system shall have the capability of interaction and the ability to assist ships with information when necessary. Such systems shall be operated in accordance with the guidelines and criteria developed by the Organization pursuant to this regulation.

(h) The master of a ship shall comply with the requirements of adopted ship reporting systems and report to the appropriate authority all information required in accordance with the provisions of each such system.

(i) All adopted ship reporting systems and actions taken to enforce compliance with those systems shall be consistent with international law, including the relevant provisions of the United Nations Convention on the Law of the Sea.

(j) Nothing in this regulation or in its associated guidelines and criteria shall prejudice the rights and duties of Governments under international law, or the legal regime of international straits.

(k) The participation of ships in accordance with the provisions of adopted ship reporting systems shall be free of charge to the ships concerned.

(l) The Organization shall ensure that adopted ship reporting systems are reviewed under the guidelines and criteria developed by the Organization."

Regulation V/15-1 - Emergency towing arrangements on tankers

2 The following new regulation V/15-1 is added:

"Regulation 15-1

Emergency towing arrangements on tankers

(a) For the purpose of this regulation, tankers include oil tankers as defined in regulation II-1/2.12, chemical tankers as defined in regulation VII/8.2 and gas carriers as defined in regulation VII/11.2.

(b) An emergency towing arrangement shall be fitted at both ends on board all tankers of not less than 20,000 tonnes deadweight as defined in regulation II-1/3.21 constructed on or after 1 January 1996. For tankers constructed before 1 January 1996, such an arrangement shall be fitted at the first scheduled dry-docking after 1 January 1996, but not later than 1 January 1999. The design and construction of the towing arrangement shall be approved by the Administration, based on the guidelines developed by the Organization."

ANNEX 2

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE
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Regulation II-2/15 - Arrangements for oil fuel, lubricating oil and other flammable oils

1 The following text is added after the title:

"(Paragraphs 2.9 to 2.12 of this regulation apply to all ships)"

2 The following new subparagraphs .9 to .12 are added after existing subparagraph .8 of paragraph 2:

- .9 All external high pressure fuel delivery lines between the high pressure fuel pumps and fuel injectors shall be protected with a jacketed piping system capable of containing fuel from a high pressure line failure. A jacketed pipe incorporates an outer pipe into which the high pressure fuel pipe is placed forming a permanent assembly. The jacketed piping system shall include a means for collection of leakages and arrangements shall be provided for an alarm to be given of a fuel line failure.
- .10 All surfaces with temperatures above 220°C which may be impinged as a result of a fuel system failure shall be properly insulated.
- .11 Oil fuel lines shall be screened or otherwise suitably protected to avoid as far as practicable oil spray or oil leakages onto hot surfaces, into machinery air intakes, or other sources of ignition. The number of joints in such piping systems shall be kept to a minimum.
- .12 Ships constructed before 1 July 1998 shall comply with the requirements of paragraphs 2.9 to 2.11 not later than 1 July 2003, except that a suitable enclosure on engines having an output of 375 kW or less having fuel injection pumps serving more than one injector may be used as an alternative to the jacketed piping system in paragraph 2.9."

3 The words "2.7 and 2.8" in the existing paragraph 3 are replaced by "2.7, 2.8, 2.10 and 2.11".

4 The words "2.4 and 2.6" in the existing paragraph 4 are replaced by "2.4, 2.6, 2.10 and 2.11".

5 The existing paragraph 5.1 is deleted, and paragraphs 5.2 and 5.3 are renumbered 5.1 and 5.2.

Regulation V/3 - Information required in danger messages

6 In paragraph (b), the phrase "Tropical storms (hurricanes in the West Indies, typhoons in the China Sea, cyclones in Indian waters and storms of a similar nature in other regions)" is replaced by "Tropical storms".

Regulation V/4 - Meteorological services

7 In paragraph (b)(ii), the phrase "To issue daily, by radio" is replaced by "To issue twice daily, by radio".

Regulation V/22 - Navigation bridge visibility

8 The following new regulation V/22 is added:

"Regulation 22

Navigation bridge visibility

(a) Ships of not less than 45 m in length as defined in regulation III/3.10, constructed on or after 1 July 1998, shall meet the following requirements:

- (i) The view of the sea surface from the conning position shall not be obscured by more than two ship lengths, or 500 m, whichever is the less, forward of the bow to 10° on either side under all conditions of draught, trim and deck cargo.
- (ii) No blind sector caused by cargo, cargo gear or other obstructions outside of the wheelhouse forward of the beam which obstructs the view of the sea surface as seen from the conning position, shall exceed 10°. The total arc of blind sectors shall not exceed 20°. The clear sectors between blind sectors shall be at least 5°. However, in the view described in paragraph (a)(i), each individual blind sector shall not exceed 5°.
- (iii) The horizontal field of vision from the conning position shall extend over an arc of not less than 225°, that is from right ahead to not less than 22.5° abaft the beam on either side of the ship.
- (iv) From each bridge wing the horizontal field of vision shall extend over an arc of at least 225°, that is from at least 45° on the opposite bow through right ahead and then from right ahead to right astern through 180° on the same side of the ship.
- (v) From the main steering position the horizontal field of vision shall extend over an arc from right ahead to at least 60° on each side of the ship.
- (vi) The ship's side shall be visible from the bridge wing.
- (vii) The height of the lower edge of the navigation bridge front windows above the bridge deck shall be kept as low as possible. In no case shall the lower edge present an obstruction to the forward view as described in this regulation.
- (viii) The upper edge of the navigation bridge front windows shall allow a forward view of the horizon, for a person with a height of eye of 1,800 mm above the bridge deck at the conning position, when the ship is pitching in heavy seas. The Administration, if satisfied that a 1,800 mm height of eye is unreasonable and impractical, may allow reduction of the height of eye but not to less than 1,600 mm.

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(ix) Windows shall meet the following requirements:

- (1) framing between navigation bridge windows shall be kept to a minimum and not be installed immediately forward of any workstation;
- (2) to help avoid reflections, the bridge front windows shall be inclined from the vertical plane top out, at an angle of not less than 10° and not more than 25°;
- (3) polarized and tinted windows shall not be fitted; and
- (4) at all times regardless of weather conditions, at least two of the navigation bridge front windows shall provide a clear view, and in addition depending on the bridge configuration, an additional number of windows shall provide a clear view.

(b) Ships constructed before 1 July 1998 shall, where practicable, meet the requirements of (a)(i) and (a)(ii). However, structural alterations or additional equipment need not be required.

(c) With ships of unconventional design which, in the opinion of the Administration cannot comply with this regulation, arrangements shall be provided to achieve a level of visibility that is as near as practical to those prescribed in this regulation."

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RESOLUTION MSC.57(67)
(adopted on 5 December 1996)

**ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION
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THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea (SOLAS), 1974, hereinafter referred to as "the Convention", concerning the procedures for amending the Annex to the Convention, other than the provisions of chapter I thereof,

HAVING CONSIDERED, at its sixty-seventh session, amendments to the Convention proposed and circulated in accordance with article VIII(b)(i) thereof,

1. **ADOPTS**, in accordance with article VIII(b)(iv) of the Convention, amendments to the Convention the text of which is set out in the Annex to the present resolution;
2. **DETERMINES**, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 1 January 1998, unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;
3. **INVITES** Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 July 1998 upon their acceptance in accordance with paragraph 2 above;
4. **REQUESTS** the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annex to all Contracting Governments to the Convention;
5. **FURTHER REQUESTS** the Secretary-General to transmit copies of this resolution and its Annex to Members of the Organization, which are not Contracting Governments to the Convention.

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ANNEX

**AMENDMENTS TO THE INTERNATIONAL CONVENTION
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CHAPTER II-1

**CONSTRUCTION - SUBDIVISION AND STABILITY, MACHINERY
AND ELECTRICAL INSTALLATIONS**

PART A-1 - STRUCTURE OF SHIPS

- 1 The following new regulations 3-3 and 3-4 are added to part A-1 of chapter II-1:

**"Regulation 3-3
Safe access to tanker bows**

1 For the purpose of this regulation and regulation 3-4, tankers include oil tankers as defined in regulation 2.12, chemical tankers as defined in regulation VII/8.2 and gas carriers as defined in regulation VII/11.2.

2 Every tanker constructed on or after 1 July 1998 shall be provided with the means to enable the crew to gain safe access to the bow even in severe weather conditions. For tankers constructed before 1 July 1998, such means of access shall be provided at the first scheduled dry-docking after 1 July 1998, but not later than 1 July 2001. Such means of access shall be approved by the Administration based on the guidelines developed by the Organization.

**Regulation 3-4
Emergency towing arrangements on tankers**

Emergency towing arrangements shall be fitted at both ends on board every tanker of not less than 20,000 tonnes deadweight, constructed on or after 1 January 1996. For tankers constructed before 1 January 1996, such an arrangement shall be fitted at the first scheduled dry-docking after 1 January 1996 but not later than 1 January 1999. The design and construction of the towing arrangements shall be approved by the Administration, based on the guidelines developed by the Organization."

PART B - SUBDIVISION AND STABILITY

- 2 The following new regulation 17-1 is added after existing regulation 17:

"Regulation 17-1

Openings in the shell plating below the bulkhead deck of passenger ships and the freeboard deck of cargo ships

Notwithstanding the requirements of regulation 17, ships constructed on or after 1 July 1998 shall comply with the requirements of regulation 17 where a reference to "margin line" shall be deemed to mean a reference to the bulkhead deck of passenger ships and the freeboard deck of cargo ships."

PART C - MACHINERY INSTALLATIONS

Regulation 26 - General

- 3 The following new paragraphs 9, 10 and 11 are added after existing paragraph 8:

"9 Non-metallic expansion joints in piping systems, if located in a system which penetrates the ship's side and both the penetration and the non-metallic expansion joint are located below the deepest load waterline, shall be inspected as part of the surveys prescribed in regulation I/10(a) and replaced as necessary, or at an interval recommended by the manufacturer.

10 Operating and maintenance instructions and engineering drawings for ship machinery and equipment essential to the safe operation of the ship shall be written in a language understandable by those officers and crew members who are required to understand such information in the performance of their duties.

11 Location and arrangement of vent pipes for fuel oil service, settling and lubrication oil tanks shall be such that in the event of a broken vent pipe this shall not directly lead to the risk of ingress of seawater splashes or rainwater. Two fuel oil service tanks for each type of fuel used on board necessary for propulsion and vital systems or equivalent arrangements shall be provided on each new ship, with a capacity of at least 8 h at maximum continuous rating of the propulsion plant and normal operating load at sea of the generator plant. This paragraph applies only to ships constructed on or after 1 July 1998."

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Regulation 31 - Machinery controls

4 The following new paragraph 5 is added after existing paragraph 4:

"5 Ships constructed on or after 1 July 1998 shall comply with the requirements of paragraphs 1 to 4, as amended, as follows:

.1 paragraph 1 is replaced by the following:

"1 Main and auxiliary machinery essential for the propulsion, control and safety of the ship shall be provided with effective means for its operation and control. All control systems essential for the propulsion, control and safety of the ship shall be independent or designed such that failure of one system does not degrade the performance of another system.";

.2 in the second and third lines of paragraph 2, the words "and the machinery spaces are intended to be manned" are deleted;

.3 the first sentence of paragraph 2.2 is replaced by the following:

".2 the control shall be performed by a single control device for each independent propeller, with automatic performance of all associated services, including, where necessary, means of preventing overload of the propulsion machinery,";

.4 paragraph 2.4 is replaced by the following:

".4 propulsion machinery orders from the navigation bridge shall be indicated in the main machinery control room and at the manoeuvring platform,";

.5 a new sentence is added at the end of paragraph 2.6 to read as follows:

"It shall also be possible to control the auxiliary machinery, essential for the propulsion and safety of the ship, at or near the machinery concerned"; and

.6 paragraphs 2.8, 2.8.1 and 2.8.2 are replaced by the following:

".8 indicators shall be fitted on the navigation bridge, the main machinery control room and at the manoeuvring platform, for:

.8.1 propeller speed and direction of rotation in the case of fixed pitch propellers; and

.8.2 propeller speed and pitch position in the case of controllable pitch propellers;".

PART D - ELECTRICAL INSTALLATIONS

Regulation 41 - Main source of electrical power and lighting systems

5 The following new paragraph 5 is added after existing paragraph 4:

"5 Ships constructed on or after 1 July 1998:

.1 in addition to paragraphs 1 to 3, shall comply with the following:

.1.1 where the main source of electrical power is necessary for propulsion and steering of the ship, the system shall be so arranged that the electrical supply to equipment necessary for propulsion and steering and to ensure safety of the ship will be maintained or immediately restored in the case of loss of any one of the generators in service;

.1.2 load shedding or other equivalent arrangements shall be provided to protect the generators required by this regulation against sustained overload;

.1.3 where the main source of electrical power is necessary for propulsion of the ship, the main busbar shall be subdivided into at least two parts which shall normally be connected by circuit breakers or other approved means; so far as is practicable, the connection of generating sets and other duplicated equipment shall be equally divided between the parts; and

.2 need not comply with paragraph 4."

Regulation 42 - Emergency source of electrical power in passenger ships

6 The following new paragraph 3.4 is added after existing paragraph 3.3:

"3.4 For ships constructed on or after 1 July 1998, where electrical power is necessary to restore propulsion, the capacity shall be sufficient to restore propulsion to the ship in conjunction with other machinery, as appropriate, from a dead ship condition within 30 min after blackout."

Regulation 43 - Emergency source of electrical power in cargo ships

7 The following new paragraph 3.4 is added after existing paragraph 3.3:

"3.4 For ships constructed on or after 1 July 1998, where electrical power is necessary to restore propulsion, the capacity shall be sufficient to restore propulsion to the ship in conjunction with other machinery, as appropriate, from a dead ship condition within 30 min after blackout."

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CHAPTER II-2
CONSTRUCTION - FIRE PROTECTION, FIRE DETECTION
AND FIRE EXTINCTION

PART A - GENERAL

Regulation 1 - Application

- 8 Existing paragraph 1.1 is replaced by the following:
- "1.1 Unless expressly provided otherwise, this chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 July 1998."
- 9 Existing paragraph 1.3.2 is replaced by the following:
- "2 the expression *all ships* means ships constructed before, on or after 1 July 1998".
- 10 Existing paragraph 2 is replaced by the following:
- "2 Unless expressly provided otherwise, for ships constructed before 1 July 1998 the Administration shall ensure that the requirements which are applicable under chapter II-2 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolutions MSC.1(XLV), MSC.6(48), MSC.13(57), MSC.22(59), MSC.24(60), MSC.27(61) and MSC.31(63), are complied with."
- 11 In paragraph 3.1, the expression "1 July 1986" is replaced by "1 July 1998".

Regulation 3 - Definitions

- 12 Existing paragraph 1 is replaced by the following:
- "1 *Non-combustible material* is a material which neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750°C, this being determined in accordance with the Fire Test Procedures Code. Any other material is a combustible material."
- 13 Existing paragraph 2 is replaced by the following:
- "2 *A standard fire test* is one in which the specimens of the relevant bulkheads and decks are exposed in a test furnace to temperatures corresponding approximately to the standard time-temperature curve. The test methods shall be in accordance with the Fire Test Procedures Code."
- 14 In paragraph 3.4, "139°C" is replaced by "140°C".

- 15 Existing paragraph 3.5 is replaced by the following:
- "5 the Administration shall require a test of a prototype bulkhead or deck in accordance with the Fire Test Procedures Code to ensure that it meets the above requirements for integrity and temperature rise."
- 16 In paragraph 4.2, "139°C" is replaced by "140°C".
- 17 Existing paragraph 4.4 is replaced by the following:
- "4 the Administration shall require a test of a prototype division, in accordance with the Fire Test Procedures Code, to ensure that it meets the above requirements for integrity and temperature rise."
- 18 Existing paragraph 8 is replaced by the following:
- "8 *Low flame spread* means that the surface thus described will adequately restrict the spread of flame, this being determined in accordance with the Fire Test Procedures Code."
- 19 Existing paragraph 22-1 is replaced by the following:
- "22-1 *Central control station* is a control station in which the following control and indicator functions are centralized:
- .1 fixed fire detection and alarm systems;
 - .2 automatic sprinklers, fire detection and alarm systems;
 - .3 fire door indicator panels;
 - .4 fire door closures;
 - .5 watertight door indicator panels;
 - .6 watertight door closures;
 - .7 ventilation fans;
 - .8 general/fire alarms;
 - .9 communication systems including telephones; and
 - .10 microphones to public address systems."
- 20 Existing paragraph 23.3 is replaced by the following:
- "3 all draperies, curtains and other suspended textile materials have qualities of resistance to the propagation of flame not inferior to those of wool of mass 0.8 kg/m², this being determined in accordance with the Fire Test Procedures Code."
- 21 Existing paragraph 23.4 is replaced by the following:
- "4 all floor coverings have low flame spread characteristics."
- 22 Existing paragraph 23.6 is replaced by the following:
- "6 all upholstered furniture has qualities of resistance to the ignition and propagation of flame, this being determined in accordance with the Fire Test Procedures Code."

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23 The following new paragraph 23.7 is added:

"7 all bedding components have qualities of resistance to the ignition and propagation of flame, this being determined in accordance with the Fire Test Procedures Code."

24 The following new paragraph 34 is added:

"34 *Fire Test Procedures Code* means the International Code for Application of Fire Test Procedures, as adopted by the Maritime Safety Committee of the Organization by resolution MSC.61(67), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I."

Regulation 12 - Automatic sprinkler, fire detection and fire alarm systems

25 Existing paragraph 1.2 is replaced by the following:

"1.2 Each section of sprinklers shall include means for giving a visual and audible alarm signal automatically at one or more indicating units whenever any sprinkler comes into operation. Such alarm systems shall be such as to indicate if any fault occurs in the system. Such units shall indicate in which section served by the system fire has occurred and shall be centralized on the navigation bridge and in addition, visible and audible alarms from the unit shall be located in a position other than on the navigation bridge, so as to ensure that the indication of fire is immediately received by the crew."

26 Existing paragraphs 1.2.1 and 1.2.2 are deleted.

Regulation 16 - Ventilation systems in ships other than passenger ships carrying more than 36 passengers

27 Existing text of paragraph 1.1 is replaced by the following:

".1 these ducts shall be of a material which has low flame spread characteristics."

28 The following new paragraph 11 is added:

"11 The following arrangements shall be tested in accordance with the Fire Test Procedures Code:

- .1 fire dampers, including relevant means of operation; and
- .2 duct penetrations through "A" class divisions. Where steel sleeves are directly joined to ventilation ducts by means of rivetted or screwed flanges or by welding, the test is not required."

Regulation 17 - Fireman's outfit

29 At the end of paragraph 3.1.1 the following sentence is added:

"however, for stairway enclosures which constitute individual main vertical zones and for the main vertical zones in the fore or aft end of a ship which do not contain spaces of categories 26.2.2(6), (7), (8) or (12), no additional fireman's outfits are required."

Regulation 18 - Miscellaneous items

30 In the parenthesis below the title of the regulation, the words "and 8" in the first sentence are deleted and the following sentence is added:

"Paragraph 8 of this regulation applies to ships constructed on or after 1 July 1998."

31 Existing paragraph 8 is replaced by the following:

"8 Provisions for helicopter facilities shall be in accordance with the standards developed by the Organization."

PART B - FIRE SAFETY MEASURES FOR PASSENGER SHIPS

Regulation 24 - Main vertical zones and horizontal zones

32 The third sentence of existing paragraph 1.1 is replaced by the following:

"Where a category 26.2.2(5), (9) or (10) space is on one side or where fuel oil tanks are on both sides of the division, the standard may be reduced to A-0."

Regulation 26 - Fire integrity of bulkheads and decks in ships carrying more than 36 passengers

33 The words "26.1 to 26.4" in paragraph 1 are replaced by "26.1 and 26.2" and the superscript "d" is added in the fourth row under columns 6, 7, 8 and 9 of table 26.1 and the following note is added to table 26.1:

"^d Where spaces of category 6, 7, 8 and 9 are located completely within the outer perimeter of the muster station, the bulkheads of these spaces are allowed to be of "B-0" class integrity. Control positions for audio, video and light installations may be considered as part of the muster station."

Regulation 28 - Means of escape

34 At the end of paragraph 1.10, "." is replaced by "; and".

35 The following new subparagraph .11 is added:

".11 In all passenger ships carrying more than 36 passengers, the requirements of 1.10 and regulation 41-2.4.7 shall also apply to the crew accommodation areas."

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Regulation 30 - Openings in "A" class divisions

36 Existing paragraph 4 is replaced by the following:

"4 Fire doors in main vertical zone bulkheads, galley boundaries and stairway enclosures other than power-operated watertight doors and those which are normally locked, shall satisfy the following requirements:

- .1 the doors shall be self-closing and be capable of closing against an angle of inclination of up to 3.5° opposing closure;
- .2 the approximate time of closure for hinged fire doors shall be no more than 40 s and no less than 10 s from the beginning of their movement with the ship in upright position. The approximate uniform rate of closure for sliding fire doors shall be of no more than 0.2 m/s and no less than 0.1 m/s with the ship in the upright position;
- .3 the doors shall be capable of remote release from the continuously manned central control station, either simultaneously or in groups and shall be capable of release also individually from a position at both sides of the door. Release switches shall have an on-off function to prevent automatic resetting of the system;
- .4 hold-back hooks not subject to central control station release are prohibited;
- .5 a door closed remotely from the central control station shall be capable of being re-opened at both sides of the door by local control. After such local opening, the door shall automatically close again;
- .6 indication shall be provided at the fire door indicator panel in the continuously manned central control station whether each of the remote-released doors are closed;
- .7 the release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system or main source of electric power;
- .8 local power accumulators for power-operated doors shall be provided in the immediate vicinity of the doors to enable the doors to be operated after disruption of the control system or main source of electric power at least ten times (fully opened and closed) using the local controls;
- .9 disruption of the control system or main source of electric power at one door shall not impair the safe functioning of the other doors;
- .10 remote-released sliding or power-operated doors shall be equipped with an alarm that sounds for at least 5 s but no more than 10 s after the door is released from the central control station and before the door begins to move and continue sounding until the door is completely closed;

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- .11 a door designed to re-open upon contacting an object in its path shall re-open not more than 1 m from the point of contact;
- .12 double-leaf doors equipped with a latch necessary to their fire integrity shall have a latch that is automatically activated by the operation of the doors when released by the control system;
- .13 doors giving direct access to special category spaces which are power-operated and automatically closed need not be equipped with the alarms and remote-release mechanisms required in .3 and .10;
- .14 the components of the local control system shall be accessible for maintenance and adjusting; and
- .15 power-operated doors shall be provided with a control system of an approved type which shall be able to operate in case of fire, this being determined in accordance with the Fire Test Procedures Code. This system shall satisfy the following requirements:
 - .15.1 the control system shall be able to operate the door at the temperature of at least 200°C for at least 60 min, served by the power supply;
 - .15.2 the power supply for all other doors not subject to fire shall not be impaired; and
 - .15.3 at temperatures exceeding 200°C the control system shall be automatically isolated from the power supply and shall be capable of keeping the door closed up to at least 945°C."

37 The second sentence of existing paragraph 6 is replaced by the following:

"The requirements for "A" class integrity of the outer boundaries of the ship shall not apply to exterior doors, except for those in superstructures and deckhouses facing life-saving appliances, embarkation and external muster station areas, external stairs and open decks used for escape routes. Stairway enclosure doors need not meet this requirement."

Regulation 32 - Ventilation systems

38 Existing paragraph 1.1 is replaced by the following:

"1.1 The ventilation system of a passenger ship carrying more than 36 passengers shall, in addition to this part of this regulation, also be in compliance with the requirements of regulations 16.2 to 16.6, 16.8, 16.9 and 16.11."

39 Existing paragraph 1.4.3.1 is replaced by the following:

"3.1 the duct is constructed of a material which has low flame spread characteristics;"

Regulation 34 - Restricted use of combustible materials

40 Existing paragraph 2 is replaced by the following:

"2 Vapour barriers and adhesives used in conjunction with insulation, as well as insulation of pipe fittings, for cold service systems need not be non-combustible, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have low flame spread characteristics."

41 Existing paragraph 7 is replaced by the following:

"7 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke and toxic products, this being determined in accordance with the Fire Test Procedures Code."

42 Existing paragraph 8 is replaced by the following:

"8 Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of an approved material which will not readily ignite or give rise to toxic or explosive hazards at elevated temperatures, this being determined in accordance with the Fire Test Procedures Code."

Regulation 37 - Protection of special category spaces

43 In paragraph 1.2.1, the following third sentence is added:

"Where fuel oil tanks are below a special category space, the integrity of the deck between such spaces may be reduced to "A-0" standard."

44 The following new paragraph 4 is added:

"4 Permanent openings for ventilation

Permanent openings in the side plating, the ends or deckhead of special category spaces shall be so situated that a fire in the special category space does not endanger stowage areas and embarkation stations for survival craft and accommodation spaces, service spaces and control stations in superstructures and deckhouses above the special category spaces."

Regulation 38 - Protection of cargo spaces, other than special category spaces, intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion

45 The following new paragraphs 5 and 6 are added:

"5 Permanent openings for ventilation

Permanent openings in the side plating, the ends or deckhead of cargo spaces shall be so situated that a fire in the cargo space does not endanger stowage areas and embarkation stations for survival craft and accommodation spaces, service spaces and control stations in superstructures and deckhouses above the cargo spaces."

6 Structural protection

For ro-ro cargo spaces of ships constructed on or after 1 July 1998, the requirements of paragraphs 1.1, 1.2 and 1.3 of regulation 38-1 shall be complied with."

46 The following new regulation 38-1 is added:

"Regulation 38-1

Protection of closed and open ro-ro cargo spaces, other than special category spaces and ro-ro cargo spaces intended for the carriage of motor vehicles with fuel in their tanks

1 General

1.1 The basic principles underlying regulation 37.1.1 also apply to this regulation.

1.2 In passenger ships carrying more than 36 passengers, the boundary bulkheads and decks of closed and open ro-ro cargo spaces shall be insulated to "A-60" class standard. However, where a category 26.2.2(5), (9) or (10) space is on one side of the division, the standard may be reduced to "A-0". Where fuel oil tanks are below a ro-ro cargo space, the integrity of the deck between such spaces may be reduced to "A-0" standard.

1.3 In passenger ships carrying not more than 36 passengers the boundary bulkheads and decks of closed and open ro-ro cargo spaces shall have a fire integrity as required for category (8) spaces in table 27.1 and the horizontal boundaries as required for category (8) spaces in table 27.2.

1.4 Permanent openings in the side plating, the ends or deckhead of open and closed ro-ro cargo spaces shall be so situated that a fire in the cargo space does not endanger stowage areas and embarkation stations for survival craft and accommodation spaces, service spaces and control stations in superstructures and deckhouses above the cargo spaces.

2 Closed ro-ro cargo spaces

Closed ro-ro cargo spaces shall comply with the requirements of regulation 38, except for paragraph 4 of that regulation.

3 Open ro-ro cargo spaces

Open ro-ro cargo spaces shall comply with the requirements of regulations 37.1.3, 37.2.1, 38.1, except that a sample extraction smoke detection system is not permitted, and 38.2.3."

PART C - FIRE SAFETY MEASURES FOR CARGO SHIPS

Regulation 49 - Restricted use of combustible materials

47 Existing paragraph 2 is replaced by the following:

"2 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke and toxic products, this being determined in accordance with the Fire Test Procedures Code."

48 Existing paragraph 3 is replaced by the following:

"3 Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of approved material which will not readily ignite, or give rise to toxic or explosive hazards at elevated temperatures, this being determined in accordance with the Fire Test Procedures Code."

Regulation 50 - Details of construction

49 Existing paragraph 3.1 is replaced by the following:

"3.1 Except in cargo spaces or refrigerated compartments of service spaces, insulating materials shall be non-combustible. Vapour barriers and adhesives used in conjunction with insulation, as well as the insulation of pipe fittings, for cold service systems, need not be of non-combustible materials, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have low flame spread characteristics."

Regulation 53 - Fire protection arrangements in cargo spaces

50 Existing paragraphs 1.2 and 1.3 are replaced by the following:

"1.2 Notwithstanding the provisions of paragraph 1.1, any cargo space in a ship engaged in the carriage of dangerous goods on deck or in cargo spaces shall be provided with a fixed gas fire-extinguishing system complying with the provisions of regulation 5 or with a fire-extinguishing system which, in the opinion of the Administration, gives equivalent protection for the cargoes carried.

1.3 The Administration may exempt from the requirements of paragraphs 1.1 and 1.2 cargo spaces of any ship if constructed and solely intended for the carriage of ore, coal, grain, unseasoned timber, non-combustible cargoes or cargoes which, in the opinion of the Administration, constitute a low fire risk. Such exemptions may be granted only if the ship is fitted with steel hatch covers and effective means of closing all ventilators and other openings leading to the cargo spaces. When such exemptions are granted, the Administration shall issue an Exemption Certificate, irrespective of the date of construction of the ship concerned, in accordance with regulation I/12(a)(vi), and shall ensure that the list of cargoes the ship is permitted to carry is attached to the Exemption Certificate."

- 51 The following new paragraph 2.5 is added:

"2.5 Permanent openings in the side plating, the ends or deckhead of open and closed ro-ro cargo spaces shall be so situated that a fire in the cargo space does not endanger stowage areas and embarkation stations for survival craft and accommodation spaces, service spaces and control stations in superstructures and deckhouses above the cargo spaces."

Regulation 54 - Special requirements for ships carrying dangerous goods

- 52 The following new paragraph 2.4.3 is added:

"2.4.3 Natural ventilation shall be provided in enclosed cargo spaces intended for the carriage of solid dangerous goods in bulk, where there is no provision for mechanical ventilation."

- 53 The following new paragraphs 2.10 and 2.11 are added:

"2.10 In ships having ro-ro cargo spaces, a separation shall be provided between a closed ro-ro cargo space and an adjacent open ro-ro cargo space. The separation shall be such as to minimize the passage of dangerous vapours and liquids between such spaces. Alternatively, such separation need not be provided if the ro-ro cargo space is considered to be a closed cargo space over its entire length and shall fully comply with the relevant special requirements of this regulation.

2.11 In ships having ro-ro cargo spaces, a separation shall be provided between a closed ro-ro cargo space and the adjacent weather deck. The separation shall be such as to minimize the passage of dangerous vapours and liquids between such spaces. Alternatively, a separation need not be provided if the arrangements of the closed ro-ro cargo spaces are in accordance with those required for the dangerous goods carried on the adjacent weather deck."

Table 54.1 - Application of the requirements to different modes of carriage of dangerous goods in ships and cargo spaces

54 Existing table 54.1 is replaced by the following:

"Wherever X appears in table 54.1 it means that this requirement is applicable to all classes of dangerous goods as given in the appropriate line of table 54.3, except as indicated by the notes.

Regulation 54.2	Weather decks .1 to .5 inclusive	.1 Not specifically designed	.2 Container cargo spaces	.3		.4 Solid dangerous goods in bulk	.5 Shipborne barges
				Closed ro-ro cargo spaces ¹	Open ro-ro cargo spaces		
.1.1	X	X	X	X	X	For application of requirements of regulation 54 to different classes of dangerous goods, see table 54.2	X
.1.2	X	X	X	X	X		-
.1.3	-	X	X	X	X		X
.1.4	-	X	X	X	X		X
.2	-	X	X	X	X		X ⁴
.3	-	X	X	X	-		X ⁴
4.1	-	X	X ¹	X	-		X ⁴
4.2	-	X	X ¹	X	-		X ⁴
.5	-	X	X	X	-		-
.6.1	X	X	X	X	X		-
.6.2	X	X	X	X	X		-
.7	X	X	-	-	X		-
.8	X	X	X ²	X	X		-
.9	-	-	-	X ³	X	-	

Notes

- 1 For classes 4 and 5.1 not applicable to closed freight containers. For classes 2, 3, 6.1 and 8 when carried in closed freight containers the ventilation rate may be reduced to not less than two air changes. For the purpose of this requirement a portable tank is a closed freight container.
- 2 Applicable to decks only.
- 3 Applies only to closed ro-ro cargo spaces, not capable of being sealed.
- 4 In the special case where the barges are capable of containing flammable vapours or alternatively if they are capable of discharging flammable vapours to a safe space outside the barge carrier compartment by means of ventilation ducts connected to the barges, these requirements may be reduced or waived to the satisfaction of the Administration.
- 5 Special category spaces shall be treated as closed ro-ro cargo spaces when dangerous goods are carried."

Table 54.2 - Application of the requirements to different classes of dangerous goods for ships and cargo spaces carrying solid dangerous goods in bulk

55 Existing table 54.2 is replaced by the following:

"

Class	4.1	4.2	4.3 ⁶	5.1	6.1	8	9
Regulation							
54.2.1.1	X	X	-	X	-	-	X
54.2.1.2	X	X	-	X	-	-	X
54.2.2	X	X ⁷	X	X ⁸	-	-	X ⁸
54.2.4.1	-	X ⁷	X	-	-	-	-
54.2.4.2	X ⁹	X ⁷	X	X ^{7,9}	-	-	X ^{7,9}
54.2.4.3	X	X	X	X	X	X	X
54.2.6	X	X	X	X	X	X	X
54.2.8	X	X	X	X ⁷	-	-	X ¹⁰

Notes

- 6 The hazards of substances in this class which may be carried in bulk are such that special consideration must be given by the Administration to the construction and equipment of the ship involved in addition to meeting the requirements enumerated in this table.
- 7 Only applicable to Seedcake containing solvent extractions, to Ammonium nitrate and to Ammonium nitrate fertilizers.
- 8 Only applicable to Ammonium nitrate and to Ammonium nitrate fertilizers. However, a degree of protection in accordance with standards contained in the International Electrotechnical Commission, publication 79 - Electrical Apparatus for Explosive Gas Atmospheres, is sufficient.
- 9 Only suitable wire mesh guards are required.
- 10 The requirements of the Code of Safe Practice for Solid Bulk Cargoes adopted by resolution A.434(XI), as amended, are sufficient."

Table 54.3 - Application of the requirements to different classes of dangerous goods except solid dangerous goods in bulk

56 Existing table 54.3 is replaced by the following:

Class	1.1-1.6	1.4S	2.1	2.2	2.3	3.1 3.2	3.3	4.1	4.2	4.3	5.1	5.2	6.1 liquids	6.1 liquids ≤23°C	6.1 liquids >23°C ≤61°C	6.1 solids	8 liquids	8 liquids ≤23°C	8 liquids >23°C ≤61°C	8 solids	9
Regulation																					
54.2.1.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
54.2.1.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
54.2.1.3	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54.2.1.4	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54.2.2	X	-	X	-	-	X	-	-	-	-	-	-	-	X	-	-	-	X	-	-	-
54.2.3	X	X	X	X	X	X	X	X	X	X	X	- ¹	X	X	X	X	X	X	X	X	-
54.2.4.1	-	-	X	-	X	X	-	X ¹¹	X ¹¹	X	X ¹¹	-	-	X	X	X ¹¹	-	X	X	-	X ¹¹
54.2.4.2	-	-	X	-	-	X	-	-	-	-	-	-	-	X	X	-	-	X	X	-	-
54.2.5	-	-	-	-	-	X	-	-	-	-	-	-	X	X	X	-	-	X	-	-	-
54.2.6	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X ¹⁴
54.2.7	-	-	-	-	-	X	X	X	X	X	X	-	-	X	X	-	-	X	X	-	-
54.2.8	X ¹²	-	X	X	X	X	X	X	X	X	X ¹³	-	-	X	X	-	-	X	X	-	-
54.2.9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Notes

- 11 When "mechanically-ventilated spaces" are required by the International Maritime Dangerous Goods Code, as amended.
- 12 Stow 3 m horizontally away from the machinery space boundaries in all cases.
- 13 Refer to the International Maritime Dangerous Goods Code.
- 14 As appropriate to the goods being carried.ⁱⁱ

PART D - FIRE SAFETY MEASURES FOR TANKERS

Regulation 56 - Location and separation of spaces

57 The sentence below the title is replaced by the following:

"(This regulation applies to ships constructed on or after 1 February 1992, except that paragraph 9 applies to ships constructed on or after 1 July 1998)."

58 Existing paragraph 7 is replaced by the following:

"7 Exterior boundaries of superstructures and deckhouses enclosing accommodation and including any overhanging decks which support such accommodation, shall be constructed of steel and insulated to "A-60" standard for the whole of the portions which face the cargo area and on the outward sides for a distance of 3 m from the end boundary facing the cargo area. In the case of the sides of those superstructures and deckhouses, such insulation shall be carried as high as is deemed necessary by the Administration."

59 The second sentence in existing paragraph 8.3 is replaced by the following:

"Such windows and sidescuttles, except wheelhouse windows, shall be constructed to "A-60" class standard."

60 The following new paragraph 9 is added:

"9 On every ship to which this regulation applies, where there is permanent access from a pipe tunnel to the main pump-room, a watertight door shall be fitted complying with the requirements of regulation II-1/25-9.2 and in addition with the following:

- .1 in addition to bridge operation, the watertight door shall be capable of being manually closed from outside the main pump-room entrance; and
- .2 the watertight door shall be kept closed during normal operations of the ship except when access to the pipe tunnel is required."

Regulation 59 - Venting, purging, gas-freeing and ventilation

61 The following new paragraph 1.2.3 is added:

".3 a secondary means of allowing full flow relief of vapour, air or inert gas mixtures to prevent over-pressure or under-pressure in the event of failure of the arrangements in 1.2.2. Alternatively, pressure sensors may be fitted in each tank protected by the arrangement required in 1.2.2, with a monitoring system in the ship's cargo control room or the position from which cargo operations are normally carried out. Such monitoring equipment shall also provide an alarm facility which is activated by detection of over-pressure or under-pressure conditions within a tank."

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62 Existing paragraph 1.3.2 is replaced by the following:

"1.3.2 Where the arrangements are combined with other cargo tanks, either stop valves or other acceptable means shall be provided to isolate each cargo tank. Where stop valves are fitted, they shall be provided with locking arrangements which shall be under the control of the responsible ship's officer. There shall be a clear visual indication of the operational status of the valves or other acceptable means. Where tanks have been isolated, it shall be ensured that relevant isolating valves are opened before cargo loading or ballasting or discharging of those tanks is commenced. Any isolation must continue to permit the flow caused by thermal variations in a cargo tank in accordance with paragraph 1.2.1."

63 The following new paragraph 1.3.3 is added:

"1.3.3 If cargo loading and ballasting or discharging of a cargo tank or cargo tank group is intended, which is isolated from a common venting system, that cargo tank or cargo tank group shall be fitted with a means for over-pressure or under-pressure protection as required in paragraph 1.2.3"

64 The following new paragraph 1.11 is added:

"1.11 Ships constructed before 1 July 1998 shall comply with the requirements of paragraphs 1.2.3 and 1.3.3 by the date of the first scheduled dry-docking after 1 July 1998, but not later than 1 July 2001."

65 The following new paragraph 5 is added:

"5 Combustible gas indicators

All tankers shall be equipped with at least one portable instrument for measuring flammable vapour concentrations, together with a sufficient set of spares. Suitable means shall be provided for the calibration of such instruments."

Regulation 62 - Inert gas systems

66 In paragraph 11.2.1, the following sentence is added at the end:

"The control system operated shall provide positive indication of the operational status of such valves."

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CHAPTER V

SAFETY OF NAVIGATION

- 67 Existing regulation 15-1 is deleted.

CHAPTER VII

CARRIAGE OF DANGEROUS GOODS

Regulation 2 - Classification

- 68 "Class 6.1 - Poisonous (toxic) substances" is replaced by the following:
"Class 6.1 - Toxic substances".
- 69 The words "Miscellaneous dangerous substances, that is" in the existing text for Class 9 are replaced by the following:
"Miscellaneous dangerous substances and articles, i.e."

Regulation 7 - Explosives in passenger ships

- 70 The following new paragraph 1.5 is added:
- "5 articles in compatibility group N shall only be allowed in passenger ships if the total net explosive mass does not exceed 50 kg per ship and no other explosives, apart from division 1.4 compatibility group S, are carried."

RESOLUTION MSC.57(67)
(adopted on 5 December 1996)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION
FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.99(73)
(adopted on 5 December 2000)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

RESOLUTION MSC.99(73)
(adopted on 5 December 2000)

**ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION
FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea (SOLAS), 1974, hereinafter referred to as "the Convention", concerning the procedures for amending the Annex to the Convention, other than the provisions of chapter I thereof,

HAVING CONSIDERED, at its seventy-third session, amendments to the Convention proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the Convention, the text of which is set out in the Annex to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 1 January 2002, unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;
3. INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 July 2002 upon their acceptance in accordance with paragraph 2 above;
4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annex to all Contracting Governments to the Convention;
5. FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its Annex to Members of the Organization, which are not Contracting Governments to the Convention.

ANNEX

**AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE
SAFETY OF LIFE AT SEA, 1974, AS AMENDED**

CHAPTER II-1

**CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY,
MACHINERY AND ELECTRICAL INSTALLATIONS**

Regulation 3-4 – Emergency towing arrangements on tankers

1 The existing text of the regulation is replaced by the following:

"Regulation 3-4

Emergency towing arrangements on tankers

1 Emergency towing arrangements shall be fitted at both ends on board every tanker of not less than 20,000 tonnes deadweight.

2 For tankers constructed on or after 1 July 2002:

.1 the arrangements shall, at all times, be capable of rapid deployment in the absence of main power on the ship to be towed and easy connection to the towing ship. At least one of the emergency towing arrangements shall be pre-rigged ready for rapid deployment; and

.2 emergency towing arrangements at both ends shall be of adequate strength taking into account the size and deadweight of the ship, and the expected forces during bad weather conditions. The design and construction and prototype testing of emergency towing arrangements shall be approved by the Administration, based on the guidelines developed by the Organization.

3 For tankers constructed before 1 July 2002, the design and construction of emergency towing arrangements shall be approved by the Administration, based on the Guidelines developed by the Organization.

2 The following new regulation 3-5 is inserted after existing regulation 3-4:

"Regulation 3-5

New installation of materials containing asbestos

1 This regulation shall apply to materials used for the structure, machinery, electrical installations and equipment covered by the present Convention.

2 For all ships, new installation of materials which contain asbestos shall be prohibited except for:

- .1 vanes used in rotary vane compressors and rotary vane vacuum pumps;
- .2 watertight joints and linings used for the circulation of fluids when, at high temperature (in excess of 350°C) or pressure (in excess of 7×10^6 Pa), there is a risk of fire, corrosion or toxicity; and
- .3 supple and flexible thermal insulation assemblies used for temperatures above 1,000°C.”

Regulation 43 – Emergency source of electrical power in cargo ships

3 In paragraph 2.2.5, the word “and” is deleted.

4 In paragraph 2.2.6, the word “motors.” is replaced by the words “motors; and”.

5 In paragraph 2.2, the following new subparagraph .7 is added after existing subparagraph .6:

“.7 in all cargo pump-rooms of tankers constructed on or after 1 July 2002.”

CHAPTER II-2

CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

6 The existing text of chapter II-2 is replaced by the following:

“PART A - GENERAL

Regulation 1

Application

1 Application

1.1 Unless expressly provided otherwise, this chapter shall apply to ships constructed on or after 1 July 2002.

1.2 For the purpose of this chapter:

- .1 the expression *ships constructed* means ships the keels of which are laid or which are at a similar stage of construction;
- .2 the expression *all ships* means ships, irrespective of type, constructed before, on or after 1 July 2002; and

- .3 a cargo ship, whenever built, which is converted to a passenger ship shall be treated as a passenger ship constructed on the date on which such a conversion commences.

1.3 For the purpose of this chapter, the expression *a similar stage of construction* means the stage at which:

- .1 construction identifiable with a specific ship begins; and
- .2 assembly of that ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less.

2 Applicable requirements to existing ships

2.1 Unless expressly provided otherwise, for ships constructed before 1 July 2002 the Administration shall ensure that the requirements which are applicable under chapter II-2 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolutions MSC.1(XLV), MSC.6(48), MSC.13(57), MSC.22(59), MSC.24(60), MSC.27(61), MSC.31(63) and MSC.57(67), are complied with.

2.2 Ships constructed before 1 July 2002 shall also comply with:

- .1 paragraphs 3, 6.5 and 6.7 as appropriate;
- .2 regulations 13.3.4.2 to 13.3.4.5, 13.4.3 and Part E, except regulations 16.3.2.2 and 16.3.2.3 thereof, as appropriate, not later than the date of the first survey after 1 July 2002;
- .3 regulations 10.4.1.3 and 10.6.4 for new installations only; and
- .4 regulation 10.5.6 not later than 1 October 2005 for passenger ships of 2,000 gross tonnage and above.

3 Repairs, alterations, modifications and outfitting

3.1 All ships which undergo repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to these ships. Such ships, if constructed before 1 July 2002, shall, as a rule, comply with the requirements for ships constructed on or after that date to at least the same extent as they did before undergoing such repairs, alterations, modifications or outfitting.

3.2 Repairs, alterations and modifications which substantially alter the dimensions of a ship or the passenger accommodation spaces, or substantially increase a ship's service life and outfitting related thereto shall meet the requirements for ships constructed on or after 1 July 2002 in so far as the Administration deems reasonable and practicable.

4 Exemptions

4.1 The Administration may, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of this chapter unreasonable or unnecessary, exempt from those requirements individual ships or classes of ships

entitled to fly the flag of its State, provided that such ships, which, in the course of their voyage, do not sail at distances of more than 20 miles from the nearest land.

4.2 In the case of passenger ships which are employed in special trades for the carriage of large numbers of special trade passengers, such as the pilgrim trade, the Administration, if satisfied that it is impracticable to enforce compliance with the requirements of this chapter, may exempt such ships from those requirements, provided that they comply fully with the provisions of:

- .1 the rules annexed to the Special Trade Passenger Ships Agreement, 1971; and
- .2 the rules annexed to the Protocol on Space Requirements for Special Trade Passenger Ships, 1973.

5 Applicable requirements depending on ship type

Unless expressly provided otherwise:

- .1 requirements not referring to a specific ship type shall apply to ships of all types; and
- .2 requirements referring to "tankers" shall apply to tankers subject to the requirements specified in paragraph 6 below.

6 Application of requirements for tankers

6.1 Requirements for tankers in this chapter shall apply to tankers carrying crude oil or petroleum products having a flashpoint not exceeding 60°C (closed cup test), as determined by an approved flashpoint apparatus, and a Reid vapour pressure which is below the atmospheric pressure or other liquid products having a similar fire hazard.

6.2 Where liquid cargoes other than those referred to in paragraph 6.1 or liquefied gases which introduce additional fire hazards are intended to be carried, additional safety measures shall be required, having due regard to the provisions of the International Bulk Chemical Code, as defined in regulation VII/8.1, the Bulk Chemical Code, the International Gas Carrier Code, as defined in regulation VII/11.1, and the Gas Carrier Code, as appropriate.

6.2.1 A liquid cargo with a flashpoint of less than 60°C for which a regular foam fire-fighting system complying with the Fire Safety Systems Code is not effective, is considered to be a cargo introducing additional fire hazards in this context. The following additional measures are required:

- .1 the foam shall be of alcohol resistant type;
- .2 the type of foam concentrates for use in chemical tankers shall be to the satisfaction of the Administration taking into account the guidelines developed by the Organization; and
- .3 the capacity and application rates of the foam extinguishing system shall comply with chapter 11 of the International Bulk Chemical Code, except that lower application rates may be accepted based on performance tests. For tankers fitted

with inert gas systems, a quantity of foam concentrate sufficient for 20 min of foam generation may be accepted.

6.2.2 For the purpose of this regulation, a liquid cargo with a vapour pressure greater than 1.013 bar absolute at 37.8°C is considered to be a cargo introducing additional fire hazards. Ships carrying such substances shall comply with paragraph 15.14 of the International Bulk Chemical Code. When ships operate in restricted areas and at restricted times, the Administration concerned may agree to waive the requirements for refrigeration systems in accordance with paragraph 15.14.3 of the International Bulk Chemical Code.

6.3 Liquid cargoes with a flashpoint exceeding 60°C other than oil products or liquid cargoes subject to the requirements of the International Bulk Chemical Code are considered to constitute a low fire risk, not requiring the protection of a fixed foam extinguishing system.

6.4 Tankers carrying petroleum products with a flashpoint exceeding 60°C (closed cup test), as determined by an approved flashpoint apparatus, shall comply with the requirements provided in regulations 10.2.1.4.4 and 10.10.2.3 and the requirements for cargo ships other than tankers, except that, in lieu of the fixed fire-extinguishing system required in regulation 10.7, they shall be fitted with a fixed deck foam system which shall comply with the provisions of the Fire Safety Systems Code.

6.5 Combination carriers constructed before, on or after 1 July 2002 shall not carry cargoes other than oil unless all cargo spaces are empty of oil and gas-freed or unless the arrangements provided in each case have been approved by the Administration taking into account the guidelines developed by the Organization.

6.6 Chemical tankers and gas carriers shall comply with the requirements for tankers, except where alternative and supplementary arrangements are provided to the satisfaction of the Administration, having due regard to the provisions of the International Bulk Chemical Code and the International Gas Carrier Code, as appropriate.

6.7 The requirements of regulations 4.5.10.1.1 and 4.5.10.1.4, and a system for continuous monitoring of the concentration of hydrocarbon gases shall be fitted on all tankers constructed before 1 July 2002 by the date of the first scheduled dry-docking after 1 July 2002, but not later than 1 July 2005. Sampling points or detector heads shall be located in suitable positions in order that potentially dangerous leakages are readily detected. When the hydrocarbon gas concentration reaches a pre-set level which shall not be higher than 10% of the lower flammable limit, a continuous audible and visual alarm signal shall be automatically effected in the pump-room and cargo control room to alert personnel to the potential hazard. However, existing monitoring systems already fitted having a pre-set level not greater than 30% of the lower flammable limit may be accepted.

Regulation 2

Fire safety objectives and functional requirements

1 Fire safety objectives

1.1 The fire safety objectives of this chapter are to:

- .1 prevent the occurrence of fire and explosion;
- .2 reduce the risk to life caused by fire;

- .3 reduce the risk of damage caused by fire to the ship, its cargo and the environment;
- .4 contain, control and suppress fire and explosion in the compartment of origin; and
- .5 provide adequate and readily accessible means of escape for passengers and crew.

2 Functional requirements

2.1 In order to achieve the fire safety objectives set out in paragraph 1, the following functional requirements are embodied in the regulations of this chapter as appropriate:

- .1 division of the ship into main vertical and horizontal zones by thermal and structural boundaries;
- .2 separation of accommodation spaces from the remainder of the ship by thermal and structural boundaries;
- .3 restricted use of combustible materials;
- .4 detection of any fire in the zone of origin;
- .5 containment and extinction of any fire in the space of origin;
- .6 protection of means of escape and access for fire-fighting;
- .7 ready availability of fire-extinguishing appliances; and
- .8 minimization of possibility of ignition of flammable cargo vapour.

3 Achievement of the fire safety objectives

The fire safety objectives set out in paragraph 1 shall be achieved by ensuring compliance with the prescriptive requirements specified in parts B, C, D, E or G, or by alternative design and arrangements which comply with part F. A ship shall be considered to meet the functional requirements set out in paragraph 2 and to achieve the fire safety objectives set out in paragraph 1 when either:

- .1 the ship's design and arrangements, as a whole, comply with the relevant prescriptive requirements in parts B, C, D, E or G;
- .2 the ship's design and arrangements, as a whole, have been reviewed and approved in accordance with part F; or
- .3 part(s) of the ship's design and arrangements have been reviewed and approved in accordance with part F and the remaining parts of the ship comply with the relevant prescriptive requirements in parts B, C, D, E or G.

Regulation 3

Definitions

For the purpose of this chapter, unless expressly provided otherwise, the following definitions shall apply:

1 *Accommodation spaces* are those spaces used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, game and hobby rooms, barber shops, pantries containing no cooking appliances and similar spaces.

2 *"A" class divisions* are those divisions formed by bulkheads and decks which comply with the following criteria:

- .1 they are constructed of steel or other equivalent material;
- .2 they are suitably stiffened;
- .3 they are insulated with approved non-combustible materials such that the average temperature of the unexposed side will not rise more than 140°C above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180°C above the original temperature, within the time listed below:

class "A-60"	60 min
class "A-30"	30 min
class "A-15"	15 min
class "A-0"	0 min

- .4 they are constructed as to be capable of preventing the passage of smoke and flame to the end of the one-hour standard fire test; and
- .5 the Administration required a test of a prototype bulkhead or deck in accordance with the Fire Test Procedures Code to ensure that it meets the above requirements for integrity and temperature rise.

3 *Atriums* are public spaces within a single main vertical zone spanning three or more open decks.

4 *"B" class divisions* are those divisions formed by bulkheads, decks, ceilings or linings which comply with the following criteria:

- .1 they are constructed of approved non-combustible materials and all materials used in the construction and erection of "B" class divisions are non-combustible, with the exception that combustible veneers may be permitted provided they meet other appropriate requirements of this chapter;
- .2 they have an insulation value such that the average temperature of the unexposed side will not rise more than 140°C above the original temperature, nor will the temperature at any one point, including any joint, rise more than 225°C above the original temperature, within the time listed below:

class "B-15"	15 min
class "B-0"	0 min

- .3 they are constructed as to be capable of preventing the passage of flame to the end of the first half hour of the standard fire test; and
- .4 the Administration required a test of a prototype division in accordance with the Fire Test Procedures Code to ensure that it meets the above requirements for integrity and temperature rise.
- 5 *Bulkhead deck* is the uppermost deck up to which the transverse watertight bulkheads are carried.
- 6 *Cargo area* is that part of the ship that contains cargo holds, cargo tanks, slop tanks and cargo pump-rooms including pump-rooms, cofferdams, ballast and void spaces adjacent to cargo tanks and also deck areas throughout the entire length and breadth of the part of the ship over the aforementioned spaces.
- 7 *Cargo ship* is a ship as defined in regulation I/2(g).
- 8 *Cargo spaces* are spaces used for cargo, cargo oil tanks, tanks for other liquid cargo and trunks to such spaces.
- 9 *Central control station* is a control station in which the following control and indicator functions are centralized:
- .1 fixed fire detection and fire alarm systems;
 - .2 automatic sprinkler, fire detection and fire alarm systems;
 - .3 fire door indicator panels;
 - .4 fire door closure;
 - .5 watertight door indicator panels;
 - .6 watertight door closures;
 - .7 ventilation fans;
 - .8 general/fire alarms;
 - .9 communication systems including telephones; and
 - .10 microphones to public address systems.
- 10 *"C" class divisions* are divisions constructed of approved non-combustible materials. They need meet neither requirements relative to the passage of smoke and flame nor limitations relative to the temperature rise. Combustible veneers are permitted provided they meet the requirements of this chapter.

- 11 *Chemical tanker* is a cargo ship constructed or adapted and used for the carriage in bulk of any liquid product of a flammable nature listed in chapter 17 of the International Bulk Chemical Code, as defined in regulation VII/8.1.
- 12 *Closed ro-ro spaces* are ro-ro spaces which are neither open ro-ro spaces nor weather decks.
- 13 *Closed vehicle spaces* are vehicle spaces which are neither open vehicle spaces nor weather decks.
- 14 *Combination carrier* is a cargo ship designed to carry both oil and solid cargoes in bulk.
- 15 *Combustible material* is any material other than a non-combustible material.
- 16 *Continuous "B" class ceilings or linings* are those "B" class ceilings or linings which terminate at an "A" or "B" class division.
- 17 *Continuously manned central control station* is a central control station which is continuously manned by a responsible member of the crew.
- 18 *Control stations* are those spaces in which the ship's radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralized. Spaces where the fire recording or fire control equipment is centralized are also considered to be a *fire control station*.
- 19 *Crude oil* is any oil occurring naturally in the earth whether or not treated to render it suitable for transportation and includes crude oil where certain distillate fractions may have been removed from or added to.
- 20 *Dangerous goods* are those goods referred to in regulation VII/2.
- 21 *Deadweight* is the difference in tonnes between the displacement of a ship in water of a specific gravity of 1.025 at the load waterline corresponding to the assigned summer freeboard and the lightweight of the ship.
- 22 *Fire Safety Systems Code* means the International Code for Fire Safety Systems as adopted by the Maritime Safety Committee of the Organization by resolution MSC.98(73), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the annex other than chapter I thereof.
- 23 *Fire Test Procedures Code* means the International Code for Application of Fire Test Procedures as adopted by the Maritime Safety Committee of the Organization by resolution MSC.61(67), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the annex other than chapter I thereof.
- 24 *Flashpoint* is the temperature in degrees Celsius (closed cup test) at which a product will give off enough flammable vapour to be ignited, as determined by an approved flashpoint apparatus.

25 *Gas carrier* is a cargo ship constructed or adapted and used for the carriage in bulk of any liquefied gas or other products of a flammable nature listed in chapter 19 of the International Gas Carrier Code, as defined in regulation VII/11.1.

26 *Helideck* is a purpose-built helicopter landing area located on a ship including all structure, fire-fighting appliances and other equipment necessary for the safe operation of helicopters.

27 *Helicopter facility* is a helideck including any refuelling and hangar facilities.

28 *Lightweight* is the displacement of a ship in tonnes without cargo, fuel, lubricating oil, ballast water, fresh water and feedwater in tanks, consumable stores, and passengers and crew and their effects.

29 *Low flame-spread* means that the surface thus described will adequately restrict the spread of flame, this being determined in accordance with the Fire Test Procedures Code.

30 *Machinery spaces* are machinery spaces of category A and other spaces containing propulsion machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces.

31 *Machinery spaces of category A* are those spaces and trunks to such spaces which contain either:

- .1 internal combustion machinery used for main propulsion;
- .2 internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW; or
- .3 any oil-fired boiler or oil fuel unit, or any oil-fired equipment other than boilers, such as inert gas generators, incinerators, etc.

32 *Main vertical zones* are those sections into which the hull, superstructure and deckhouses are divided by "A" class divisions, the mean length and width of which on any deck does not in general exceed 40 m.

33 *Non-combustible material* is a material which neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750°C, this being determined in accordance with the Fire Test Procedures Code.

34 *Oil fuel unit* is the equipment used for the preparation of oil fuel for delivery to an oil-fired boiler, or equipment used for the preparation for delivery of heated oil to an internal combustion engine, and includes any oil pressure pumps, filters and heaters dealing with oil at a pressure of more than 0.18 N/mm².

35 *Open ro-ro spaces* are those ro-ro spaces that are either open at both ends or have an opening at one end, and are provided with adequate natural ventilation effective over their entire length through permanent openings distributed in the side plating or deckhead or from above, having a total area of at least 10% of the total area of the space sides.

36 *Open vehicle spaces* are those vehicle spaces either open at both ends, or have an opening at one end and are provided with adequate natural ventilation effective over their entire length through permanent openings distributed in the side plating or deckhead or from above, having a total area of at least 10% of the total area of the space sides.

37 *Passenger ship* is a ship as defined in regulation I/2(f).

38 *Prescriptive requirements* means the construction characteristics, limiting dimensions, or fire safety systems specified in parts B, C, D, E or G.

39 *Public spaces* are those portions of the accommodation which are used for halls, dining rooms, lounges and similar permanently enclosed spaces.

40 *Rooms containing furniture and furnishings of restricted fire risk*, for the purpose of regulation 9, are those rooms containing furniture and furnishings of restricted fire risk (whether cabins, public spaces, offices or other types of accommodation) in which:

- .1 case furniture such as desks, wardrobes, dressing tables, bureaux, dressers, are constructed entirely of approved non-combustible materials, except that a combustible veneer not exceeding 2 mm may be used on the working surface of such articles;
- .2 free-standing furniture such as chairs, sofas, tables, are constructed with frames of non-combustible materials;
- .3 draperies, curtains and other suspended textile materials have qualities of resistance to the propagation of flame not inferior to those of wool having a mass of 0.8 kg/m², this being determined in accordance with the Fire Test Procedures Code;
- .4 floor coverings have low flame-spread characteristics;
- .5 exposed surfaces of bulkheads, linings and ceilings have low flame-spread characteristics;
- .6 upholstered furniture has qualities of resistance to the ignition and propagation of flame, this being determined in accordance with the Fire Test Procedures Code; and
- .7 bedding components have qualities of resistance to the ignition and propagation of flame, this being determined in accordance with the Fire Test Procedures Code.

41 *Ro-ro spaces* are spaces not normally subdivided in any way and normally extending to either a substantial length or the entire length of the ship in which motor vehicles with fuel in their tanks for their own propulsion and/or goods (packaged or in bulk, in or on rail or road cars, vehicles (including road or rail tankers), trailers, containers, pallets, demountable tanks or in or on similar stowage units or other receptacles) can be loaded and unloaded normally in a horizontal direction.

42 *Ro-ro passenger ship* means a passenger ship with ro-ro spaces or special category spaces.

43 *Steel or other equivalent material* means any non-combustible material which, by itself or due to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable exposure to the standard fire test (e.g., aluminium alloy with appropriate insulation).

44 *Sauna* is a hot room with temperatures normally varying between 80°C and 120°C where the heat is provided by a hot surface (e.g. by an electrically-heated oven). The hot room may also include the space where the oven is located and adjacent bathrooms.

45 *Service spaces* are those spaces used for galleys, pantries containing cooking appliances, lockers, mail and specie rooms, storerooms, workshops other than those forming part of the machinery spaces, and similar spaces and trunks to such spaces.

46 *Special category spaces* are those enclosed vehicle spaces above and below the bulkhead deck, into and from which vehicles can be driven and to which passengers have access. Special category spaces may be accommodated on more than one deck provided that the total overall clear height for vehicles does not exceed 10 m.

47 *A standard fire test* is a test in which specimens of the relevant bulkheads or decks are exposed in a test furnace to temperatures corresponding approximately to the standard time-temperature curve in accordance with the test method specified in the Fire Test Procedures Code.

48 *Tanker* is a ship as defined in regulation I/2(h).

49 *Vehicle spaces* are cargo spaces intended for carriage of motor vehicles with fuel in their tanks for their own propulsion.

50 *Weather deck* is a deck which is completely exposed to the weather from above and from at least two sides.

PART B - PREVENTION OF FIRE AND EXPLOSION

Regulation 4

Probability of ignition

1 Purpose

The purpose of this regulation is to prevent the ignition of combustible materials or flammable liquids. For this purpose, the following functional requirements shall be met:

- .1 means shall be provided to control leaks of flammable liquids;
- .2 means shall be provided to limit the accumulation of flammable vapours;
- .3 the ignitability of combustible materials shall be restricted;
- .4 ignition sources shall be restricted;
- .5 ignition sources shall be separated from combustible materials and flammable liquids; and

- .6 the atmosphere in cargo tanks shall be maintained out of the explosive range.

2 Arrangements for oil fuel, lubrication oil and other flammable oils

2.1 Limitations in the use of oils as fuel

The following limitations shall apply to the use of oil as fuel:

- .1 except as otherwise permitted by this paragraph, no oil fuel with a flashpoint of less than 60°C shall be used;
- .2 in emergency generators oil fuel with a flashpoint of not less than 43°C may be used;
- .3 the use of oil fuel having a flashpoint of less than 60°C but not less than 43°C may be permitted (e.g., for feeding the emergency fire pump's engines and the auxiliary machines which are not located in the machinery spaces of category A) subject to the following:
 - .3.1 fuel oil tanks except those arranged in double bottom compartments shall be located outside of machinery spaces of category A;
 - .3.2 provisions for the measurement of oil temperature are provided on the suction pipe of the oil fuel pump;
 - .3.3 stop valves and/or cocks are provided on the inlet side and outlet side of the oil fuel strainers; and
 - .3.4 pipe joints of welded construction or of circular cone type or spherical type union joint are applied as much as possible; and
- .4 in cargo ships the use of fuel having a lower flashpoint than otherwise specified in paragraph 2.1, for example, crude oil may be permitted provided that such fuel is not stored in any machinery space and subject to the approval by the Administration of the complete installation.

2.2 Arrangements for oil fuel

In a ship in which oil fuel is used, the arrangements for the storage, distribution and utilization of the oil fuel shall be such as to ensure the safety of the ship and persons on board and shall at least comply with the following provisions.

2.2.1 Location of oil fuel systems

As far as practicable, parts of the oil fuel system containing heated oil under pressure exceeding 0.18 N/mm² shall not be placed in a concealed position such that defects and leakage cannot readily be observed. The machinery spaces in way of such parts of the oil fuel system shall be adequately illuminated.

2.2.2 *Ventilation of machinery spaces*

The ventilation of machinery spaces shall be sufficient under normal conditions to prevent accumulation of oil vapour.

2.2.3 *Oil fuel tanks*

2.2.3.1 Fuel oil, lubrication oil and other flammable oils shall not be carried in forepeak tanks.

2.2.3.2 As far as practicable, oil fuel tanks shall be part of the ships structure and shall be located outside machinery spaces of category A. Where oil fuel tanks, other than double bottom tanks, are necessarily located adjacent to or within machinery spaces of category A, at least one of their vertical sides shall be contiguous to the machinery space boundaries, and shall preferably have a common boundary with the double bottom tanks, and the area of the tank boundary common with the machinery spaces shall be kept to a minimum. Where such tanks are situated within the boundaries of machinery spaces of category A they shall not contain oil fuel having a flashpoint of less than 60°C. In general, the use of free-standing oil fuel tanks shall be avoided. When such tanks are employed their use shall be prohibited in category A machinery spaces on passenger ships. Where permitted, they shall be placed in an oil-tight spill tray of ample size having a suitable drain pipe leading to a suitably sized spill oil tank.

2.2.3.3 No oil fuel tank shall be situated where spillage or leakage therefrom can constitute a fire or explosion hazard by falling on heated surfaces.

2.2.3.4 Oil fuel pipes, which, if damaged, would allow oil to escape from a storage, settling or daily service tank having a capacity of 500 l and above situated above the double bottom, shall be fitted with a cock or valve directly on the tank capable of being closed from a safe position outside the space concerned in the event of a fire occurring in the space in which such tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel or similar space, valves on the tank shall be fitted, but control in the event of fire may be effected by means of an additional valve on the pipe or pipes outside the tunnel or similar space. If such an additional valve is fitted in the machinery space, it shall be operated from a position outside this space. The controls for remote operation of the valve for the emergency generator fuel tank shall be in a separate location from the controls for remote operation of other valves for tanks located in machinery spaces.

2.2.3.5 Safe and efficient means of ascertaining the amount of oil fuel contained in any oil fuel tank shall be provided.

2.2.3.5.1 Where sounding pipes are used, they shall not terminate in any space where the risk of ignition of spillage from the sounding pipe might arise. In particular, they shall not terminate in passenger or crew spaces. As a general rule, they shall not terminate in machinery spaces. However, where the Administration considers that these latter requirements are impracticable, it may permit termination of sounding pipes in machinery spaces on condition that all of the following requirements are met:

- .1 an oil-level gauge is provided meeting the requirements of paragraph 2.2.3.5.2;
- .2 the sounding pipes terminate in locations remote from ignition hazards unless precautions are taken, such as the fitting of effective screens, to prevent the oil

fuel in the case of spillage through the terminations of the sounding pipes from coming into contact with a source of ignition; and

- .3 the termination of sounding pipes are fitted with self-closing blanking devices and with a small-diameter self-closing control cock located below the blanking device for the purpose of ascertaining before the blanking device is opened that oil fuel is not present. Provisions shall be made so as to ensure that any spillage of oil fuel through the control cock involves no ignition hazard.

2.2.3.5.2 Other oil-level gauges may be used in place of sounding pipes subject to the following conditions:

- .1 in passenger ships, such gauges shall not require penetration below the top of the tank and their failure or overfilling of the tanks shall not permit release of fuel; and
- .2 in cargo ships, the failure of such gauges or overfilling of the tank shall not permit release of fuel into the space. The use of cylindrical gauge glasses is prohibited. The Administration may permit the use of oil-level gauges with flat glasses and self-closing valves between the gauges and fuel tanks.

2.2.3.5.3 The means prescribed in paragraph 2.2.3.5.2 which are acceptable to the Administration shall be maintained in the proper condition to ensure their continued accurate functioning in service.

2.2.4 *Prevention of overpressure*

Provisions shall be made to prevent overpressure in any oil tank or in any part of the oil fuel system, including the filling pipes served by pumps on board. Air and overflow pipes and relief valves shall discharge to a position where there is no risk of fire or explosion from the emergence of oils and vapour and shall not lead into crew spaces, passenger spaces nor into special category spaces, closed ro-ro cargo spaces, machinery spaces or similar spaces.

2.2.5 *Oil fuel piping*

2.2.5.1 Oil fuel pipes and their valves and fittings shall be of steel or other approved material, except that restricted use of flexible pipes shall be permissible in positions where the Administration is satisfied that they are necessary. Such flexible pipes and end attachments shall be of approved fire-resisting materials of adequate strength and shall be constructed to the satisfaction of the Administration. For valves, fitted to oil fuel tanks and which are under static pressure, steel or spheroidal-graphite cast iron may be accepted. However, ordinary cast iron valves may be used in piping systems where the design pressure is lower than 7 bar and the design temperature is below 60°C.

2.2.5.2 External high-pressure fuel delivery lines between the high-pressure fuel pumps and fuel injectors shall be protected with a jacketed piping system capable of containing fuel from a high-pressure line failure. A jacketed pipe incorporates an outer pipe into which the high-pressure fuel pipe is placed, forming a permanent assembly. The jacketed piping system shall include a means for collection of leakages and arrangements shall be provided with an alarm in case of a fuel line failure.

2.2.5.3 Oil fuel lines shall not be located immediately above or near units of high temperature including boilers, steam pipelines, exhaust manifolds, silencers or other equipment required to be insulated by paragraph 2.2.6. As far as practicable, oil fuel lines shall be arranged far apart from hot surfaces, electrical installations or other sources of ignition and shall be screened or otherwise suitably protected to avoid oil spray or oil leakage onto the sources of ignition. The number of joints in such piping systems shall be kept to a minimum.

2.2.5.4 Components of a diesel engine fuel system shall be designed considering the maximum peak pressure which will be experienced in service, including any high pressure pulses which are generated and transmitted back into the fuel supply and spill lines by the action of fuel injection pumps. Connections within the fuel supply and spill lines shall be constructed having regard to their ability to prevent pressurized oil fuel leaks while in service and after maintenance.

2.2.5.5 In multi-engine installations which are supplied from the same fuel source, means of isolating the fuel supply and spill piping to individual engines, shall be provided. The means of isolation shall not affect the operation of the other engines and shall be operable from a position not rendered inaccessible by a fire on any of the engines.

2.2.5.6 Where the Administration may permit the conveying of oil and combustible liquids through accommodation and service spaces, the pipes conveying oil or combustible liquids shall be of a material approved by the Administration having regard to the fire risk.

2.2.6 *Protection of high temperature surfaces*

2.2.6.1 Surfaces with temperatures above 220°C which may be impinged as a result of a fuel system failure shall be properly insulated.

2.2.6.2 Precautions shall be taken to prevent any oil that may escape under pressure from any pump, filter or heater from coming into contact with heated surfaces.

2.3 *Arrangements for lubricating oil*

2.3.1 The arrangements for the storage, distribution and utilization of oil used in pressure lubrication systems shall be such as to ensure the safety of the ship and persons on board. The arrangements made in machinery spaces of category A, and whenever practicable in other machinery spaces, shall at least comply with the provisions of paragraphs 2.2.1, 2.2.3.3, 2.2.3.4, 2.2.3.5, 2.2.4, 2.2.5.1, 2.2.5.3 and 2.2.6, except that:

- .1 this does not preclude the use of sight-flow glasses in lubricating systems provided that they are shown by testing to have a suitable degree of fire resistance; and
- .2 sounding pipes may be authorized in machinery spaces; however, the requirements of paragraphs 2.2.3.5.1.1 and 2.2.3.5.1.3 need not be applied on condition that the sounding pipes are fitted with appropriate means of closure.

2.3.2 The provisions of paragraph 2.2.3.4 shall also apply to lubricating oil tanks except those having a capacity less than 500 l, storage tanks on which valves are closed during the normal operation mode of the ship, or where it is determined that an unintended operation of a quick closing valve on the oil lubricating tank would endanger the safe operation of the main propulsion and essential auxiliary machinery.

2.4 *Arrangements for other flammable oils*

The arrangements for the storage, distribution and utilization of other flammable oils employed under pressure in power transmission systems, control and activating systems and heating systems shall be such as to ensure the safety of the ship and persons on board. Suitable oil collecting arrangements for leaks shall be fitted below hydraulic valves and cylinders. In locations where means of ignition are present, such arrangements shall at least comply with the provisions of paragraphs 2.2.3.3, 2.2.3.5, 2.2.5.3 and 2.2.6 and with the provisions of paragraphs 2.2.4 and 2.2.5.1 in respect of strength and construction.

2.5 *Arrangements for oil fuel in periodically unattended machinery spaces*

In addition to the requirements of paragraphs 2.1 to 2.4, the oil fuel and lubricating oil systems in a periodically unattended machinery space shall comply with the following:

- .1 where daily service oil fuel tanks are filled automatically, or by remote control, means shall be provided to prevent overflow spillages. Other equipment which treats flammable liquids automatically (e.g., oil fuel purifiers) which, whenever practicable, shall be installed in a special space reserved for purifiers and their heaters, shall have arrangements to prevent overflow spillages; and
- .2 where daily service oil fuel tanks or settling tanks are fitted with heating arrangements, a high temperature alarm shall be provided if the flashpoint of the oil fuel can be exceeded.

3 Arrangements for gaseous fuel for domestic purpose

Gaseous fuel systems used for domestic purposes shall be approved by the Administration. Storage of gas bottles shall be located on the open deck or in a well ventilated space which opens only to the open deck.

4 Miscellaneous items of ignition sources and ignitability

4.1 *Electric radiators*

Electric radiators, if used, shall be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiators shall be fitted with an element so exposed that clothing, curtains, or other similar materials can be scorched or set on fire by heat from the element.

4.2 *Waste receptacles*

Waste receptacles shall be constructed of non-combustible materials with no openings in the sides or bottom.

4.3 *Insulation surfaces protected against oil penetration*

In spaces where penetration of oil products is possible, the surface of insulation shall be impervious to oil or oil vapours.

4.4 *Primary deck coverings*

Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of approved material which will not readily ignite, this being determined in accordance with the Fire Test Procedures Code.

5 Cargo areas of tankers

5.1 *Separation of cargo oil tanks*

5.1.1 Cargo pump-rooms, cargo tanks, slop tanks and cofferdams shall be positioned forward of machinery spaces. However, oil fuel bunker tanks need not be forward of machinery spaces. Cargo tanks and slop tanks shall be isolated from machinery spaces by cofferdams, cargo pump-rooms, oil bunker tanks or ballast tanks. Pump-rooms containing pumps and their accessories for ballasting those spaces situated adjacent to cargo tanks and slop tanks and pumps for oil fuel transfer, shall be considered as equivalent to a cargo pump-room within the context of this regulation provided that such pump-rooms have the same safety standard as that required for cargo pump-rooms. Pump-rooms intended solely for ballast or oil fuel transfer, however, need not comply with the requirements of regulation 10.9. The lower portion of the pump-room may be recessed into machinery spaces of category A to accommodate pumps, provided that the deck head of the recess is in general not more than one third of the moulded depth above the keel, except that in the case of ships of not more than 25,000 tonnes deadweight, where it can be demonstrated that for reasons of access and satisfactory piping arrangements this is impracticable, the Administration may permit a recess in excess of such height, but not exceeding one half of the moulded depth above the keel.

5.1.2 Main cargo control stations, control stations, accommodation and service spaces (excluding isolated cargo handling gear lockers) shall be positioned aft of cargo tanks, slop tanks, and spaces which isolate cargo or slop tanks from machinery spaces, but not necessarily aft of the oil fuel bunker tanks and ballast tanks, and shall be arranged in such a way that a single failure of a deck or bulkhead shall not permit the entry of gas or fumes from the cargo tanks into main cargo control stations, control stations, or accommodation and service spaces. A recess provided in accordance with paragraph 5.1.1 need not be taken into account when the position of these spaces is being determined.

5.1.3 However, where deemed necessary, the Administration may permit main cargo control stations, control stations, accommodation and service spaces forward of the cargo tanks, slop tanks and spaces which isolate cargo and slop tanks from machinery spaces, but not necessarily forward of oil fuel bunker tanks or ballast tanks. Machinery spaces, other than those of category A, may be permitted forward of the cargo tanks and slop tanks provided they are isolated from the cargo tanks and slop tanks by cofferdams, cargo pump-rooms, oil fuel bunker tanks or ballast tanks, and have at least one portable fire extinguisher. In cases where they contain internal combustion machinery, one approved foam-type extinguisher of at least 45 l capacity or equivalent shall be arranged in addition to portable fire extinguishers. If operation of a semi-portable fire extinguisher is impracticable, this fire extinguisher may be replaced by two additional portable fire extinguishers. Main cargo control stations, control stations and accommodation and service spaces shall be arranged in such a way that a single failure of a deck or bulkhead shall not permit the entry of gas or fumes from the cargo tanks into such spaces. In addition, where deemed necessary for the safety or navigation of the ship, the Administration may permit machinery spaces containing internal combustion machinery not being main propulsion machinery having an output greater than 375 kW to be located forward of the cargo area provided the arrangements are in accordance with the provisions of this paragraph.

5.1.4 In combination carriers only:

- .1 the slop tanks shall be surrounded by cofferdams except where the boundaries of the slop tanks are part of the hull, main cargo deck, cargo pump-room bulkhead or oil fuel bunker tank. These cofferdams shall not be open to a double bottom, pipe tunnel, pump-room or other enclosed space, nor shall they be used for cargo or ballast and shall not be connected to piping systems serving oil cargo or ballast. Means shall be provided for filling the cofferdams with water and for draining them. Where the boundary of a slop tank is part of the cargo pump-room bulkhead, the pump-room shall not be open to the double bottom, pipe tunnel or other enclosed space; however, openings provided with gastight bolted covers may be permitted;
- .2 means shall be provided for isolating the piping connecting the pump-room with the slop tanks referred to in paragraph 5.1.4.1. The means of isolation shall consist of a valve followed by a spectacle flange or a spool piece with appropriate blank flanges. This arrangement shall be located adjacent to the slop tanks, but where this is unreasonable or impracticable, it may be located within the pump-room directly after the piping penetrates the bulkhead. A separate permanently installed pumping and piping arrangement incorporating a manifold, provided with a shut-off valve and a blank flange, shall be provided for discharging the contents of the slop tanks directly to the open deck for disposal to shore reception facilities when the ship is in the dry cargo mode. When the transfer system is used for slop transfer in the dry cargo mode, it shall have no connection to other systems. Separation from other systems by means of removal of spool pieces may be accepted;
- .3 hatches and tank cleaning openings to slop tanks shall only be permitted on the open deck and shall be fitted with closing arrangements. Except where they consist of bolted plates with bolts at watertight spacing, these closing arrangements shall be provided with locking arrangements under the control of the responsible ship's officer; and
- .4 where cargo wing tanks are provided, cargo oil lines below deck shall be installed inside these tanks. However, the Administration may permit cargo oil lines to be placed in special ducts provided they are capable of being adequately cleaned and ventilated to the satisfaction of the Administration. Where cargo wing tanks are not provided, cargo oil lines below deck shall be placed in special ducts.

5.1.5 Where the fitting of a navigation position above the cargo area is shown to be necessary, it shall be for navigation purposes only and it shall be separated from the cargo tank deck by means of an open space with a height of at least 2 m. The fire protection requirements for such a navigation position shall be that required for control stations, as specified in regulation 9.2.4.2 and other provisions for tankers, as applicable.

5.1.6 Means shall be provided to keep deck spills away from the accommodation and service areas. This may be accomplished by provision of a permanent continuous coaming of a height of at least 300 mm, extending from side to side. Special consideration shall be given to the arrangements associated with stern loading.

5.2 *Restriction on boundary openings*

5.2.1 Except as permitted in paragraph 5.2.2, access doors, air inlets and openings to accommodation spaces, service spaces, control stations and machinery spaces shall not face the cargo area. They shall be located on the transverse bulkhead not facing the cargo area or on the outboard side of the superstructure or deck-house at a distance of at least 4% of the length of the ship, but not less than 3 m from the end of the superstructure or deckhouse facing the cargo area. This distance need not exceed 5 m.

5.2.2 The Administration may permit access doors in boundary bulkheads facing the cargo area or within the 5 m limits specified in paragraph 5.2.1, to main cargo control stations and to such service spaces used as provision rooms, store-rooms and lockers, provided they do not give access directly or indirectly to any other space containing or providing for accommodation, control stations or service spaces such as galleys, pantries or workshops, or similar spaces containing sources of vapour ignition. The boundary of such a space shall be insulated to "A-60" standard, with the exception of the boundary facing the cargo area. Bolted plates for the removal of machinery may be fitted within the limits specified in paragraph 5.2.1. Wheelhouse doors and windows may be located within the limits specified in paragraph 5.2.1 so long as they are designed to ensure that the wheelhouse can be made rapidly and efficiently gas and vapour tight.

5.2.3 Windows and sidescuttles facing the cargo area and on the sides of the superstructures and deck-houses within the limits specified in paragraph 5.2.1 shall be of the fixed (non-opening) type. Such windows and sidescuttles, except wheelhouse windows, shall be constructed to "A-60" class standard.

5.2.4 Where there is permanent access from a pipe tunnel to the main pump-room, a watertight door shall be fitted complying with the requirements of regulation II-1/25-9.2 and, in addition, with the following:

- .1 in addition to the bridge operation, the watertight door shall be capable of being manually closed from outside the main pump-room entrance; and
- .2 the watertight door shall be kept closed during normal operations of the ship except when access to the pipe tunnel is required.

5.2.5 Permanent approved gastight lighting enclosures for illuminating cargo pump-rooms may be permitted in bulkheads and decks separating cargo pump-rooms and other spaces provided they are of adequate strength and the integrity and gastightness of the bulkhead or deck is maintained.

5.2.6 The arrangement of ventilation inlets and outlets and other deck-house and superstructure boundary space openings shall be such as to complement the provisions of paragraph 5.3 and regulation 11.6. Such vents, especially for machinery spaces, shall be situated as far aft as practicable. Due consideration in this regard shall be given when the ship is equipped to load or discharge at the stern. Sources of ignition such as electrical equipment shall be so arranged as to avoid an explosion hazard.

5.3 *Cargo tank venting*

5.3.1 *General requirements*

The venting systems of cargo tanks shall be entirely distinct from the air pipes of the other compartments of the ship. The arrangements and position of openings in the cargo tank deck from which emission of flammable vapours can occur shall be such as to minimize the possibility of flammable vapours being admitted to enclosed spaces containing a source of ignition, or collecting in the vicinity of deck machinery and equipment which may constitute an ignition hazard. In accordance with this general principle, the criteria in paragraphs 5.3.2 to 5.3.5 and regulation 11.6 will apply.

5.3.2 *Venting arrangements*

5.3.2.1 The venting arrangements in each cargo tank may be independent or combined with other cargo tanks and may be incorporated into the inert gas piping.

5.3.2.2 Where the arrangements are combined with other cargo tanks, either stop valves or other acceptable means shall be provided to isolate each cargo tank. Where stop valves are fitted, they shall be provided with locking arrangements which shall be under the control of the responsible ship's officer. There shall be a clear visual indication of the operational status of the valves or other acceptable means. Where tanks have been isolated, it shall be ensured that relevant isolating valves are opened before cargo loading or ballasting or discharging of those tanks is commenced. Any isolation must continue to permit the flow caused by thermal variations in a cargo tank in accordance with regulation 11.6.1.1.

5.3.2.3 If cargo loading and ballasting or discharging of a cargo tank or cargo tank group is intended, which is isolated from a common venting system, that cargo tank or cargo tank group shall be fitted with a means for over-pressure or under-pressure protection as required in regulation 11.6.3.2.

5.3.2.4 The venting arrangements shall be connected to the top of each cargo tank and shall be self-draining to the cargo tanks under all normal conditions of trim and list of the ship. Where it may not be possible to provide self-draining lines, permanent arrangements shall be provided to drain the vent lines to a cargo tank.

5.3.3 *Safety devices in venting systems*

The venting system shall be provided with devices to prevent the passage of flame into the cargo tanks. The design, testing and locating of these devices shall comply with the requirements established by the Administration based on the guidelines developed by the Organization. Ullage openings shall not be used for pressure equalization. They shall be provided with self-closing and tightly sealing covers. Flame arresters and screens are not permitted in these openings.

5.3.4 *Vent outlets for cargo handling and ballasting*

5.3.4.1 Vent outlets for cargo loading, discharging and ballasting required by regulation 11.6.1.2 shall:

- .1.1 permit the free flow of vapour mixtures; or

- .1.2 permit the throttling of the discharge of the vapour mixtures to achieve a velocity of not less than 30 m/s;
- .2 be so arranged that the vapour mixture is discharged vertically upwards;
- .3 where the method is by free flow of vapour mixtures, be such that the outlet shall be not less than 6 m above the cargo tank deck or fore and aft gangway if situated within 4 m of the gangway and located not less than 10 m measured horizontally from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery, which may include anchor windlass and chain locker openings, and equipment which may constitute an ignition hazard; and
- .4 where the method is by high-velocity discharge, be located at a height not less than 2 m above the cargo tank deck and not less than 10 m measured horizontally from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery, which may include anchor windlass and chain locker openings, and equipment which may constitute an ignition hazard. These outlets shall be provided with high velocity devices of an approved type.

5.3.4.2 The arrangements for the venting of vapours displaced from the cargo tanks during loading and ballasting shall comply with paragraph 5.3 and regulation 11.6 and shall consist of either one or more mast risers, or a number of high-velocity vents. The inert gas supply main may be used for such venting.

5.3.5 *Isolation of slop tanks in combination carriers*

In combination carriers, the arrangements for isolating slop tanks containing oil or oil residues from other cargo tanks shall consist of blank flanges which will remain in position at all times when cargoes other than liquid cargoes referred to in regulation 1.6.1 are carried.

5.4 *Ventilation*

5.4.1 *Ventilation systems in cargo pump-rooms*

Cargo pump-rooms shall be mechanically ventilated and discharges from the exhaust fans shall be led to a safe place on the open deck. The ventilation of these rooms shall have sufficient capacity to minimize the possibility of accumulation of flammable vapours. The number of air changes shall be at least 20 per hour, based upon the gross volume of the space. The air ducts shall be arranged so that all of the space is effectively ventilated. The ventilation shall be of the suction type using fans of the non-sparking type.

5.4.2 *Ventilation systems in combination carriers*

In combination carriers, cargo spaces and any enclosed spaces adjacent to cargo spaces shall be capable of being mechanically ventilated. The mechanical ventilation may be provided by portable fans. An approved fixed gas warning system capable of monitoring flammable vapours shall be provided in cargo pump-rooms, pipe ducts and cofferdams, as referred to in paragraph 5.1.4, adjacent to slop tanks. Suitable arrangements shall be made to facilitate measurement of flammable vapours in all other spaces within the cargo area. Such measurements shall be made possible from the open deck or easily accessible positions.

5.5 *Inert gas systems*

5.5.1 *Application*

5.5.1.1 For tankers of 20,000 tonnes deadweight and upwards, the protection of the cargo tanks shall be achieved by a fixed inert gas system in accordance with the requirements of the Fire Safety Systems Code, except that, in lieu of the above, the Administration, after having given consideration to the ship's arrangement and equipment, may accept other fixed installations if they afford protection equivalent to the above, in accordance with regulation I/5. The requirements for alternative fixed installations shall comply with the requirements in paragraph 5.5.4.

5.5.1.2 Tankers operating with a cargo tank cleaning procedure using crude oil washing shall be fitted with an inert gas system complying with the Fire Safety Systems Code and with fixed tank washing machines.

5.5.1.3 Tankers required to be fitted with inert gas systems shall comply with the following provisions:

- .1 double hull spaces shall be fitted with suitable connections for the supply of inert gas;
- .2 where hull spaces are connected to a permanently fitted inert gas distribution system, means shall be provided to prevent hydrocarbon gases from the cargo tanks entering the double hull spaces through the system; and
- .3 where such spaces are not permanently connected to an inert gas distribution system, appropriate means shall be provided to allow connection to the inert gas main.

5.5.2 *Inert gas systems of chemical tankers and gas carriers*

The requirements for inert gas systems contained in the Fire Safety Systems Code need not be applied to:

- .1 chemical tankers and gas carriers when carrying cargoes described in regulation 1.6.1, provided that they comply with the requirements for inert gas systems on chemical tankers established by the Administration, based on the guidelines developed by the Organization; or
- .2 chemical tankers and gas carriers when carrying flammable cargoes other than crude oil or petroleum products such as cargoes listed in chapters 17 and 18 of the International Bulk Chemical Code, provided that the capacity of tanks used for their carriage does not exceed 3,000 m³ and the individual nozzle capacities of tank washing machines do not exceed 17.5 m³/h and the total combined throughput from the number of machines in use in a cargo tank at any one time does not exceed 110 m³/h.

5.5.3 *General requirements for inert gas systems*

5.5.3.1 The inert gas system shall be capable of inerting, purging and gas-freeing empty tanks and maintaining the atmosphere in cargo tanks with the required oxygen content.

5.5.3.2 The inert gas system referred to in paragraph 5.5.3.1 shall be designed, constructed and tested in accordance with the Fire Safety Systems Code.

5.5.3.3 Tankers fitted with a fixed inert gas system shall be provided with a closed ullage system.

5.5.4 *Requirements for equivalent systems*

5.5.4.1 Where an installation equivalent to a fixed inert gas system is installed, it shall:

- .1 be capable of preventing dangerous accumulations of explosive mixtures in intact cargo tanks during normal service throughout the ballast voyage and necessary in-tank operations; and
- .2 be so designed as to minimize the risk of ignition from the generation of static electricity by the system itself.

5.6 *Inerting, purging and gas-freeing*

5.6.1 Arrangements for purging and/or gas-freeing shall be such as to minimize the hazards due to dispersal of flammable vapours in the atmosphere and to flammable mixtures in a cargo tank.

5.6.2 The procedure for cargo tank purging and/or gas-freeing shall be carried out in accordance with regulation 16.3.2.

5.6.3 The arrangements for inerting, purging or gas-freeing of empty tanks as required in paragraph 5.5.3.1 shall be to the satisfaction of the Administration and shall be such that the accumulation of hydrocarbon vapours in pockets formed by the internal structural members in a tank is minimized and that:

- .1 on individual cargo tanks, the gas outlet pipe, if fitted, shall be positioned as far as practicable from the inert gas/air inlet and in accordance with paragraph 5.3 and regulation 11.6. The inlet of such outlet pipes may be located either at deck level or at not more than 1 m above the bottom of the tank;
- .2 the cross-sectional area of such gas outlet pipe referred to in paragraph 5.6.3.1 shall be such that an exit velocity of at least 20 m/s can be maintained when any three tanks are being simultaneously supplied with inert gas. Their outlets shall extend not less than 2 m above deck level; and
- .3 each gas outlet referred to in paragraph 5.6.3.2 shall be fitted with suitable blanking arrangements.

5.7 *Gas measurement*

5.7.1 *Portable instrument*

Tankers shall be equipped with at least one portable instrument for measuring flammable vapour concentrations, together with a sufficient set of spares. Suitable means shall be provided for the calibration of such instruments.

5.7.2 *Arrangements for gas measurement in double hull and double bottom spaces*

5.7.2.1 Suitable portable instruments for measuring oxygen and flammable vapour concentrations shall be provided. In selecting these instruments, due attention shall be given to their use in combination with the fixed gas sampling line systems referred to in paragraph 5.7.2.2.

5.7.2.2 Where the atmosphere in double hull spaces cannot be reliably measured using flexible gas sampling hoses, such spaces shall be fitted with permanent gas sampling lines. The configuration of gas sampling lines shall be adapted to the design of such spaces.

5.7.2.3 The materials of construction and the dimensions of gas sampling lines shall be such as to prevent restriction. Where plastic materials are used, they shall be electrically conductive.

5.8 *Air supply to double hull and double bottom spaces*

Double hull and double bottom spaces shall be fitted with suitable connections for the supply of air.

5.9 *Protection of cargo area*

Drip pans for collecting cargo residues in cargo lines and hoses shall be provided in the area of pipe and hose connections under the manifold area. Cargo hoses and tank washing hoses shall have electrical continuity over their entire lengths including couplings and flanges (except shore connections) and shall be earthed for removal of electrostatic charges.

5.10 *Protection of cargo pump-rooms*

5.10.1 In tankers:

- .1 cargo pumps, ballast pumps and stripping pumps, installed in cargo pump-rooms and driven by shafts passing through pump-room bulkheads shall be fitted with temperature sensing devices for bulkhead shaft glands, bearings and pump casings. A continuous audible and visual alarm signal shall be automatically effected in the cargo control room or the pump control station;
- .2 lighting in cargo pump-rooms, except emergency lighting, shall be interlocked with ventilation such that the ventilation shall be in operation when switching on the lighting. Failure of the ventilation system shall not cause the lighting to go out;
- .3 a system for continuous monitoring of the concentration of hydrocarbon gases shall be fitted. Sampling points or detector heads shall be located in suitable positions in order that potentially dangerous leakages are readily detected. When the hydrocarbon gas concentration reaches a pre-set level which shall not be higher than 10% of the lower flammable limit, a continuous audible and visual alarm signal shall be automatically effected in the pump-room, engine control room, cargo control room and navigation bridge to alert personnel to the potential hazard; and
- .4 all pump-rooms shall be provided with bilge level monitoring devices together with appropriately located alarms.

Regulation 5

Fire growth potential

1 Purpose

The purpose of this regulation is to limit the fire growth potential in every space of the ship. For this purpose, the following functional requirements shall be met:

- .1 means of control for the air supply to the space shall be provided;
- .2 means of control for flammable liquids in the space shall be provided; and
- .3 the use of combustible materials shall be restricted.

2 Control of air supply and flammable liquid to the space

2.1 Closing appliances and stopping devices of ventilation

2.1.1 The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated. The means of closing shall be easily accessible as well as prominently and permanently marked and shall indicate whether the shut-off is open or closed.

2.1.2 Power ventilation of accommodation spaces, service spaces, cargo spaces, control stations and machinery spaces shall be capable of being stopped from an easily accessible position outside the space being served. This position shall not be readily cut off in the event of a fire in the spaces served.

2.1.3 In passenger ships carrying more than 36 passengers, power ventilation, except machinery space and cargo space ventilation and any alternative system which may be required under regulation 8.2, shall be fitted with controls so grouped that all fans may be stopped from either of two separate positions which shall be situated as far apart as practicable. Fans serving power ventilation systems to cargo spaces shall be capable of being stopped from a safe position outside such spaces.

2.2 Means of control in machinery spaces

2.2.1 Means of control shall be provided for opening and closure of skylights, closure of openings in funnels which normally allow exhaust ventilation and closure of ventilator dampers.

2.2.2 Means of control shall be provided for stopping ventilating fans. Controls provided for the power ventilation serving machinery spaces shall be grouped so as to be operable from two positions, one of which shall be outside such spaces. The means provided for stopping the power ventilation of the machinery spaces shall be entirely separate from the means provided for stopping ventilation of other spaces.

2.2.3 Means of control shall be provided for stopping forced and induced draught fans, oil fuel transfer pumps, oil fuel unit pumps, lubricating oil service pumps, thermal oil circulating pumps and oil separators (purifiers). However, paragraphs 2.2.4 and 2.2.5 need not apply to oily water separators.

2.2.4 The controls required in paragraphs 2.2.1 to 2.2.3 and in regulation 4.2.2.3.4 shall be located outside the space concerned so they will not be cut off in the event of fire in the space they serve.

2.2.5 In passenger ships, the controls required in paragraphs 2.2.1 to 2.2.4 and in regulations 8.3.3 and 9.5.2.3 and the controls for any required fire-extinguishing system shall be situated at one control position or grouped in as few positions as possible to the satisfaction of the Administration. Such positions shall have a safe access from the open deck.

2.3 *Additional requirements for means of control in periodically unattended machinery spaces*

2.3.1 For periodically unattended machinery spaces, the Administration shall give special consideration to maintaining the fire integrity of the machinery spaces, the location and centralization of the fire-extinguishing system controls, the required shutdown arrangements (e.g., ventilation, fuel pumps, etc.) and that additional fire-extinguishing appliances and other fire-fighting equipment and breathing apparatus may be required.

2.3.2 In passenger ships, these requirements shall be at least equivalent to those of machinery spaces normally attended.

3 Fire protection materials

3.1 *Use of non-combustible materials*

3.1.1 *Insulating materials*

Insulating materials shall be non-combustible, except in cargo spaces, mail rooms, baggage rooms and refrigerated compartments of service spaces. Vapour barriers and adhesives used in conjunction with insulation, as well as the insulation of pipe fittings for cold service systems, need not be of non-combustible materials, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have low flame-spread characteristics.

3.1.2 *Ceilings and linings*

3.1.2.1 In passenger ships, except in cargo spaces, all linings, grounds, draught stops and ceilings shall be of non-combustible material except in mail rooms, baggage rooms, saunas or refrigerated compartments of service spaces. Partial bulkheads or decks used to subdivide a space for utility or artistic treatment shall also be of non-combustible materials.

3.1.2.2 In cargo ships, all linings, ceilings, draught stops and their associated grounds shall be of non-combustible materials in the following spaces:

- .1 in accommodation and service spaces and control stations for ships where Method IC is specified as referred to in regulation 9.2.3.1; and
- .2 in corridors and stairway enclosures serving accommodation and service spaces and control stations for ships where Method IIC and IIIC are specified as referred to in regulation 9.2.3.1.

3.2 *Use of combustible materials*

3.2.1 *General*

3.2.1.1 In passenger ships, "A", "B" or "C" class divisions in accommodation and services spaces which are faced with combustible materials, facings, mouldings, decorations and veneers shall comply with the provisions of paragraphs 3.2.2 to 3.2.4 and regulation 6. However, traditional wooden benches and wooden linings on bulkheads and ceilings are permitted in saunas and such materials need not be subject to the calculations prescribed in paragraphs 3.2.2 and 3.2.3.

3.2.1.2 In cargo ships, non-combustible bulkheads, ceilings and linings fitted in accommodation and service spaces may be faced with combustible materials, facings, mouldings, decorations and veneers provided such spaces are bounded by non-combustible bulkheads, ceilings and linings in accordance with the provisions of paragraphs 3.2.2 to 3.2.4 and regulation 6.

3.2.2 *Maximum calorific value of combustible materials*

Combustible materials used on the surfaces and linings specified in paragraph 3.2.1 shall have a calorific value not exceeding 45 MJ/m² of the area for the thickness used. The requirements of this paragraph are not applicable to the surfaces of furniture fixed to linings or bulkheads.

3.2.3 *Total volume of combustible materials*

Where combustible materials are used in accordance with paragraph 3.2.1, they shall comply with the following requirements:

- .1 the total volume of combustible facings, mouldings, decorations and veneers in accommodation and service spaces shall not exceed a volume equivalent to 2.5 mm veneer on the combined area of the walls and ceiling linings. Furniture fixed to linings, bulkheads or decks need not be included in the calculation of the total volume of combustible materials; and
- .2 in the case of ships fitted with an automatic sprinkler system complying with the provisions of the Fire Safety Systems Code, the above volume may include some combustible material used for erection of "C" class divisions.

3.2.4 *Low flame-spread characteristics of exposed surfaces*

The following surfaces shall have low flame-spread characteristics in accordance with the Fire Test Procedures Code:

3.2.4.1 In passenger ships:

- .1 exposed surfaces in corridors and stairway enclosures and of bulkhead and ceiling linings in accommodation and service spaces (except saunas) and control stations; and
- .2 surfaces and grounds in concealed or inaccessible spaces in accommodation and service spaces and control stations.

3.2.4.2 In cargo ships:

- .1 exposed surfaces in corridors and stairway enclosures and of ceilings in accommodation and service spaces (except saunas) and control stations; and
- .2 surfaces and grounds in concealed or inaccessible spaces in accommodation and service spaces and control stations.

3.3 *Furniture in stairway enclosures of passenger ships*

Furniture in stairway enclosures shall be limited to seating. It shall be fixed, limited to six seats on each deck in each stairway enclosure, be of restricted fire risk determined in accordance with the Fire Test Procedure Code, and shall not restrict the passenger escape route. The Administration may permit additional seating in the main reception area within a stairway enclosure if it is fixed, non-combustible and does not restrict the passenger escape route. Furniture shall not be permitted in passenger and crew corridors forming escape routes in cabin areas. In addition to the above, lockers of non-combustible material, providing storage for non-hazardous safety equipment required by these regulations, may be permitted. Drinking water dispensers and ice cube machines may be permitted in corridors provided they are fixed and do not restrict the width of the escape routes. This applies as well to decorative flower or plant arrangements, statues or other objects of art such as paintings and tapestries in corridors and stairways.

Regulation 6

Smoke generation potential and toxicity

1 Purpose

The purpose of this regulation is to reduce the hazard to life from smoke and toxic products generated during a fire in spaces where persons normally work or live. For this purpose, the quantity of smoke and toxic products released from combustible materials, including surface finishes, during fire shall be limited.

2 Paints, varnishes and other finishes

Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke and toxic products, this being determined in accordance with the Fire Test Procedures Code.

3 Primary deck coverings

Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of approved material which will not give rise to smoke or toxic or explosive hazards at elevated temperatures, this being determined in accordance with the Fire Test Procedures Code.

PART C - SUPPRESSION OF FIRE

Regulation 7

Detection and alarm

1 Purpose

The purpose of this regulation is to detect a fire in the space of origin and to provide for alarm for safe escape and fire-fighting activity. For this purpose, the following functional requirements shall be met:

- .1 fixed fire detection and fire alarm system installations shall be suitable for the nature of the space, fire growth potential and potential generation of smoke and gases;
- .2 manually operated call points shall be placed effectively to ensure a readily accessible means of notification; and
- .3 fire patrols shall provide an effective means of detecting and locating fires and alerting the navigation bridge and fire teams.

2 General requirements

2.1 A fixed fire detection and fire alarm system shall be provided in accordance with the provisions of this regulation.

2.2 A fixed fire detection and fire alarm system and a sample extraction smoke detection system required in this regulation and other regulations in this part shall be of an approved type and comply with the Fire Safety Systems Code.

2.3 Where a fixed fire detection and fire alarm system is required for the protection of spaces other than those specified in paragraph 5.1, at least one detector complying with the Fire Safety Systems Code shall be installed in each such space.

3 Initial and periodical tests

3.1 The function of fixed fire detection and fire alarm systems required by the relevant regulations of this chapter shall be tested under varying conditions of ventilation after installation.

3.2 The function of fixed fire detection and fire alarm systems shall be periodically tested to the satisfaction of the Administration by means of equipment producing hot air at the appropriate temperature, or smoke or aerosol particles having the appropriate range of density or particle size, or other phenomena associated with incipient fires to which the detector is designed to respond.

4 Protection of machinery spaces

4.1 Installation

A fixed fire detection and fire alarm system shall be installed in:

- .1 periodically unattended machinery spaces; and
- .2 machinery spaces where:
 - .2.1 the installation of automatic and remote control systems and equipment has been approved in lieu of continuous manning of the space; and
 - .2.2 the main propulsion and associated machinery including sources of the main sources of electrical power are provided with various degrees of automatic or remote control and are under continuous manned supervision from a control room.

4.2 Design

The fixed fire detection and fire alarm system required in paragraph 4.1.1 shall be so designed and the detectors so positioned as to detect rapidly the onset of fire in any part of those spaces and under any normal conditions of operation of the machinery and variations of ventilation as required by the possible range of ambient temperatures. Except in spaces of restricted height and where their use is specially appropriate, detection systems using only thermal detectors shall not be permitted. The detection system shall initiate audible and visual alarms distinct in both respects from the alarms of any other system not indicating fire, in sufficient places to ensure that the alarms are heard and observed on the navigation bridge and by a responsible engineer officer. When the navigation bridge is unmanned, the alarm shall sound in a place where a responsible member of the crew is on duty.

5 Protection of accommodation and service spaces and control stations

5.1 Smoke detectors in accommodation spaces

Smoke detectors shall be installed in all stairways, corridors and escape routes within accommodation spaces as provided in paragraphs 5.2, 5.3 and 5.4. Consideration shall be given to the installation of special purpose smoke detectors within ventilation ducting.

5.2 Requirements for passenger ships carrying more than 36 passengers

A fixed fire detection and fire alarm system shall be installed and arranged as to provide smoke detection in service spaces, control stations and accommodation spaces, including corridors, stairways and escape routes within accommodation spaces. Smoke detectors need not be fitted in private bathrooms and galleys. Spaces having little or no fire risk such as voids, public toilets, carbon dioxide rooms and similar spaces need not be fitted with a fixed fire detection and alarm system.

5.3 Requirements for passenger ships carrying not more than 36 passengers

There shall be installed throughout each separate zone, whether vertical or horizontal, in all accommodation and service spaces and, where it is considered necessary by the Administration,

in control stations, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc., either:

- .1 a fixed fire detection and fire alarm system so installed and arranged as to detect the presence of fire in such spaces and providing smoke detection in corridors, stairways and escape routes within accommodation spaces; or
- .2 an automatic sprinkler, fire detection and fire alarm system of an approved type complying with the relevant requirements of the Fire Safety Systems Code and so installed and arranged as to protect such spaces and, in addition, a fixed fire detection and fire alarm system and so installed and arranged as to provide smoke detection in corridors, stairways and escape routes within accommodation spaces.

5.4 *Protection of atriums in passenger ships*

The entire main vertical zone containing the atrium shall be protected throughout with a smoke detection system.

5.5 *Cargo ships*

Accommodation and service spaces and control stations of cargo ships shall be protected by a fixed fire detection and fire alarm system and/or an automatic sprinkler, fire detection and fire alarm system as follows depending on a protection method adopted in accordance with regulation 9.2.3.1.

5.5.1 Method IC

A fixed fire detection and fire alarm system shall be so installed and arranged as to provide smoke detection in all corridors, stairways and escape routes within accommodation spaces.

5.5.2 Method IIC

An automatic sprinkler, fire detection and fire alarm system of an approved type complying with the relevant requirements of the Fire Safety Systems Code shall be so installed and arranged as to protect accommodation spaces, galleys and other service spaces, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc. In addition, a fixed fire detection and fire alarm system shall be so installed and arranged as to provide smoke detection in all corridors, stairways and escape routes within accommodation spaces.

5.5.3 Method IIIC

A fixed fire detection and fire alarm system shall be so installed and arranged as to detect the presence of fire in all accommodation spaces and service spaces providing smoke detection in corridors, stairways and escape routes within accommodation spaces, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc. In addition, a fixed fire detection and fire alarm system shall be so installed and arranged as to provide smoke detection in all corridors, stairways and escape routes within accommodation spaces.

6 Protection of cargo spaces in passenger ships

A fixed fire detection and fire alarm system or a sample extraction smoke detection system shall be provided in any cargo space which, in the opinion of the Administration, is not accessible, except where it is shown to the satisfaction of the Administration that the ship is engaged on voyages of such short duration that it would be unreasonable to apply this requirement.

7 Manually operated call points

Manually operated call points complying with the Fire Safety Systems Code shall be installed throughout the accommodation spaces, service spaces and control stations. One manually operated call point shall be located at each exit. Manually operated call points shall be readily accessible in the corridors of each deck such that no part of the corridor is more than 20 m from a manually operated call point.

8 Fire patrols in passenger ships

8.1 Fire patrols

For ships carrying more than 36 passengers an efficient patrol system shall be maintained so that an outbreak of fire may be promptly detected. Each member of the fire patrol shall be trained to be familiar with the arrangements of the ship as well as the location and operation of any equipment he may be called upon to use.

8.2 Inspection hatches

The construction of ceiling and bulkheads shall be such that it will be possible, without impairing the efficiency of the fire protection, for the fire patrols to detect any smoke originating in concealed and inaccessible places, except where in the opinion of the Administration there is no risk of fire originating in such places.

8.3 Two-way portable radiotelephone apparatus

Each member of the fire patrol shall be provided with a two-way portable radiotelephone apparatus.

9 Fire alarm signalling systems in passenger ships

9.1 Passenger ships shall at all times when at sea, or in port (except when out of service), be so manned or equipped as to ensure that any initial fire alarm is immediately received by a responsible member of the crew.

9.2 The control panel of fixed fire detection and fire alarm systems shall be designed on the fail-safe principle (e.g., an open detector circuit shall cause an alarm condition).

9.3 Passenger ships carrying more than 36 passengers shall have the fire detection alarms for the systems required by paragraph 5.2 centralized in a continuously manned central control station. In addition, controls for remote closing of the fire doors and shutting down the ventilation fans shall be centralized in the same location. The ventilation fans shall be capable of reactivation by the crew at the continuously manned control station. The control panels in the central control station shall be capable of indicating open or closed positions of fire doors and closed or off status of the detectors, alarms and fans. The control panel shall be continuously

powered and shall have an automatic change-over to standby power supply in case of loss of normal power supply. The control panel shall be powered from the main source of electrical power and the emergency source of electrical power defined by regulation II-1/42 unless other arrangements are permitted by the regulations, as applicable.

9.4 A special alarm, operated from the navigation bridge or fire control station, shall be fitted to summon the crew. This alarm may be part of the ship's general alarm system and shall be capable of being sounded independently of the alarm to the passenger spaces.

Regulation 8

Control of smoke spread

1 Purpose

The purpose of this regulation is to control the spread of smoke in order to minimize the hazards from smoke. For this purpose, means for controlling smoke in atriums, control stations, machinery spaces and concealed spaces shall be provided.

2 Protection of control stations outside machinery spaces

Practicable measures shall be taken for control stations outside machinery spaces in order to ensure that ventilation, visibility and freedom from smoke are maintained so that, in the event of fire, the machinery and equipment contained therein may be supervised and continue to function effectively. Alternative and separate means of air supply shall be provided and air inlets of the two sources of supply shall be so disposed that the risk of both inlets drawing in smoke simultaneously is minimized. At the discretion of the Administration, such requirements need not apply to control stations situated on, and opening on to, an open deck or where local closing arrangements would be equally effective.

3 Release of smoke from machinery spaces

3.1 The provisions of this paragraph shall apply to machinery spaces of category A and, where the Administration considers desirable, to other machinery spaces.

3.2 Suitable arrangements shall be made to permit the release of smoke, in the event of fire, from the space to be protected, subject to the provisions of regulation 9.5.2.1. The normal ventilation systems may be acceptable for this purpose.

3.3 Means of control shall be provided for permitting the release of smoke and such controls shall be located outside the space concerned so that they will not be cut off in the event of fire in the space they serve.

3.4 In passenger ships, the controls required by paragraph 3.3 shall be situated at one control position or grouped in as few positions as possible to the satisfaction of the Administration. Such positions shall have a safe access from the open deck.

4 Draught stops

Air spaces enclosed behind ceilings, panelling or linings shall be divided by close-fitting draught stops spaced not more than 14 m apart. In the vertical direction, such enclosed air spaces, including those behind linings of stairways, trunks, etc., shall be closed at each deck.

5 Smoke extraction systems in atriums of passenger ships

Atriums shall be equipped with a smoke extraction system. The smoke extraction system shall be activated by the required smoke detection system and be capable of manual control. The fans shall be sized such that the entire volume within space can be exhausted in 10 min or less.

Regulation 9

Containment of fire

1 Purpose

The purpose of this regulation is to contain a fire in the space of origin. For this purpose, the following functional requirements shall be met:

- .1 the ship shall be subdivided by thermal and structural boundaries;
- .2 thermal insulation of boundaries shall have due regard to the fire risk of the space and adjacent spaces; and
- .3 the fire integrity of the divisions shall be maintained at openings and penetrations.

2 Thermal and structural boundaries

2.1 Thermal and structural subdivision

Ships of all types shall be subdivided into spaces by thermal and structural divisions having regard to the fire risks of the space.

2.2 Passenger ships

2.2.1 Main vertical zones and horizontal zones

2.2.1.1.1 In ships carrying more than 36 passengers, the hull, superstructure and deckhouses shall be subdivided into main vertical zones by "A-60" class divisions. Steps and recesses shall be kept to a minimum, but where they are necessary they shall also be "A-60" class divisions. Where a category (5), (9) or (10) space defined in paragraph 2.2.3.2.2 is on one side or where fuel oil tanks are on both sides of the division the standard may be reduced to "A-0".

2.2.1.1.2 In ships carrying not more than 36 passengers, the hull, superstructure and deckhouses in way of accommodation and service spaces shall be subdivided into main vertical zones by "A" class divisions. These divisions shall have insulation values in accordance with tables in paragraph 2.2.4.

2.2.1.2 As far as practicable, the bulkheads forming the boundaries of the main vertical zones above the bulkhead deck shall be in line with watertight subdivision bulkheads situated immediately below the bulkhead deck. The length and width of main vertical zones may be extended to a maximum of 48 m in order to bring the ends of main vertical zones to coincide with watertight subdivision bulkheads or in order to accommodate a large public space extending for the whole length of the main vertical zone provided that the total area of the main vertical zone is not greater than 1,600 m² on any deck. The length or width of a main vertical zone is the maximum distance between the furthestmost points of the bulkheads bounding it.

2.2.1.3 Such bulkheads shall extend from deck to deck and to the shell or other boundaries.

2.2.1.4 Where a main vertical zone is subdivided by horizontal "A" class divisions into horizontal zones for the purpose of providing an appropriate barrier between a zone with sprinklers and a zone without sprinklers, the divisions shall extend between adjacent main vertical zone bulkheads and to the shell or exterior boundaries of the ship and shall be insulated in accordance with the fire insulation and integrity values given in table 9.4.

2.2.1.5.1 On ships designed for special purposes, such as automobile or railroad car ferries, where the provision of main vertical zone bulkheads would defeat the purpose for which the ship is intended, equivalent means for controlling and limiting a fire shall be substituted and specifically approved by the Administration. Service spaces and ship stores shall not be located on ro-ro decks unless protected in accordance with the applicable regulations.

2.2.1.5.2 However, in a ship with special category spaces, such spaces shall comply with the applicable provisions of regulation 20 and where such compliance would be inconsistent with other requirements for passenger ships specified in this chapter, the requirements of regulation 20 shall prevail.

2.2.2 *Bulkheads within a main vertical zone*

2.2.2.1 For ships carrying more than 36 passengers, bulkheads which are not required to be "A" class divisions shall be at least "B" class or "C" class divisions as prescribed in the tables in paragraph 2.2.3.

2.2.2.2 For ships carrying not more than 36 passengers, bulkheads within accommodation and service spaces which are not required to be "A" class divisions shall be at least "B" class or "C" class divisions as prescribed in the tables in paragraph 2.2.4. In addition, corridor bulkheads, where not required to be "A" class, shall be "B" class divisions which shall extend from deck to deck except:

- .1 when continuous "B" class ceilings or linings are fitted on both sides of the bulkhead, the portion of the bulkhead behind the continuous ceiling or lining shall be of material which, in thickness and composition, is acceptable in the construction of "B" class divisions, but which shall be required to meet "B" class integrity standards only in so far as is reasonable and practicable in the opinion of the Administration; and
- .2 in the case of a ship protected by an automatic sprinkler system complying with the provisions of the Fire Safety Systems Code, the corridor bulkheads may terminate at a ceiling in the corridor provided such bulkheads and ceilings are of "B" class standard in compliance with paragraph 2.2.4. All doors and frames in such bulkheads shall be of non-combustible materials and shall have the same fire integrity as the bulkhead in which they are fitted.

2.2.2.3 Bulkheads required to be "B" class divisions, except corridor bulkheads as prescribed in paragraph 2.2.2.2, shall extend from deck to deck and to the shell or other boundaries. However, where a continuous "B" class ceiling or lining is fitted on both sides of a bulkhead which is at least of the same fire resistance as the adjoining bulkhead, the bulkhead may terminate at the continuous ceiling or lining.

2.2.3 *Fire integrity of bulkheads and decks in ships carrying more than 36 passengers*

2.2.3.1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks of passenger ships, the minimum fire integrity of all bulkheads and decks shall be as prescribed in tables 9.1 and 9.2. Where, due to any particular structural arrangements in the ship, difficulty is experienced in determining from the tables the minimum fire integrity value of any divisions, such values shall be determined to the satisfaction of the Administration.

2.2.3.2 The following requirements shall govern application of the tables:

- .1 Table 9.1 shall apply to bulkheads not bounding either main vertical zones or horizontal zones. Table 9.2 shall apply to decks not forming steps in main vertical zones nor bounding horizontal zones.
- .2 For determining the appropriate fire integrity standards to be applied to boundaries between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (14) below. Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this regulation, or where it is possible to assign two or more classifications to a space, it shall be treated as a space within the relevant category having the most stringent boundary requirements. Smaller, enclosed rooms within a space that have less than 30% communicating openings to that space are considered separate spaces. The fire integrity of the boundary bulkheads and decks of such smaller rooms shall be as prescribed in tables 9.1 and 9.2. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

(1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.
Spaces containing the ship's radio equipment.
Fire control stations.
Control room for propulsion machinery when located outside the propulsion machinery space.
Spaces containing centralized fire alarm equipment.
Spaces containing centralized emergency public address system stations and equipment.

(2) *Stairways*

Interior stairways, lifts, totally enclosed emergency escape trunks, and escalators (other than those wholly contained within the machinery spaces) for passengers and crew and enclosures thereto.
In this connection a stairway which is enclosed at only one level shall be regarded as part of the space from which it is not separated by a fire door.

(3) *Corridors*

Passenger and crew corridors and lobbies.

(4) *Evacuation stations and external escape routes*

Survival craft stowage area.

Open deck spaces and enclosed promenades forming lifeboat and liferaft embarkation and lowering stations.

Assembly stations, internal and external.

External stairs and open decks used for escape routes.

The ship's side to the waterline in the lightest seagoing condition, superstructure and deckhouse sides situated below and adjacent to the liferaft and evacuation slide embarkation areas.

(5) *Open deck spaces*

Open deck spaces and enclosed promenades clear of lifeboat and liferaft embarkation and lowering stations. To be considered in this category, enclosed promenades shall have no significant fire risk, meaning that furnishings shall be restricted to deck furniture. In addition, such spaces shall be naturally ventilated by permanent openings.

Air spaces (the space outside superstructures and deckhouses).

(6) *Accommodation spaces of minor fire risk*

Cabins containing furniture and furnishings of restricted fire risk.

Offices and dispensaries containing furniture and furnishings of restricted fire risk.

Public spaces containing furniture and furnishings of restricted fire risk and having a deck area of less than 50 m².

(7) *Accommodation spaces of moderate fire risk*

Spaces as in category (6) above but containing furniture and furnishings of other than restricted fire risk.

Public spaces containing furniture and furnishings of restricted fire risk and having a deck area of 50 m² or more.

Isolated lockers and small store-rooms in accommodation spaces having areas less than 4 m² (in which flammable liquids are not stowed).

Sale shops. Motion picture projection and film stowage rooms. Diet kitchens (containing no open flame).

Cleaning gear lockers (in which flammable liquids are not stowed).

Laboratories (in which flammable liquids are not stowed).

Pharmacies.

Small drying rooms (having a deck area of 4 m² or less).

Specie rooms.

Operating rooms.

(8) *Accommodation spaces of greater fire risk*

Public spaces containing furniture and furnishings of other than restricted fire risk and having a deck area of 50 m² or more.

Barber shops and beauty parlours.

Saunas.

(9) *Sanitary and similar spaces*

Communal sanitary facilities, showers, baths, water closets, etc.

Small laundry rooms.

Indoor swimming pool area.

Isolated pantries containing no cooking appliances in accommodation spaces.

Private sanitary facilities shall be considered a portion of the space in which they are located.

(10) *Tanks, voids and auxiliary machinery spaces having little or no fire risk*

Water tanks forming part of the ship's structure.

Voids and cofferdams.

Auxiliary machinery spaces which do not contain machinery having a pressure lubrication system and where storage of combustibles is prohibited, such as:

ventilation and air-conditioning rooms;

windlass room;

steering gear room;

stabilizer equipment room;

electrical propulsion motor room;

rooms containing section switchboards and purely electrical equipment other than oil-filled electrical transformers (above 10 kVA);

shaft alleys and pipe tunnels; and

spaces for pumps and refrigeration machinery (not handling or using flammable liquids).

Closed trunks serving the spaces listed above.

Other closed trunks such as pipe and cable trunks.

(11) *Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk*

Cargo oil tanks.

Cargo holds, trunkways and hatchways.

Refrigerated chambers.

Oil fuel tanks (where installed in a separate space with no machinery).

Shaft alleys and pipe tunnels allowing storage of combustibles.

Auxiliary machinery spaces as in category (10) which contain machinery having a pressure lubrication system or where storage of combustibles is permitted.

Oil fuel filling stations.

Spaces containing oil-filled electrical transformers (above 10 kVA).

Spaces containing turbine and reciprocating steam engine driven auxiliary generators and small internal combustion engines of power output up to 110 kW driving generators, sprinkler, drencher or fire pumps, bilge pumps, etc.

Closed trunks serving the spaces listed above.

(12) *Machinery spaces and main galleys*

Main propulsion machinery rooms (other than electric propulsion motor rooms) and boiler rooms.

Auxiliary machinery spaces other than those in categories (10) and (11) which contain internal combustion machinery or other oil-burning, heating or pumping units.

Main galleys and annexes.

Trunks and casings to the spaces listed above.

(13) *Store-rooms, workshops, pantries, etc.*

Main pantries not annexed to galleys.

Main laundry.

Large drying rooms (having a deck area of more than 4 m²).

Miscellaneous stores.

Mail and baggage rooms.

Garbage rooms.

Workshops (not part of machinery spaces, galleys, etc.).

Lockers and store-rooms having areas greater than 4 m², other than those spaces that have provisions for the storage of flammable liquids.

(14) *Other spaces in which flammable liquids are stowed*

Paint lockers.

Store-rooms containing flammable liquids (including dyes, medicines, etc.).

Laboratories (in which flammable liquids are stowed);

- .3 Where a single value is shown for the fire integrity of a boundary between two spaces, that value shall apply in all cases.
- .4 Notwithstanding the provisions of paragraph 2.2.2, there are no special requirements for material or integrity of boundaries where only a dash appears in the tables.
- .5 The Administration shall determine in respect of category (5) spaces whether the insulation values in table 9.1 shall apply to ends of deckhouses and superstructures, and whether the insulation values in table 9.2 shall apply to weather decks. In no case shall the requirements of category (5) of tables 9.1 or 9.2 necessitate enclosure of spaces which in the opinion of the Administration need not be enclosed.

Table 9.1 – Bulkheads not bounding either main vertical zones or horizontal zones

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations (1)	B-0 ^a	A-0	A-0	A-0	A-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60
Stairways (2)		A-0 ^a	A-0	A-0	A-0	A-0	A-15	A-15	A-0 ^c	A-0	A-15	A-30	A-15	A-30
Corridors (3)			B-15	A-60	A-0	B-15	B-15	B-15	B-15	A-0	A-15	A-30	A-0	A-30
Evacuation stations and external escape routes (4)					A-0	A-60 ^{b,d}	A-60 ^{b,d}	A-60 ^{b,d}	A-0 ^d	A-0	A-60 ^b	A-60 ^b	A-60 ^b	A-60 ^b
Open deck spaces (5)						A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of minor fire risk (6)						B-0	B-0	B-0	C	A-0	A-0	A-30	A-0	A-30
Accommodation spaces of moderate fire risk (7)							B-0	B-0	C	A-0	A-15	A-60	A-15	A-60
Accommodation spaces of greater fire risk (8)							B-0	C	A-0	A-30	A-60	A-15	A-60	
Sanitary and similar spaces (9)								C	A-0	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk (10)										A-0 ^a	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk (11)											A-0 ^a	A-0	A-0	A-15
Machinery spaces and main galleys (12)												A-0 ^a	A-0	A-60
Store-rooms, workshops, pantries, etc. (13)													A-0 ^a	A-0
Other spaces in which flammable liquids are stowed (14)														A-30

See notes following table 9.2.

Notes: To be applied to tables 9.1 and 9.2.

- a Where adjacent spaces are in the same numerical category and superscript "a" appears, a bulkhead or deck between such spaces need not be fitted if deemed unnecessary by the Administration. For example, in category (12) a bulkhead need not be required between a galley and its annexed pantries provided the pantry bulkhead and decks maintain the integrity of the galley boundaries. A bulkhead is, however, required between a galley and machinery space even though both spaces are in category (12).
 - b The ship's side, to the waterline in the lightest seagoing condition, superstructure and deckhouse sides situated below and adjacent to liferafts and evacuation slides may be reduced to "A-30".
 - c Where public toilets are installed completely within the stairway enclosure, the public toilet bulkhead within the stairway enclosure can be of "B" class integrity.
 - d Where spaces of categories (6), (7), (8) and (9) are located completely within the outer perimeter of the assembly station, the bulkheads of these spaces are allowed to be of "B-0" class integrity. Control positions for audio, video and light installations may be considered as part of the assembly station.
-

2.2.3.3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing wholly or in part, to the required insulation and integrity of a division.

2.2.3.4 *Construction and arrangement of saunas*

2.2.3.4.1 The perimeter of the sauna shall be of "A" class boundaries and may include changing rooms, showers and toilets. The sauna shall be insulated to "A-60" standard against other spaces except those inside of the perimeter and spaces of categories (5), (9) and (10).

2.2.3.4.2 Bathrooms with direct access to saunas may be considered as part of them. In such cases, the door between sauna and the bathroom need not comply with fire safety requirements.

2.2.3.4.3 The traditional wooden lining on the bulkheads and ceiling are permitted in the sauna. The ceiling above the oven shall be lined with a non-combustible plate with an air gap of at least 30 mm. The distance from the hot surfaces to combustible materials shall be at least 500 mm or the combustible materials shall be protected (e.g., non-combustible plate with an air gap of at least 30 mm).

2.2.3.4.4 The traditional wooden benches are permitted to be used in the sauna.

2.2.3.4.5 The sauna door shall open outwards by pushing.

2.2.3.4.6 Electrically heated ovens shall be provided with a timer.

2.2.4 *Fire integrity of bulkheads and decks in ships carrying not more than 36 passengers*

2.2.4.1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks of passenger ships, the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 9.3 and 9.4.

2.2.4.2 The following requirements govern application of the tables:

- .1 Tables 9.3 and 9.4 shall apply respectively to the bulkheads and decks separating adjacent spaces.
- .2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) below. Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this regulation, or where it is possible to assign two or more classifications to a space, it shall be treated as a space within the relevant category having the most stringent boundary requirements. Smaller, enclosed rooms within a space that have less than 30% communicating openings to that space are considered separate spaces. The fire integrity of the boundary bulkheads and decks of such smaller rooms shall be as prescribed in tables 9.3 and 9.4. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

(1) *Control stations*

Spaces containing emergency sources of power and lighting.

Wheelhouse and chartroom.

Spaces containing the ship's radio equipment.

Fire control stations.

Control room for propulsion machinery when located outside the machinery space.

Spaces containing centralized fire alarm equipment.

(2) *Corridors*

Passenger and crew corridors and lobbies.

(3) *Accommodation spaces*

Spaces as defined in regulation 3.1 excluding corridors.

(4) *Stairways*

Interior stairways, lifts, totally enclosed emergency escape trunks, and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connection, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(5) *Service spaces (low risk)*

Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m² and drying rooms and laundries.

(6) *Machinery spaces of category A*

Spaces as defined in regulation 3.31.

(7) *Other machinery spaces*

Electrical equipment rooms (auto-telephone exchange, air-conditioning duct spaces).

Spaces as defined in regulation 3.30 excluding machinery spaces of category A.

(8) *Cargo spaces*

All spaces used for cargo (including cargo oil tanks) and trunkways and hatchways to such spaces, other than special category spaces.

(9) *Service spaces (high risk)*

Galleys, pantries containing cooking appliances, paint lockers, lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids, saunas and workshops other than those forming part of the machinery spaces.

(10) *Open decks*

Open deck spaces and enclosed promenades having little or no fire risk. Enclosed promenades shall have no significant fire risk, meaning that furnishing shall be restricted to deck furniture. In addition, such spaces shall be naturally ventilated by permanent openings. Air spaces (the space outside superstructures and deckhouses).

(11) *Special category and ro-ro spaces*

Spaces as defined in regulations 3.41 and 3.46.

.3 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is not protected by an automatic sprinkler system complying with the provisions of the Fire Safety Systems Code or between such zones neither of which is so protected, the higher of the two values given in the tables shall apply.

.4 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is protected by an automatic sprinkler system complying with the provisions of the Fire Safety Systems Code or between such zones both of which are so protected, the lesser of the two values given in the tables shall apply. Where a zone with sprinklers and a zone without sprinklers meet within accommodation and service spaces, the higher of the two values given in the tables shall apply to the division between the zones.

2.2.4.3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

2.2.4.4 External boundaries which are required in regulation 11.2 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there

is no requirement for such boundaries of passenger ships to have "A" class integrity. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be constructed of materials which are to the satisfaction of the Administration.

2.2.4.5 Saunas shall comply with paragraph 2.2.3.4.

Table 9.3 – Fire integrity of bulkheads separating adjacent spaces

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0 ^c	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*	A-60
Corridors (2)		C ^e	B-0 ^e	A-0 ^a B-0 ^e	B-0 ^e	A-60	A-0	A-0	A-15 A-0 ^d	*	A-15
Accommodation spaces (3)			C ^e	A-0 ^a B-0 ^e	B-0 ^e	A-60	A-0	A-0	A-15 A-0 ^d	*	A-30 A-0 ^d
Stairways (4)				A-0 ^a B-0 ^e	A-0 ^a B-0 ^e	A-60	A-0	A-0	A-15 A-0 ^d	*	A-15
Service spaces (low risk) (5)					C ^e	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A (6)						*	A-0	A-0	A-60	*	A-60
Other machinery spaces (7)							A-0 ^b	A-0	A-0	*	A-0
Cargo spaces (8)								*	A-0	*	A-0
Service spaces (high risk) (9)									A-0 ^b	*	A-30
Open decks (10)											A-0
Special category and ro-ro spaces (11)											A-0

Table 9.4 – Fire integrity of decks separating adjacent spaces

Space below ↓ Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*	A-30
Corridors (2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Accommodation spaces (3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30 A-0 ^d
Stairways (4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*	A-0
Service spaces (low risk) (5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A (6)	A-60	A-60	A-60	A-60	A-60	*	A-60 ^f	A-30	A-60	*	A-60
Other machinery spaces (7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*	A-0
Cargo spaces (8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*	A-0
Service spaces (high risk) (9)	A-60	A-30 A-0 ^d	A-30 A-0 ^d	A-30 A-0 ^d	A-0	A-60	A-0	A-0	A-0	*	A-30
Open decks (10)	*	*	*	*	*	*	*	*	*	-	A-0
Special category and ro-ro spaces (11)	A-60	A-15	A-30 A-0 ^d	A-15	A-0	A-30	A-0	A-0	A-30	A-0	A-0

Notes: To be applied to both tables 9.3 and 9.4 as appropriate.

- a For clarification as to which applies, see paragraphs 2.2.2 and 2.2.5.
 - b Where spaces are of the same numerical category and superscript b appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose (e.g., in category (9)). A galley next to a galley does not require a bulkhead, but a galley next to a paint room requires an "A-0" bulkhead.
 - c Bulkhead separating the wheelhouse and chartroom from each other may have a "B-0" rating.
 - d See paragraphs 2.2.4.2.3 and 2.2.4.2.4.
 - e For the application of paragraph 2.2.1.1.2, "B-0" and "C", where appearing in table 9.3, shall be read as "A-0".
 - f Fire insulation need not be fitted if the machinery space in category (7), in the opinion of the Administration, has little or no fire risk.
-

* Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material, but is not required to be of "A" class standard. However, where a deck, except in a category (10) space, is penetrated for the passage of electric cables, pipes and vent ducts, such penetrations shall be made tight to prevent the passage of flame and smoke. Divisions between control stations (emergency generators) and open decks may have air intake openings without means for closure, unless a fixed gas fire-extinguishing system is fitted.

For the application of paragraph 2.2.1.1.2, an asterisk, where appearing in table 9.4, except for categories (8) and (10), shall be read as "A-0".

2.2.5 Protection of stairways and lifts in accommodation area

2.2.5.1 Stairways shall be within enclosures formed of "A" class divisions, with positive means of closure at all openings, except that:

- .1 a stairway connecting only two decks need not be enclosed, provided the integrity of the deck is maintained by proper bulkheads or self-closing doors in one 'tween-deck space. When a stairway is closed in one 'tween-deck space, the stairway enclosure shall be protected in accordance with the tables for decks in paragraphs 2.2.3 or 2.2.4; and
- .2 stairways may be fitted in the open in a public space, provided they lie wholly within the public space.

2.2.5.2 Lift trunks shall be so fitted as to prevent the passage of smoke and flame from one 'tween-deck to another and shall be provided with means of closing so as to permit the control of draught and smoke. Machinery for lifts located within stairway enclosures shall be arranged in a separate room, surrounded by steel boundaries, except that small passages for lift cables are permitted. Lifts which open into spaces other than corridors, public spaces, special category spaces, stairways and external areas shall not open into stairways included in the means of escape.

2.3 *Cargo ships except tankers*

2.3.1 *Methods of protection in accommodation area*

2.3.1.1 One of the following methods of protection shall be adopted in accommodation and service spaces and control stations:

.1 **Method IC**

The construction of internal divisional bulkheads of non-combustible "B" or "C" class divisions generally without the installation of an automatic sprinkler, fire detection and fire alarm system in the accommodation and service spaces, except as required by regulation 7.5.5.1; or

.2 **Method IIC**

The fitting of an automatic sprinkler, fire detection and fire alarm system as required by regulation 7.5.5.2 for the detection and extinction of fire in all spaces in which fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheads; or

.3 **Method IIIC**

The fitting of a fixed fire detection and fire alarm system as required by regulation 7.5.5.3, in spaces in which a fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheads, except that in no case shall the area of any accommodation space or spaces bounded by an "A" or "B" class division exceed 50 m². However, consideration may be given by the Administration to increasing this area for public spaces.

2.3.1.2 The requirements for the use of non-combustible materials in the construction and insulation of boundary bulkheads of machinery spaces, control stations, service spaces, etc., and the protection of the above stairway enclosures and corridors will be common to all three methods outlined in paragraph 2.3.1.1.

2.3.2 *Bulkheads within accommodation area*

2.3.2.1 Bulkheads required to be "B" class divisions shall extend from deck to deck and to the shell or other boundaries. However, where a continuous "B" class ceiling or lining is fitted on both sides of the bulkhead, the bulkhead may terminate at the continuous ceiling or lining.

2.3.2.2 Method IC

Bulkheads not required by this or other regulations for cargo ships to be "A" or "B" class divisions, shall be of at least "C" class construction.

2.3.2.3 Method IIC

There shall be no restriction on the construction of bulkheads not required by this or other regulations for cargo ships to be "A" or "B" class divisions except in individual cases where "C" class bulkheads are required in accordance with table 9.5.

2.3.2.4 Method IIIC

There shall be no restriction on the construction of bulkheads not required for cargo ships to be "A" or "B" class divisions except that the area of any accommodation space or spaces bounded by a continuous "A" or "B" class division shall in no case exceed 50 m², except in individual cases where "C" class bulkheads are required in accordance with table 9.5. However, consideration may be given by the Administration to increasing this area for public spaces.

2.3.3 *Fire integrity of bulkheads and decks*

2.3.3.1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks of cargo ships, the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 9.5 and 9.6.

2.3.3.2 The following requirements shall govern application of the tables:

- .1 Tables 9.5 and 9.6 shall apply respectively to the bulkheads and decks separating adjacent spaces.
- .2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) below. Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this regulation, or where it is possible to assign two or more classifications to a space, it shall be treated as a space within the relevant category having the most stringent boundary requirements. Smaller, enclosed rooms within a space that have less than 30% communicating openings to that space are considered separate spaces. The fire integrity of the boundary bulkheads and decks of such smaller rooms shall be as prescribed in tables 9.5 and 9.6. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.
 - (1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.
Spaces containing the ship's radio equipment.
Fire control stations.
Control room for propulsion machinery when located outside the machinery space.
Spaces containing centralized fire alarm equipment.
 - (2) *Corridors*

Corridors and lobbies.
 - (3) *Accommodation spaces*

Spaces as defined in regulation 3.1, excluding corridors.

(4) *Stairways*

Interior stairway, lifts, totally enclosed emergency escape trunks, and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connection, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(5) *Service spaces (low risk)*

Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m² and drying rooms and laundries.

(6) *Machinery spaces of category A*

Spaces as defined in regulation 3.31.

(7) *Other machinery spaces*

Electrical equipment rooms (auto-telephone exchange, air-conditioning duct spaces).

Spaces as defined in regulation 3.30, excluding machinery spaces of category A.

(8) *Cargo spaces*

All spaces used for cargo (including cargo oil tanks) and trunkways and hatchways to such spaces.

(9) *Service spaces (high risk)*

Galleys, pantries containing cooking appliances, saunas, paint lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces.

(10) *Open decks*

Open deck spaces and enclosed promenades having little or no fire risk. To be considered in this category, enclosed promenades shall have no significant fire risk, meaning that furnishings shall be restricted to deck furniture. In addition, such spaces shall be naturally ventilated by permanent openings.

Air spaces (the space outside superstructures and deckhouses).

(11) *Ro-ro and vehicle spaces*

Ro-ro spaces as defined in regulation 3.41.

Vehicle spaces as defined in regulation 3.49.

Table 9.5 – Fire integrity of bulkheads separating adjacent spaces

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0 ^e	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*	A-60
Corridors (2)		C	B-0	B-0 A-0 ^c	B-0	A-60	A-0	A-0	A-0	*	A-30
Accommodation spaces (3)			C ^{a, b}	B-0 A-0 ^c	B-0	A-60	A-0	A-0	A-0	*	A-30
Stairways (4)				B-0 A-0 ^c	B-0 A-0 ^c	A-60	A-0	A-0	A-0	*	A-30
Service spaces (low risk) (5)					C	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A (6)						*	A-0	A-0 ^g	A-60	*	A-60 ^f
Other machinery spaces (7)							A-0 ^d	A-0	A-0	*	A-0
Cargo spaces (8)								*	A-0	*	A-0
Service spaces (high risk) (9)									A-0 ^d	*	A-30
Open decks (10)										-	A-0
Ro-ro and vehicle spaces (11)											* ^h

Table 9.6 – Fire integrity of decks separating adjacent spaces

Space below ↓ Space → above	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*	A-60
Corridors (2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30
Accommodation spaces (3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30
Stairways (4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*	A-30
Service spaces (low risk) (5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A (6)	A-60	A-60	A-60	A-60	A-60	*	A-60 ⁱ	A-30	A-60	*	A-60
Other machinery spaces (7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*	A-0
Cargo spaces (8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*	A-0
Service spaces (high risk) (9)	A-60	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0 ^d	*	A-30
Open decks (10)	*	*	*	*	*	*	*	*	*	-	*
Ro-ro and vehicle spaces (11)	A-60	A-30	A-30	A-30	A-0	A-60	A-0	A-0	A-30	*	* ^h

Notes: To be applied to tables 9.5 and 9.6 as appropriate.

- a No special requirements are imposed upon bulkheads in methods IIC and IIIC fire protection.
 - b In case of method IIIC, "B" class bulkheads of "B-0" rating shall be provided between spaces or groups of spaces of 50 m² and over in area.
 - c For clarification as to which applies, see paragraphs 2.3.2 and 2.3.4.
 - d Where spaces are of the same numerical category and superscript d appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose (e.g., in category (9)). A galley next to a galley does not require a bulkhead, but a galley next to a paint room requires an "A-0" bulkhead.
 - e Bulkheads separating the wheelhouse, chartroom and radio room from each other may have a "B-0" rating.
 - f An "A-0" rating may be used if no dangerous goods are intended to be carried or if such goods are stowed not less than 3 m horizontally from such a bulkhead.
 - g For cargo spaces in which dangerous goods are intended to be carried, regulation 19.3.8 applies.
 - h Bulkheads and decks separating ro-ro spaces shall be capable of being closed reasonably gastight and such divisions shall have "A" class integrity in so far as reasonable and practicable, if in the opinion of the Administration it has little or no fire risk.
 - i Fire insulation need not be fitted in the machinery space in category (7) if, in the opinion of the Administration, it has little or no fire risk.
-

* Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material but is not required to be of "A" class standard. However, where a deck, except an open deck, is penetrated for the passage of electric cables, pipes and vent ducts, such penetrations shall be made tight to prevent the passage of flame and smoke. Divisions between control stations (emergency generators) and open decks may have air intake openings without means for closure, unless a fixed gas fire-extinguishing system is fitted.

2.3.3.3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

2.3.3.4 External boundaries which are required in regulation 11.2 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries of cargo ships to have "A" class integrity. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be constructed of materials which are to the satisfaction of the Administration.

2.3.3.5 Saunas shall comply with paragraph 2.2.3.4.

2.3.4 *Protection of stairways and lift trunks in accommodation spaces, service spaces and control stations*

2.3.4.1 Stairways which penetrate only a single deck shall be protected, at a minimum, at one level by at least "B-0" class divisions and self-closing doors. Lifts which penetrate only a single deck shall be surrounded by "A-0" class divisions with steel doors at both levels. Stairways and lift trunks which penetrate more than a single deck shall be surrounded by at least "A-0" class divisions and be protected by self-closing doors at all levels.

2.3.4.2 On ships having accommodation for 12 persons or less, where stairways penetrate more than a single deck and where there are at least two escape routes direct to the open deck at every accommodation level, the "A-0" requirements of paragraph 2.3.4.1 may be reduced to "B-0".

2.4 *Tankers*

2.4.1 *Application*

For tankers, only method IC as defined in paragraph 2.3.1.1 shall be used.

2.4.2 *Fire integrity of bulkheads and decks*

2.4.2.1 In lieu of paragraph 2.3 and in addition to complying with the specific provisions for fire integrity of bulkheads and decks of tankers, the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 9.7 and 9.8.

2.4.2.2 The following requirements shall govern application of the tables:

- .1 Tables 9.7 and 9.8 shall apply respectively to the bulkhead and decks separating adjacent spaces.
- .2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (10) below. Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this regulation, or where it is possible to assign two or more classifications to a space, it shall be treated as a space within the relevant category having the most stringent boundary requirements. Smaller, enclosed areas within a space that have less than 30% communicating openings to that space are considered separate areas. The fire integrity of the boundary bulkheads and decks of such smaller spaces shall be as prescribed in tables 9.7 and 9.8. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

(1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.
Spaces containing the ship's radio equipment.
Fire control stations.
Control room for propulsion machinery when located outside the machinery space.
Spaces containing centralized fire alarm equipment.

(2) *Corridors*

Corridors and lobbies.

(3) *Accommodation spaces*

Spaces as defined in regulation 3.1, excluding corridors.

(4) *Stairways*

Interior stairways, lifts, totally enclosed emergency escape trunks, and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connection, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(5) *Service spaces (low risk)*

Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m² and drying rooms and laundries.

(6) *Machinery spaces of category A*

Spaces as defined in regulation 3.31.

(7) *Other machinery spaces*

Electrical equipment rooms (auto-telephone exchange and air-conditioning duct spaces).

Spaces as defined in regulation 3.30, excluding machinery spaces of category A.

(8) *Cargo pump-rooms*

Spaces containing cargo pumps and entrances and trunks to such spaces.

(9) *Service spaces (high risk)*

Galleys, pantries containing cooking appliances, saunas, paint lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids and workshops other than those forming part of the machinery spaces.

(10) *Open decks*

Open deck spaces and enclosed promenades having little or no fire risk. To be considered in this category, enclosed promenades shall have no significant fire risk, meaning that furnishings shall be restricted to deck furniture. In addition, such spaces shall be naturally ventilated by permanent openings.

Air spaces (the space outside superstructures and deckhouses).

2.4.2.3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

2.4.2.4 External boundaries which are required in regulation 11.2 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there

Notes: To be applied to tables 9.7 and 9.8 as appropriate.

- a For clarification as to which applies, see paragraphs 2.3.2 and 2.3.4.
 - b Where spaces are of the same numerical category and superscript b appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose (e.g. in category (9)). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.
 - c Bulkheads separating the wheelhouse, chartroom and radio room from each other may have a "B-0" rating.
 - d Bulkheads and decks between cargo pump-rooms and machinery spaces of category A may be penetrated by cargo pump shaft glands and similar gland penetrations, provided that gastight seals with efficient lubrication or other means of ensuring the permanence of the gas seal are fitted in way of the bulkheads or deck.
 - e Fire insulation need not be fitted in the machinery space in category (7) if, in the opinion of the Administration, it has little or no fire risk.
-

* Where an asterisk appears in the table, the division is required to be of steel or other equivalent material, but is not required to be of "A" class standard. However, where a deck, except an open deck, is penetrated for the passage of electric cables, pipes and vent ducts, such penetrations shall be made tight to prevent the passage of flame and smoke. Divisions between control stations (emergency generators) and open decks may have air intake openings without means for closure, unless a fixed gas fire-extinguishing system is fitted.

3 Penetration in fire-resisting divisions and prevention of heat transmission

3.1 Where "A" class divisions are penetrated, such penetrations shall be tested in accordance with the Fire Test Procedures Code, subject to the provisions of paragraph 4.1.1.5. In the case of ventilation ducts, paragraphs 7.1.2 and 7.3.1 apply. However, where a pipe penetration is made of steel or equivalent material having a thickness of 3 mm or greater and a length of not less than 900 mm (preferably 450 mm on each side of the division), and no openings, testing is not required. Such penetrations shall be suitably insulated by extension of the insulation at the same level of the division.

3.2 Where "B" class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts, etc., or for the fitting of ventilation terminals, lighting fixtures and similar devices, arrangements shall be made to ensure that the fire resistance is not impaired, subject to the provisions of paragraph 7.3.2. Pipes other than steel or copper that penetrate "B" class divisions shall be protected by either:

- .1 a fire tested penetration device suitable for the fire resistance of the division pierced and the type of pipe used; or
- .2 a steel sleeve, having a thickness of not less than 1.8 mm and a length of not less than 900 mm for pipe diameters of 150 mm or more and not less than 600 mm for pipe diameters of less than 150 mm (preferably equally divided to each side of the division). The pipe shall be connected to the ends of the sleeve by flanges or couplings; or the clearance between the sleeve and the pipe shall not exceed 2.5 mm; or any clearance between pipe and sleeve shall be made tight by means of non-combustible or other suitable material.

3.3 Uninsulated metallic pipes penetrating "A" or "B" class divisions shall be of materials having a melting temperature which exceeds 950°C for "A-0" and 850°C for "B-0" class divisions.

3.4 In approving structural fire protection details, the Administration shall have regard to the risk of heat transmission at intersections and terminal points of required thermal barriers. The insulation of a deck or bulkhead shall be carried past the penetration, intersection or terminal point for a distance of at least 450 mm in the case of steel and aluminium structures. If a space is divided with a deck or a bulkhead of "A" class standard having insulation of different values, the insulation with the higher value shall continue on the deck or bulkhead with the insulation of the lesser value for a distance of at least 450 mm.

4 Protection of openings in fire-resisting divisions

4.1 Openings in bulkheads and decks in passenger ships

4.1.1 Openings in "A" class divisions

4.1.1.1 Except for hatches between cargo, special category, store, and baggage spaces, and between such spaces and the weather decks, openings shall be provided with permanently attached means of closing which shall be at least as effective for resisting fires as the divisions in which they are fitted.

4.1.1.2 The construction of doors and door frames in "A" class divisions, with the means of securing them when closed, shall provide resistance to fire as well as to the passage of smoke and flame equivalent to that of the bulkheads in which the doors are situated, this being determined in accordance with the Fire Test Procedures Code. Such doors and door frames shall be constructed of steel or other equivalent material. Watertight doors need not be insulated.

4.1.1.3 It shall be possible for each door to be opened and closed from each side of the bulkhead by one person only.

4.1.1.4 Fire doors in main vertical zone bulkheads, galley boundaries and stairway enclosures other than power-operated watertight doors and those which are normally locked, shall satisfy the following requirements:

- .1 the doors shall be self-closing and be capable of closing with an angle of inclination of up to 3.5° opposing closure;
- .2 the approximate time of closure for hinged fire doors shall be no more than 40 s and no less than 10 s from the beginning of their movement with the ship in upright position. The approximate uniform rate of closure for sliding doors shall be of no more than 0.2 m/s and no less than 0.1 m/s with the ship in upright position;
- .3 the doors, except those for emergency escape trunks, shall be capable of remote release from the continuously manned central control station, either simultaneously or in groups and shall be capable of release also individually from a position at both sides of the door. Release switches shall have an on-off function to prevent automatic resetting of the system;
- .4 hold-back hooks not subject to central control station release are prohibited;

- .5 a door closed remotely from the central control station shall be capable of being re-opened from both sides of the door by local control. After such local opening, the door shall automatically close again;
- .6 indication shall be provided at the fire door indicator panel in the continuously manned central control station whether each door is closed;
- .7 the release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system or central power supply;
- .8 local power accumulators for power-operated doors shall be provided in the immediate vicinity of the doors to enable the doors to be operated after disruption of the control system or central power supply at least ten times (fully opened and closed) using the local controls;
- .9 disruption of the control system or central power supply at one door shall not impair the safe functioning of the other doors;
- .10 remote-released sliding or power-operated doors shall be equipped with an alarm that sounds at least 5 s but no more than 10 s, after the door being released from the central control station and before the door begins to move and continues sounding until the door is completely closed;
- .11 a door designed to re-open upon contacting an object in its path shall re-open not more than 1 m from the point of contact;
- .12 double-leaf doors equipped with a latch necessary for their fire integrity shall have a latch that is automatically activated by the operation of the doors when released by the system;
- .13 doors giving direct access to special category spaces which are power-operated and automatically closed need not be equipped with the alarms and remote-release mechanisms required in paragraphs 4.1.1.4.3 and 4.1.1.4.10;
- .14 the components of the local control system shall be accessible for maintenance and adjusting;
- .15 power-operated doors shall be provided with a control system of an approved type which shall be able to operate in case of fire and be in accordance with the Fire Test Procedures Code. This system shall satisfy the following requirements:
 - .15.1 the control system shall be able to operate the door at the temperature of at least 200°C for at least 60 min, served by the power supply;
 - .15.2 the power supply for all other doors not subject to fire shall not be impaired; and
 - .15.3 at temperatures exceeding 200°C the control system shall be automatically isolated from the power supply and shall be capable of keeping the door closed up to at least 945°C.

4.1.1.5 In ships carrying not more than 36 passengers, where a space is protected by an automatic sprinkler fire detection and fire alarm system complying with the provisions the Fire Safety Systems Code or fitted with a continuous "B" class ceiling, openings in decks not forming steps in main vertical zones nor bounding horizontal zones shall be closed reasonably tight and such decks shall meet the "A" class integrity requirements in so far as is reasonable and practicable in the opinion of the Administration.

4.1.1.6 The requirements for "A" class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles, provided that there is no requirement for such boundaries to have "A" class integrity in paragraph 4.1.3.3. The requirements for "A" class integrity of the outer boundaries of the ship shall not apply to exterior doors, except for those in superstructures and deckhouses facing life-saving appliances, embarkation and external assembly station areas, external stairs and open decks used for escape routes. Stairway enclosure doors need not meet this requirement.

4.1.1.7 Except for watertight doors, weathertight doors (semi-watertight doors), doors leading to the open deck and doors which need to be reasonably gastight, all "A" class doors located in stairways, public spaces and main vertical zone bulkheads in escape routes shall be equipped with a self-closing hose port. The material, construction and fire resistance of the hose port shall be equivalent to the door into which it is fitted, and shall be a 150 mm square clear opening with the door closed and shall be inset into the lower edge of the door, opposite the door hinges or, in the case of sliding doors, nearest the opening.

4.1.1.8 Where it is necessary that a ventilation duct passes through a main vertical zone division, a fail-safe automatic closing fire damper shall be fitted adjacent to the division. The damper shall also be capable of being manually closed from each side of the division. The operating position shall be readily accessible and be marked in red light-reflecting colour. The duct between the division and the damper shall be of steel or other equivalent material and, if necessary, insulated to comply with the requirements of paragraph 3.1. The damper shall be fitted on at least one side of the division with a visible indicator showing whether the damper is in the open position.

4.1.2 *Openings in "B" class divisions*

4.1.2.1 Doors and door frames in "B" class divisions and means of securing them shall provide a method of closure which shall have resistance to fire equivalent to that of the divisions, this being determined in accordance with the Fire Test Procedure Code except that ventilation openings may be permitted in the lower portion of such doors. Where such opening is in or under a door, the total net area of any such opening or openings shall not exceed 0.05 m². Alternatively, a non-combustible air balance duct routed between the cabin and the corridor, and located below the sanitary unit is permitted where the cross-sectional area of the duct does not exceed 0.05 m². All ventilation openings shall be fitted with a grill made of non-combustible material. Doors shall be non-combustible.

4.1.2.2 Cabin doors in "B" class divisions shall be of a self-closing type. Hold-back hooks are not permitted.

4.1.2.3 The requirements for "B" class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles. Similarly, the requirements for "B" class integrity shall not apply to exterior doors in superstructures and deckhouses. For ships carrying not more than 36 passengers, the Administration may permit the use of combustible materials in doors separating cabins from the individual interior sanitary spaces such as showers.

4.1.2.4 In ships carrying not more than 36 passengers, where an automatic sprinkler system complying with the provisions of the Fire Safety Systems Code is fitted:

- .1 openings in decks not forming steps in main vertical zones nor bounding horizontal zones shall be closed reasonably tight and such decks shall meet the "B" class integrity requirements in so far as is reasonable and practicable in the opinion of the Administration; and
- .2 openings in corridor bulkheads of "B" class materials shall be protected in accordance with the provisions of paragraph 2.2.2.

4.1.3 *Windows and sidescuttles*

4.1.3.1 Windows and sidescuttles in bulkheads within accommodation and service spaces and control stations other than those to which the provisions of paragraph 4.1.1.6 and of paragraph 4.1.2.3 apply, shall be so constructed as to preserve the integrity requirements of the type of bulkheads in which they are fitted, this being determined in accordance with the Fire Test Procedures Code.

4.1.3.2 Notwithstanding the requirements of tables 9.1 to 9.4, windows and sidescuttles in bulkheads separating accommodation and service spaces and control stations from weather shall be constructed with frames of steel or other suitable material. The glass shall be retained by a metal glazing bead or angle.

4.1.3.3 Windows facing life-saving appliances, embarkation and assembly stations, external stairs and open decks used for escape routes, and windows situated below liferaft and escape slide embarkation areas shall have fire integrity as required in table 9.1. Where automatic dedicated sprinkler heads are provided for windows, "A-0" windows may be accepted as equivalent. To be considered under this paragraph, the sprinkler heads shall either be:

- .1 dedicated heads located above the windows, and installed in addition to the conventional ceiling sprinklers; or
- .2 conventional ceiling sprinkler heads arranged such that the window is protected by an average application rate of at least 5 l/m^2 and the additional window area is included in the calculation of the area of coverage.

Windows located in the ship's side below the lifeboat embarkation area shall have fire integrity at least equal to "A-0" class.

4.2 *Doors in fire-resisting divisions in cargo ships*

4.2.1 The fire resistance of doors shall be equivalent to that of the division in which they are fitted, this being determined in accordance with the Fire Test Procedures Code. Doors and door frames in "A" class divisions shall be constructed of steel. Doors in "B" class divisions shall be non-combustible. Doors fitted in boundary bulkheads of machinery spaces of category A shall be reasonably gastight and self-closing. In ships constructed according to method IC, the Administration may permit the use of combustible materials in doors separating cabins from individual interior sanitary accommodation such as showers.

4.2.2 Doors required to be self-closing shall not be fitted with hold-back hooks. However, hold-back arrangements fitted with remote release devices of the fail-safe type may be utilized.

4.2.3 In corridor bulkheads, ventilation openings may be permitted in and under the doors of cabins and public spaces. Ventilation openings are also permitted in "B" class doors leading to lavatories, offices, pantries, lockers and store-rooms. Except as permitted below, the openings shall be provided only in the lower half of a door. Where such an opening is in or under a door, the total net area of any such opening or openings shall not exceed 0.05 m². Alternatively, a non-combustible air balance duct routed between the cabin and the corridor, and located below the sanitary unit is permitted where the cross-sectional area of the duct does not exceed 0.05 m². Ventilation openings, except those under the door, shall be fitted with a grill made of non-combustible material.

4.2.4 Watertight doors need not be insulated.

5 Protection of openings in machinery spaces boundaries

5.1 Application

5.1.1 The provision of this paragraph shall apply to machinery spaces of category A and, where the Administration considers it desirable, to other machinery spaces.

5.2 Protection of openings in machinery space boundaries

5.2.1 The number of skylights, doors, ventilators, openings in funnels to permit exhaust ventilation and other openings to machinery spaces shall be reduced to a minimum consistent with the needs of ventilation and the proper and safe working of the ship.

5.2.2 Skylights shall be of steel and shall not contain glass panels.

5.2.3 Means of control shall be provided for closing power-operated doors or actuating release mechanisms on doors other than power-operated watertight doors. The control shall be located outside the space concerned, where they will not be cut off in the event of fire in the space it serves.

5.2.4 In passenger ships, the means of control required in paragraph 5.2.3 shall be situated at one control position or grouped in as few positions as possible to the satisfaction of the Administration. Such positions shall have safe access from the open deck.

5.2.5 In passenger ships, doors, other than power-operated watertight doors, shall be so arranged that positive closure is assured in case of fire in the space by power-operated closing arrangements or by the provision of self-closing doors capable of closing against an inclination of 3.5° opposing closure, and having a fail-safe hold-back arrangement, provided with a remotely operated release device. Doors for emergency escape trunks need not be fitted with a fail-safe hold-back facility and a remotely operated release device.

5.2.6 Windows shall not be fitted in machinery space boundaries. However, this does not preclude the use of glass in control rooms within the machinery spaces.

6 Protection of cargo space boundaries

6.1 In passenger ships carrying more than 36 passengers, the boundary bulkheads and decks of special category and ro-ro spaces shall be insulated to "A-60" class standard. However, where a category (5), (9) and (10) space, as defined in paragraph 2.2.3, is on one side of the division the standard may be reduced to "A-0". Where fuel oil tanks are below a special category space, the integrity of the deck between such spaces may be reduced to "A-0" standard.

6.2 In passenger ships carrying not more than 36 passengers, the boundary bulkheads of special category spaces shall be insulated as required for category (11) spaces in table 9.3 and the horizontal boundaries as required for category (11) spaces in table 9.4.

6.3 In passenger ships carrying not more than 36 passengers the boundary bulkheads and decks of closed and open ro-ro spaces shall have a fire integrity as required for category (8) spaces in table 9.3 and the horizontal boundaries as required for category (8) spaces in table 9.4.

6.4 In passenger ships, indicators shall be provided on the navigation bridge which shall indicate when any fire door leading to or from the special category spaces is closed.

6.5 In tankers, for the protection of cargo tanks carrying crude oil and petroleum products having a flashpoint not exceeding 60°C, materials readily rendered ineffective by heat shall not be used for valves, fittings, tank opening covers, cargo vent piping, and cargo piping so as to prevent the spread of fire to the cargo.

7 Ventilation systems

7.1 Duct and dampers

7.1.1 Ventilation ducts shall be of non-combustible material. However, short ducts, not generally exceeding 2 m in length and with a free cross-sectional area not exceeding 0.02 m², need not be non-combustible subject to the following conditions:

- .1 the ducts are made of a material which has low flame-spread characteristics;
- .2 the ducts are only used at the end of the ventilation device; and
- .3 the ducts are not situated less than 600 mm, measured along the duct, from an opening in an "A" or "B" class division including continuous "B" class ceiling.

7.1.2 The following arrangements shall be tested in accordance with the Fire Test Procedures Code:

- .1 fire dampers, including their relevant means of operation; and
- .2 duct penetrations through "A" class divisions. However, the test is not required where steel sleeves are directly joined to ventilation ducts by means of riveted or screwed flanges or by welding.

7.2 Arrangement of ducts

7.2.1 The ventilation systems for machinery spaces of category A, vehicle spaces, ro-ro spaces, galleys, special category spaces and cargo spaces shall, in general, be separated from each other and from the ventilation systems serving other spaces. Except that the galley ventilation systems on cargo ships of less than 4,000 gross tonnage and in passenger ships carrying not more than 36 passengers, need not be completely separated, but may be served by separate ducts from a ventilation unit serving other spaces. In any case, an automatic fire damper shall be fitted in the galley ventilation duct near the ventilation unit. Ducts provided for the ventilation of machinery spaces of category A, galleys, vehicle spaces, ro-ro spaces or special category spaces shall not pass through accommodation spaces, service spaces or control stations unless they comply with the conditions specified in paragraphs 7.2.1.1.1 to 7.2.1.1.4 or 7.2.1.2.1 and 7.2.1.2.2 below:

- .1.1 the ducts are constructed of steel having a thickness of at least 3 mm and 5 mm for ducts the widths or diameters of which are up to and including 300 mm and 760 mm and over respectively and, in the case of such ducts, the widths or diameters of which are between 300 mm and 760 mm having a thickness obtained by interpolation;
- .1.2 the ducts are suitably supported and stiffened;
- .1.3 the ducts are fitted with automatic fire dampers close to the boundaries penetrated; and
- .1.4 the ducts are insulated to "A-60" class standard from the machinery spaces, galleys, vehicle spaces, ro-ro spaces or special category spaces to a point at least 5 m beyond each fire damper;

or

- .2.1 the ducts are constructed of steel in accordance with paragraphs 7.2.1.1.1 and 7.2.1.1.2; and
- .2.2 the ducts are insulated to "A-60" class standard throughout the accommodation spaces, service spaces or control stations;

except that penetrations of main zone divisions shall also comply with the requirements of paragraph 4.1.1.8.

7.2.2 Ducts provided for ventilation to accommodation spaces, service spaces or control stations shall not pass through machinery spaces of category A, galleys, vehicle spaces, ro-ro spaces or special category spaces unless they comply with the conditions specified in paragraphs 7.2.2.1.1 to 7.2.2.1.3 or 7.2.2.2.1 and 7.2.2.2.2 below:

- .1.1 the ducts where they pass through a machinery space of category A, galley, vehicle space, ro-ro space or special category space are constructed of steel in accordance with paragraphs 7.2.1.1.1 and 7.2.1.1.2;
- .1.2 automatic fire dampers are fitted close to the boundaries penetrated; and
- .1.3 the integrity of the machinery space, galley, vehicle space, ro-ro space or special category space boundaries is maintained at the penetrations;

or

- .2.1 the ducts where they pass through a machinery space of category A, galley, vehicle space, ro-ro space or special category space are constructed of steel in accordance with paragraphs 7.2.1.1.1 and 7.2.1.1.2; and
- .2.2 the ducts are insulated to "A-60" standard within the machinery space, galley, vehicle space, ro-ro space or special category space;

except that penetrations of main zone divisions shall also comply with the requirements of paragraph 4.1.1.8.

7.3 *Details of duct penetrations*

7.3.1 Where a thin plated duct with a free cross-sectional area equal to, or less than, 0.02 m² passes through "A" class bulkheads or decks, the opening shall be lined with a steel sheet sleeve having a thickness of at least 3 mm and a length of at least 200 mm, divided preferably into 100 mm on each side of the bulkhead or, in the case of the deck, wholly laid on the lower side of the decks pierced. Where ventilation ducts with a free cross-sectional area exceeding 0.02 m² pass through "A" class bulkheads or decks, the opening shall be lined with a steel sheet sleeve. However, where such ducts are of steel construction and pass through a deck or bulkhead, the ducts and sleeves shall comply with the following:

- .1 the sleeves shall have a thickness of at least 3 mm and a length of at least 900 mm. When passing through bulkheads, this length shall be divided preferably into 450 mm on each side of the bulkhead. These ducts, or sleeves lining such ducts, shall be provided with fire insulation. The insulation shall have at least the same fire integrity as the bulkhead or deck through which the duct passes; and
- .2 ducts with a free cross-sectional area exceeding 0.075 m² shall be fitted with fire dampers in addition to the requirements of paragraph 7.3.1.1. The fire damper shall operate automatically, but shall also be capable of being closed manually from both sides of the bulkhead or deck. The damper shall be provided with an indicator which shows whether the damper is open or closed. Fire dampers are not required, however, where ducts pass through spaces surrounded by "A" class divisions, without serving those spaces, provided those ducts have the same fire integrity as the divisions which they pierce. Fire dampers shall be easily accessible. Where they are placed behind ceilings or linings, these ceilings or linings shall be provided with an inspection door on which a plate reporting the identification number of the fire damper is provided. The fire damper identification number shall also be placed on any remote controls required.

7.3.2 Ventilation ducts with a free cross-sectional area exceeding 0.02 m² passing through "B" class bulkheads shall be lined with steel sheet sleeves of 900 mm in length divided preferably into 450 mm on each side of the bulkheads unless the duct is of steel for this length.

7.4 *Ventilation systems for passenger ships carrying more than 36 passengers*

7.4.1 The ventilation system of a passenger ship carrying more than 36 passengers shall be in compliance with the following additional requirements.

7.4.2 In general, the ventilation fans shall be so disposed that the ducts reaching the various spaces remain within the main vertical zone.

7.4.3 Where ventilation systems penetrate decks, precautions shall be taken, in addition to those relating to the fire integrity of the deck required by paragraphs 3.1 and 4.1.1.5, to reduce the likelihood of smoke and hot gases passing from one 'tween-deck space to another through the system. In addition to insulation requirements contained in paragraph 7.4, vertical ducts shall, if necessary, be insulated as required by the appropriate tables 9.1 and 9.2.

7.4.4 Except in cargo spaces, ventilation ducts shall be constructed of the following materials:

- .1 ducts not less than 0.075 m² in free cross-sectional area and all vertical ducts serving more than a single 'tween-deck space shall be constructed of steel or other equivalent material;
- .2 ducts less than 0.075 m² in free cross-sectional area other than the vertical ducts referred to in paragraph 7.4.4.1, shall be constructed of non-combustible materials. Where such ducts penetrate "A" or "B" class division due regard shall be given to ensuring the fire integrity of the division; and
- .3 short length of duct, not in general exceeding 0.02 m² in free cross-sectional area nor 2 m in length, need not be non-combustible provided that all of the following conditions are met:
 - .3.1 the duct is constructed of a material which has low flame-spread characteristics;
 - .3.2 the duct is used only at the terminal end of the ventilation system; and
 - .3.3 the duct is not located closer than 600 mm measured along its length to a penetration of an "A" or "B" class division, including continuous "B" class ceilings.

7.4.5 Stairway enclosures shall be ventilated and served by an independent fan and duct system which shall not serve any other spaces in the ventilation systems.

7.4.6 Exhaust ducts shall be provided with hatches for inspection and cleaning. The hatches shall be located near the fire dampers.

7.5 *Exhaust ducts from galley ranges*

7.5.1 *Requirements for passenger ships carrying more than 36 passengers*

Exhaust ducts from galley ranges shall meet the requirements of paragraphs 7.2.1.2.1 and 7.2.1.2.2 and shall be fitted with:

- .1 a grease trap readily removable for cleaning unless an alternative approved grease removal system is fitted;
- .2 a fire damper located in the lower end of the duct which is automatically and remotely operated and, in addition, a remotely operated fire damper located in the upper end of the duct;

- .3 a fixed means for extinguishing a fire within the duct;
- .4 remote-control arrangements for shutting off the exhaust fans and supply fans, for operating the fire dampers mentioned in paragraph 7.5.1.2 and for operating the fire-extinguishing system, which shall be placed in a position close to the entrance to the galley. Where a multi-branch system is installed, a remote means located with the above controls shall be provided to close all branches exhausting through the same main duct before an extinguishing medium is released into the system; and
- .5 suitably located hatches for inspection and cleaning.

7.5.2 Requirements for cargo ships and passenger ships carrying not more than 36 passenger ships

7.5.2.1 Where they pass through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be constructed of "A" class divisions. Each exhaust duct shall be fitted with:

- .1 a grease trap readily removable for cleaning;
- .2 a fire damper located in the lower end of the duct;
- .3 arrangements, operable from within the galley, for shutting off the exhaust fans; and
- .4 fixed means for extinguishing a fire within the duct.

Regulation 10

Fire fighting

1 Purpose

The purpose of this regulation is to suppress and swiftly extinguish a fire in the space of origin. For this purpose, the following functional requirements shall be met:

- .1 fixed fire-extinguishing systems shall be installed having due regard to the fire growth potential of the protected spaces; and
- .2 fire-extinguishing appliances shall be readily available.

2 Water supply systems

Ships shall be provided with fire pumps, fire mains, hydrants and hoses complying with the applicable requirements of this regulation.

2.1 *Fire mains and hydrants*

2.1.1 *General*

Materials readily rendered ineffective by heat shall not be used for fire mains and hydrants unless adequately protected. The pipes and hydrants shall be so placed that the fire hoses may be easily coupled to them. The arrangement of pipes and hydrants shall be such as to avoid the possibility of freezing. Suitable drainage provisions shall be provided for fire main piping. Isolation valves shall be installed for all open deck fire main branches used for purposes other than fire fighting. In ships where deck cargo may be carried, the positions of the hydrants shall be such that they are always readily accessible and the pipes shall be arranged as far as practicable to avoid risk of damage by such cargo.

2.1.2 *Ready availability of water supply*

The arrangements for the ready availability of water supply shall be:

- .1 in passenger ships:
 - .1.1 of 1,000 gross tonnage and upwards such that at least one effective jet of water is immediately available from any hydrant in an interior location and so as to ensure the continuation of the output of water by the automatic starting of one required fire pump;
 - .1.2 of less than 1,000 gross tonnage by automatic start of at least one fire pump or by remote starting from the navigation bridge of at least one fire pump. If the pump starts automatically or if the bottom valve cannot be opened from where the pump is remotely started, the bottom valve shall always be kept open; and
 - .1.3 if fitted with periodically unattended machinery spaces in accordance with regulation II-1/54, the Administration shall determine provisions for fixed water fire-extinguishing arrangement for such spaces equivalent to those required for normally attended machinery spaces;
- .2 in cargo ships:
 - .2.1 to the satisfaction of the Administration; and
 - .2.2 with a periodically unattended machinery space or when only one person is required on watch, there shall be immediate water delivery from the fire main system at a suitable pressure, either by remote starting of one of the main fire pumps with remote starting from the navigation bridge and fire control station, if any, or permanent pressurization of the fire main system by one of the main fire pumps, except that the Administration may waive this requirement for cargo ships of less than 1,600 gross tonnage if the fire pump starting arrangement in the machinery space is in an easily accessible position.

2.1.3 *Diameter of fire mains*

The diameter of the fire main and water service pipes shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously, except that in the case of cargo ships the diameter need only be sufficient for the discharge of 140 m³/h.

2.1.4 *Isolating valves and relief valves*

2.1.4.1 Isolating valves to separate the section of the fire main within the machinery space containing the main fire pump or pumps from the rest of the fire main shall be fitted in an easily accessible and tenable position outside the machinery spaces. The fire main shall be so arranged that when the isolating valves are shut all the hydrants on the ship, except those in the machinery space referred to above, can be supplied with water by another fire pump or an emergency fire pump. The emergency fire pump, its seawater inlet, and suction and delivery pipes and isolating valves shall be located outside the machinery space. If this arrangement cannot be made, the sea-chest may be fitted in the machinery space if the valve is remotely controlled from a position in the same compartment as the emergency fire pump and the suction pipe is as short as practicable. Short lengths of suction or discharge piping may penetrate the machinery space, provided they are enclosed in a substantial steel casing, or are insulated to "A-60" class standards. The pipes shall have substantial wall thickness, but in no case less than 11 mm, and shall be welded except for the flanged connection to the sea inlet valve.

2.1.4.2 A valve shall be fitted to serve each fire hydrant so that any fire hose may be removed while the fire pumps are in operation.

2.1.4.3 Relief valves shall be provided in conjunction with fire pumps if the pumps are capable of developing a pressure exceeding the design pressure of the water service pipes, hydrants and hoses. These valves shall be so placed and adjusted as to prevent excessive pressure in any part of the fire main system.

2.1.4.4 In tankers, isolation valves shall be fitted in the fire main at poop front in a protected position and on the tank deck at intervals of not more than 40 m to preserve the integrity of the fire main system in case of fire or explosion.

2.1.5 *Number and position of hydrants*

2.1.5.1 The number and position of hydrants shall be such that at least two jets of water not emanating from the same hydrant, one of which shall be from a single length of hose, may reach any part of the ship normally accessible to the passengers or crew while the ship is being navigated and any part of any cargo space when empty, any ro-ro space or any vehicle space in which latter case the two jets shall reach any part of the space, each from a single length of hose. Furthermore, such hydrants shall be positioned near the accesses to the protected spaces.

2.1.5.2 In addition to the requirements in the paragraph 2.1.5.1, passenger ships shall comply with the following:

- .1 in the accommodation, service and machinery spaces, the number and position of hydrants shall be such that the requirements of paragraph 2.1.5.1 may be complied with when all watertight doors and all doors in main vertical zone bulkheads are closed; and

- .2 where access is provided to a machinery space of category A at a low level from an adjacent shaft tunnel, two hydrants shall be provided external to, but near the entrance to that machinery space. Where such access is provided from other spaces, in one of those spaces two hydrants shall be provided near the entrance to the machinery space of category A. Such provision need not be made where the tunnel or adjacent spaces are not part of the escape route.

2.1.6 *Pressure at hydrants*

With the two pumps simultaneously delivering water through the nozzles specified in paragraph 2.3.3, with the quantity of water as specified in paragraph 2.1.3, through any adjacent hydrants, the following minimum pressures shall be maintained at all hydrants:

- .1 for passenger ships:
- | | |
|---------------------------------|--------------------------|
| 4,000 gross tonnage and upwards | 0.40 N/mm ² |
| less than 4,000 gross tonnage | 0.30 N/mm ² ; |
- .2 for cargo ships:
- | | |
|---------------------------------|------------------------------|
| 6,000 gross tonnage and upwards | 0.27 N/mm ² |
| less than 6,000 gross tonnage | 0.25 N/mm ² ; and |
- .3 the maximum pressure at any hydrant shall not exceed that at which the effective control of a fire hose can be demonstrated.

2.1.7 *International shore connection*

2.1.7.1 Ships of 500 gross tonnage and upwards shall be provided with at least one international shore connection complying with the Fire Safety Systems Code.

2.1.7.2 Facilities shall be available enabling such a connection to be used on either side of the ship.

2.2 *Fire pumps*

2.2.1 *Pumps accepted as fire pumps*

Sanitary, ballast, bilge or general service pumps may be accepted as fire pumps, provided that they are not normally used for pumping oil and that, if they are subject to occasional duty for the transfer or pumping of oil fuel, suitable change-over arrangements are fitted.

2.2.2 *Number of fire pumps*

Ships shall be provided with independently driven fire pumps as follows:

- .1 in passenger ships of:
- | | |
|---------------------------------|----------------|
| 4,000 gross tonnage and upwards | at least three |
| less than 4,000 gross tonnage | at least two |

.2 in cargo ships of:

1,000 gross tonnage and upwards	at least two
less than 1,000 gross tonnage	at least two power driven pumps, one of which shall be independently driven.

2.2.3 *Arrangement of fire pumps and fire mains*

2.2.3.1 *Fire pumps*

The arrangement of sea connections, fire pumps and their sources of power shall be as to ensure that:

- .1 in passenger ships of 1,000 gross tonnage and upwards, in the event of a fire in any one compartment all the fire pumps will not be put out of action; and
- .2 in passenger ships of less than 1,000 gross tonnage and in cargo ships, if a fire in any one compartment could put all the pumps out of action, there shall be an alternative means consisting of an emergency fire pump complying with the provisions of the Fire Safety Systems Code with its source of power and sea connection located outside the space where the main fire pumps or their sources of power are located.

2.2.3.2 *Requirements for the space containing the emergency fire pump*

2.2.3.2.1 *Location of the space*

The space containing the fire pump shall not be contiguous to the boundaries of machinery spaces of category A or those spaces containing main fire pumps. Where this is not practicable, the common bulkhead between the two spaces shall be insulated to a standard of structural fire protection equivalent to that required for a control station.

2.2.3.2.2 *Access to the emergency fire pump*

No direct access shall be permitted between the machinery space and the space containing the emergency fire pump and its source of power. When this is impracticable, the Administration may accept an arrangement where the access is by means of an airlock with the door of the machinery space being of "A-60" class standard, and the other door being at least steel, both reasonably gastight, self-closing and without any hold back arrangements. Alternatively, the access may be through a watertight door capable of being operated from a space remote from the machinery space and the space containing the emergency fire pump and unlikely to be cut off in the event of fire in those spaces. In such cases, a second means of access to the space containing the emergency fire pump and its source of power shall be provided.

2.2.3.2.3 *Ventilation of the emergency fire pump space*

Ventilation arrangements to the space containing the independent source of power for the emergency fire pump shall be such as to preclude, as far as practicable, the possibility of smoke from a machinery space fire entering or being drawn into that space.

2.2.3.3 *Additional pumps for cargo ships*

In addition, in cargo ships where other pumps, such as general service, bilge and ballast, etc., are fitted in a machinery space, arrangements shall be made to ensure that at least one of these pumps, having the capacity and pressure required by paragraphs 2.1.6.2 and 2.2.4.2, is capable of providing water to the fire main.

2.2.4 *Capacity of fire pumps*

2.2.4.1 *Total capacity of required fire pumps*

The required fire pumps shall be capable of delivering for fire-fighting purposes a quantity of water, at the pressure specified in paragraph 2.1.6, as follows:

- .1 pumps in passenger ships, the quantity of water is not less than two thirds of the quantity required to be dealt with by the bilge pumps when employed for bilge pumping; and
- .2 pumps in cargo ships, other than any emergency pump, the quantity of water is not less than four thirds of the quantity required under regulation II-1/21 to be dealt with by each of the independent bilge pumps in a passenger ship of the same dimension when employed in bilge pumping, provided that in no cargo ship need the total required capacity of the fire pumps exceed 180 m³/h.

2.2.4.2 *Capacity of each fire pump*

Each of the required fire pumps (other than any emergency pump required in paragraph 2.2.3.1.2 for cargo ships) shall have a capacity not less than 80% of the total required capacity divided by the minimum number of required fire pumps but in any case not less than 25 m³/h and each such pump shall in any event be capable of delivering at least the two required jets of water. These fire pumps shall be capable of supplying the fire main system under the required conditions. Where more pumps than the minimum of required pumps are installed, such additional pumps shall have a capacity of at least 25 m³/h and shall be capable of delivering at least the two jets of water required in paragraph 2.1.5.1.

2.3 *Fire hoses and nozzles*

2.3.1 *General specifications*

2.3.1.1 Fire hoses shall be of non-perishable material approved by the Administration and shall be sufficient in length to project a jet of water to any of the spaces in which they may be required to be used. Each hose shall be provided with a nozzle and the necessary couplings. Hoses specified in this chapter as "fire hoses" shall, together with any necessary fittings and tools, be kept ready for use in conspicuous positions near the water service hydrants or connections. Additionally, in interior locations in passenger ships carrying more than 36 passengers fire hoses shall be connected to the hydrants at all times. Fire hoses shall have a length of at least 10 m, but not more than:

- .1 15 m in machinery spaces;
- .2 20 m in other spaces and open decks; and

.3 25 m for open decks on ships with a maximum breadth in excess of 30 m.

2.3.1.2 Unless one hose and nozzle is provided for each hydrant in the ship, there shall be complete interchangeability of hose couplings and nozzles.

2.3.2 *Number and diameter of fire hoses*

2.3.2.1 Ships shall be provided with fire hoses the number and diameter of which shall be to the satisfaction of the Administration.

2.3.2.2 In passenger ships, there shall be at least one fire hose for each of the hydrants required by paragraph 2.1.5 and these hoses shall be used only for the purposes of extinguishing fires or testing the fire-extinguishing apparatus at fire drills and surveys.

2.3.2.3 In cargo ships:

- .1 of 1,000 gross tonnage and upwards, the number of fire hoses to be provided shall be one for each 30 m length of the ship and one spare, but in no case less than five in all. This number does not include any hoses required in any engine or boiler room. The Administration may increase the number of hoses required so as to ensure that hoses in sufficient number are available and accessible at all times, having regard to the type of ship and the nature of trade in which the ship is employed. Ships carrying dangerous goods in accordance with regulation 19 shall be provided with three hoses and nozzles, in addition to those required above; and
- .2 of less than 1,000 gross tonnage, the number of fire hoses to be provided shall be calculated in accordance with the provisions of paragraph 2.3.2.3.1. However, the number of hoses shall in no case be less than three.

2.3.3 *Size and types of nozzles*

2.3.3.1 For the purposes of this chapter, standard nozzle sizes shall be 12 mm, 16 mm and 19 mm or as near thereto as possible. Larger diameter nozzles may be permitted at the discretion of the Administration.

2.3.3.2 For accommodation and service spaces, a nozzle size greater than 12 mm need not be used.

2.3.3.3 For machinery spaces and exterior locations, the nozzle size shall be such as to obtain the maximum discharge possible from two jets at the pressure mentioned in paragraph 2.1.6 from the smallest pump, provided that a nozzle size greater than 19 mm need not be used.

2.3.3.4 Nozzles shall be of an approved dual-purpose type (i.e., spray/jet type) incorporating a shutoff.

3 Portable fire extinguishers

3.1 *Type and design*

Portable fire extinguishers shall comply with the requirements of the Fire Safety Systems Code.

3.2 *Arrangement of fire extinguishers*

3.2.1 Accommodation spaces, service spaces and control stations shall be provided with portable fire extinguishers of appropriate types and in sufficient number to the satisfaction of the Administration. Ships of 1,000 gross tonnage and upwards shall carry at least five portable fire extinguishers.

3.2.2 One of the portable fire extinguishers intended for use in any space shall be stowed near the entrance to that space.

3.2.3 Carbon dioxide fire extinguishers shall not be placed in accommodation spaces. In control stations and other spaces containing electrical or electronic equipment or appliances necessary for the safety of the ship, fire extinguishers shall be provided whose extinguishing media are neither electrically conductive nor harmful to the equipment and appliances.

3.2.4 Fire extinguishers shall be situated ready for use at easily visible places, which can be reached quickly and easily at any time in the event of a fire, and in such a way that their serviceability is not impaired by the weather, vibration or other external factors. Portable fire extinguishers shall be provided with devices which indicate whether they have been used.

3.3 *Spare charges*

3.3.1 Spare charges shall be provided for 100% of the first ten extinguishers and 50% of the remaining fire extinguishers capable of being recharged on board. Not more than sixty total spare charges are required. Instructions for recharging shall be carried on board.

3.3.2 For fire extinguishers which cannot be recharged onboard, additional portable fire extinguishers of the same quantity, type, capacity and number as determined in paragraph 3.3.1 above shall be provided in lieu of spare charges.

4 **Fixed fire-extinguishing systems**

4.1 *Types of fixed fire-extinguishing systems*

4.1.1 A fixed fire-extinguishing system required by paragraph 5 below may be any of the following systems:

- .1 a fixed gas fire-extinguishing system complying with the provisions of the Fire Safety Systems Code;
- .2 a fixed high-expansion foam fire-extinguishing system complying with the provisions of the Fire Safety Systems Code; and
- .3 a fixed pressure water-spraying fire-extinguishing system complying with the provisions of the Fire Safety Systems Code.

4.1.2 Where a fixed fire-extinguishing system not required by this chapter is installed, it shall meet the requirements of the relevant regulations of this chapter and the Fire Safety Systems Code.

4.1.3 Fire-extinguishing systems using Halon 1211, 1301, and 2402 and perfluorocarbons shall be prohibited.

4.1.4 In general, the Administration shall not permit the use of steam as a fire-extinguishing medium in fixed fire-extinguishing systems. Where the use of steam is permitted by the Administration, it shall be used only in restricted areas as an addition to the required fire-extinguishing system and shall comply with the requirements of the Fire Safety System Code.

4.2 *Closing appliances for fixed gas fire-extinguishing systems*

Where a fixed gas fire-extinguishing system is used, openings which may admit air to, or allow gas to escape from, a protected space shall be capable of being closed from outside the protected space.

4.3 *Storage rooms of fire-extinguishing medium*

When the fire-extinguishing medium is stored outside a protected space, it shall be stored in a room which is located behind the forward collision bulkhead, and is used for no other purposes. Any entrance to such a storage room shall preferably be from the open deck and shall be independent of the protected space. If the storage space is located below deck, it shall be located no more than one deck below the open deck and shall be directly accessible by a stairway or ladder from the open deck. Spaces which are located below deck or spaces where access from the open deck is not provided, shall be fitted with a mechanical ventilation system designed to take exhaust air from the bottom of the space and shall be sized to provide at least 6 air changes per hour. Access doors shall open outwards, and bulkheads and decks including doors and other means of closing any opening therein, which form the boundaries between such rooms and adjacent enclosed spaces shall be gastight. For the purpose of the application of tables 9.1 to 9.8, such storage rooms shall be treated as fire control stations.

4.4 *Water pumps for other fire-extinguishing systems*

Pumps, other than those serving the fire main, required for the provision of water for fire-extinguishing systems required by this chapter, their sources of power and their controls shall be installed outside the space or spaces protected by such systems and shall be so arranged that a fire in the space or spaces protected will not put any such system out of action.

5 Fire-extinguishing arrangements in machinery spaces

5.1 *Machinery spaces containing oil-fired boilers or oil fuel units*

5.1.1 *Fixed fire-extinguishing systems*

Machinery spaces of category A containing oil-fired boilers or oil fuel units shall be provided with any one of the fixed fire-extinguishing systems in paragraph 4.1. In each case, if the engine and boiler rooms are not entirely separate, or if fuel oil can drain from the boiler room into the engine-room, the combined engine and boiler rooms shall be considered as one compartment.

5.1.2 *Additional fire-extinguishing arrangements*

5.1.2.1 There shall be in each boiler room or at an entrance outside of the boiler room at least one portable foam applicator unit complying with the provisions of the Fire Safety Systems Code.

5.1.2.2 There shall be at least two portable foam extinguishers or equivalent in each firing space in each boiler room and in each space in which a part of the oil fuel installation is situated. There shall be not less than one approved foam-type extinguisher of at least 135 l capacity or equivalent in each boiler room. These extinguishers shall be provided with hoses on reels suitable for reaching any part of the boiler room. In the case of domestic boilers of less than 175 kW an approved foam-type extinguisher of at least 135 l capacity is not required.

5.1.2.3 In each firing space there shall be a receptacle containing at least 0.1 m³ sand, sawdust impregnated with soda, or other approved dry material, along with a suitable shovel for spreading the material. An approved portable extinguisher may be substituted as an alternative.

5.2 *Machinery spaces containing internal combustion machinery*

5.2.1 *Fixed fire-extinguishing systems*

Machinery spaces of category A containing internal combustion machinery shall be provided with one of the fixed fire-extinguishing systems in paragraph 4.1.

5.2.2 *Additional fire-extinguishing arrangements*

5.2.2.1 There shall be at least one portable foam applicator unit complying with the provisions of the Fire Safety Systems Code.

5.2.2.2 There shall be in each such space approved foam-type fire extinguishers, each of at least 45 l capacity or equivalent, sufficient in number to enable foam or its equivalent to be directed on to any part of the fuel and lubricating oil pressure systems, gearing and other fire hazards. In addition, there shall be provided a sufficient number of portable foam extinguishers or equivalent which shall be so located that no point in the space is more than 10 m walking distance from an extinguisher and that there are at least two such extinguishers in each such space. For smaller spaces of cargo ships the Administration may consider relaxing this requirement.

5.3 *Machinery spaces containing steam turbines or enclosed steam engines*

5.3.1 *Fixed fire-extinguishing systems*

In spaces containing steam turbines or enclosed steam engines used for main propulsion or other purposes having in the aggregate a total power output of not less than 375 kW, one of the fire-extinguishing systems specified in paragraph 4.1 shall be provided if such spaces are periodically unattended.

5.3.2 *Additional fire-extinguishing arrangements*

5.3.2.1 There shall be approved foam fire extinguishers each of at least 45 l capacity or equivalent sufficient in number to enable foam or its equivalent to be directed on to any part of the pressure lubrication system, on to any part of the casings enclosing pressure lubricated parts of the turbines, engines or associated gearing, and any other fire hazards. However, such extinguishers shall not be required if protection, at least equivalent to that required by this subparagraph, is provided in such spaces by a fixed fire-extinguishing system fitted in compliance with paragraph 4.1.

5.3.2.2 There shall be a sufficient number of portable foam extinguishers or equivalent which shall be so located that no point in the space is more than 10 m walking distance from an extinguisher and that there are at least two such extinguishers in each such space, except that such extinguishers shall not be required in addition to any provided in compliance with paragraph 5.1.2.2.

5.4 *Other machinery spaces*

Where, in the opinion of the Administration, a fire hazard exists in any machinery space for which no specific provisions for fire-extinguishing appliances are prescribed in paragraphs 5.1, 5.2 and 5.3, there shall be provided in, or adjacent to, that space such a number of approved portable fire extinguishers or other means of fire extinction as the Administration may deem sufficient.

5.5 *Additional requirements for passenger ships*

In passenger ships carrying more than 36 passengers, each machinery space of category A shall be provided with at least two suitable water fog applicators.

5.6 *Fixed local application fire-extinguishing systems*

5.6.1 Paragraph 5.6 shall apply to passenger ships of 500 gross tonnage and above and cargo ships of 2000 gross tonnage and above.

5.6.2 Machinery spaces of category A above 500 m³ in volume shall, in addition to the fixed fire-extinguishing system required in paragraph 5.1.1, be protected by an approved type of fixed water-based or equivalent local application fire-extinguishing system, based on the guidelines developed by the Organization. In the case of periodically unattended machinery spaces, the fire-extinguishing system shall have both automatic and manual release capabilities. In the case of continuously manned machinery spaces, the fire-extinguishing system is only required to have a manual release capability.

5.6.3 Fixed local application fire-extinguishing systems are to protect areas such as the following without the necessity of engine shutdown, personnel evacuation, or sealing of the spaces:

- .1 the fire hazard portions of internal combustion machinery used for the ship's main propulsion and power generation;
- .2 boiler fronts;
- .3 the fire hazard portions of incinerators; and
- .4 purifiers for heated fuel oil.

5.6.4 Activation of any local application system shall give a visual and distinct audible alarm in the protected space and at continuously manned stations. The alarm shall indicate the specific system activated. The system alarm requirements described within this paragraph are in addition to, and not a substitute for, the detection and fire alarm system required elsewhere in this chapter.

6 Fire-extinguishing arrangements in control stations, accommodation and service spaces

6.1 Sprinkler systems in passenger ships

6.1.1 Passenger ships carrying more than 36 passengers shall be equipped with an automatic sprinkler, fire detection and fire alarm system of an approved type complying with the requirements of the Fire Safety Systems Code in all control stations, accommodation and service spaces, including corridors and stairways. Alternatively, control stations, where water may cause damage to essential equipment, may be fitted with an approved fixed fire-extinguishing system of another type. Spaces having little or no fire risk such as voids, public toilets, carbon dioxide rooms and similar spaces need not be fitted with an automatic sprinkler system.

6.1.2 In passenger ships carrying not more than 36 passengers, when a fixed smoke detection and fire alarm system complying with the provisions of the Fire Safety Systems Code is provided only in corridors, stairways and escape routes within accommodation spaces, an automatic sprinkler system shall be installed in accordance with regulation 7.5.3.2.

6.2 Sprinkler systems for cargo ships

In cargo ships in which method IIC specified in regulation 9.2.3.1.1.2 is adopted, an automatic sprinkler, fire detection and fire alarm system shall be fitted in accordance with the requirements in regulation 7.5.5.2.

6.3 Spaces containing flammable liquid

6.3.1 Paint lockers shall be protected by:

- .1 a carbon dioxide system, designed to give a minimum volume of free gas equal to 40% of the gross volume of the protected space;
- .2 a dry powder system, designed for at least 0.5 kg powder/m³;
- .3 a water spraying or sprinkler system, designed for 5 l/m² min. Water spraying systems may be connected to the fire main of the ship; or
- .4 a system providing equivalent protection, as determined by the Administration.

In all cases, the system shall be operable from outside the protected space.

6.3.2 Flammable liquid lockers shall be protected by an appropriate fire-extinguishing arrangement approved by the Administration.

6.3.3 For lockers of a deck area of less than 4 m², which do not give access to accommodation spaces, a portable carbon dioxide fire-extinguisher sized to provide a minimum volume of free gas equal to 40% of the gross volume of the space may be accepted in lieu of a fixed system. A discharge port shall be arranged in the locker to allow the discharge of the extinguisher without having to enter into the protected space. The required portable fire extinguisher shall be stowed adjacent to the port. Alternatively, a port or hose connection may be provided to facilitate the use of fire main water.

6.4 *Deep-fat cooking equipment*

Deep-fat cooking equipment shall be fitted with the following:

- .1 an automatic or manual fire-extinguishing system tested to an international standard acceptable to the Organization;
- .2 a primary and backup thermostat with an alarm to alert the operator in the event of failure of either thermostat;
- .3 arrangements for automatically shutting off the electrical power upon activation of the fire-extinguishing system;
- .4 an alarm for indicating operation of the fire-extinguishing system in the galley where the equipment is installed; and
- .5 controls for manual operation of the fire-extinguishing system which are clearly labelled for ready use by the crew.

7 Fire-extinguishing arrangements in cargo spaces

7.1 *Fixed gas fire-extinguishing systems for general cargo*

7.1.1 Except as provided for in paragraph 7.2, the cargo spaces of passenger ships of 1,000 gross tonnage and upwards shall be protected by a fixed carbon dioxide or inert gas fire-extinguishing system complying with the provisions of the Fire Safety Systems Code or by a fixed high-expansion foam fire-extinguishing system which gives equivalent protection.

7.1.2 Where it is shown to the satisfaction of the Administration that a passenger ship is engaged on voyages of such short duration that it would be unreasonable to apply the requirements of paragraph 7.1.1 and also in ships of less than 1,000 gross tonnage, the arrangements in cargo spaces shall be to the satisfaction of the Administration, provided that the ship is fitted with steel hatch covers and effective means of closing all ventilators and other openings leading to the cargo spaces.

7.1.3 Except for ro-ro and vehicle spaces, cargo spaces on cargo ships of 2,000 gross tonnage and upwards shall be protected by a fixed carbon dioxide or inert gas fire-extinguishing system complying with the provisions of the Fire Safety Systems Code, or by a fire-extinguishing system which gives equivalent protection.

7.1.4 The Administration may exempt from the requirements of paragraphs 7.1.3 and 7.2 cargo spaces of any cargo ship if constructed, and solely intended, for the carriage of ore, coal, grain, unseasoned timber, non-combustible cargoes or cargoes which, in the opinion of the Administration, constitute a low fire risk. Such exemptions may be granted only if the ship is fitted with steel hatch covers and effective means of closing all ventilators and other openings leading to the cargo spaces. When such exemptions are granted, the Administration shall issue an Exemption Certificate, irrespective of the date of construction of the ship concerned, in accordance with regulation I/12(a)(vi), and shall ensure that the list of cargoes the ship is permitted to carry is attached to the Exemption Certificate.

7.2 *Fixed gas fire-extinguishing systems for dangerous goods*

A ship engaged in the carriage of dangerous goods in any cargo spaces shall be provided with a fixed carbon dioxide or inert gas fire-extinguishing system complying with the provisions of the Fire Safety Systems Code or with a fire-extinguishing system which, in the opinion of the Administration, gives equivalent protection for the cargoes carried.

8 Cargo tank protection

8.1 *Fixed deck foam fire-extinguishing systems*

8.1.1 For tankers of 20,000 tonnes deadweight and upwards, a fixed deck foam fire-extinguishing system shall be provided complying with the provisions of the Fire Safety Systems Code, except that, in lieu of the above, the Administration, after having given consideration to the ship's arrangement and equipment, may accept other fixed installations if they afford protection equivalent to the above, in accordance with regulation I/5. The requirements for alternative fixed installations shall comply with the requirements in paragraph 8.1.2.

8.1.2 In accordance with paragraph 8.1.1, where the Administration accepts an equivalent fixed installation in lieu of the fixed deck foam fire-extinguishing system, the installation shall:

- .1 be capable of extinguishing spill fires and also preclude ignition of spilled oil not yet ignited; and
- .2 be capable of combating fires in ruptured tanks.

8.1.3 Tankers of less than 20,000 tonnes deadweight shall be provided with a deck foam fire-extinguishing system complying with the requirements of the Fire Safety Systems Code.

9 Protection of cargo pump-rooms in tankers

9.1 *Fixed fire-extinguishing systems*

Each cargo pump-room shall be provided with one of the following fixed fire-extinguishing systems operated from a readily accessible position outside the pump-room. Cargo pump-rooms shall be provided with a system suitable for machinery spaces of category A.

9.1.1 A carbon dioxide fire-extinguishing system complying with the provisions of the Fire Safety Systems Code and with the following:

- .1 the alarms giving audible warning of the release of fire-extinguishing medium shall be safe for use in a flammable cargo vapour/air mixture; and
- .2 a notice shall be exhibited at the controls stating that due to the electrostatic ignition hazard, the system is to be used only for fire-extinguishing and not for inerting purposes.

9.1.2 A high-expansion foam fire-extinguishing system complying with the provisions of the Fire Safety Systems Code, provided that the foam concentrate supply is suitable for extinguishing fires involving the cargoes carried.

9.1.3 A fixed pressure water-spraying fire-extinguishing system complying with the provisions of the Fire Safety Systems Code.

9.2 *Quantity of fire-extinguishing medium*

Where the fire-extinguishing medium used in the cargo pump-room system is also used in systems serving other spaces, the quantity of medium provided or its delivery rate need not be more than the maximum required for the largest compartment.

10 **Fire-fighter's outfits**

10.1 *Types of fire-fighter's outfits*

Fire-fighter's outfits shall comply with the Fire Safety Systems Code.

10.2 *Number of fire-fighter's outfits*

10.2.1 Ships shall carry at least two fire-fighter's outfits.

10.2.2 In addition, in passenger ships there shall be provided:

- .1 for every 80 m, or part thereof, of the aggregate of the lengths of all passenger spaces and service spaces on the deck which carries such spaces or, if there is more than one such deck, on the deck which has the largest aggregate of such lengths, two fire-fighter's outfits and, in addition, two sets of personal equipment, each set comprising the items stipulated in the Fire Safety Systems Code. In passenger ships carrying more than 36 passengers, two additional fire-fighter's outfits shall be provided for each main vertical zone. However, for stairway enclosures which constitute individual main vertical zones and for the main vertical zones in the fore or aft end of a ship which do not contain spaces of categories (6), (7), (8) or (12) defined in regulation 9.2.2.3, no additional fire-fighter's outfits are required; and
- .2 ships carrying more than 36 passengers, for each pair of breathing apparatus there shall be provided one water fog applicator which shall be stored adjacent to such apparatus.

10.2.3 In addition, in tankers, two fire-fighter's outfits shall be provided.

10.2.4 The Administration may require additional sets of personal equipment and breathing apparatus, having due regard to the size and type of the ship.

10.2.5 Two spare charges shall be provided for each required breathing apparatus. Passenger ships carrying not more than 36 passengers and cargo ships that are equipped with suitably located means for fully recharging the air cylinders free from contamination, need carry only one spare charge for each required apparatus. In passenger ships carrying more than 36 passengers, at least two spare charges for each breathing apparatus shall be provided.

10.3 *Storage of fire-fighter's outfits*

10.3.1 The fire-fighter's outfits or sets of personal equipment shall be kept ready for use in an easily accessible location that is permanently and clearly marked and, where more than one

fire-fighter's outfit or more than one set of personal equipment is carried, they shall be stored in widely separated positions.

10.3.2 In passenger ships, at least two fire-fighter's outfits and, in addition, one set of personal equipment shall be available at any one position. At least two fire-fighter's outfits shall be stored in each main vertical zone.

Regulation 11

Structural integrity

1 Purpose

The purpose of this regulation is to maintain structural integrity of the ship preventing partial or whole collapse of the ship structures due to strength deterioration by heat. For this purpose, materials used in the ships' structure shall ensure that the structural integrity is not degraded due to fire.

2 Material of hull, superstructures, structural bulkheads, decks and deckhouses

The hull, superstructures, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material. For the purpose of applying the definition of steel or other equivalent material as given in regulation 3.43 the "applicable fire exposure" shall be according to the integrity and insulation standards given in tables 9.1 to 9.4. For example, where divisions such as decks or sides and ends of deckhouses are permitted to have "B-0" fire integrity, the "applicable fire exposure" shall be half an hour.

3 Structure of aluminium alloy

Unless otherwise specified in paragraph 2, in cases where any part of the structure is of aluminium alloy, the following shall apply:

- .1 the insulation of aluminium alloy components of "A" or "B" class divisions, except structure which, in the opinion of the Administration, is non-load-bearing, shall be such that the temperature of the structural core does not rise more than 200°C above the ambient temperature at any time during the applicable fire exposure to the standard fire test; and
- .2 special attention shall be given to the insulation of aluminium alloy components of columns, stanchions and other structural members required to support lifeboat and liferaft stowage, launching and embarkation areas, and "A" and "B" class divisions to ensure:
 - .2.1 that for such members supporting lifeboat and liferaft areas and "A" class divisions, the temperature rise limitation specified in paragraph 3.1 shall apply at the end of one hour; and
 - .2.2 that for such members required to support "B" class divisions, the temperature rise limitation specified in paragraph 3.1 shall apply at the end of half an hour.

4 Machinery spaces of category A

4.1 Crowns and casings

Crowns and casings of machinery spaces of category A shall be of steel construction and shall be insulated as required by tables 9.5 and 9.7, as appropriate.

4.2 Floor plating

The floor plating of normal passageways in machinery spaces of category A shall be made of steel.

5 Materials of overboard fittings

Materials readily rendered ineffective by heat shall not be used for overboard scuppers, sanitary discharges, and other outlets which are close to the waterline and where the failure of the material in the event of fire would give rise to danger of flooding.

6 Protection of cargo tank structure against pressure or vacuum in tankers

6.1 General

The venting arrangements shall be so designed and operated as to ensure that neither pressure nor vacuum in cargo tanks shall exceed design parameters and be such as to provide for:

- .1 the flow of the small volumes of vapour, air or inert gas mixtures caused by thermal variations in a cargo tank in all cases through pressure/vacuum valves; and
- .2 the passage of large volumes of vapour, air or inert gas mixtures during cargo loading and ballasting, or during discharging.

6.2 Openings for small flow by thermal variations

Openings for pressure release required by paragraph 6.1.1 shall:

- .1 have as great a height as is practicable above the cargo tank deck to obtain maximum dispersal of flammable vapours, but in no case less than 2 m above the cargo tank deck; and
- .2 be arranged at the furthest distance practicable but not less than 5 m from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery and equipment which may constitute an ignition hazard. Anchor windlass and chain locker openings constitute an ignition hazard.

6.3 *Safety measures in cargo tanks*

6.3.1 *Preventive measures against liquid rising in the venting system*

Provisions shall be made to guard against liquid rising in the venting system to a height which would exceed the design head of cargo tanks. This shall be accomplished by high-level alarms or overflow control systems or other equivalent means, together with independent gauging devices and cargo tank filling procedures. For the purposes of this regulation, spill valves are not considered equivalent to an overflow system.

6.3.2 *Secondary means for pressure/vacuum relief*

A secondary means of allowing full flow relief of vapour, air or inert gas mixtures shall be provided to prevent over-pressure or under-pressure in the event of failure of the arrangements in paragraph 6.1.2. Alternatively, pressure sensors may be fitted in each tank protected by the arrangement required in paragraph 6.1.2, with a monitoring system in the ship's cargo control room or the position from which cargo operations are normally carried out. Such monitoring equipment shall also provide an alarm facility which is activated by detection of over-pressure or under-pressure conditions within a tank.

6.3.3 *Bypasses in vent mains*

Pressure/vacuum valves required by paragraph 6.1.1 may be provided with a bypass arrangement when they are located in a vent main or masthead riser. Where such an arrangement is provided there shall be suitable indicators to show whether the bypass is open or closed.

6.3.4 *Pressure/vacuum-breaking devices*

One or more pressure/vacuum-breaking devices shall be provided to prevent the cargo tanks from being subject to:

- .1 a positive pressure, in excess of the test pressure of the cargo tank, if the cargo were to be loaded at the maximum rated capacity and all other outlets are left shut; and
- .2 a negative pressure in excess of 700 mm water gauge if the cargo were to be discharged at the maximum rated capacity of the cargo pumps and the inert gas blowers were to fail.

Such devices shall be installed on the inert gas main unless they are installed in the venting system required by regulation 4.5.3.1 or on individual cargo tanks. The location and design of the devices shall be in accordance with regulation 4.5.3 and paragraph 6.

6.4 *Size of vent outlets*

Vent outlets for cargo loading, discharging and ballasting required by paragraph 6.1.2 shall be designed on the basis of the maximum designed loading rate multiplied by a factor of at least 1.25 to take account of gas evolution, in order to prevent the pressure in any cargo tank from exceeding the design pressure. The master shall be provided with information regarding the maximum permissible loading rate for each cargo tank and, in the case of combined venting systems, for each group of cargo tanks.

PART D - ESCAPE

Regulation 12

Notification of crew and passengers

1 Purpose

The purpose of this regulation is to notify crew and passengers of a fire for safe evacuation. For this purpose, a general emergency alarm system and a public address system shall be provided.

2 General emergency alarm system

A general emergency alarm system required by regulation III/6.4.2 shall be used for notifying crew and passengers of a fire.

3 Public address systems in passenger ships

A public address system or other effective means of communication complying with the requirements of regulation III/6.5 shall be available throughout the accommodation and service spaces and control stations and open decks.

Regulation 13

Means of escape

1 Purpose

The purpose of this regulation is to provide means of escape so that persons onboard can safely and swiftly escape to the lifeboat and liferaft embarkation deck. For this purpose, the following functional requirements shall be met:

- .1 safe escape routes shall be provided;
- .2 escape routes shall be maintained in a safe condition, clear of obstacles; and
- .3 additional aids for escape shall be provided as necessary to ensure accessibility, clear marking, and adequate design for emergency situations.

2 General requirements

2.1 Unless expressly provided otherwise in this regulation, at least two widely separated and ready means of escape shall be provided from all spaces or group of spaces.

2.2 Lifts shall not be considered as forming one of the means of escape as required by this regulation.

3 Means of escape from control stations, accommodation and service spaces

3.1 General requirements

3.1.1 Stairways and ladders shall be so arranged as to provide ready means of escape to the lifeboat and liferaft embarkation deck from passenger and crew accommodation spaces and from spaces in which the crew is normally employed, other than machinery spaces.

3.1.2 Unless expressly provided otherwise in this regulation, a corridor, lobby, or part of a corridor from which there is only one route of escape shall be prohibited. Dead-end corridors used in service areas which are necessary for the practical utility of the ship, such as fuel oil stations and athwartship supply corridors, shall be permitted, provided such dead-end corridors are separated from crew accommodation areas and are inaccessible from passenger accommodation areas. Also, a part of a corridor that has a depth not exceeding its width is considered a recess or local extension and is permitted.

3.1.3 All stairways in accommodation and service spaces and control stations shall be of steel frame construction except where the Administration sanctions the use of other equivalent material.

3.1.4 If a radiotelegraph station has no direct access to the open deck, two means of escape from or access to, the station shall be provided, one of which may be a porthole or window of sufficient size or other means to the satisfaction of the Administration.

3.1.5 Doors in escape routes shall, in general, open in-way of the direction of escape, except that:

- .1 individual cabin doors may open into the cabins in order to avoid injury to persons in the corridor when the door is opened; and
- .2 doors in vertical emergency escape trunks may open out of the trunk in order to permit the trunk to be used both for escape and for access.

3.2 Means of escape in passenger ships

3.2.1 Escape from spaces below the bulkhead deck

3.2.1.1 Below the bulkhead deck two means of escape, at least one of which shall be independent of watertight doors, shall be provided from each watertight compartment or similarly restricted space or group of spaces. Exceptionally, the Administration may dispense with one of the means of escape for crew spaces that are entered only occasionally, if the required escape route is independent of watertight doors.

3.2.1.2 Where the Administration has granted dispensation under the provisions of paragraph 3.2.1.1, this sole means of escape shall provide safe escape. However, stairways shall not be less than 800 mm in clear width with handrails on both sides.

3.2.2 Escape from spaces above the bulkhead deck

Above the bulkhead deck there shall be at least two means of escape from each main vertical zone or similarly restricted space or group of spaces at least one of which shall give access to a stairway forming a vertical escape.

3.2.3 *Direct access to stairway enclosures*

Stairway enclosures in accommodation and service spaces shall have direct access from the corridors and be of a sufficient area to prevent congestion, having in view the number of persons likely to use them in an emergency. Within the perimeter of such stairway enclosures, only public toilets, lockers of non-combustible material providing storage for non-hazardous safety equipment and open information counters are permitted. Only public spaces, corridors, lifts, public toilets, special category spaces and open ro-ro spaces to which any passengers carried can have access, other escape stairways required by paragraph 3.2.4.1 and external areas are permitted to have direct access to these stairway enclosures. Small corridors or "lobbies" used to separate an enclosed stairway from galleys or main laundries may have direct access to the stairway provided they have a minimum deck area of 4.5 m², a width of no less than 900 mm and contain a fire hose station.

3.2.4 *Details of means of escape*

3.2.4.1 At least one of the means of escape required by paragraphs 3.2.1.1 and 3.2.2 shall consist of a readily accessible enclosed stairway, which shall provide continuous fire shelter from the level of its origin to the appropriate lifeboat and liferaft embarkation decks, or to the uppermost weather deck if the embarkation deck does not extend to the main vertical zone being considered. In the latter case, direct access to the embarkation deck by way of external open stairways and passageways shall be provided and shall have emergency lighting in accordance with regulation III/11.5 and slip-free surfaces underfoot. Boundaries facing external open stairways and passageways forming part of an escape route and boundaries in such a position that their failure during a fire would impede escape to the embarkation deck shall have fire integrity, including insulation values, in accordance with tables 9.1 to 9.4, as appropriate.

3.2.4.2 Protection of access from the stairway enclosures to the lifeboat and liferaft embarkation areas shall be provided either directly or through protected internal routes which have fire integrity and insulation values for stairway enclosures as determined by tables 9.1 to 9.4, as appropriate.

3.2.4.3 Stairways serving only a space and a balcony in that space shall not be considered as forming one of the required means of escape.

3.2.4.4 Each level within an atrium shall have two means of escape, one of which shall give direct access to an enclosed vertical means of escape meeting the requirements of paragraph 3.2.4.1.

3.2.4.5 The widths, number and continuity of escapes shall be in accordance with the requirements in the Fire Safety Systems Code.

3.2.5 *Marking of escape routes*

3.2.5.1 In addition to the emergency lighting required by regulations II-1/42 and III/11.5, the means of escape, including stairways and exits, shall be marked by lighting or photoluminescent strip indicators placed not more than 300 mm above the deck at all points of the escape route including angles and intersections. The marking must enable passengers to identify the routes of escape and readily identify the escape exits. If electric illumination is used, it shall be supplied by the emergency source of power and it shall be so arranged that the failure of any single light or cut in a lighting strip will not result in the marking being ineffective. Additionally, escape route signs and fire equipment location markings shall be of photoluminescent material or

marked by lighting. The Administration shall ensure that such lighting or photoluminescent equipment has been evaluated, tested and applied in accordance with the Fire Safety Systems Code.

3.2.5.2 In passenger ships carrying more than 36 passengers, the requirements of the paragraph 3.2.5.1 shall also apply to the crew accommodation areas.

3.2.6 *Normally locked doors that form part of an escape route*

3.2.6.1 Cabin and stateroom doors shall not require keys to unlock them from inside the room. Neither shall there be any doors along any designated escape route which require keys to unlock them when moving in the direction of escape.

3.2.6.2 Escape doors from public spaces that are normally latched shall be fitted with a means of quick release. Such means shall consist of a door-latching mechanism incorporating a device that releases the latch upon the application of a force in the direction of escape flow. Quick release mechanisms shall be designed and installed to the satisfaction of the Administration and, in particular:

- .1 consist of bars or panels, the actuating portion of which extends across at least one half of the width of the door leaf, at least 760 mm and not more than 1120 mm above the deck;
- .2 cause the latch to release when a force not exceeding 67 N is applied; and
- .3 not be equipped with any locking device, set screw or other arrangement that prevents the release of the latch when pressure is applied to the releasing device.

3.3 *Means of escape in cargo ships*

3.3.1 *General*

At all levels of accommodation there shall be provided at least two widely separated means of escape from each restricted space or group of spaces.

3.3.2 *Escape from spaces below the lowest open deck*

Below the lowest open deck the main means of escape shall be a stairway and the second escape may be a trunk or a stairway.

3.3.3 *Escape from spaces above the lowest open deck*

Above the lowest open deck the means of escape shall be stairways or doors to an open deck or a combination thereof.

3.3.4 *Dead-end corridors*

No dead-end corridors having a length of more than 7 m shall be accepted.

3.3.5 *Width and continuity of escape routes*

The width, number and continuity of escape routes shall be in accordance with the requirements in the Fire Safety Systems Code.

3.3.6 *Dispensation from two means of escape*

Exceptionally, the Administration may dispense with one of the means of escape, for crew spaces that are entered only occasionally, if the required escape route is independent of watertight doors.

3.4 *Emergency escape breathing devices*

3.4.1 Emergency escape breathing devices shall comply with the Fire Safety Systems Code. Spare emergency escape breathing devices shall be kept onboard.

3.4.2 All ships shall carry at least two emergency escape breathing devices within accommodation spaces.

3.4.3 In all passenger ships, at least two emergency escape breathing devices shall be carried in each main vertical zone.

3.4.4 In all passenger ships carrying more than 36 passengers, two emergency escape breathing devices, in addition to those required in paragraph 3.4.3 above, shall be carried in each main vertical zone.

3.4.5 However, paragraphs 3.4.3 and 3.4.4 do not apply to stairway enclosures which constitute individual main vertical zones and for the main vertical zones in the fore or aft end of a ship which do not contain spaces of categories (6), (7), (8) or (12) defined in regulation 9.2.2.3.

4 Means of escape from machinery spaces

4.1 *Means of escape on passenger ships*

Means of escape from each machinery space in passenger ships shall comply with the following provisions.

4.1.1 *Escape from spaces below the bulkhead deck*

Where the space is below the bulkhead deck, the two means of escape shall consist of either:

- .1 two sets of steel ladders as widely separated as possible, leading to doors in the upper part of the space similarly separated and from which access is provided to the appropriate lifeboat and liferaft embarkation decks. One of these ladders shall be located within a protected enclosure that satisfies regulation 9.2.2.3, category (2), or regulation 9.2.2.4, category (4), as appropriate, from the lower part of the space it serves to a safe position outside the space. Self-closing fire doors of the same fire integrity standards shall be fitted in the enclosure. The ladder shall be fixed in such a way that heat is not transferred into the enclosure through non-insulated fixing points. The protected enclosure shall have minimum internal dimensions of at least 800 mm x 800 mm, and shall have emergency lighting provisions; or
- .2 one steel ladder leading to a door in the upper part of the space from which access is provided to the embarkation deck and additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the embarkation deck.

4.1.2 *Escape from spaces above the bulkhead deck*

Where the space is above the bulkhead deck, the two means of escape shall be as widely separated as possible and the doors leading from such means of escape shall be in a position from which access is provided to the appropriate lifeboat and liferaft embarkation decks. Where such means of escape require the use of ladders, these shall be of steel.

4.1.3 *Dispensation from two means of escape*

In a ship of less than 1,000 gross tonnage, the Administration may dispense with one of the means of escape, due regard being paid to the width and disposition of the upper part of the space. In a ship of 1,000 gross tonnage and above, the Administration may dispense with one means of escape from any such space, including a normally unattended auxiliary machinery space, so long as either a door or a steel ladder provides a safe escape route to the embarkation deck, due regard being paid to the nature and location of the space and whether persons are normally employed in that space. In the steering gear space, a second means of escape shall be provided when the emergency steering position is located in that space unless there is direct access to the open deck.

4.1.4 *Escape from machinery control rooms*

Two means of escape shall be provided from a machinery control room located within a machinery space, at least one of which will provide continuous fire shelter to a safe position outside the machinery space.

4.2 *Means of escape on cargo ships*

Means of escape from each machinery space in cargo ships shall comply with the following provisions.

4.2.1 *Escape from machinery spaces of category A*

Except as provided in paragraph 4.2.2, two means of escape shall be provided from each machinery space of category A. In particular, one of the following provisions shall be complied with:

- .1 two sets of steel ladders as widely separated as possible leading to doors in the upper part of the space similarly separated and from which access is provided to the open deck. One of these ladders shall be located within a protected enclosure that satisfies regulation 9.2.3.3, category (4), from the lower part of the space it serves to a safe position outside the space. Self-closing fire doors of the same fire integrity standards shall be fitted in the enclosure. The ladder shall be fixed in such a way that heat is not transferred into the enclosure through non-insulated fixing points. The enclosure shall have minimum internal dimensions of at least 800 mm x 800 mm, and shall have emergency lighting provisions; or
- .2 one steel ladder leading to a door in the upper part of the space from which access is provided to the open deck and, additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the open deck.

4.2.2 *Dispensation from two means of escape*

In a ship of less than 1,000 gross tonnage, the Administration may dispense with one of the means of escape required under paragraph 4.2.1, due regard being paid to the dimension and disposition of the upper part of the space. In addition, the means of escape from machinery spaces of category A need not comply with the requirement for an enclosed fire shelter listed in paragraph 4.2.1.1. In the steering gear space, a second means of escape shall be provided when the emergency steering position is located in that space unless there is direct access to the open deck.

4.2.3 *Escape from machinery spaces other than those of category A*

From machinery spaces other than those of category A, two escape routes shall be provided except that a single escape route may be accepted for spaces that are entered only occasionally, and for spaces where the maximum travel distance to the door is 5 m or less.

4.3 *Emergency escape breathing devices*

4.3.1 On all ships, within the machinery spaces, emergency escape breathing devices shall be situated ready for use at easily visible places, which can be reached quickly and easily at any time in the event of fire. The location of emergency escape breathing devices shall take into account the layout of the machinery space and the number of persons normally working in the spaces.

4.3.2 The number and location of these devices shall be indicated in the fire control plan required in regulation 15.2.4.

4.3.3 Emergency escape breathing devices shall comply with the Fire Safety Systems Code.

5 Means of escape on passenger ships from special category and open ro-ro spaces to which any passengers carried can have access

5.1 In special category and open ro-ro spaces to which any passengers carried can have access, the number and locations of the means of escape both below and above the bulkhead deck shall be to the satisfaction of the Administration and, in general, the safety of access to the embarkation deck shall be at least equivalent to that provided for under paragraphs 3.2.1.1, 3.2.2, 3.2.4.1 and 3.2.4.2. Such spaces shall be provided with designated walkways to the means of escape with a breadth of at least 600 mm. The parking arrangements for the vehicles shall maintain the walkways clear at all times.

5.2 One of the escape routes from the machinery spaces where the crew is normally employed shall avoid direct access to any special category space.

6 Means of escape from ro-ro spaces

At least two means of escape shall be provided in ro-ro spaces where the crew are normally employed. The escape routes shall provide a safe escape to the lifeboat and liferaft embarkation decks and shall be located at the fore and aft ends of the space.

7 Additional requirements for ro-ro passenger ships

7.1 General

7.1.1 Escape routes shall be provided from every normally occupied space on the ship to an assembly station. These escape routes shall be arranged so as to provide the most direct route possible to the assembly station, and shall be marked with symbols based on the guidelines developed by the Organization.

7.1.2 The escape route from cabins to stairway enclosures shall be as direct as possible, with a minimum number of changes in direction. It shall not be necessary to cross from one side of the ship to the other to reach an escape route. It shall not be necessary to climb more than two decks up or down in order to reach an assembly station or open deck from any passenger space.

7.1.3 External routes shall be provided from open decks, as referred to in paragraph 7.1.2, to the survival craft embarkation stations.

7.1.4 Where enclosed spaces adjoin an open deck, openings from the enclosed space to the open deck shall, where practicable, be capable of being used as an emergency exit.

7.1.5 Escape routes shall not be obstructed by furniture and other obstructions. With the exception of tables and chairs which may be cleared to provide open space, cabinets and other heavy furnishings in public spaces and along escape routes shall be secured in place to prevent shifting if the ship rolls or lists. Floor coverings shall also be secured in place. When the ship is underway, escape routes shall be kept clear of obstructions such as cleaning carts, bedding, luggage and boxes of goods.

7.2 Instruction for safe escape

7.2.1 Decks shall be sequentially numbered, starting with "1" at the tank top or lowest deck. The numbers shall be prominently displayed at stair landings and lift lobbies. Decks may also be named, but the deck number shall always be displayed with the name.

7.2.2 Simple "mimic" plans showing the "you are here" position and escape routes marked by arrows, shall be prominently displayed on the inside of each cabin door and in public spaces. The plan shall show the directions of escape and shall be properly oriented in relation to its position on the ship.

7.3 Strength of handrails and corridors

7.3.1 Handrails or other handholds shall be provided in corridors along the entire escape route so that a firm handhold is available at every step of the way, where possible, to the assembly stations and embarkation stations. Such handrails shall be provided on both sides of longitudinal corridors more than 1.8 m in width and transverse corridors more than 1 m in width. Particular attention shall be paid to the need to be able to cross lobbies, atriums and other large open spaces along escape routes. Handrails and other handholds shall be of such strength as to withstand a distributed horizontal load of 750 N/m applied in the direction of the centre of the corridor or space, and a distributed vertical load of 750 N/m applied in the downward direction. The two loads need not be applied simultaneously.

7.3.2 The lowest 0.5 m of bulkheads and other partitions forming vertical divisions along escape routes shall be able to sustain a load of 750 N/m to allow them to be used as walking surfaces from the side of the escape route with the ship at large angles of heel.

7.4 *Evacuation analysis*

Escape routes shall be evaluated by an evacuation analysis early in the design process. The analysis shall be used to identify and eliminate, as far as practicable, congestion which may develop during an abandonment, due to normal movement of passengers and crew along escape routes, including the possibility that crew may need to move along these routes in a direction opposite the movement of passengers. In addition, the analysis shall be used to demonstrate that escape arrangements are sufficiently flexible to provide for the possibility that certain escape routes, assembly stations, embarkation stations or survival craft may not be available as a result of a casualty.

PART E - OPERATIONAL REQUIREMENTS

Regulation 14

Operational readiness and maintenance

1 Purpose

The purpose of this regulation is to maintain and monitor the effectiveness of the fire safety measures the ship is provided with. For this purpose, the following functional requirements shall be met:

- .1 fire protection systems and fire-fighting systems and appliances shall be maintained ready for use; and
- .2 fire protection systems and fire-fighting systems and appliances shall be properly tested and inspected.

2 General requirements

At all times while the ship is in service, the requirements of paragraph 1.1 shall be complied with. A ship is not in service when:

- .1 it is in for repairs or lay-up (either at anchor or in port) or in dry-dock;
- .2 it is declared not in service by the owner or the owner's representative; and
- .3 in the case of passenger ships, there are no passengers on board.

2.1 Operational readiness

2.1.1 The following fire protection systems shall be kept in good order so as to ensure their required performance if a fire occurs:

- .1 structural fire protection including fire-resisting divisions, and protection of openings and penetrations in these divisions;

- .2 fire detection and fire alarm systems; and
- .3 means of escape systems and appliances.

2.1.2 Fire-fighting systems and appliances shall be kept in good working order and readily available for immediate use. Portable extinguishers which have been discharged shall be immediately recharged or replaced with an equivalent unit.

2.2 *Maintenance, testing and inspections*

2.2.1 Maintenance, testing and inspections shall be carried out based on the guidelines developed by the Organization and in a manner having due regard to ensuring the reliability of fire-fighting systems and appliances.

2.2.2 The maintenance plan shall be kept on board the ship and shall be available for inspection whenever required by the Administration.

2.2.3 The maintenance plan shall include at least the following fire protection systems and fire-fighting systems and appliances, where installed:

- .1 fire mains, fire pumps and hydrants including hoses, nozzles and international shore connections;
- .2 fixed fire detection and fire alarm systems;
- .3 fixed fire-extinguishing systems and other fire-extinguishing appliances;
- .4 automatic sprinkler, fire detection and fire alarm systems;
- .5 ventilation systems including fire and smoke dampers, fans and their controls;
- .6 emergency shut down of fuel supply;
- .7 fire doors, including their controls;
- .8 general emergency alarm systems;
- .9 emergency escape breathing devices;
- .10 portable fire extinguishers including spare charges; and
- .11 fire-fighter's outfits.

2.2.4 The maintenance programme may be computer-based.

3 Additional requirements for passenger ships

In addition to the fire protection systems and appliances listed in paragraph 2.2.3, ships carrying more than 36 passengers shall develop a maintenance plan for low-location lighting and public address systems.

4 Additional requirements for tankers

In addition to the fire protection systems and appliances listed in paragraph 2.2.3, tankers shall have a maintenance plan for:

- .1 inert gas systems;
- .2 deck foam systems;
- .3 fire safety arrangements in cargo pump-rooms; and
- .4 flammable gas detectors.

Regulation 15

Instructions, on-board training and drills

1 Purpose

The purpose of this regulation is to mitigate the consequences of fire by means of proper instructions for training and drills of persons onboard in correct procedures under emergency conditions. For this purpose, the crew shall have the necessary knowledge and skills to handle fire emergency cases, including passenger care.

2 General requirements

2.1 Instructions, duties and organization

2.1.1 Crew members shall receive instruction on fire safety onboard the ship.

2.1.2 Crew members shall receive instructions on their assigned duties.

2.1.3 Parties responsible for fire-extinguishing shall be organized. These parties shall have the capability to complete their duties at all times while the ship is in service.

2.2 Onboard training and drills

2.2.1 Crew members shall be trained to be familiar with the arrangements of the ship as well as the location and operation of any fire-fighting systems and appliances that they may be called upon to use.

2.2.2 Training in the use of the emergency escape breathing devices shall be considered as part of on-board training.

2.2.3 Performance of crew members assigned fire-fighting duties shall be periodically evaluated by conducting on-board training and drills to identify areas in need of improvement, to ensure competency in fire-fighting skills is maintained, and to ensure the operational readiness of the fire-fighting organization.

2.2.4 On-board training in the use of the ship's fire-extinguishing systems and appliances shall be planned and conducted in accordance with provisions of regulation III/19.4.1.

2.2.5 Fire drills shall be conducted and recorded in accordance with the provisions of regulations III/19.3 and III/19.5.

2.3 *Training manuals*

2.3.1 A training manual shall be provided in each crew mess room and recreation room or in each crew cabin.

2.3.2 The training manual shall be written in the working language of the ship.

2.3.3 The training manual, which may comprise several volumes, shall contain the instructions and information required in paragraph 2.3.4 in easily understood terms and illustrated wherever possible. Any part of such information may be provided in the form of audio-visual aides in lieu of the manual.

2.3.4 The training manual shall explain the following in detail:

- .1 general fire safety practice and precautions related to the dangers of smoking, electrical hazards, flammable liquids and similar common shipboard hazards;
- .2 general instructions on fire-fighting activities and fire-fighting procedures including procedures for notification of a fire and use of manually operated call points;
- .3 meanings of the ship's alarms;
- .4 operation and use of fire-fighting systems and appliances;
- .5 operation and use of fire doors;
- .6 operation and use of fire and smoke dampers; and
- .7 escape systems and appliances.

2.4 *Fire control plans*

2.4.1 General arrangement plans shall be permanently exhibited for the guidance of the ship's officers, showing clearly for each deck the control stations, the various fire sections enclosed by "A" class divisions, the sections enclosed by "B" class divisions together with particulars of the fire detection and fire alarm systems, the sprinkler installation, the fire-extinguishing appliances, means of access to different compartments, decks, etc., and the ventilating system including particulars of the fan control positions, the position of dampers and identification numbers of the ventilating fans serving each section. Alternatively, at the discretion of the Administration, the aforementioned details may be set out in a booklet, a copy of which shall be supplied to each officer, and one copy shall at all times be available on board in an accessible position. Plans and booklets shall be kept up to date; any alterations thereto shall be recorded as soon as practicable. Description in such plans and booklets shall be in the language or languages required by the Administration. If the language is neither English nor French, a translation into one of those languages shall be included.

2.4.2 A duplicate set of fire control plans or a booklet containing such plans shall be permanently stored in a prominently marked weathertight enclosure outside the deckhouse for the assistance of shore-side fire-fighting personnel.

3 Additional requirements for passenger ships

3.1 *Fire drills*

In addition to the requirement of paragraph 2.2.3, fire drills shall be conducted in accordance with the provisions of regulation III/30 having due regard to notification of passengers and movement of passengers to assembly stations and embarkation decks.

3.2 *Fire control plans*

In ships carrying more than 36 passengers, plans and booklets required by this regulation shall provide information regarding fire protection, fire detection and fire extinction based on the guidelines developed by the Organization.

Regulation 16

Operations

1 Purpose

The purpose of this regulation is to provide information and instructions for proper ship and cargo handling operations in relation to fire safety. For this purpose, the following functional requirements shall be met:

- .1 fire safety operational booklets shall be provided on board; and
- .2 flammable vapour releases from cargo tank venting shall be controlled.

2 Fire safety operational booklets

2.1 The required fire safety operational booklet shall contain the necessary information and instructions for the safe operation of the ship and cargo handling operations in relation to fire safety. The booklet shall include information concerning the crew's responsibilities for the general fire safety of the ship while loading and discharging cargo and while underway. Necessary fire safety precautions for handling general cargoes shall be explained. For ships carrying dangerous goods and flammable bulk cargoes, the fire safety operational booklet shall also provide reference to the pertinent fire-fighting and emergency cargo handling instructions contained in the Code of Safe Practice for Solid Bulk Cargoes, the International Bulk Chemical Code, the International Gas Carrier Code and the International Maritime Dangerous Goods Code, as appropriate.

2.2 The fire safety operational booklet shall be provided in each crew mess room and recreation room or in each crew cabin.

2.3 The fire safety operational booklet shall be written in the working language of the ship.

2.4 The fire safety operational booklet may be combined with the training manuals required in regulation 15.2.3.

3 Additional requirements for tankers

3.1 General

The fire safety operational booklet referred to in paragraph 2 shall include provisions for preventing fire spread to the cargo area due to ignition of flammable vapours and include procedures of cargo tank gas-purging and/or gas-freeing taking into account the provisions in paragraph 3.2.

3.2 Procedures for cargo tank purging and/or gas-freeing

3.2.1 When the ship is provided with an inert gas system, the cargo tanks shall first be purged in accordance with the provisions of regulation 4.5.6 until the concentration of hydrocarbon vapours in the cargo tanks has been reduced to less than 2% by volume. Thereafter, gas-freeing may take place at the cargo tank deck level.

3.2.2 When the ship is not provided with an inert gas system, the operation shall be such that the flammable vapour is discharged initially through:

- .1 the vent outlets as specified in regulation 4.5.3.4;
- .2 outlets at least 2 m above the cargo tank deck level with a vertical efflux velocity of at least 30 m/s maintained during the gas-freeing operation; or
- .3 outlets at least 2 m above the cargo tank deck level with a vertical efflux velocity of at least 20 m/s and which are protected by suitable devices to prevent the passage of flame.

3.2.3 The above outlets shall be located not less than 10 m measured horizontally from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery, which may include anchor windlass and chain locker openings, and equipment which may constitute an ignition hazard.

3.2.4 When the flammable vapour concentration at the outlet has been reduced to 30% of the lower flammable limit, gas-freeing may be continued at cargo tank deck level.

PART F - ALTERNATIVE DESIGN AND ARRANGEMENTS

Regulation 17

Alternative design and arrangements

1 Purpose

The purpose of this regulation is to provide a methodology for alternative design and arrangements for fire safety.

2 General

2.1 Fire safety design and arrangements may deviate from the prescriptive requirements set out in parts B, C, D, E or G, provided that the design and arrangements meet the fire safety objectives and the functional requirements.

2.2 When fire safety design or arrangements deviate from the prescriptive requirements of this chapter, engineering analysis, evaluation and approval of the alternative design and arrangements shall be carried out in accordance with this regulation.

3 Engineering analysis

The engineering analysis shall be prepared and submitted to the Administration, based on the guidelines developed by the Organization and shall include, as a minimum, the following elements:

- .1 determination of the ship type and space(s) concerned;
- .2 identification of prescriptive requirement(s) with which the ship or the space(s) will not comply;
- .3 identification of the fire and explosion hazards of the ship or the space(s) concerned including:
 - .3.1 identification of the possible ignition sources;
 - .3.2 identification of the fire growth potential of each space concerned;
 - .3.3 identification of the smoke and toxic effluent generation potential for each space concerned;
 - .3.4 identification of the potential for the spread of fire, smoke or of toxic effluents from the space(s) concerned to other spaces;
- .4 determination of the required fire safety performance criteria for the ships or the space(s) concerned addressed by the prescriptive requirement(s), in particular:
 - .4.1 performance criteria shall be based on the fire safety objectives and on the functional requirements of this chapter;
 - .4.2 performance criteria shall provide a degree of safety not less than that achieved by using the prescriptive requirements; and
 - .4.3 performance criteria shall be quantifiable and measurable;
- .5 detailed description of the alternative design and arrangements, including a list of the assumptions used in the design and any proposed operational restrictions or conditions; and
- .6 technical justification demonstrating that the alternative design and arrangements meet the required fire safety performance criteria.

4 Evaluation of the alternative design and arrangements

4.1 The engineering analysis required in paragraph 3 shall be evaluated and approved by the Administration taking into account the guidelines developed by the Organization.

4.2 A copy of the documentation, as approved by the Administration, indicating that the alternative design and arrangements comply with this regulation shall be carried onboard the ship.

5 Exchange of information

The Administration shall communicate to the Organization pertinent information concerning alternative design and arrangements approved by them for circulation to all Contracting Governments.

6 Re-evaluation due to change of conditions

If the assumptions, and operational restrictions that were stipulated in the alternative design and arrangements are changed, the engineering analysis shall be carried out under the changed condition and shall be approved by the Administration.

PART G - SPECIAL REQUIREMENTS

Regulation 18

Helicopter facilities

1 Purpose

The purpose of this regulation is to provide additional measures in order to address the fire safety objectives of this chapter for ships fitted with special facilities for helicopters. For this purpose, the following functional requirements shall be met:

- .1 helideck structure shall be adequate to protect the ship from the fire hazards associated with helicopter operations;
- .2 fire-fighting appliances shall be provided to adequately protect the ship from the fire hazards associated with helicopter operations;
- .3 refuelling and hangar facilities and operations shall provide the necessary measures to protect the ship from the fire hazards associated with helicopter operations; and
- .4 operation manuals and training shall be provided.

2 Application

2.1 In addition to complying with the requirements of regulations in parts B, C, D and E, as appropriate, ships equipped with helidecks shall comply with the requirements of this regulation.

2.2 Where helicopters land or conduct winching operations on an occasional or emergency basis on ships without helidecks, fire-fighting equipment fitted in accordance with the requirements in part C may be used. This equipment shall be made readily available in close proximity to the landing or winching areas during helicopter operations.

2.3 Notwithstanding the requirements of paragraph 2.2 above, ro-ro passenger ships without helidecks shall comply with regulation III/28.

3 Structure

3.1 Construction of steel or other equivalent material

In general, the construction of the helidecks shall be of steel or other equivalent materials. If the helideck forms the deckhead of a deckhouse or superstructure, it shall be insulated to "A-60" class standard.

3.2 Construction of aluminium or other low melting point metals

If the Administration permits aluminium or other low melting point metal construction that is not made equivalent to steel, the following provisions shall be satisfied:

- .1 if the platform is cantilevered over the side of the ship, after each fire on the ship or on the platform, the platform shall undergo a structural analysis to determine its suitability for further use; and
- .2 if the platform is located above the ship's deckhouse or similar structure, the following conditions shall be satisfied:
 - .2.1 the deckhouse top and bulkheads under the platform shall have no openings;
 - .2.2 windows under the platform shall be provided with steel shutters; and
 - .2.3 after each fire on the platform or in close proximity, the platform shall undergo a structural analysis to determine its suitability for further use.

4 Means of escape

A helideck shall be provided with both a main and an emergency means of escape and access for fire fighting and rescue personnel. These shall be located as far apart from each other as is practicable and preferably on opposite sides of the helideck.

5 Fire-fighting appliances

5.1 In close proximity to the helideck, the following fire-fighting appliances shall be provided and stored near the means of access to that helideck:

- .1 at least two dry powder extinguishers having a total capacity of not less than 45 kg;
- .2 carbon dioxide extinguishers of a total capacity of not less than 18 kg or equivalent;
- .3 a suitable foam application system consisting of monitors or foam making branch pipes capable of delivering foam to all parts of the helideck in all weather conditions in which helicopters can operate. The system shall be capable of delivering a discharge rate as required in table 18.1 for at least 5 min;

Table 18.1 - Foam discharge rates

Category	Helicopter overall length	Discharge rate foam solution (l/min)
H1	up to but not including 15 m	250
H2	from 15 m up to but not including 24 m	500
H3	from 24 m up to but not including 35 m	800

- .4 the principal agent shall be suitable for use with salt water and conform to performance standards not inferior to those acceptable to the Organization;
- .5 at least two nozzles of an approved dual-purpose type (jet/spray) and hoses sufficient to reach any part of the helideck;
- .6 in addition to the requirements of regulation 10.10, two sets of fire-fighter's outfits; and
- .7 at least the following equipment shall be stored in a manner that provides for immediate use and protection from the elements:
 - .1 adjustable wrench;
 - .2 blanket, fire resistant;
 - .3 cutters, bolt 60 cm;
 - .4 hook, grab or salving;
 - .5 hacksaw, heavy duty complete with six spare blades;
 - .6 ladder;
 - .7 lift line 5 mm diameter and 15 m in length;
 - .8 pliers, side cutting;
 - .9 set of assorted screwdrivers; and
 - .10 harness knife complete with sheath.

6 Drainage facilities

Drainage facilities in way of helidecks shall be constructed of steel and shall lead directly overboard independent of any other system and shall be designed so that drainage does not fall onto any part of the ship.

7 Helicopter refuelling and hangar facilities

Where the ship has helicopter refuelling and hangar facilities, the following requirements shall be complied with:

- .1 a designated area shall be provided for the storage of fuel tanks which shall be:
 - .1.1 as remote as is practicable from accommodation spaces, escape routes and embarkation stations; and
 - .1.2 isolated from areas containing a source of vapour ignition;

- .2 the fuel storage area shall be provided with arrangements whereby fuel spillage may be collected and drained to a safe location;
- .3 tanks and associated equipment shall be protected against physical damage and from a fire in an adjacent space or area;
- .4 where portable fuel storage tanks are used, special attention shall be given to:
 - .4.1 design of the tank for its intended purpose;
 - .4.2 mounting and securing arrangements;
 - .4.3 electric bonding; and
 - .4.4 inspection procedures;
- .5 storage tank fuel pumps shall be provided with means which permit shutdown from a safe remote location in the event of a fire. Where a gravity fuelling system is installed, equivalent closing arrangements shall be provided to isolate the fuel source;
- .6 the fuel pumping unit shall be connected to one tank at a time. The piping between the tank and the pumping unit shall be of steel or equivalent material, as short as possible, and protected against damage;
- .7 electrical fuel pumping units and associated control equipment shall be of a type suitable for the location and potential hazards;
- .8 fuel pumping units shall incorporate a device which will prevent over-pressurization of the delivery or filling hose;
- .9 equipment used in refuelling operations shall be electrically bonded;
- .10 "NO SMOKING" signs shall be displayed at appropriate locations;
- .11 hangar, refuelling and maintenance facilities shall be treated as category 'A' machinery spaces with regard to structural fire protection, fixed fire-extinguishing and detection system requirements;
- .12 enclosed hangar facilities or enclosed spaces containing refuelling installations shall be provided with mechanical ventilation, as required by regulation 20.3 for closed ro-ro spaces of cargo ships. Ventilation fans shall be of non-sparking type; and
- .13 electric equipment and wiring in enclosed hangar or enclosed spaces containing refuelling installations shall comply with regulations 20.3.2, 20.3.3 and 20.3.4.

8 Operations manual and fire-fighting arrangements

8.1 Each helicopter facility shall have an operations manual, including a description and a checklist of safety precautions, procedures and equipment requirements. This manual may be part of the ship's emergency response procedures.

8.2 The procedures and precautions to be followed during refuelling operations shall be in accordance with recognized safe practices and contained in the operations manual.

8.3 Fire-fighting personnel consisting of at least two persons trained for rescue and fire-fighting duties and fire-fighting equipment shall be immediately available at all times when helicopter operations are expected.

8.4 Fire-fighting personnel shall be present during refuelling operations. However, the fire-fighting personnel shall not be involved with refuelling activities.

8.5 On-board refresher training shall be carried out and additional supplies of fire-fighting media shall be provided for training and testing of the equipment.

Regulation 19

Carriage of dangerous goods

1 Purpose

The purpose of this regulation is to provide additional safety measures in order to address the fire safety objectives of this chapter for ships carrying dangerous goods. For this purpose, the following functional requirements shall be met:

- .1 fire protection systems shall be provided to protect the ship from the added fire hazards associated with carriage of dangerous goods;
- .2 dangerous goods shall be adequately separated from ignition sources; and
- .3 appropriate personnel protective equipment shall be provided for the hazards associated with the carriage of dangerous goods.

2 General requirements

2.1 In addition to complying with the requirements of regulations in parts B, C, D, E and regulations 18 and 20, as appropriate, ship types and cargo spaces, referred to in paragraph 2.2, intended for the carriage of dangerous goods shall comply with the requirements of this regulation, as appropriate, except when carrying dangerous goods in limited quantities unless such requirements have already been met by compliance with the requirements elsewhere in this chapter. The types of ships and modes of carriage of dangerous goods are referred to in paragraph 2.2 and in table 19.1. Cargo ships of less than 500 gross tonnage shall comply with this regulation, but Administrations may reduce the requirements and such reduced requirements shall be recorded in the document of compliance referred to in paragraph 4.

2.2 The following ship types and cargo spaces shall govern the application of tables 19.1 and 19.2:

- .1 ships and cargo spaces not specifically designed for the carriage of freight containers, but intended for the carriage of dangerous goods in packaged form including goods in freight containers and portable tanks;

- .2 purpose-built containerships and cargo spaces intended for the carriage of dangerous goods in freight containers and portable tanks;
- .3 ro-ro ships and ro-ro spaces intended for the carriage of dangerous goods;
- .4 ships and cargo spaces intended for the carriage of solid dangerous goods in bulk; and
- .5 ships and cargo spaces intended for carriage of dangerous goods other than liquids and gases in bulk in shipborne barges.

3 Special requirements

Unless otherwise specified, the following requirements shall govern the application of tables 19.1, 19.2 and 19.3 to both "on-deck" and "under-deck" stowage of dangerous goods where the numbers of the following paragraphs are indicated in the first column of the tables.

3.1 *Water supplies*

3.1.1 Arrangements shall be made to ensure immediate availability of a supply of water from the fire main at the required pressure either by permanent pressurization or by suitably placed remote arrangements for the fire pumps.

3.1.2 The quantity of water delivered shall be capable of supplying four nozzles of a size and at pressures as specified in regulation 10.2, capable of being trained on any part of the cargo space when empty. This amount of water may be applied by equivalent means to the satisfaction of the Administration.

3.1.3 Means shall be provided for effectively cooling the designated underdeck cargo space by at least 5 l/min per square metre of the horizontal area of cargo spaces, either by a fixed arrangement of spraying nozzles or flooding the cargo space with water. Hoses may be used for this purpose in small cargo spaces and in small areas of larger cargo spaces at the discretion of the Administration. However, the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. The drainage system shall be sized to remove no less than 125% of the combined capacity of both the water spraying system pumps and the required number of fire hose nozzles. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of not more than 40 m in each watertight compartment. If this is not possible, the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information.

3.1.4 Provision to flood a designated under-deck cargo space with suitable specified media may be substituted for the requirements in paragraph 3.1.3.

3.1.5 The total required capacity of the water supply shall satisfy paragraphs 3.1.2 and 3.1.3, if applicable, simultaneously calculated for the largest designated cargo space. The capacity requirements of paragraph 3.1.2 shall be met by the total capacity of the main fire pump(s) not including the capacity of the emergency fire pump, if fitted. If a drencher system is used to satisfy paragraph 3.1.3, the drencher pump shall also be taken into account in this total capacity calculation.

3.2 *Sources of ignition*

Electrical equipment and wiring shall not be fitted in enclosed cargo spaces or vehicle spaces unless it is essential for operational purposes in the opinion of the Administration. However, if electrical equipment is fitted in such spaces, it shall be of a certified safe type for use in the dangerous environments to which it may be exposed unless it is possible to completely isolate the electrical system (e.g. by removal of links in the system, other than fuses). Cable penetrations of the decks and bulkheads shall be sealed against the passage of gas or vapour. Through runs of cables and cables within the cargo spaces shall be protected against damage from impact. Any other equipment which may constitute a source of ignition of flammable vapour shall not be permitted.

3.3 *Detection system*

Ro-ro spaces shall be fitted with a fixed fire detection and fire alarm system complying with the requirements of the Fire Safety Systems Code. All other types of cargo spaces shall be fitted with either a fixed fire detection and fire alarm system or a sample extraction smoke detection system complying with the requirements of the Fire Safety Systems Code. If a sample extraction smoke detection system is fitted, particular attention shall be made to paragraph 2.1.3 in chapter 10 of the Fire Safety Systems Code in order to prevent the leakage of toxic fumes into occupied areas.

3.4 *Ventilation*

3.4.1 Adequate power ventilation shall be provided in enclosed cargo spaces. The arrangement shall be such as to provide for at least six air changes per hour in the cargo space based on an empty cargo space and for removal of vapours from the upper or lower parts of the cargo space, as appropriate.

3.4.2 The fans shall be such as to avoid the possibility of ignition of flammable gas air mixtures. Suitable wire mesh guards shall be fitted over inlet and outlet ventilation openings.

3.4.3 Natural ventilation shall be provided in enclosed cargo spaces intended for the carriage of solid dangerous goods in bulk, where there is no provision for mechanical ventilation.

3.5 *Bilge pumping*

3.5.1 Where it is intended to carry flammable or toxic liquids in enclosed cargo spaces, the bilge pumping system shall be designed to protect against inadvertent pumping of such liquids through machinery space piping or pumps. Where large quantities of such liquids are carried, consideration shall be given to the provision of additional means of draining those cargo spaces.

3.5.2 If the bilge drainage system is additional to the system served by pumps in the machinery space, the capacity of the system shall be not less than 10 m³/h per cargo space served. If the additional system is common, the capacity need not exceed 25 m³/h. The additional bilge system need not be arranged with redundancy.

3.5.3 Whenever flammable or toxic liquids are carried, the bilge line into the machinery space shall be isolated either by fitting a blank flange or by a closed lockable valve.

3.5.4 Enclosed spaces outside machinery spaces containing bilge pumps serving cargo spaces intended for carriage of flammable or toxic liquids shall be fitted with separate mechanical ventilation giving at least six air changes per hour. If the space has access from another enclosed space, the door shall be self-closing.

3.5.5 If bilge drainage of cargo spaces is arranged by gravity drainage, the drainage shall be either led directly overboard or to a closed drain tank located outside the machinery spaces. The tank shall be provided with a vent pipe to a safe location on the open deck. Drainage from a cargo space into bilge wells in a lower space is only permitted if that space satisfies the same requirements as the cargo space above.

3.6 *Personnel protection*

3.6.1 Four sets of full protective clothing resistant to chemical attack shall be provided in addition to the fire-fighter's outfits required by regulation 10.10. The protective clothing shall cover all skin, so that no part of the body is unprotected.

3.6.2 At least two self-contained breathing apparatuses additional to those required by regulation 10 shall be provided. Two spare charges suitable for use with the breathing apparatus shall be provided for each required apparatus. Passenger ships carrying not more than 36 passengers and cargo ships that are equipped with suitably located means for fully recharging the air cylinders free from contamination, need carry only one spare charge for each required apparatus.

3.7 *Portable fire extinguishers*

Portable fire extinguishers with a total capacity of at least 12 kg of dry powder or equivalent shall be provided for the cargo spaces. These extinguishers shall be in addition to any portable fire extinguishers required elsewhere in this chapter.

3.8 *Insulation of machinery space boundaries*

Bulkheads forming boundaries between cargo spaces and machinery spaces of category A shall be insulated to "A-60" class standard, unless the dangerous goods are stowed at least 3 m horizontally away from such bulkheads. Other boundaries between such spaces shall be insulated to "A-60" class standard.

3.9 *Water-spray system*

Each open ro-ro space having a deck above it and each space deemed to be a closed ro-ro space not capable of being sealed, shall be fitted with an approved fixed pressure water-spraying system for manual operation which shall protect all parts of any deck and vehicle platform in the space, except that the Administration may permit the use of any other fixed fire-extinguishing system that has been shown by full-scale test to be no less effective. However, the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. The drainage system shall be sized to remove no less than 125% of the combined capacity of both the water-spraying system pumps and the required number of fire hose nozzles. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of not more than 40 m in each watertight compartment. If this is not possible the adverse effect upon stability of the added

weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information.

3.10 Separation of ro-ro spaces

3.10.1 In ships having ro-ro spaces, a separation shall be provided between a closed ro-ro space and an adjacent open ro-ro space. The separation shall be such as to minimize the passage of dangerous vapours and liquids between such spaces. Alternatively, such separation need not be provided if the ro-ro space is considered to be a closed cargo space over its entire length and shall fully comply with the relevant special requirements of this regulation.

3.10.2 In ships having ro-ro spaces, a separation shall be provided between a closed ro-ro space and the adjacent weather deck. The separation shall be such as to minimize the passage of dangerous vapours and liquids between such spaces. Alternatively, a separation need not be provided if the arrangements of the closed ro-ro spaces are in accordance with those required for the dangerous goods carried on adjacent weather deck.

4 Document of compliance

The Administration shall provide the ship with an appropriate document as evidence of compliance of construction and equipment with the requirements of this regulation. Certification for dangerous goods, except solid dangerous goods in bulk, is not required for those cargoes specified as class 6.2 and 7, as defined in regulation VII/2, and dangerous goods in limited quantities.

Table 19.1 - Application of the requirements to different modes of carriage of dangerous goods in ships and cargo spaces

Where “X” appears in table 19.1, it means this requirement is applicable to all classes of dangerous goods as given in the appropriate line of table 19.3, except as indicated by the notes.

Regulation 19.2.2 Regulation 19	Weather decks .1 to .5 inclusive	.1 Not specially designed	.2 Container cargo spaces	.3		.4 Solid dangerous goods in bulk	.5 Shipborne barges
				Closed ro-ro spaces ⁵	Open ro-ro spaces		
3.1.1	X	X	X	X	X	For application of requirements of regulation 19 to different classes of dangerous goods, see table 19.2	X
3.1.2	X	X	X	X	X		-
3.1.3	-	X	X	X	X		X
3.1.4	-	X	X	X	X		X
3.2	-	X	X	X	X		X ⁴
3.3	-	X	X	X	-		X ⁴
3.4.1	-	X	X ¹	X	-		X ⁴
3.4.2	-	X	X ¹	X	-		X ⁴
3.5	-	X	X	X	-		-
3.6.1	X	X	X	X	X		-
3.6.2	X	X	X	X	X		-
3.7	X	X	-	-	X		-
3.8	X	X	X ²	X	X		-
3.9	-	-	-	X ³	X		-
3.10.1	-	-	-	X	-		-
3.10.2	-	-	-	X	-	-	

Notes

- 1 For classes 4 and 5.1 not applicable to closed freight containers.

For classes 2, 3, 6.1 and 8 when carried in closed freight containers the ventilation rate may be reduced to not less than two air changes. For the purpose of this requirement a portable tank is a closed freight container.
- 2 Applicable to decks only.
- 3 Applies only to closed ro-ro spaces, not capable of being sealed.
- 4 In the special case where the barges are capable of containing flammable vapours or alternatively if they are capable of discharging flammable vapours to a safe space outside the barge carrier compartment by means of ventilation ducts connected to the barges, these requirements may be reduced or waived to the satisfaction of the Administration.
- 5 Special category spaces shall be treated as closed ro-ro spaces when dangerous goods are carried.

Table 19.2 - Application of the requirements to different classes of dangerous goods for ships and cargo spaces carrying solid dangerous goods in bulk

Class Regulation 19	4.1	4.2	4.3 ⁶	5.1	6.1	8	9
3.1.1	X	X	-	X	-	-	X
3.1.2	X	X	-	X	-	-	X
3.2	X	X ⁷	X	X ⁸	-	-	X ⁸
3.4.1	-	X ⁷	X	-	-	-	-
3.4.2	X ⁹	X ⁷	X	X ^{7,9}	-	-	X ^{7,9}
3.4.3	X	X	X	X	X	X	X
3.6	X	X	X	X	X	X	X
3.8	X	X	X	X ⁷	-	-	X ¹⁰

Notes:

- 6 The hazards of substances in this class which may be carried in bulk are such that special consideration shall be given by the Administration to the construction and equipment of the ship involved in addition to meeting the requirements enumerated in this table.
- 7 Only applicable to Seedcake containing solvent extractions, to Ammonium nitrate and to Ammonium nitrate fertilizers.
- 8 Only applicable to Ammonium nitrate and to Ammonium nitrate fertilizers. However, a degree of protection in accordance with standards contained in the International Electrotechnical Commission publication 60079, *Electrical Apparatus for Explosive Gas Atmospheres*, is sufficient.
- 9 Only suitable wire mesh guards are required.
- 10 The requirements of the Code of Safe Practice for Solid bulk Cargoes adopted by resolution A.434(XI), as amended, are sufficient.

Table 19.3 - Application of the requirements to different classes of dangerous goods except solid dangerous goods in bulk

Class	1.1 to 1.6	1.4S	2.1	2.2	2.3	3.1 3.2 liquids ≤23°C ¹⁵	3.3 liquids >23°C ¹⁵ ≤61°C	4.1	4.2	4.3	5.1	5.2	6.1 liquids	6.1 liquids ≤23°C ¹⁵	6.1 liquids >23°C ¹⁵ ≤61°C	6.1 solids	8 liquids	8 liquids ≤23°C ¹⁵	8 liquids >23°C ¹⁵ ≤61°C	8 solids	9
Regulation 19																					
3.1.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.1.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
3.1.3	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.1.4	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.2	X	-	X	-	-	X	-	-	-	-	-	-	-	X	-	-	-	X	-	-	-
3.3	X	X	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	X
3.4.1	-	-	X	-	X	X	-	X ¹¹	X ¹¹	X	X ¹¹	-	-	X	X	X ¹¹	-	X	X	-	X ¹¹
3.4.2	-	-	X	-	-	X	-	-	-	-	-	-	-	X	X	-	-	X	X	-	-
3.5	-	-	-	-	-	X	-	-	-	-	-	-	X	X	X	-	-	X	-	-	-
3.6	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.7	-	-	-	-	-	X	X	X	X	X	X	-	-	X	X	-	-	X	X	-	-
3.8	X ¹²	-	X	X	X	X	X	X	X	X	X ¹³	-	-	X	X	-	-	X	X	-	-
3.9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.10.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.10.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Notes

- 11 When "mechanically-ventilated spaces" are required by the International Maritime Dangerous Goods Code, as amended.
- 12 Stow 3 m horizontally away from the machinery space boundaries in all cases.
- 13 Refer to the International Maritime Dangerous Goods Code, as amended.
- 14 As appropriate to the goods to be carried.
- 15 Refers to flashpoint.

Regulation 20

Protection of vehicle, special category and ro-ro spaces

1 Purpose

The purpose of this regulation is to provide additional safety measures in order to address the fire safety objectives of this chapter for ships fitted with vehicle, special category and ro-ro spaces. For this purpose, the following functional requirements shall be met:

- .1 fire protection systems shall be provided to adequately protect the ship from the fire hazards associated with vehicle, special category and ro-ro spaces;
- .2 ignition sources shall be separated from vehicle, special category and ro-ro spaces;
and
- .3 vehicle, special category and ro-ro spaces shall be adequately ventilated.

2 General requirements

2.1 Application

In addition to complying with the requirements of regulations in parts B, C, D and E, as appropriate, vehicle, special category and ro-ro spaces shall comply with the requirements of this regulation.

2.2 Basic principles for passenger ships

2.2.1 The basic principle underlying the provisions of this regulation is that the main vertical zoning required by regulation 9.2 may not be practicable in vehicle spaces of passenger ships and, therefore, equivalent protection must be obtained in such spaces on the basis of a horizontal zone concept and by the provision of an efficient fixed fire-extinguishing system. Based on this concept, a horizontal zone for the purpose of this regulation may include special category spaces on more than one deck provided that the total overall clear height for vehicles does not exceed 10 m.

2.2.2 The basic principle underlying the provisions of paragraph 2.2.1 are also applicable to ro-ro spaces.

2.2.3 The requirements of ventilation systems, openings in "A" class divisions and penetrations in "A" class divisions for maintaining the integrity of vertical zones in this chapter shall be applied equally to decks and bulkheads forming the boundaries separating horizontal zones from each other and from the remainder of the ship.

3 Precaution against ignition of flammable vapours in closed vehicle spaces, closed ro-ro spaces and special category spaces

3.1 Ventilation systems

3.1.1 Capacity of ventilation systems

There shall be provided an effective power ventilation system sufficient to give at least the following air changes:

<i>.1</i>	Passenger ships	
	Special category spaces	10 air changes per hour
	Closed ro-ro and vehicle spaces other than special category spaces for ships carrying more than 36 passengers	10 air changes per hour
	Closed ro-ro and vehicle spaces other than special category spaces for ships carrying not more than 36 passengers	6 air changes per hour
<i>.2</i>	Cargo ships	6 air changes per hour

The Administration may require an increased number of air changes when vehicles are being loaded and unloaded.

3.1.2 Performance of ventilation systems

3.1.2.1 In passenger ships, the power ventilation system required in paragraph 3.1.1 shall be separate from other ventilation systems and shall be in operation at all times when vehicles are in such spaces. Ventilation ducts serving such cargo spaces capable of being effectively sealed shall be separated for each such space. The system shall be capable of being controlled from a position outside such spaces.

3.1.2.2 In cargo ships, ventilation fans shall normally be run continuously whenever vehicles are on board. Where this is impracticable, they shall be operated for a limited period daily as weather permits and in any case for a reasonable period prior to discharge, after which period the ro-ro or vehicle space shall be proved gas-free. One or more portable combustible gas detecting instruments shall be carried for this purpose. The system shall be entirely separate from other ventilating systems. Ventilation ducts serving ro-ro or vehicle spaces shall be capable of being effectively sealed for each cargo space. The system shall be capable of being controlled from a position outside such spaces.

3.1.2.3 The ventilation system shall be such as to prevent air stratification and the formation of air pockets.

3.1.3 Indication of ventilation systems

Means shall be provided on the navigation bridge to indicate any loss of the required ventilating capacity.

3.1.4 *Closing appliances and ducts*

3.1.4.1 Arrangements shall be provided to permit a rapid shutdown and effective closure of the ventilation system from outside of the space in case of fire, taking into account the weather and sea conditions.

3.1.4.2 Ventilation ducts, including dampers, within a common horizontal zone shall be made of steel. In passenger ships, ventilation ducts that pass through other horizontal zones or machinery spaces shall be "A-60" class steel ducts constructed in accordance with regulations 9.7.2.1.1 and 9.7.2.1.2.

3.1.5 *Permanent openings*

Permanent openings in the side plating, the ends or deckhead of the space shall be so situated that a fire in the cargo space does not endanger stowage areas and embarkation stations for survival craft and accommodation spaces, service spaces and control stations in superstructures and deckhouses above the cargo spaces.

3.2 *Electrical equipment and wiring*

3.2.1 Except as provided in paragraph 3.2.2, electrical equipment and wiring shall be of a type suitable for use in an explosive petrol and air mixture.

3.2.2 In case of other than special category spaces below the bulkhead deck, notwithstanding the provisions in paragraph 3.2.1, above a height of 450 mm from the deck and from each platform for vehicles, if fitted, except platforms with openings of sufficient size permitting penetration of petrol gases downwards, electrical equipment of a type so enclosed and protected as to prevent the escape of sparks shall be permitted as an alternative on condition that the ventilation system is so designed and operated as to provide continuous ventilation of the cargo spaces at the rate of at least ten air changes per hour whenever vehicles are on board.

3.3 *Electrical equipment and wiring in exhaust ventilation ducts*

Electrical equipment and wiring, if installed in an exhaust ventilation duct, shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

3.4 *Other ignition sources*

Other equipment which may constitute a source of ignition of flammable vapours shall not be permitted.

3.5 *Scuppers and discharges*

Scuppers shall not be led to machinery or other spaces where sources of ignition may be present.

4 Detection and alarm

4.1 *Fixed fire detection and fire alarm systems*

Except as provided in paragraph 4.3.1, there shall be provided a fixed fire detection and fire alarm system complying with the requirements of the Fire Safety Systems Code. The fixed fire

detection system shall be capable of rapidly detecting the onset of fire. The type of detectors and their spacing and location shall be to the satisfaction of the Administration, taking into account the effects of ventilation and other relevant factors. After being installed, the system shall be tested under normal ventilation conditions and shall give an overall response time to the satisfaction of the Administration.

4.2 *Sample extraction smoke detection systems*

Except open ro-ro spaces, open vehicle spaces and special category spaces, a sample extraction smoke detection system complying with the requirements of the Fire Safety Systems Code may be used as an alternative of the fixed fire detection and fire alarm system required in paragraph 4.1.

4.3 *Special category spaces*

4.3.1 An efficient fire patrol system shall be maintained in special category spaces. If an efficient fire patrol system is maintained by a continuous fire watch at all times during the voyage, a fixed fire detection and fire alarm systems is not required.

4.3.2 Manually operated call points shall be spaced so that no part of the space is more than 20 m from a manually operated call point, and one shall be placed close to each exit from such spaces.

5 Structural protection

Notwithstanding the provisions of regulation 9.2.2, in passenger ships carrying more than 36 passengers, the boundary bulkheads and decks of special category spaces and ro-ro spaces shall be insulated to "A-60" class standard. However, where a category (5), (9) and (10) space, as defined in regulation 9.2.2.3, is on one side of the division, the standard may be reduced to "A-0". Where fuel oil tanks are below a special category space or a ro-ro space, the integrity of the deck between such spaces, may be reduced to "A-0" standard.

6 Fire-extinction

6.1 *Fixed fire-extinguishing systems*

6.1.1 Vehicle spaces and ro-ro spaces which are not special category spaces and are capable of being sealed from a location outside of the cargo spaces shall be fitted with a fixed gas fire-extinguishing system which shall comply with the provisions of the Fire Safety Systems Code, except that:

- .1 if a carbon dioxide fire-extinguishing system is fitted, the quantity of gas available shall be at least sufficient to give a minimum volume of free gas equal to 45% of the gross volume of the largest such cargo space which is capable of being sealed, and the arrangements shall be such as to ensure that at least two thirds of the gas required for the relevant space shall be introduced within 10 min;
- .2 any other fixed inert gas fire-extinguishing system or fixed high-expansion foam fire-extinguishing system may be fitted provided the Administration is satisfied that an equivalent protection is achieved; and

- .3 as an alternative, a fire-extinguishing system meeting the requirements of paragraph 6.1.2 may be fitted.

6.1.2 Ro-ro and vehicle spaces not capable of being sealed and special category spaces shall be fitted with an approved fixed pressure water-spraying system for manual operation which shall protect all parts of any deck and vehicle platform in such spaces. Such water-spray systems shall have:

- .1 a pressure gauge on the valve manifold;
- .2 clear marking on each manifold valve indicating the spaces served;
- .3 instructions for maintenance and operation located in the valve room; and
- .4 a sufficient number of drainage valves.

6.1.3 The Administration may permit the use of any other fixed fire-extinguishing system that has been shown that it is not less effective by a full-scale test in conditions simulating a flowing petrol fire in a vehicle space or a ro-ro space in controlling fires likely to occur in such a space.

6.1.4 When fixed pressure water-spraying fire-extinguishing systems are provided, in view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or decks during the operation of the water-spraying system, the following arrangements shall be provided:

- .1 in passenger ships:
 - .1.1 in the spaces above the bulkhead deck, scuppers shall be fitted so as to ensure that such water is rapidly discharged directly overboard;
 - .1.2.1 in ro-ro passenger ships discharge valves for scuppers, fitted with positive means of closing operable from a position above the bulkhead deck in accordance with the requirements of the International Convention on Load Lines in force, shall be kept open while the ships are at sea;
 - .1.2.2 any operation of valves referred to in paragraph 6.1.4.1.2.1 shall be recorded in the log-book;
 - .1.3 in the spaces below the bulkhead deck, the Administration may require pumping and drainage facilities to be provided additional to the requirements of regulation II-1/21. In such case, the drainage system shall be sized to remove no less than 125% of the combined capacity of both the water spraying system pumps and the required number of fire hose nozzles. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of not more than 40 m in each watertight compartment;
- .2 in cargo ships, the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. In such case, the drainage system shall be sized to remove no less than 125% of the combined capacity of both the water-spraying

system pumps and the required number of fire hose nozzles. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of not more than 40 m in each watertight compartment. If this is not possible, the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information. Such information shall be included in the stability information supplied to the master as required by regulation II-1/22.

6.2 *Portable fire extinguishers*

6.2.1 Portable fire-extinguishers shall be provided at each deck level in each hold or compartment where vehicles are carried, spaced not more than 20 m apart on both sides of the space. At least one portable fire-extinguisher shall be located at each access to such a cargo space.

6.2.2 In addition to the provision of paragraph 6.2.1, the following fire-extinguishing appliances shall be provided in vehicle, ro-ro and special category spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion:

- .1 at least three water-fog applicators; and
- .2 one portable foam applicator unit complying with the provisions of the Fire Safety Systems Code, provided that at least two such units are available in the ship for use in such spaces. "

CHAPTER V

SAFETY OF NAVIGATION

7 The existing text of chapter V is replaced by the following:

"Regulation 1

Application

1 Unless expressly provided otherwise, this chapter shall apply to all ships on all voyages, except:

- .1 warships, naval auxiliaries and other ships owned or operated by a Contracting Government and used only on government non-commercial service; and
- .2 ships solely navigating the Great Lakes of North America and their connecting and tributary waters as far east as the lower exit of the St. Lambert Lock at Montreal in the Province of Quebec, Canada.

However, warships, naval auxiliaries or other ships owned or operated by a Contracting Government and used only on government non-commercial service are encouraged to act in a manner consistent, so far as reasonable and practicable, with this chapter.

2 The Administration may decide to what extent this chapter shall apply to ships operating solely in waters landward of the baselines which are established in accordance with international law.

3 A rigidly connected composite unit of a pushing vessel and associated pushed vessel, when designed as a dedicated and integrated tug and barge combination, shall be regarded as a single ship for the purpose of this chapter.

4 The Administration shall determine to what extent the provisions of regulations 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27 and 28 do not apply to the following categories of ships:

- .1 ships below 150 gross tonnage engaged on any voyage;
- .2 ships below 500 gross tonnage not engaged on international voyages; and
- .3 fishing vessels.

Regulation 2

Definitions

For the purpose of this chapter:

- 1 *Constructed* in respect of a ship means a stage of construction where:
 - .1 the keel is laid; or
 - .2 construction identifiable with a specific ship begins; or
 - .3 assembly of the ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material whichever is less.
- 2 *Nautical chart* or *nautical publication* is a special-purpose map or book, or a specially compiled database from which such a map or book is derived, that is issued officially by or on the authority of a Government, authorized Hydrographic Office or other relevant government institution and is designed to meet the requirements of marine navigation.
- 3 *All ships* means any ship, vessel or craft irrespective of type and purpose.

Regulation 3

Exemptions and equivalents

- 1 The Administration may grant general exemptions to ships without mechanical means of propulsion from the requirements of regulations 15, 17, 18, 19 (except 19.2.1.7), 20, 22, 24, 25, 26, 27 and 28.
- 2 The Administration may grant to individual ships exemptions or equivalents of a partial or conditional nature, when any such ship is engaged on a voyage

where the maximum distance of the ship from the shore, the length and nature of the voyage, the absence of general navigational hazards, and other conditions affecting safety are such as to render the full application of this chapter unreasonable or unnecessary, provided that the Administration has taken into account the effect such exemptions and equivalents may have upon the safety of all other ships.

3 Each Administration shall submit to the Organization, as soon as possible after 1 January in each year, a report summarising all new exemptions and equivalents granted under paragraph 2 of this regulation during the previous calendar year and giving the reasons for granting such exemptions and equivalents. The Organization shall circulate such particulars to other Contracting Governments for information.

Regulation 4

Navigational warnings

Each Contracting Government shall take all steps necessary to ensure that, when intelligence of any dangers is received from whatever reliable source, it shall be promptly brought to the knowledge of those concerned and communicated to other interested Governments.

Regulation 5

Meteorological services and warnings

1 Contracting Governments undertake to encourage the collection of meteorological data by ships at sea and to arrange for their examination, dissemination and exchange in the manner most suitable for the purpose of aiding navigation. Administrations shall encourage the use of meteorological instruments of a high degree of accuracy, and shall facilitate the checking of such instruments upon request. Arrangements may be made by appropriate national meteorological services for this checking to be undertaken, free of charge to the ship.

2 In particular, Contracting Governments undertake to carry out, in co-operation, the following meteorological arrangements:

- .1 to warn ships of gales, storms and tropical cyclones by the issue of information in text and, as far as practicable graphic form, using the appropriate shore-based facilities for terrestrial and space radiocommunications services.
- .2 to issue, at least twice daily, by terrestrial and space radiocommunication services, as appropriate, weather information suitable for shipping containing data, analyses, warnings and forecasts of weather, waves and ice. Such information shall be transmitted in text and, as far as practicable, graphic form including meteorological analysis and prognosis charts transmitted by facsimile or in digital form for reconstitution on board the ship's data processing system.
- .3 to prepare and issue such publications as may be necessary for the efficient conduct of meteorological work at sea and to arrange, if practicable, for

the publication and making available of daily weather charts for the information of departing ships.

- .4 to arrange for a selection of ships to be equipped with tested marine meteorological instruments (such as a barometer, a barograph, a psychrometer, and suitable apparatus for measuring sea temperature) for use in this service, and to take, record and transmit meteorological observations at the main standard times for surface synoptic observations (i.e. at least four times daily, whenever circumstances permit) and to encourage other ships to take, record and transmit observations in a modified form, particularly when in areas where shipping is sparse.
- .5 to encourage companies to involve as many of their ships as practicable in the making and recording of weather observations; these observations to be transmitted using the ship's terrestrial or space radiocommunications facilities for the benefit of the various national meteorological services.
- .6 the transmission of these weather observations is free of charge to the ships concerned.
- .7 when in the vicinity of a tropical cyclone, or of a suspected tropical cyclone, ships should be encouraged to take and transmit their observations at more frequent intervals whenever practicable, bearing in mind navigational preoccupations of ships' officers during storm conditions.
- .8 to arrange for the reception and transmission of weather messages from and to ships, using the appropriate shore-based facilities for terrestrial and space radiocommunications services.
- .9 to encourage masters to inform ships in the vicinity and also shore stations whenever they experience a wind speed of 50 knots or more (force 10 on the Beaufort scale).
- .10 to endeavour to obtain a uniform procedure in regard to the international meteorological services already specified, and as far as practicable, to conform to the technical regulations and recommendations made by the World Meteorological Organization, to which Contracting Governments may refer, for study and advice, any meteorological question which may arise in carrying out the present Convention.

3 The information provided for in this regulation shall be furnished in a form for transmission and be transmitted in the order of priority prescribed by the Radio Regulations. During transmission "to all stations" of meteorological information, forecasts and warnings, all ship stations must conform to the provisions of the Radio Regulations.

4 Forecasts, warnings, synoptic and other meteorological data intended for ships shall be issued and disseminated by the national meteorological service in the best position to serve various coastal and high seas areas, in accordance with mutual arrangements made by Contracting Governments, in particular as defined by the World Meteorological Organization's System for the Preparation and Dissemination of

Meteorological Forecasts and Warnings for the High Seas under the Global Maritime Distress and Safety System (GMDSS).

Regulation 6

Ice Patrol Service

1 The Ice Patrol contributes to safety of life at sea, safety and efficiency of navigation and protection of the marine environment in the North Atlantic. Ships transiting the region of icebergs guarded by the Ice Patrol during the ice season are required to make use of the services provided by the Ice Patrol.

2 The Contracting Governments undertake to continue an ice patrol and a service for study and observation of ice conditions in the North Atlantic. During the whole of the ice season, i.e. for the period from February 15th through July 1st of each year, the south-eastern, southern and south-western limits of the region of icebergs in the vicinity of the Grand Banks of Newfoundland shall be guarded for the purpose of informing passing ships of the extent of this dangerous region; for the study of ice conditions in general; and for the purpose of affording assistance to ships and crews requiring aid within the limits of operation of the patrol ships and aircraft. During the rest of the year the study and observation of ice conditions shall be maintained as advisable.

3 Ships and aircraft used for the ice patrol service and the study and observation of ice conditions may be assigned other duties provided that such other duties do not interfere with the primary purpose or increase the cost of this service.

4 The Government of the United States of America agrees to continue the overall management of the ice patrol service and the study and observation of ice conditions, including the dissemination of information therefrom.

5 The terms and conditions governing the management, operation and financing of the Ice Patrol are set forth in the Rules for the management, operation and financing of the North Atlantic Ice Patrol appended to this chapter which shall form an integral part of this chapter.

6 If, at any time, the United States and/or Canadian Governments should desire, to discontinue providing these services, it may do so and the Contracting Governments shall settle the question of continuing these services in accordance with their mutual interests. The United States and/or Canadian Governments shall provide 18 months written notice to all Contracting Governments whose ships entitled to fly their flag and whose ships registered in territories to which those Contracting Governments have extended this regulation benefit from these services before discontinuing providing these services.

Regulation 7

Search and rescue services

1 Each Contracting Government undertakes to ensure that necessary arrangements are made for distress communication and co-ordination in their area of responsibility and for the rescue of persons in distress at sea around its coasts. These arrangements shall include the establishment, operation and maintenance of such search and rescue facilities

as are deemed practicable and necessary, having regard to the density of the seagoing traffic and the navigational dangers and shall, so far as possible, provide adequate means of locating and rescuing such persons.

2 Each Contracting Government undertakes to make available information to the Organization concerning its existing search and rescue facilities and the plans for changes therein, if any.

3 Passenger ships to which chapter I applies, shall have on board a plan for co-operation with appropriate search and rescue services in event of an emergency. The plan shall be developed in co-operation between the ship, the company, as defined in regulation IX/1 and the search and rescue services. The plan shall include provisions for periodic exercises to be undertaken to test its effectiveness. The plan shall be developed based on the guidelines developed by the Organization.

Regulation 8

Life-saving signals

Contracting Governments undertake to arrange that life-saving signals are used by search and rescue facilities engaged in search and rescue operations when communicating with ships or persons in distress.

Regulation 9

Hydrographic services

1 Contracting Governments undertake to arrange for the collection and compilation of hydrographic data and the publication, dissemination and keeping up to date of all nautical information necessary for safe navigation.

2 In particular, Contracting Governments undertake to co-operate in carrying out, as far as possible, the following nautical and hydrographic services, in the manner most suitable for the purpose of aiding navigation:

- .1 to ensure that hydrographic surveying is carried out, as far as possible, adequate to the requirements of safe navigation;
- .2 to prepare and issue nautical charts, sailing directions, lists of lights, tide tables and other nautical publications, where applicable, satisfying the needs of safe navigation;
- .3 to promulgate notices to mariners in order that nautical charts and publications are kept, as far as possible, up to date; and
- .4 to provide data management arrangements to support these services.

3 Contracting Governments undertake to ensure the greatest possible uniformity in charts and nautical publications and to take into account, whenever possible, relevant international resolutions and recommendations.

4 Contracting Governments undertake to co-ordinate their activities to the greatest possible degree in order to ensure that hydrographic and nautical information is made available on a world-wide scale as timely, reliably, and unambiguously as possible.

Regulation 10

Ships' routeing

1 Ships' routeing systems contribute to safety of life at sea, safety and efficiency of navigation and/or protection of the marine environment. Ships' routeing systems are recommended for use by, and may be made mandatory for, all ships, certain categories of ships or ships carrying certain cargoes, when adopted and implemented in accordance with the guidelines and criteria developed by the Organization.

2 The Organization is recognized as the only international body for developing guidelines, criteria and regulations on an international level for ships' routeing systems. Contracting Governments shall refer proposals for the adoption of ships' routeing systems to the Organization. The Organization will collate and disseminate to Contracting Governments all relevant information with regard to any adopted ships' routeing systems.

3 The initiation of action for establishing a ships' routeing system is the responsibility of the Government or Governments concerned. In developing such systems for adoption by the Organization, the guidelines and criteria developed by the Organization* shall be taken into account.

4 Ships' routeing systems should be submitted to the Organization for adoption. However, a Government or Governments implementing ships' routeing systems not intended to be submitted to the Organization for adoption or which have not been adopted by the Organization are encouraged to take into account, wherever possible, the guidelines and criteria developed by the Organization.

5 Where two or more Governments have a common interest in a particular area, they should formulate joint proposals for the delineation and use of a routeing system therein on the basis of an agreement between them. Upon receipt of such proposal and before proceeding with consideration of it for adoption, the Organization shall ensure details of the proposal are disseminated to the Governments which have a common interest in the area, including countries in the vicinity of the proposed ships' routeing system.

6 Contracting Governments shall adhere to the measures adopted by the Organization concerning ships' routeing. They shall promulgate all information necessary for the safe and effective use of adopted ships' routeing systems. A Government or Governments concerned may monitor traffic in those systems. Contracting Governments shall do everything in their power to secure the appropriate use of ships' routeing systems adopted by the Organization.

7 A ship shall use a mandatory ships' routeing system adopted by the Organization as required for its category or cargo carried and in accordance with the relevant provisions in force unless there are compelling reasons not to use a particular ships' routeing system. Any such reason shall be recorded in the ships' log.

8 Mandatory ships' routing systems shall be reviewed by the Contracting Government or Governments concerned in accordance with the guidelines and criteria developed by the Organization.

9 All adopted ships' routing systems and actions taken to enforce compliance with those systems shall be consistent with international law, including the relevant provisions of the 1982 United Nations Convention on the Law of the Sea.

10 Nothing in this regulation nor its associated guidelines and criteria shall prejudice the rights and duties of Governments under international law or the legal regimes of straits used for international navigation and archipelagic sea lanes.

Regulation 11

Ship reporting systems

1 Ship reporting systems contribute to safety of life at sea, safety and efficiency of navigation and/or protection of the marine environment. A ship reporting system, when adopted and implemented in accordance with the guidelines and criteria developed by the Organization pursuant to this regulation, shall be used by all ships, or certain categories of ships or ships carrying certain cargoes in accordance with the provisions of each system so adopted.

2 The Organization is recognized as the only international body for developing guidelines, criteria and regulations on an international level for ship reporting systems. Contracting Government shall refer proposals for the adoption of ship reporting systems to the Organization. The Organization will collate and disseminate to Contracting Governments all relevant information with regard to any adopted ship reporting system.

3 The initiation of action for establishing a ship reporting system is the responsibility of the Government or Governments concerned. In developing such systems provision of the guidelines and criteria developed by the Organization shall be taken into account.

4 Ship reporting systems not submitted to the Organization for adoption do not necessarily need to comply with this regulation. However, Governments implementing such systems are encouraged to follow, wherever possible, the guidelines and criteria developed by the Organization. Contracting Governments may submit such systems to the Organization for recognition.

5 Where two or more Governments have a common interest in a particular area, they should formulate proposals for a co-ordinated ship reporting system on the basis of agreement between them. Before proceeding with a proposal for adoption of a ship reporting system, the Organization shall disseminate details of the proposal to those Governments which have a common interest in the area covered by the proposed system. Where a co-ordinated ship reporting system is adopted and established, it shall have uniform procedures and operations.

6 After adoption of a ship reporting system in accordance with this regulation, the Government or Governments concerned shall take all measures necessary for the promulgation of any information needed for the efficient and effective use of the system. Any adopted ship reporting system shall have the capability of interaction and the ability

to assist ships with information when necessary. Such systems shall be operated in accordance with the guidelines and criteria developed by the Organization pursuant to this regulation.

7 The master of a ship shall comply with the requirements of adopted ship reporting systems and report to the appropriate authority all information required in accordance with the provisions of each such system.

8 All adopted ship reporting systems and actions taken to enforce compliance with those systems shall be consistent with international law, including the relevant provisions of the United Nations Convention on the Law of the Sea.

9 Nothing in this regulation or its associated guidelines and criteria shall prejudice the rights and duties of Governments under international law or the legal regimes of straits used for international navigation and archipelagic sea lanes.

10 The participation of ships in accordance with the provisions of adopted ship reporting systems shall be free of charge to the ships concerned.

11 The Organization shall ensure that adopted ship reporting systems are reviewed under the guidelines and criteria developed by the Organization.

Regulation 12

Vessel traffic services

1 Vessel traffic services (VTS) contribute to safety of life at sea, safety and efficiency of navigation and protection of the marine environment, adjacent shore areas, work sites and offshore installations from possible adverse effects of maritime traffic.

2 Contracting Governments undertake to arrange for the establishment of VTS where, in their opinion, the volume of traffic or the degree of risk justifies such services.

3 Contracting Governments planning and implementing VTS shall, wherever possible, follow the guidelines developed by the Organization. The use of VTS may only be made mandatory in sea areas within the territorial seas of a coastal State.

4 Contracting Governments shall endeavour to secure the participation in, and compliance with, the provisions of vessel traffic services by ships entitled to fly their flag.

5 Nothing in this regulation or the guidelines adopted by the Organization shall prejudice the rights and duties of Governments under international law or the legal regimes of straits used for international navigation and archipelagic sea lanes.

Regulation 13

Establishment and operation of aids to navigation

1 Each Contracting Government undertakes to provide, as it deems practical and necessary either individually or in co-operation with other Contracting Governments, such aids to navigation as the volume of traffic justifies and the degree of risk requires.

2 In order to obtain the greatest possible uniformity in aids to navigation, Contracting Governments undertake to take into account the international recommendations and guidelines when establishing such aids.

3 Contracting Governments undertake to arrange for information relating to aids to navigation to be made available to all concerned. Changes in the transmissions of position-fixing systems which could adversely affect the performance of receivers fitted in ships shall be avoided as far as possible and only be effected after timely and adequate notice has been promulgated.

Regulation 14

Ships' manning

1 Contracting Governments undertake, each for its national ships, to maintain, or, if it is necessary, to adopt, measures for the purpose of ensuring that, from the point of view of safety of life at sea, all ships shall be sufficiently and efficiently manned.

2 Every ship to which chapter I applies shall be provided with an appropriate minimum safe manning document or equivalent issued by the Administration as evidence of the minimum safe manning considered necessary to comply with the provisions of paragraph 1.

3 On all ships, to ensure effective crew performance in safety matters, a working language shall be established and recorded in the ship's log-book. The company, as defined in regulation IX/1, or the master, as appropriate, shall determine the appropriate working language. Each seafarer shall be required to understand and, where appropriate, give orders and instructions and to report back in that language. If the working language is not an official language of the State whose flag the ship is entitled to fly, all plans and lists required to be posted shall include a translation into the working language.

4 On ships to which chapter I applies, English shall be used on the bridge as the working language for bridge-to-bridge and bridge-to-shore safety communications as well as for communications on board between the pilot and bridge watchkeeping personnel, unless those directly involved in the communication speak a common language other than English.

Regulation 15

Principles relating to bridge design, design and arrangement of navigational systems and equipment and bridge procedures

All decisions which are made for the purpose of applying the requirements of regulations 19, 22, 24, 25, 27 and 28 and which affect bridge design, the design and arrangement of navigational systems and equipment on the bridge and bridge procedures shall be taken with the aim of:

- .1 facilitating the tasks to be performed by the bridge team and the pilot in making full appraisal of the situation and in navigating the ship safely under all operational conditions;
- .2 promoting effective and safe bridge resource management;

- .3 enabling the bridge team and the pilot to have convenient and continuous access to essential information which is presented in a clear and unambiguous manner, using standardized symbols and coding systems for controls and displays;
- .4 indicating the operational status of automated functions and integrated components, systems and/or sub-systems;
- .5 allowing for expeditious, continuous and effective information processing and decision-making by the bridge team and the pilot;
- .6 preventing or minimizing excessive or unnecessary work and any conditions or distractions on the bridge which may cause fatigue or interfere with the vigilance of the bridge team and the pilot; and
- .7 minimizing the risk of human error and detecting such error if it occurs, through monitoring and alarm systems, in time for the bridge team and the pilot to take appropriate action.

Regulation 16

Maintenance of equipment

- 1 The Administration shall be satisfied that adequate arrangements are in place to ensure that the performance of the equipment required by this chapter is maintained.
- 2 Except as provided in regulations I/7(b)(ii), I/8 and I/9, while all reasonable steps shall be taken to maintain the equipment required by this chapter in efficient working order, malfunctions of that equipment shall not be considered as making the ship unseaworthy or as a reason for delaying the ship in ports where repair facilities are not readily available, provided suitable arrangements are made by the master to take the inoperative equipment or unavailable information into account in planning and executing a safe voyage to a port where repairs can take place.

Regulation 17

Electromagnetic compatibility

- 1 Administrations shall ensure that all electrical and electronic equipment on the bridge or in the vicinity of the bridge, on ships constructed on or after 1 July 2002, is tested for electromagnetic compatibility taking into account the recommendations developed by the Organization.
- 2 Electrical and electronic equipment shall be so installed that electromagnetic interference does not affect the proper function of navigational systems and equipment.
- 3 Portable electrical and electronic equipment shall not be operated on the bridge if it may affect the proper function of navigational systems and equipment.

Regulation 18

Approval, surveys and performance standards of navigational systems and equipment and voyage data recorder

1 Systems and equipment required to meet the requirements of regulations 19 and 20 shall be of a type approved by the Administration.

2 Systems and equipment, including associated back-up arrangements, where applicable, installed on or after 1 July 2002 to perform the functional requirements of regulations 19 and 20 shall conform to appropriate performance standards not inferior to those adopted by the Organization.

3 When systems and equipment are replaced or added to on ships constructed before 1 July 2002, such systems and equipment shall, in so far as is reasonable and practicable, comply with the requirements of paragraph 2.

4 Systems and equipment installed prior to the adoption of performance standards by the Organization may subsequently be exempted from full compliance with such standards at the discretion of the Administration, having due regard to the recommended criteria adopted by the Organization. However, for an electronic chart display and information system (ECDIS) to be accepted as satisfying the chart carriage requirement of regulation 19.2.1.4, that system shall conform to the relevant performance standards not inferior to those adopted by the Organization in effect on the date of installation, or, for systems installed before 1 January 1999, not inferior to the performance standards adopted by the Organization on 23 November 1995.

5 The Administration shall require that the manufacturers have a quality control system audited by a competent authority to ensure continuous compliance with the type approval conditions. Alternatively, the Administration may use final product verification procedures where the compliance with the type approval certificate is verified by a competent authority before the product is installed on board ships.

6 Before giving approval to systems or equipment embodying new features not covered by this chapter, the Administration shall ensure that such features support functions at least as effective as those required by this chapter.

7 When equipment, for which performance standards have been developed by the Organization, is carried on ships in addition to those items of equipment required by regulations 19 and 20, such equipment shall be subject to approval and shall as far as practicable comply with performance standards not inferior to those adopted by the Organization.

8 The voyage data recorder system, including all sensors, shall be subjected to an annual performance test. The test shall be conducted by an approved testing or servicing facility to verify the accuracy, duration and recoverability of the recorded data. In addition, tests and inspections shall be conducted to determine the serviceability of all protective enclosures and devices fitted to aid location. A copy of the certificate of compliance issued by the testing facility, stating the date of compliance and the applicable performance standards, shall be retained on board the ship.

Regulation 19

Carriage requirements for shipborne navigational systems and equipment

1 Application and requirements

Subject to the provisions of regulation 1.4:

1.1 Ships constructed on or after 1 July 2002 shall be fitted with navigational systems and equipment which will fulfil the requirements prescribed in paragraphs 2.1 to 2.9.

1.2 Ships constructed before 1 July 2002 shall:

- .1 subject to the provisions of paragraphs 1.2.2 and 1.2.3, unless they comply fully with this regulation, continue to be fitted with equipment which fulfils the requirements prescribed in regulations V/11, V/12 and V/20 of the International Convention for the Safety of Life at Sea, 1974 in force prior to 1 July 2002;
- .2 be fitted with the equipment or systems required in paragraph 2.1.6 not later than the first survey after 1 July 2002 at which time the radio direction-finding apparatus referred to in V/12 (p) of the International Convention for the Safety of Life at Sea, 1974 in force prior to 1 July 2002 shall no longer be required; and
- .3 be fitted with the system required in paragraph 2.4 not later than the dates specified in paragraphs 2.4.2 and 2.4.3.

2 Shipborne navigational equipment and systems

2.1 All ships irrespective of size shall have:

- .1 a properly adjusted standard magnetic compass, or other means, independent of any power supply to determine the ship's heading and display the reading at the main steering position;
- .2 a pelorus or compass bearing device, or other means, independent of any power supply to take bearings over an arc of the horizon of 360°;
- .3 means of correcting heading and bearings to true at all times;
- .4 nautical charts and nautical publications to plan and display the ship's route for the intended voyage and to plot and monitor positions throughout the voyage; an electronic chart display and information system (ECDIS) may be accepted as meeting the chart carriage requirements of this subparagraph;
- .5 back-up arrangements to meet the functional requirements of subparagraph .4, if this function is partly or fully fulfilled by electronic means;

- .6 a receiver for a global navigation satellite system or a terrestrial radionavigation system, or other means, suitable for use at all times throughout the intended voyage to establish and update the ship's position by automatic means;
- .7 if less than 150 gross tonnage and if practicable, a radar reflector, or other means, to enable detection by ships navigating by radar at both 9 and 3 GHz;
- .8 when the ship's bridge is totally enclosed and unless the Administration determines otherwise, a sound reception system, or other means, to enable the officer in charge of the navigational watch to hear sound signals and determine their direction;
- .9 a telephone, or other means, to communicate heading information to the emergency steering position, if provided.

2.2 All ships of 150 gross tonnage and upwards and passenger ships irrespective of size shall, in addition to the requirements of paragraph 2.1, be fitted with:

- .1 a spare magnetic compass interchangeable with the magnetic compass, as referred to in paragraph 2.1.1, or other means to perform the function referred to in paragraph 2.1.1 by means of replacement or duplicate equipment;
- .2 a daylight signalling lamp, or other means to communicate by light during day and night using an energy source of electrical power not solely dependent upon the ship's power supply.

2.3 All ships of 300 gross tonnage and upwards and passenger ships irrespective of size shall, in addition to meeting the requirements of paragraph 2.2, be fitted with:

- .1 an echo sounding device, or other electronic means, to measure and display the available depth of water;
- .2 a 9 GHz radar, or other means to determine and display the range and bearing of radar transponders and of other surface craft, obstructions, buoys, shorelines and navigational marks to assist in navigation and in collision avoidance;
- .3 an electronic plotting aid, or other means, to plot electronically the range and bearing of targets to determine collision risk;
- .4 speed and distance measuring device, or other means, to indicate speed and distance through the water;
- .5 a properly adjusted transmitting heading device, or other means to transmit heading information for input to the equipment referred to in paragraphs 2.3.2, 2.3.3 and 2.4.

2.4 All ships of 300 gross tonnage and upwards engaged on international voyages and cargo ships of 500 gross tonnage and upwards not engaged on international voyages

and passenger ships irrespective of size shall be fitted with an automatic identification system (AIS), as follows:

- .1 ships constructed on or after 1 July 2002;
- .2 ships engaged on international voyages constructed before 1 July 2002:
 - .2.1 in the case of passenger ships, not later than 1 July 2003;
 - .2.2 in the case of tankers, not later than the first survey for safety equipment on or after 1 July 2003;
 - .2.3 in the case of ships, other than passenger ships and tankers, of 50,000 gross tonnage and upwards, not later than 1 July 2004;
 - .2.4 in the case of ships, other than passenger ships and tankers, of 10,000 gross tonnage and upwards but less than 50,000 gross tonnage, not later than 1 July 2005;
 - .2.5 in the case of ships, other than passenger ships and tankers, of 3,000 gross tonnage and upwards but less than 10,000 gross tonnage, not later than 1 July 2006.
 - .2.6 in the case of ships, other than passenger ships and tankers, of 300 gross tonnage and upwards but less than 3,000 gross tonnage, not later than 1 July 2007; and
- .3 ships not engaged on international voyages constructed before 1 July 2002, not later than 1 July 2008;
- .4 the Administration may exempt ships from the application of the requirements of this paragraph when such ships will be taken permanently out of service within two years after the implementation date specified in subparagraphs .2 and .3;
- .5 AIS shall:
 - .1 provide automatically to appropriately equipped shore stations, other ships and aircraft information, including the ship's identity, type, position, course, speed, navigational status and other safety-related information;
 - .2 receive automatically such information from similarly fitted ships;
 - .3 monitor and track ships; and
 - .4 exchange data with shore-based facilities;
- .6 the requirements of paragraph 2.4.5 shall not be applied to cases where international agreements, rules or standards provide for the protection of navigational information; and
- .7 AIS shall be operated taking into account the guidelines adopted by the Organization.

2.5 All ships of 500 gross tonnage and upwards shall, in addition to meeting the requirements of paragraph 2.3 with the exception of paragraphs 2.3.3 and 2.3.5, and the requirements of paragraph 2.4, have:

- .1 a gyro compass, or other means, to determine and display their heading by shipborne non-magnetic means and to transmit heading information for input to the equipment referred in paragraphs 2.3.2, 2.4 and 2.5.5;
- .2 a gyro compass heading repeater, or other means, to supply heading information visually at the emergency steering position if provided;
- .3 a gyro compass bearing repeater, or other means, to take bearings, over an arc of the horizon of 360°, using the gyro compass or other means referred to in subparagraph .1. However ships less than 1,600 gross tonnage shall be fitted with such means as far as possible;
- .4 rudder, propeller, thrust, pitch and operational mode indicators, or other means to determine and display rudder angle, propeller revolutions, the force and direction of thrust and, if applicable, the force and direction of lateral thrust and the pitch and operational mode, all to be readable from the conning position; and
- .5 an automatic tracking aid, or other means, to plot automatically the range and bearing of other targets to determine collision risk.

2.6 On all ships of 500 gross tonnage and upwards, failure of one piece of equipment should not reduce the ship's ability to meet the requirements of paragraphs 2.1.1, 2.1.2 and 2.1.4.

2.7 All ships of 3000 gross tonnage and upwards shall, in addition to meeting the requirements of paragraph 2.5, have:

- .1 a 3 GHz radar or where considered appropriate by the Administration a second 9 GHz radar, or other means to determine and display the range and bearing of other surface craft, obstructions, buoys, shorelines and navigational marks to assist in navigation and in collision avoidance, which are functionally independent of those referred to in paragraph 2.3.2; and
- .2 a second automatic tracking aid, or other means to plot automatically the range and bearing of other targets to determine collision risk which are functionally independent of those referred to in paragraph 2.5.5.

2.8 All ships of 10,000 gross tonnage and upwards shall, in addition to meeting the requirements of paragraph 2.7 with the exception of paragraph 2.7.2, have:

- .1 an automatic radar plotting aid, or other means, to plot automatically the range and bearing of at least 20 other targets, connected to a device to indicate speed and distance through the water, to determine collision risks and simulate a trial manoeuvre; and

- .2 a heading or track control system, or other means, to automatically control and keep to a heading and/or straight track.

2.9 All ships of 50,000 gross tonnage and upwards shall, in addition to meeting the requirements of paragraph 2.8, have:

- .1 a rate of turn indicator, or other means, to determine and display the rate of turn; and
- .2 a speed and distance measuring device, or other means, to indicate speed and distance over the ground in the forward and athwartships direction.

3 When "other means" are permitted under this regulation, such means must be approved by Administration in accordance with regulation 18.

4 The navigational equipment and systems referred to in this regulation shall be so installed, tested and maintained as to minimize malfunction.

5 Navigational equipment and systems offering alternative modes of operation shall indicate the actual mode of use.

6 Integrated bridge systems shall be so arranged that failure of one sub-system is brought to immediate attention of the officer in charge of the navigational watch by audible and visual alarms, and does not cause failure to any other sub-system. In case of failure in one part of an integrated navigational system, it shall be possible to operate each other individual item of equipment or part of the system separately.

Regulation 20

Voyage data recorders

1 To assist in casualty investigations, ships, when engaged on international voyages, subject to the provisions of regulation 1.4, shall be fitted with a voyage data recorder (VDR) as follows:

- .1 passenger ships constructed on or after 1 July 2002;
- .2 ro-ro passenger ships constructed before 1 July 2002 not later than the first survey on or after 1 July 2002;
- .3 passenger ships other than ro-ro passenger ships constructed before 1 July 2002 not later than 1 January 2004; and
- .4 ships, other than passenger ships, of 3,000 gross tonnage and upwards constructed on or after 1 July 2002.

2 Administrations may exempt ships, other than ro-ro passenger ships, constructed before 1 July 2002 from being fitted with a VDR where it can be demonstrated that interfacing a VDR with the existing equipment on the ship is unreasonable and impracticable.

Regulation 21

International Code of Signals

All ships which, in accordance with the present Convention, are required to carry a radio installation shall carry the International Code of Signals as may be amended by the Organization. The Code shall also be carried by any other ship which, in the opinion of the Administration, has a need to use it.

Regulation 22

Navigation bridge visibility

1 Ships of not less than 45 m in length as defined in regulation III/3.12, constructed on or after 1 July 1998, shall meet the following requirements:

- .1 The view of the sea surface from the conning position shall not be obscured by more than two ship lengths, or 500 m, whichever is the less, forward of the bow to 10° on either side under all conditions of draught, trim and deck cargo;
- .2 No blind sector caused by cargo, cargo gear or other obstructions outside of the wheelhouse forward of the beam which obstructs the view of the sea surface as seen from the conning position, shall exceed 10°. The total arc of blind sectors shall not exceed 20°. The clear sectors between blind sectors shall be at least 5°. However, in the view described in .1, each individual blind sector shall not exceed 5°;
- .3 The horizontal field of vision from the conning position shall extend over an arc of not less than 225°, that is from right ahead to not less than 22.5°, abaft the beam on either side of the ship;
- .4 From each bridge wing the horizontal field of vision shall extend over an arc at least 225°, that is from at least 45° on the opposite bow through right ahead and then from right ahead to right astern through 180° on the same side of the ship;
- .5 From the main steering position the horizontal field of vision shall extend over an arc from right ahead to at least 60° on each side of the ship;
- .6 The ship's side shall be visible from the bridge wing;
- .7 The height of the lower edge of the navigation bridge front windows above the bridge deck shall be kept as low as possible. In no case shall the lower edge present an obstruction to the forward view as described in this regulation;
- .8 The upper edge of the navigation bridge front windows shall allow a forward view of the horizon, for a person with a height of eye of 1,800 mm above the bridge deck at the conning position, when the ship is pitching in heavy seas. The Administration, if satisfied that a 1,800 mm height of eye

is unreasonable and impractical, may allow reduction of the height of eye but not less than 1,600 mm;

.9 Windows shall meet the following requirements:

.9.1 To help avoid reflections, the bridge front windows shall be inclined from the vertical plane top out, at an angle of not less than 10° and not more than 25°.

.9.2 Framing between navigation bridge windows shall be kept to a minimum and not be installed immediately forward of any work station.

.9.3 Polarized and tinted windows shall not be fitted.

.9.4 A clear view through at least two of the navigation bridge front windows and, depending on the bridge configuration, an additional number of clear-view windows shall be provided at all times, regardless of weather conditions.

2 Ships constructed before 1 July 1998 shall, where practicable, meet the requirements of paragraphs 1.1 and 1.2. However, structural alterations or additional equipment need not be required.

3 On ships of unconventional design which, in the opinion of the Administration, cannot comply with this regulation, arrangements shall be provided to achieve a level of visibility that is as near as practical to that prescribed in this regulation.

Regulation 23

Pilot transfer arrangements

1 Application

1.1 Ships engaged on voyages in the course of which pilots are likely to be employed shall be provided with pilot transfer arrangements.

1.2 Equipment and arrangements for pilot transfer which are installed on or after 1 January 1994 shall comply with the requirements of this regulation, and due regard shall be paid to the standards adopted by the Organization.

1.3 Equipments and arrangements for pilot transfer which are provided on ships before 1 January 1994 shall at least comply with the requirements of regulation 17 of the International Convention for the Safety of Life at Sea, 1974 in force prior to that date, and due regard shall be paid to the standards adopted by the Organization prior to that date.

1.4 Equipment and arrangements which are replaced after 1 January 1994 shall, in so far as is reasonable and practicable, comply with the requirements of this regulation.

2 General

2.1 All arrangements used for pilot transfer shall efficiently fulfill their purpose of enabling pilots to embark and disembark safely. The appliances shall be kept clean, properly maintained and stowed and shall be regularly inspected to ensure that they are safe to use. They shall be used solely for the embarkation and disembarkation of personnel.

2.2 The rigging of the pilot transfer arrangements and the embarkation of a pilot shall be supervised by a responsible officer having means of communication with the navigation bridge who shall also arrange for the escort of the pilot by a safe route to and from the navigation bridge. Personnel engaged in rigging and operating any mechanical equipment shall be instructed in the safe procedures to be adopted and the equipment shall be tested prior to use.

3 Transfer arrangements

3.1 Arrangements shall be provided to enable the pilot to embark and disembark safely on either side of the ship.

3.2 In all ships where the distance from sea level to the point of access to, or egress from, the ship exceeds 9 m, and when it is intended to embark and disembark pilots by means of the accommodation ladder, or by means of mechanical pilot hoists or other equally safe and convenient means in conjunction with a pilot ladder, the ship shall carry such equipment on each side, unless the equipment is capable of being transferred for use on either side.

3.3 Safe and convenient access to, and egress from, the ship shall be provided by either:

- .1 a pilot ladder requiring a climb of not less than 1.5 m and not more than 9 m above the surface of the water so positioned and secured that:
 - .1.1 it is clear of any possible discharges from the ship;
 - .1.2 it is within the parallel body length of the ship and, as far as is practicable, within the mid-ship half length of the ship;
 - .1.3 each step rests firmly against the ship's side; where constructional features, such as rubbing bands, would prevent the implementation of this provision, special arrangements shall, to the satisfaction of the Administration, be made to ensure that persons are able to embark and disembark safely;
 - .1.4 the single length of pilot ladder is capable of reaching the water from the point of access to, or egress from, the ship and due allowance is made for all conditions of loading and trim of the ship, and for an adverse list of 15°; the securing strong point, shackles and securing ropes shall be at least as strong as the side ropes;

- .2 an accommodation ladder in conjunction with the pilot ladder, or other equally safe and convenient means, whenever the distance from the surface of the water to the point of access to the ship is more than 9 m. The accommodation ladder shall be sited leading aft. When in use, the lower end of the accommodation ladder shall rest firmly against the ship's side within the parallel body length of the ship and, as far as is practicable, within the mid-ship half length and clear of all discharges; or
- .3 a mechanical pilot hoist so located that it is within the parallel body length of the ship and, as far as is practicable, within the mid-ship half length of the ship and clear of all discharges.

4 Access to the ship's deck

Means shall be provided to ensure safe, convenient and unobstructed passage for any person embarking on, or disembarking from, the ship between the head of the pilot ladder, or of any accommodation ladder or other appliance, and the ship's deck. Where such passage is by means of:

- .1 a gateway in the rails or bulwark, adequate handholds shall be provided;
- .2 a bulwark ladder, two handhold stanchions rigidly secured to the ship's structure at or near their bases and at higher points shall be fitted. The bulwark ladder shall be securely attached to the ship to prevent overturning.

5 Shipside doors

Shipside doors used for pilot transfer shall not open outwards.

6 Mechanical pilot hoists

6.1 The mechanical pilot hoist and its ancillary equipment shall be of a type approved by the Administration. The pilot hoist shall be designed to operate as a moving ladder to lift and lower one person on the side of the ship, or as a platform to lift and lower one or more persons on the side of the ship. It shall be of such design and construction as to ensure that the pilot can be embarked and disembarked in a safe manner, including a safe access from the hoist to the deck and vice versa. Such access shall be gained directly by a platform securely guarded by handrails.

6.2 Efficient hand gear shall be provided to lower or recover the person or persons carried, and kept ready for use in the event of power failure.

6.3 The hoist shall be securely attached to the structure of the ship. Attachment shall not be solely by means of the ship's side rails. Proper and strong attachment points shall be provided for hoists of the portable type on each side of the ship.

6.4 If belting is fitted in the way of the hoist position, such belting shall be cut back sufficiently to allow the hoist to operate against the ship's side.

6.5 A pilot ladder shall be rigged adjacent to the hoist and available for immediate use so that access to it is available from the hoist at any point of its travel. The pilot ladder shall be capable of reaching the sea level from its own point of access to the ship.

6.6 The position on the ship's side where the hoist will be lowered shall be indicated.

6.7 An adequate protected stowage position shall be provided for the portable hoist. In very cold weather, to avoid the danger of ice formation, the portable hoist shall not be rigged until its use is imminent.

7 Associated equipment

7.1 The following associated equipment shall be kept at hand ready for immediate use when persons are being transferred;

- .1 two man-ropes of not less than 28 mm in diameter properly secured to the ship if required by the pilot;
- .2 a lifebuoy equipped with a self-igniting light;
- .3 a heaving line.

7.2 When required by paragraph 4, stanchions and bulwark ladders shall be provided.

8 Lighting

Adequate lighting shall be provided to illuminate the transfer arrangements overside, the position on deck where a person embarks or disembarks and the controls of the mechanical pilot hoist.

Regulation 24

Use of heading and/or track control systems

1 In areas of high traffic density, in conditions of restricted visibility and in all other hazardous navigational situations where heading and/or track control systems are in use, it shall be possible to establish manual control of the ship's steering immediately.

2 In circumstances as above, the officer in charge of the navigational watch shall have available without delay the services of a qualified helmsperson who shall be ready at all times to take over steering control.

3 The change-over from automatic to manual steering and vice versa shall be made by or under the supervision of a responsible officer.

4 The manual steering shall be tested after prolonged use of heading and/or track control systems, and before entering areas where navigation demands special caution.

Regulation 25

Operation of steering gear

In areas where navigation demands special caution, ships shall have more than one steering gear power unit in operation when such units are capable of simultaneous operation.

Regulation 26

Steering gear: Testing and drills

1 Within 12 hours before departure, the ship's steering gear shall be checked and tested by the ship's crew. The test procedure shall include, where applicable, the operation of the following:

- .1 the main steering gear;
- .2 the auxiliary steering gear;
- .3 the remote steering gear control systems;
- .4 the steering positions located on the navigation bridge;
- .5 the emergency power supply;
- .6 the rudder angle indicators in relation to the actual position of the rudder;
- .7 the remote steering gear control system power failure alarms;
- .8 the steering gear power unit failure alarms; and
- .9 automatic isolating arrangements and other automatic equipment.

2 The checks and tests shall include:

- .1 the full movement of the rudder according to the required capabilities of the steering gear;
- .2 a visual inspection for the steering gear and its connecting linkage; and
- .3 the operation of the means of communication between the navigation bridge and steering gear compartment.

3.1 Simple operating instructions with a block diagram showing the change-over procedures for remote steering gear control systems and steering gear power units shall be permanently displayed on the navigation bridge and in the steering compartment.

3.2 All ships' officers concerned with the operation and/or maintenance of steering gear shall be familiar with the operation of the steering systems fitted on the ship and with the procedures for changing from one system to another.

4 In addition to the routine checks and tests prescribed in paragraphs 1 and 2, emergency steering drills shall take place at least once every three months in order to practise emergency steering procedures. These drills shall include direct control within the steering gear compartment, the communications procedure with the navigation bridge and, where applicable the operation of alternative power supplies.

5 The Administration may waive the requirements to carry out the checks and tests prescribed in paragraphs 1 and 2 for ships which regularly engage on voyages of short duration. Such ships shall carry out these checks and tests at least once every week.

6 The date upon which the checks and tests prescribed in paragraphs 1 and 2 are carried out and the date and details of emergency steering drills carried out under paragraph 4, shall be recorded.

Regulation 27

Nautical charts and nautical publications

Nautical charts and nautical publications, such as sailing directions, lists of lights, notices to mariners, tide tables and all other nautical publications necessary for the intended voyage, shall be adequate and up to date.

Regulation 28

Records of navigational activities

All ships engaged on international voyages shall keep on board a record of navigational activities and incidents which are of importance to safety of navigation and which must contain sufficient detail to restore a complete record of the voyage, taking into account the recommendations adopted by the Organization. When such information is not maintained in the ship's log-book, it shall be maintained in another form approved by the Administration.

Regulation 29

Life-saving signals to be used by ships, aircraft or persons in distress

An illustrated table describing the life-saving signals shall be readily available to the officer of the watch of every ship to which this chapter applies. The signals shall be used by ships or persons in distress when communicating with life-saving stations, maritime rescue units and aircraft engaged in search and rescue operations.

Regulation 30

Operational limitations

1 This regulation applies to all passenger ships to which chapter I applies.

2 A list of all limitations on the operation of a passenger ship including exemptions from any of these regulations, restrictions in operating areas, weather restrictions, sea state restrictions, restrictions in permissible loads, trim, speed and any other limitations, whether imposed by the Administration or established during the design or the building

stages, shall be compiled before the passenger ship is put in service. The list, together with any necessary explanations, shall be documented in a form acceptable to the Administration, which shall be kept on board readily available to the master. The list shall be kept updated. If the language used is not English or French, the list shall be provided in one of the two languages.

Regulation 31

Danger messages

1 The master of every ship which meets with dangerous ice, a dangerous derelict, or any other direct danger to navigation, or a tropical storm, or encounters sub-freezing air temperatures associated with gale force winds causing severe ice accretion on superstructures, or winds of force 10 or above on the Beaufort scale for which no storm warning has been received, is bound to communicate the information by all means at his disposal to ships in the vicinity, and also to the competent authorities. The form in which the information is sent is not obligatory. It may be transmitted either in plain language (preferably English) or by means of the International Code of Signals.

2 Each Contracting Government will take all steps necessary to ensure that when intelligence of any of the dangers specified in paragraph 1 is received, it will be promptly brought to the knowledge of those concerned and communicated to other interested Governments.

3 The transmission of messages respecting the dangers specified is free of cost to the ships concerned.

4 All radio messages issued under paragraph 1 shall be preceded by the safety signal, using the procedure as prescribed by the Radio Regulations as defined in regulation IV/2.

Regulation 32

Information required in danger messages

The following information is required in danger messages:

- 1 Ice, derelicts and other direct dangers to navigation:
 - .1 The kind of ice, derelict or danger observed.
 - .2 The position of the ice, derelict or danger when last observed.
 - .3 The time and date (Universal Co-ordinated Time) when the danger was last observed.
- 2 Tropical cyclones (storms)
 - .1 A statement that a tropical cyclone has been encountered. This obligation should be interpreted in a broad spirit, and information transmitted whenever the master has good reason to believe that a tropical cyclone is developing or exists in the neighbourhood.

- .2 Time, date (Universal Co-ordinated Time) and position of ship when the observation was taken.
- .3 As much of the following information as is practicable should be included in the message:
 - barometric pressure, preferably corrected (stating millibars, millimetres, or inches, and whether corrected or uncorrected);
 - barometric tendency (the change in barometric pressure during the past three hours);
 - true wind direction;
 - wind force (Beaufort scale);
 - state of the sea (smooth, moderate, rough, high);
 - swell (slight, moderate, heavy) and the true direction from which it comes. Period or length of swell (short, average, long) would also be of value;
 - true course and speed of ship.

Subsequent observations

3 When a master has reported a tropical cyclone or other dangerous storm, it is desirable but not obligatory, that further observations be made and transmitted hourly, if practicable, but in any case at intervals of not more than 3 hours, so long as the ship remains under the influence of the storm.

4 Winds of force 10 or above on the Beaufort scale for which no storm warning has been received. This is intended to deal with storms other than the tropical cyclones referred to in paragraph 2; when such a storm is encountered, the message should contain similar information to that listed under the paragraph but excluding the details concerning sea and swell.

5 Sub-freezing air temperatures associated with gale force winds causing severe ice accretion on superstructures:

- .1 Time and date (Universal Co-ordinated Time).
- .2 Air temperature.
- .3 Sea temperature (if practicable).
- .4 Wind force and direction.

Examples

Ice

TTT ICE. LARGE BERG SIGHTED IN 4506 N, 4410W, AT 0800 UTC. MAY 15.

Derelicts

TTT DERELICT. OBSERVED DERELICT ALMOST SUBMERGED IN 4006 N, 1243 W, AT 1630 UTC. APRIL 21.

Danger to navigation

TTT NAVIGATION. ALPHA LIGHTSHIP NOT ON STATION. 1800 UTC. JANUARY 3.

Tropical cyclone

TTT STORM. 0030 UTC. AUGUST 18. 2004 N, 11354 E. BAROMETER CORRECTED 994 MILLIBARS, TENDENCY DOWN 6 MILLIBARS. WIND NW, FORCE 9, HEAVY SQUALLS. HEAVY EASTERLY SWELL. COURSE 067, 5 KNOTS.

TTT STORM. APPEARANCES INDICATE APPROACH OF HURRICANE. 1300 UTC. SEPTEMBER 14. 2200 N, 7236 W. BAROMETER CORRECTED 29.64 INCHES, TENDENCY DOWN .015 INCHES. WIND NE, FORCE 8, FREQUENT RAIN SQUALLS. COURSE 035, 9 KNOTS.

TTT STORM. CONDITIONS INDICATE INTENSE CYCLONE HAS FORMED. 0200 UTC. MAY 4. 1620 N, 9203 E. BAROMETER UNCORRECTED 753 MILLIMETRES, TENDENCY DOWN 5 MILLIMETRES. WIND S BY W, FORCE 5. COURSE 300, 8 KNOTS.

TTT STORM. TYPHOON TO SOUTHEAST. 0300 UTC. JUNE 12. 1812 N, 12605 E. BAROMETER FALLING RAPIDLY. WIND INCREASING FROM N.

TTT STORM. WIND FORCE 11, NO STORM WARNING RECEIVED. 0300 UTC. MAY 4. 4830 N, 30 W. BAROMETER CORRECTED 983 MILLIBARS, TENDENCY DOWN 4 MILLIBARS. WIND SW, FORCE 11 VEERING. COURSE 260, 6 KNOTS.

Icing

TTT EXPERIENCING SEVERE ICING. 1400 UTC. MARCH 2. 69 N, 10 W. AIR TEMPERATURE 18°F (-7.8°C). SEA TEMPERATURE 29°F (-1.7°C). WIND NE, FORCE 8.

Regulation 33

Distress messages: Obligations and procedures

1 The master of a ship at sea which is in a position to be able to provide assistance on receiving a signal from any source that persons are in distress at sea, is bound to proceed with all speed to their assistance, if possible informing them or the search and rescue service that the ship is doing so. If the ship receiving the distress alert is unable or, in the special circumstances of the case, considers it unreasonable or unnecessary to proceed to their assistance, the master must enter in the log-book the reason for failing to proceed to the assistance of the persons in distress, taking into account the recommendation of the Organization, to inform the appropriate search and rescue service accordingly.

2 The master of a ship in distress or the search and rescue service concerned, after consultation, so far as may be possible, with the masters of ships which answer the distress alert, has the right to requisition one or more of those ships as the master of the ship in distress or the search and rescue service considers best able to render assistance, and it shall be the duty of the master or masters of the ship or ships requisitioned to comply with the requisition by continuing to proceed with all speed to the assistance of persons in distress.

3 Masters of ships shall be released from the obligation imposed by paragraph 1 on learning that their ships have not been requisitioned and that one or more other ships have been requisitioned and are complying with the requisition. This decision shall, if possible be communicated to the other requisitioned ships and to the search and rescue service.

4 The master of a ship shall be released from the obligation imposed by paragraph 1 and, if his ship has been requisitioned, from the obligation imposed by paragraph 2 on being informed by the persons in distress or by the search and rescue service or by the master of another ship which has reached such persons that assistance is no longer necessary.

5 The provisions of this regulation do not prejudice the Convention for the Unification of Certain Rules of Law Relating to Assistance and Salvage at Sea, signed at Brussels on 23 September 1910, particularly the obligation to render assistance imposed by article 11 of that Convention.

Regulation 34

Safe navigation and avoidance of dangerous situations

1 Prior to proceeding to sea, the master shall ensure that the intended voyage has been planned using the appropriate nautical charts and nautical publications for the area concerned, taking into account the guidelines and recommendations developed by the Organization.

2 The voyage plan shall identify a route which:

- .1 takes into account any relevant ships' routing systems;

- .2 ensures sufficient sea room for the safe passage of the ship throughout the voyage;
- .3 anticipates all known navigational hazards and adverse weather conditions; and
- .4 takes into account the marine environmental protection measures that apply, and avoids as far as possible actions and activities which could cause damage to the environment.

3 The owner, the charterer, or the company, as defined in regulation IX/1, operating the ship or any other person, shall not prevent or restrict the master of the ship from taking or executing any decision which, in the master's professional judgement, is necessary for safe navigation and protection of the marine environment.

Regulation 35

Misuse of distress signals

The use of an international distress signal, except for the purpose of indicating that a person or persons are in distress, and the use of any signal which may be confused with an international distress signal, are prohibited.

APPENDIX TO CHAPTER V

RULES FOR THE MANAGEMENT, OPERATION AND FINANCING OF THE NORTH ATLANTIC ICE PATROL

- 1 In these Rules:
 - .1 *Ice season* means the annual period between February 15 and July 1.
 - .2 *Region of icebergs guarded by the ice patrol* means the south-eastern, southern and south-western limits of the region of icebergs in the vicinity of the Grand Banks of Newfoundland.
 - .3 *Routes passing through regions of icebergs guarded by the Ice Patrol* means:
 - .3.1 routes between Atlantic Coast ports of Canada (including inland ports approached from the North Atlantic through the Gut of Canso and Cabot Straits) and ports of Europe, Asia or Africa approached from the North Atlantic through or north of the Straits of Gibraltar (except routes which pass south of the extreme limits of ice of all types).
 - .3.2 routes via Cape Race, Newfoundland between Atlantic Coast ports of Canada (including inland ports approached from the North Atlantic through the Gut of Canso and Cabot Straits) west of Cape

Race, Newfoundland and Atlantic Coast ports of Canada north of Cape Race, Newfoundland.

.3.3 routes between Atlantic and Gulf Coast ports of the United States of America (including inland ports approached from the North Atlantic through the Gut of Canso and Cabot straits) and ports of Europe, Asia or Africa approached from the North Atlantic through or north of the Straits of Gibraltar (except routes which pass south of the extreme limits of ice of all types).

.3.4 routes via Cape Race, Newfoundland between Atlantic and Gulf Coast ports of the United States of America (including inland ports approached from the North Atlantic through the Gut of Canso and Cabot Straits) and Atlantic Coast ports of Canada north of Cape Race, Newfoundland.

.4 *Extreme limits of ice of all types* in the North Atlantic Ocean is defined by a line connecting the following points:

A - 42° 23'.00N, 59° 25'.00W	J - 39° 49'.00N, 41° 00'.00W
B - 41° 23'.00N, 57° 00'.00W	K - 40° 39'.00N, 39° 00'.00W
C - 40° 47'.00N, 55° 00'.00W	L - 41° 19'.00N, 38° 00'.00W
D - 40° 07'.00N, 53° 00'.00W	M - 43° 00'.00N, 37° 27'.00W
E - 39° 18'.00N, 49° 39'.00W	N - 44° 00'.00N, 37° 29'.00W
F - 38° 00'.00N, 47° 35'.00W	O - 46° 00'.00N, 37° 55'.00W
G - 37° 41'.00N, 46° 40'.00W	P - 48° 00'.00N, 38° 28'.00W
H - 38° 00'.00N, 45° 33'.00W	Q - 50° 00'.00N, 39° 07'.00W
I - 39° 05'.00N, 43° 00'.00W	R - 51° 25'.00N, 39° 45'.00W.

.5 *Managing and operating* means maintaining, administering and operating the Ice Patrol, including the dissemination of information received therefrom.

.6 *Contributing Government* means a Contracting Government undertaking to contribute to the costs of the ice patrol service pursuant to these Rules.

2 Each Contracting Government specially interested in these services whose ships pass through the region of icebergs during the ice season undertakes to contribute to the Government of the United States of America its proportionate share of the costs for the management and operation of the ice patrol service. The contribution to the Government of the United States of America shall be based on the ratio which the average annual gross tonnage of that contributing Government's ships passing through the region of icebergs guarded by the Ice Patrol during the previous three ice seasons bears to the combined average annual gross tonnage of all ships that passed through the region of icebergs guarded by the Ice Patrol during the previous three ice seasons.

3 All contributions shall be calculated by multiplying the ratio described in paragraph 2 by the average actual annual cost incurred by the Governments of the United States of America and Canada of managing and operating ice patrol services during the previous three years. This ratio shall be computed annually, and shall be expressed in terms of a lump sum per-annum fee.

4 Each of the contributing Governments has the right to alter or discontinue its contribution, and other interested Governments may undertake to contribute to the expense. The contributing Government which avails itself of this right will continue to be responsible for its current contribution up to 1 September following the date of giving notice of intention to alter or discontinue its contribution. To take advantage of the said right it must give notice to the managing Government at least six months before the said 1 September.

5 Each contributing Government shall notify the Secretary-General of its undertaking pursuant to paragraph 2, who shall notify all Contracting Governments.

6 The Government of the United States of America shall furnish annually to each contributing Government a statement of the total cost incurred by the Governments of the United States of America and Canada of managing and operating the Ice Patrol for that year and of the average percentage share for the past three years of each contributing Government.

7 The managing government shall publish annual accounts including a statement of costs incurred by the governments providing the services for the past three years and the total gross tonnage using the service for the past three years. The accounts shall be publicly available. Within three months after having received the cost statement, contributing Governments may request more detailed information regarding the costs incurred in managing and operating the Ice Patrol.

8 These Rules shall be operative beginning with the ice season of 2002.”

CHAPTER IX

MANAGEMENT FOR THE SAFE OPERATION OF SHIPS

Regulation 1 - Definitions

8 In paragraph 8, the reference “X/1.2” is replaced by “X/1”.

Regulation 3 - Safety management requirements

9 At the end of existing paragraph 1, the following text is added:

"For the purpose of this regulation, the requirements of the Code shall be treated as mandatory."

Regulation 6 - Verification and control

10 In existing paragraph 6.2, the words "Subject to the provisions of paragraph 3 of this regulation" are deleted.

11 Existing paragraph 6.3 is deleted.

CHAPTER X

SAFETY MEASURES FOR HIGH-SPEED CRAFT

Regulation 1 - Definitions

12 Existing paragraph 1 is replaced by the following:

"For the purpose of this chapter:

1 *High-Speed Craft Code, 1994 (1994 HSC Code)* means the International Code of Safety for High-Speed Craft adopted by the Maritime Safety Committee of the Organization by resolution MSC.36(63), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I.

2 *High-Speed Craft Code, 2000 (2000 HSC Code)* means the International Code of Safety for High-Speed Craft, 2000 adopted by the Maritime Safety Committee of the Organization by resolution MSC.97(73), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I."

13 Existing paragraph 2 is replaced by the following:

"3 *High-speed craft* is a craft capable of a maximum speed, in metres per second (m/s), equal to or exceeding:

$$3.7 \nabla^{0.1667}$$

where:

∇ = volume of displacement corresponding to the design waterline (m³),

excluding craft the hull of which is supported completely clear above the water surface in non-displacement mode by aerodynamic forces generated by ground effect."

14 The existing paragraphs 3 and 4 are renumbered as paragraphs 4 and 5.

15 In the renumbered paragraph 5, in subparagraph .2, the figure "1%" is replaced by "3%".

Regulation 2 - Application

16 In paragraph 2, the date "1 January 1996" is replaced by "1 July 2002" in two places.

Regulation 3 - Requirements for high-speed craft

17 Existing paragraph 1 is replaced by the following:

"1 Notwithstanding the provisions of chapters I to IV and regulations V/18, 19 and 20:

- .1 a high-speed craft constructed on or after 1 January 1996 but before 1 July 2002 which complies with the requirements of the High-Speed Craft Code, 1994 in its entirety and which has been surveyed and certified as provided in that Code shall be deemed to have complied with the requirements of chapters I to IV and regulations V/18, 19 and 20. For the purpose of this regulation, the requirements of that Code shall be treated as mandatory.
- .2 a high-speed craft constructed on or after 1 July 2002 which complies with the requirements of the High-Speed Craft Code, 2000 in its entirety and which has been surveyed and certified as provided in that Code shall be deemed to have complied with the requirements of chapters I to IV and regulations V/18, 19 and 20."

APPENDIX

Record of Equipment for the Passenger Ship Safety Certificate (Form P)

18 Existing sections 5 and 6 are deleted and a new section 5 is inserted as follows:

“5 Details of navigational systems and equipment

Item	Actual provision
1.1 Standard magnetic compass*
1.2 Spare magnetic compass*
1.3 Gyro compass*
1.4 Gyro compass heading repeater*
1.5 Gyro compass bearing repeater*
1.6 Heading or track control system*
1.7 Pelorus or compass bearing device*
1.8 Means of correcting heading and bearings
1.9 Transmitting heading device (THD)*
2.1 Nautical charts/Electronic chart display and information system (ECDIS)**
2.2 Back up arrangements for ECDIS
2.3 Nautical publications
2.4 Back up arrangements for electronic nautical publications
3.1 Receiver for a global navigation satellite system/terrestrial radionavigation system* **
3.2 9 GHz radar*
3.3 Second radar (3 GHz/ 9 GHZ**)*
3.4 Automatic radar plotting aid (ARPA)*
3.5 Automatic tracking aid*
3.6 Second automatic tracking aid*
3.7 Electronic plotting aid*
4 Automatic identification system (AIS)
5 Voyage data recorder (VDR)

Item		Actual provision
6.1	Speed and distance measuring device (through the water)*	.....
6.2	Speed and distance measuring device (over the ground in the forward and athwartship direction)*	.....
7	Echo sounding device*	
8.1	Rudder, propeller, thrust, pitch and operational mode indicator*	.....
8.2	Rate of turn indicator*	.....
9	Sound reception system*	.....
10	Telephone to emergency steering position*	.....
11	Daylight signalling lamp*	.....
12	Radar reflector*	.....
13	International Code of Signals	.....

* Alternative means of meeting this requirement are permitted under regulation V/19. In case of other means they shall be specified.

** Delete as appropriate."

Record of Equipment for the Cargo Ship Safety Equipment Certificate (Form E)

19 Existing section 3 and related footnote are deleted and a new section 3 is inserted as follows:

“3 Details of navigational systems and equipment

Item	Actual provision
1.1 Standard magnetic compass*
1.2 Spare magnetic compass*
1.3 Gyro compass*
1.4 Gyro compass heading repeater*
1.5 Gyro compass bearing repeater*
1.6 Heading or track control system*
1.7 Pelorus or compass bearing device*
1.8 Means of correcting heading and bearings
1.9 Transmitting heading device (THD)*
2.1 Nautical charts/Electronic chart display and information system (ECDIS)**
2.2 Back up arrangements for ECDIS
2.3 Nautical publications
2.4 Back up arrangements for electronic nautical publications
3.1 Receiver for a global navigation satellite system/terrestrial radionavigation system* **
3.2 9 GHz radar*
3.3 Second radar (3 GHz/ 9 GHz**)*
3.4 Automatic radar plotting aid (ARPA)*
3.5 Automatic tracking aid*
3.6 Second automatic tracking aid*
3.7 Electronic plotting aid*
4 Automatic identification system (AIS)
5 Voyage data recorder (VDR)

Item	Actual provision
6.1 Speed and distance measuring device (through the water)*
6.2 Speed and distance measuring device (over the ground in the forward and athwartship direction)*
7 Echo sounding device*
8.1 Rudder, propeller, thrust, pitch and operational mode indicator*
8.2 Rate of turn indicator*
9 Sound reception system*
10 Telephone to emergency steering position*
11 Daylight signalling lamp*
12 Radar reflector*
13 International Code of Signals

* Alternative means of meeting this requirement are permitted under regulation V/19. In case of other means they shall be specified.

** Delete as appropriate."

RESOLUTION MSC.99(73)
(adopted on 5 December 2000)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

RESOLUTION MSC.134(76)
(adopted on 12 December 2002)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL
CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

ANNEX 3

**RESOLUTION MSC.134(76)
(adopted on 12 December 2002)**

**ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION
FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as "the Convention"), concerning the amendment procedure applicable to the Annex to the Convention, other than to the provisions of chapter I thereof,

HAVING CONSIDERED, at its seventy-sixth session, amendments to the Convention, proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the Convention, the text of which is set out in the Annex to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the said amendments shall be deemed to have been accepted on 1 January 2004, unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;
3. INVITES SOLAS Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 July 2004 upon their acceptance in accordance with paragraph 2 above;
4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annex to all Contracting Governments to the Convention;
5. FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its Annex to Members of the Organization, which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

CHAPTER II-1

CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

PART A-1

STRUCTURE OF SHIPS

- 1 The following new regulation 3-6 is added after existing regulation 3-5:

“Regulation 3-6

Access to and within spaces in the cargo area of oil tankers and bulk carriers

1 Application

1.1 Except as provided for in paragraph 1.2, this regulation applies to oil tankers of 500 gross tonnage and over and bulk carriers, as defined in regulation IX/1, of 20,000 gross tonnage and over, constructed on or after 1 January 2005.

1.2 Oil tankers of 500 gross tonnage and over constructed on or after 1 October 1994 but before 1 January 2005 shall comply with the provisions of regulation II-1/12-2 adopted by resolution MSC.27(61).

2 Means of access to cargo and other spaces

2.1 Each space within the cargo area shall be provided with a permanent means of access to enable, throughout the life of a ship, overall and close-up inspections and thickness measurements of the ship's structures to be carried out by the Administration, the company, as defined in regulation IX/1, and the ship's personnel and others as necessary. Such means of access shall comply with the requirements of paragraph 5 and with the Technical provisions for means of access for inspections, adopted by the Maritime Safety Committee by resolution MSC.133(76), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I.

2.2 Where a permanent means of access may be susceptible to damage during normal cargo loading and unloading operations or where it is impracticable to fit permanent means of access, the Administration may allow, in lieu thereof, the provision of movable or portable means of access, as specified in the Technical provisions, provided that the means of attaching, rigging, suspending or supporting the portable means of access forms a permanent part of the ship's structure. All portable equipment shall be capable of being readily erected or deployed by ship's personnel.

2.3 The construction and materials of all means of access and their attachment to the ship's structure shall be to the satisfaction of the Administration. The means of access shall be subject to survey prior to, or in conjunction with, its use in carrying out surveys in accordance with regulation I/10.

3 Safe access to cargo holds, cargo tanks, ballast tanks and other spaces

3.1 Safe access* to cargo holds, cofferdams, ballast tanks, cargo tanks and other spaces in the cargo area shall be direct from the open deck and such as to ensure their complete inspection. Safe access* to double bottom spaces may be from a pump-room, deep cofferdam, pipe tunnel, cargo hold, double hull space or similar compartment not intended for the carriage of oil or hazardous cargoes.

3.2 Tanks, and subdivisions of tanks, having a length of 35 m or more, shall be fitted with at least two access hatchways and ladders, as far apart as practicable. Tanks less than 35 m in length shall be served by at least one access hatchway and ladder. When a tank is subdivided by one or more swash bulkheads or similar obstructions which do not allow ready means of access to the other parts of the tank, at least two hatchways and ladders shall be fitted.

3.3 Each cargo hold shall be provided with at least two means of access as far apart as practicable. In general, these accesses should be arranged diagonally, for example one access near the forward bulkhead on the port side, the other one near the aft bulkhead on the starboard side.

4 Ship structure access manual

4.1 A ship's means of access to carry out overall and close-up inspections and thickness measurements shall be described in a Ship structure access manual approved by the Administration, an updated copy of which shall be kept on board. The Ship structure access manual shall include the following for each space in the cargo area:

- .1 plans showing the means of access to the space, with appropriate technical specifications and dimensions;
- .2 plans showing the means of access within each space to enable an overall inspection to be carried out, with appropriate technical specifications and dimensions. The plans shall indicate from where each area in the space can be inspected;
- .3 plans showing the means of access within the space to enable close-up inspections to be carried out, with appropriate technical specifications and dimensions. The plans shall indicate the positions of critical structural areas, whether the means of access is permanent or portable and from where each area can be inspected;

* Refer to the Recommendations for entering enclosed spaces aboard ships, adopted by the Organization by resolution A.864(20).

- .4 instructions for inspecting and maintaining the structural strength of all means of access and means of attachment, taking into account any corrosive atmosphere that may be within the space;
- .5 instructions for safety guidance when rafting is used for close-up inspections and thickness measurements;
- .6 instructions for the rigging and use of any portable means of access in a safe manner;
- .7 an inventory of all portable means of access; and
- .8 records of periodical inspections and maintenance of the ship's means of access.

4.2 For the purpose of this regulation "critical structural areas" are locations which have been identified from calculations to require monitoring or from the service history of similar or sister ships to be sensitive to cracking, buckling, deformation or corrosion which would impair the structural integrity of the ship.

5 General technical specifications

5.1 For access through horizontal openings, hatches or manholes, the dimensions shall be sufficient to allow a person wearing a self-contained air-breathing apparatus and protective equipment to ascend or descend any ladder without obstruction and also provide a clear opening to facilitate the hoisting of an injured person from the bottom of the space. The minimum clear opening shall not be less than 600 mm x 600 mm. When access to a cargo hold is arranged through the cargo hatch, the top of the ladder shall be placed as close as possible to the hatch coaming. Access hatch coamings having a height greater than 900 mm shall also have steps on the outside in conjunction with the ladder.

5.2 For access through vertical openings, or manholes, in swash bulkheads, floors, girders and web frames providing passage through the length and breadth of the space, the minimum opening shall be not less than 600 mm x 800 mm at a height of not more than 600 mm from the bottom shell plating unless gratings or other foot holds are provided.

5.3 For oil tankers of less than 5,000 tonnes deadweight, the Administration may approve, in special circumstances, smaller dimensions for the openings referred to in paragraphs 5.1 and 5.2, if the ability to traverse such openings or to remove an injured person can be proved to the satisfaction of the Administration."

PART B

SUBDIVISION AND STABILITY

Regulation 12-2 - Access to spaces in the cargo area of oil tankers

- 2 The existing regulation 12-2 is deleted.

PART C

MACHINERY INSTALLATIONS

Regulation 31 - Machinery control

- 3 The following new subparagraph .10 is added to paragraph 2 of the regulation:

".10 automation systems shall be designed in a manner which ensures that threshold warning of impending or imminent slowdown or shutdown of the propulsion system is given to the officer in charge of the navigational watch in time to assess navigational circumstances in an emergency. In particular, the systems shall control, monitor, report, alert and take safety action to slow down or stop propulsion while providing the officer in charge of the navigational watch an opportunity to manually intervene, except for those cases where manual intervention will result in total failure of the engine and/or propulsion equipment within a short time, for example in the case of overspeed."

CHAPTER II-2

CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

Regulation 3 – Definitions

- 4 In paragraph 20, the words “regulation VII/2” are replaced by the words “the IMDG Code, as defined in regulation VII/1.1”.

Regulation 19 – Carriage of dangerous goods

- 5 In table 19.3, in vertical columns 7 and 8 (concerning flashpoints of class 3), the numbers “3.1 3.2” and “3.3”, respectively, are replaced by the number “3”.

6 In table 19.3, in vertical column 13 (concerning class 5.2), the character “X” in rows 15 (concerning paragraph 3.10.1) and 16 (concerning paragraph 3.10.2) is replaced by the character “X¹⁶” and a new note 16 is added as follows:

“¹⁶ Under the provisions of the IMDG Code, as amended, stowage of class 5.2 dangerous goods under deck or in enclosed ro-ro spaces is prohibited.”

CHAPTER III

LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Regulation 26 - Additional requirements for ro-ro passenger ships

7 The following new subparagraph .4 is added at the end of paragraph 1:

“.4 before 1 July 2004 shall comply with the requirements of paragraph 2.5 not later than the first survey on or after that date.”

8 The following new subparagraph .5 is added at the end of paragraph 2:

“.5 Liferafts carried on ro-ro passenger ships shall be fitted with a radar transponder* in the ratio of one transponder for every four liferafts. The transponder shall be mounted inside the liferaft so its antenna is more than one metre above the sea level when the liferaft is deployed, except that for canopied reversible liferafts the transponder shall be so arranged as to be readily accessed and erected by survivors. Each transponder shall be arranged to be manually erected when the liferaft is deployed. Containers of liferafts fitted with transponders shall be clearly marked.

* Refer to the Performance standards for survival craft radar transponders for use in search and rescue operations, adopted by the Organization by resolution A.802(19).”

CHAPTER XII

ADDITIONAL SAFETY MEASURES FOR BULK CARRIERS

9 The following new regulations 12 and 13 are added after existing regulation 11:

“Regulation 12

Hold, ballast and dry space water level detectors

(This regulation applies to bulk carriers regardless of their date of construction)

1 Bulk carriers shall be fitted with water level detectors:

- .1 in each cargo hold, giving audible and visual alarms, one when the water level above the inner bottom in any hold reaches a height of 0.5 m and another at a height not less than 15% of the depth of the cargo hold but not more than 2 m. On bulk carriers to which regulation 9.2 applies, detectors with only the latter alarm need be installed. The water level detectors shall be fitted in the aft end of the cargo holds. For cargo holds which are used for water ballast, an alarm overriding device may be installed. The visual alarms shall clearly discriminate between the two different water levels detected in each hold;
 - .2 in any ballast tank forward of the collision bulkhead required by regulation II-1/11, giving an audible and visual alarm when the liquid in the tank reaches a level not exceeding 10% of the tank capacity. An alarm overriding device may be installed to be activated when the tank is in use; and
 - .3 in any dry or void space other than a chain cable locker, any part of which extends forward of the foremost cargo hold, giving an audible and visual alarm at a water level of 0.1 m above the deck. Such alarms need not be provided in enclosed spaces the volume of which does not exceed 0.1% of the ship's maximum displacement volume.
- 2 The audible and visual alarms specified in paragraph 1 shall be located on the navigation bridge.
- 3 Bulk carriers constructed before 1 July 2004 shall comply with the requirements of this regulation not later than the date of the annual, intermediate or renewal survey of the ship to be carried out after 1 July 2004, whichever comes first.

Regulation 13

Availability of pumping systems

(This regulation applies to bulk carriers regardless of their date of construction)

- 1 On bulk carriers, the means for draining and pumping ballast tanks forward of the collision bulkhead and bilges of dry spaces any part of which extends forward of the foremost cargo hold shall be capable of being brought into operation from a readily accessible enclosed space, the location of which is accessible from the navigation bridge or propulsion machinery control position without traversing exposed freeboard or superstructure decks. Where pipes serving such tanks or bilges pierce the collision bulkhead, valve operation by means of remotely operated actuators may be accepted, as an alternative to the valve control specified in regulation II-1/11.4, provided that the location of such valve controls complies with this regulation.
- 2 Bulk carriers constructed before 1 July 2004 shall comply with the requirements of this regulation not later than the date of the first intermediate or renewal survey of the ship to be carried out after 1 July 2004, but in no case later than 1 July 2007."

RESOLUTION MSC.134(76)
(adopted on 12 December 2002)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL
CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

RESOLUTION MSC.194(80)
(adopted on 20 May 2005)

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

RESOLUTION MSC.194(80)

(adopted on 20 May 2005)

**AMENDMENTS TO THE INTERNATIONAL CONVENTION
FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as "the Convention"), concerning the amendment procedure applicable to the Annex to the Convention, other than the provisions of chapter I thereof,

HAVING CONSIDERED, at its eightieth session, amendments to the Convention, proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the Convention, the text of which is set out in the Annexes to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that:
 - (a) the said amendments set out in Annex 1 shall be deemed to have been accepted on 1 July 2006; and
 - (b) the said amendments set out in Annex 2 shall be deemed to have been accepted on 1 July 2008,

unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3. INVITES SOLAS Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention:
 - (a) the amendments set out in Annex 1 shall enter into force on 1 January 2007; and
 - (b) the amendments set out in Annex 2 shall enter into force on 1 January 2009,

upon their acceptance in accordance with paragraph 2 above;

4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annexes to all Contracting Governments to the Convention;

5. FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its Annexes to Members of the Organization, which are not Contracting Governments to the Convention.

ANNEX 1

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

CHAPTER II-1

CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

PART A GENERAL

Regulation 2 – Definitions

- 1 The following new paragraph 14 is added after the existing paragraph 13:
“14 *Bulk carrier* means a bulk carrier as defined in regulation XII/1.1”.

PART A-1 STRUCTURE OF SHIPS

- 2 The existing text of part A-1 is replaced by the following:

“PART A-1 STRUCTURE OF SHIPS

Regulation 3-1 Structural, mechanical and electrical requirements for ships

In addition to the requirements contained elsewhere in the present regulations, ships shall be designed, constructed and maintained in compliance with the structural, mechanical and electrical requirements of a classification society which is recognized by the Administration in accordance with the provisions of regulation XI-1/1, or with applicable national standards of the Administration which provide an equivalent level of safety.

Regulation 3-2 Corrosion prevention of seawater ballast tanks in oil tankers and bulk carriers

(This regulation applies to oil tankers and bulk carriers constructed
on or after 1 July 1998)

All dedicated seawater ballast tanks shall have an efficient corrosion prevention system, such as hard protective coatings or equivalent. The coatings should preferably be of a light colour. The scheme for the selection, application and maintenance of the system shall be approved by the Administration, based on the guidelines adopted by the Organization. Where appropriate, sacrificial anodes shall also be used.

Regulation 3-3 **Safe access to tanker bows**

1 For the purpose of this regulation and regulation 3-4, tankers include oil tankers as defined in regulation 2, chemical tankers as defined in regulation VII/8.2 and gas carriers as defined in regulation VII/11.2.

2 Every tanker shall be provided with the means to enable the crew to gain safe access to the bow even in severe weather conditions. Such means of access shall be approved by the Administration based on the guidelines developed by the Organization.

Regulation 3-4 **Emergency towing arrangements on tankers**

1 Emergency towing arrangements shall be fitted at both ends on board every tanker of not less than 20,000 tonnes deadweight.

2 For tankers constructed on or after 1 July 2002:

.1 the arrangements shall, at all times, be capable of rapid deployment in the absence of main power on the ship to be towed and easy connection to the towing ship. At least one of the emergency towing arrangements shall be pre-rigged ready for rapid deployment; and

.2 emergency towing arrangements at both ends shall be of adequate strength taking into account the size and deadweight of the ship, and the expected forces during bad weather conditions. The design and construction and prototype testing of the emergency towing arrangements shall be approved by the Administration, based on the Guidelines developed by the Organization.

3 For tankers constructed before 1 July 2002, the design and construction of emergency towing arrangements shall be approved by the Administration, based on the Guidelines developed by the Organization.

Regulation 3-5 **New installation of materials containing asbestos**

1 This regulation shall apply to materials used for the structure, machinery, electrical installations and equipment covered by the present Convention.

2 For all ships, new installation of materials which contain asbestos shall be prohibited except for:

.1 vanes used in rotary vane compressors and rotary vane vacuum pumps;

.2 watertight joints and linings used for the circulation of fluids when, at high temperature (in excess of 350°C) or pressure (in excess of 7×10^6 Pa), there is a risk of fire, corrosion or toxicity; and

.3 supple and flexible thermal insulation assemblies used for temperatures above 1,000°C.

Regulation 3-6
Access to and within spaces in, and forward of, the cargo area of oil tankers
and bulk carriers

1 Application

1.1 Except as provided for in paragraph 1.2, this regulation applies to oil tankers of 500 gross tonnage and over and bulk carriers, as defined in regulation IX/1, of 20,000 gross tonnage and over, constructed on or after 1 January 2006.

1.2 Oil tankers of 500 gross tonnage and over constructed on or after 1 October 1994 but before 1 January 2005 shall comply with the provisions of regulation II-1/12-2 adopted by resolution MSC.27(61).

2 Means of access to cargo and other spaces

2.1 Each space shall be provided with means of access to enable, throughout the life of a ship, overall and close-up inspections and thickness measurements of the ship's structures to be carried out by the Administration, the company, as defined in regulation IX/1, and the ship's personnel and others as necessary. Such means of access shall comply with the requirements of paragraph 5 and with the Technical provisions for means of access for inspections, adopted by the Maritime Safety Committee by resolution MSC.133(76), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I.

2.2 Where a permanent means of access may be susceptible to damage during normal cargo loading and unloading operations or where it is impracticable to fit permanent means of access, the Administration may allow, in lieu thereof, the provision of movable or portable means of access, as specified in the Technical provisions, provided that the means of attaching, rigging, suspending or supporting the portable means of access forms a permanent part of the ship's structure. All portable equipment shall be capable of being readily erected or deployed by ship's personnel.

2.3 The construction and materials of all means of access and their attachment to the ship's structure shall be to the satisfaction of the Administration. The means of access shall be subject to survey prior to, or in conjunction with, its use in carrying out surveys in accordance with regulation I/10.

3 Safe access to cargo holds, cargo tanks, ballast tanks and other spaces

3.1 Safe access to cargo holds, cofferdams, ballast tanks, cargo tanks and other spaces in the cargo area shall be direct from the open deck and such as to ensure their complete inspection. Safe access to double bottom spaces or to forward ballast tanks may be from a pump-room, deep cofferdam, pipe tunnel, cargo hold, double hull space or similar compartment not intended for the carriage of oil or hazardous cargoes.

3.2 Tanks, and subdivisions of tanks, having a length of 35 m or more, shall be fitted with at least two access hatchways and ladders, as far apart as practicable. Tanks less than 35 m in length shall be served by at least one access hatchway and ladder. When a tank is subdivided by one or more swash bulkheads or similar obstructions which do not allow ready means of access to the other parts of the tank, at least two hatchways and ladders shall be fitted.

3.3 Each cargo hold shall be provided with at least two means of access as far apart as practicable. In general, these accesses should be arranged diagonally, for example one access near the forward bulkhead on the port side, the other one near the aft bulkhead on the starboard side.

4 Ship structure access manual

4.1 A ship's means of access to carry out overall and close-up inspections and thickness measurements shall be described in a Ship structure access manual approved by the Administration, an updated copy of which shall be kept on board. The Ship structure access manual shall include the following for each space:

- .1 plans showing the means of access to the space, with appropriate technical specifications and dimensions;
- .2 plans showing the means of access within each space to enable an overall inspection to be carried out, with appropriate technical specifications and dimensions. The plans shall indicate from where each area in the space can be inspected;
- .3 plans showing the means of access within the space to enable close-up inspections to be carried out, with appropriate technical specifications and dimensions. The plans shall indicate the positions of critical structural areas, whether the means of access is permanent or portable and from where each area can be inspected;
- .4 instructions for inspecting and maintaining the structural strength of all means of access and means of attachment, taking into account any corrosive atmosphere that may be within the space;
- .5 instructions for safety guidance when rafting is used for close-up inspections and thickness measurements;
- .6 instructions for the rigging and use of any portable means of access in a safe manner;
- .7 an inventory of all portable means of access; and
- .8 records of periodical inspections and maintenance of the ship's means of access.

4.2 For the purpose of this regulation "critical structural areas" are locations which have been identified from calculations to require monitoring or from the service history of similar or sister ships to be sensitive to cracking, buckling, deformation or corrosion which would impair the structural integrity of the ship.

5 General technical specifications

5.1 For access through horizontal openings, hatches or manholes, the dimensions shall be sufficient to allow a person wearing a self-contained air-breathing apparatus and protective equipment to ascend or descend any ladder without obstruction and also provide a clear opening to facilitate the hoisting of an injured person from the bottom of the space. The minimum clear opening shall not be less than 600 mm x 600 mm. When access to a cargo hold is arranged through the cargo hatch, the top of the ladder shall be

placed as close as possible to the hatch coaming. Access hatch coamings having a height greater than 900 mm shall also have steps on the outside in conjunction with the ladder.

5.2 For access through vertical openings, or manholes, in swash bulkheads, floors, girders and web frames providing passage through the length and breadth of the space, the minimum opening shall be not less than 600 mm x 800 mm at a height of not more than 600 mm from the bottom shell plating unless gratings or other foot holds are provided.

5.3 For oil tankers of less than 5,000 tonnes deadweight, the Administration may approve, in special circumstances, smaller dimensions for the openings referred to in paragraphs 5.1 and 5.2, if the ability to traverse such openings or to remove an injured person can be proved to the satisfaction of the Administration.

Regulation 3-7

Construction drawings maintained on board and ashore

1 A set of as-built construction drawings and other plans showing any subsequent structural alterations shall be kept on board a ship constructed on or after 1 January 2007.

2 An additional set of such drawings shall be kept ashore by the Company, as defined in regulation IX/1.2.

Regulation 3-8

Towing and mooring equipment

1 This regulation applies to ships constructed on or after 1 January 2007, but does not apply to emergency towing arrangements provided in accordance with regulation 3-4.

2 Ships shall be provided with arrangements, equipment and fittings of sufficient safe working load to enable the safe conduct of all towing and mooring operations associated with the normal operation of the ship.

3 Arrangements, equipment and fittings provided in accordance with paragraph 2 shall meet the appropriate requirements of the Administration or an organization recognized by the Administration under regulation I/6.

4 Each fitting or item of equipment provided under this regulation shall be clearly marked with any restrictions associated with its safe operation, taking into account the strength of its attachment to the ship's structure."

PART B

SUBDIVISION AND STABILITY

3 The following new regulation 23-3 is added after existing regulation 23-2:

"Regulation 23-3

Water level detectors on single hold cargo ships other than bulk carriers

1 Single hold cargo ships other than bulk carriers constructed before 1 January 2007 shall comply with the requirements of this regulation not later than the date of the first intermediate or renewal survey of the ship to be carried out after 1 January 2007, whichever comes first.

2 For the purpose of this regulation, *freeboard deck* has the meaning defined in the International Convention on Load Lines in force.

3 Ships having a length (L) of less than 80 m, or 100 m if constructed before 1 July 1998, and a single cargo hold below the freeboard deck or cargo holds below the freeboard deck which are not separated by at least one bulkhead made watertight up to that deck, shall be fitted in such space or spaces with water level detectors.

4 The water level detectors required by paragraph 3 shall:

- .1 give an audible and visual alarm at the navigation bridge when the water level above the inner bottom in the cargo hold reaches a height of not less than 0.3 m, and another when such level reaches not more than 15% of the mean depth of the cargo hold; and
- .2 be fitted at the aft end of the hold, or above its lowest part where the inner bottom is not parallel to the designed waterline. Where webs or partial watertight bulkheads are fitted above the inner bottom, Administrations may require the fitting of additional detectors.

5 The water level detectors required by paragraph 3 need not be fitted in ships complying with regulation XII/12, or in ships having watertight side compartments each side of the cargo hold length extending vertically at least from inner bottom to freeboard deck.”

PART C MACHINERY INSTALLATIONS

Regulation 31 – Machinery controls

4 The existing paragraph 2.10 is deleted.

5 The following new paragraph 6 is added after the existing paragraph 5:

“6 Ships constructed on or after 1 July 2004 shall comply with the requirements of paragraphs 1 to 5, as amended, as follows:

.1 a new subparagraph .10 is added to paragraph 2 to read as follows:

“.10 automation systems shall be designed in a manner which ensures that threshold warning of impending or imminent slowdown or shutdown of the propulsion system is given to the officer in charge of the navigational watch in time to assess navigational circumstances in an emergency. In particular, the systems shall control, monitor, report, alert and take safety action to slow down or stop propulsion while providing the officer in charge of the navigational watch an opportunity to manually intervene, except for those cases where manual intervention will result in total failure of the engine and/or propulsion equipment within a short time, for example in the case of overspeed.””

ANNEX 2

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

CHAPTER II-1

CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

- 1 The existing text of parts A, B and B-1 of the chapter is replaced by the following:

“PART A GENERAL

Regulation 1 Application

1.1 Unless expressly provided otherwise, this chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 January 2009.

1.2 For the purpose of this chapter, the term *a similar stage of construction* means the stage at which:

- .1 construction identifiable with a specific ship begins; and
- .2 assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is less.

1.3 For the purpose of this chapter:

- .1 the expression *ships constructed* means ships the keels of which are laid or which are at a similar stage of construction;
- .2 the expression *all ships* means ships constructed before, on or after 1 January 2009;
- .3 a cargo ship, whenever built, which is converted to a passenger ship shall be treated as a passenger ship constructed on the date on which such a conversion commences;
- .4 the expression *alterations and modifications of a major character* means, in the context of cargo ship subdivision and stability, any modification to the construction which affects the level of subdivision of that ship. Where a cargo ship is subject to such modification, it shall be demonstrated that the *A/R* ratio calculated for the ship after such modifications is not less than the *A/R* ratio calculated for the ship before the modification. However, in those cases where the ship's *A/R* ratio before modification is equal to or greater than unity, it is only necessary that the ship after modification has an *A* value which is not less than *R*, calculated for the modified ship.

2 Unless expressly provided otherwise, for ships constructed before 1 January 2009, the Administration shall ensure that the requirements which are applicable under chapter II-1 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolutions MSC.1(XLV), MSC.6(48), MSC.11(55), MSC.12(56), MSC.13(57), MSC.19(58), MSC.26(60), MSC.27(61), Resolution 1 of the 1995 SOLAS Conference, MSC.47(66), MSC.57(67), MSC.65(68), MSC.69(69), MSC.99(73), MSC.134(76), MSC.151(78) and MSC.170(79) are complied with.

3 All ships which undergo repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to these ships. Such ships, if constructed before the date on which any relevant amendments enter into force, shall, as a rule, comply with the requirements for ships constructed on or after that date to at least the same extent as they did before undergoing such repairs, alterations, modifications or outfitting. Repairs, alterations and modifications of a major character and outfitting related thereto shall meet the requirements for ships constructed on or after the date on which any relevant amendments enter into force, in so far as the Administration deems reasonable and practicable.

4 The Administration of a State may, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of this chapter unreasonable or unnecessary, exempt from those requirements individual ships or classes of ships entitled to fly the flag of that State which, in the course of their voyage, do not proceed more than 20 miles from the nearest land.

5 In the case of passenger ships which are employed in special trades for the carriage of large numbers of special trade passengers, such as the pilgrim trade, the Administration of the State whose flag such ships are entitled to fly, if satisfied that it is impracticable to enforce compliance with the requirements of this chapter, may exempt such ships from those requirements, provided that they comply fully with the provisions of:

- .1 the rules annexed to the Special Trade Passenger Ships Agreement, 1971; and
- .2 the rules annexed to the Protocol on Space Requirements for Special Trade Passenger Ships, 1973.

Regulation 2 **Definitions**

For the purpose of this chapter, unless expressly provided otherwise:

1 *Subdivision length (L_s)* of the ship is the greatest projected moulded length of that part of the ship at or below deck or decks limiting the vertical extent of flooding with the ship at the deepest subdivision draught.

2 *Mid-length* is the mid-point of the subdivision length of the ship.

3 *Aft terminal* is the aft limit of the subdivision length.

4 *Forward terminal* is the forward limit of the subdivision length.

5 *Length (L)* is the length as defined in the International Convention on Load Lines in force.

6 *Freeboard deck* is the deck as defined in the International Convention on Load Lines in force.

7 *Forward perpendicular* is the forward perpendicular as defined in the International Convention on Load Lines in force.

8 *Breadth (B)* is the greatest moulded breadth of the ship at or below the deepest subdivision draught.

9 *Draught (d)* is the vertical distance from the keel line at mid-length to the waterline in question.

10 *Deepest subdivision draught (d_s)* is the waterline which corresponds to the summer load line draught of the ship.

11 *Light service draught (d_l)* is the service draught corresponding to the lightest anticipated loading and associated tankage, including, however, such ballast as may be necessary for stability and/or immersion. Passenger ships should include the full complement of passengers and crew on board.

12 *Partial subdivision draught (d_p)* is the light service draught plus 60% of the difference between the light service draught and the deepest subdivision draught.

13 *Trim* is the difference between the draught forward and the draught aft, where the draughts are measured at the forward and aft terminals respectively, disregarding any rake of keel.

14 *Permeability (μ)* of a space is the proportion of the immersed volume of that space which can be occupied by water.

15 *Machinery spaces* are spaces between the watertight boundaries of a space containing the main and auxiliary propulsion machinery, including boilers, generators and electric motors primarily intended for propulsion. In the case of unusual arrangements, the Administration may define the limits of the machinery spaces.

16 *Weathertight* means that in any sea conditions water will not penetrate into the ship.

17 *Watertight* means having scantlings and arrangements capable of preventing the passage of water in any direction under the head of water likely to occur in intact and damaged conditions. In the damaged condition, the head of water is to be considered in the worst situation at equilibrium, including intermediate stages of flooding.

18 *Design pressure* means the hydrostatic pressure for which each structure or appliance assumed watertight in the intact and damage stability calculations is designed to withstand.

19 *Bulkhead deck* in a passenger ship means the uppermost deck at any point in the subdivision length (*L_s*) to which the main bulkheads and the ship's shell are carried watertight and the lowermost deck from which passenger and crew evacuation will not be impeded by water in any stage of flooding for damage cases defined in regulation 8 and in part B-2 of this chapter. The bulkhead deck may be a stepped deck. In a cargo ship the freeboard deck may be taken as the bulkhead deck.

- 20 *Deadweight* is the difference in tonnes between the displacement of a ship in water of a specific gravity of 1.025 at the draught corresponding to the assigned summer freeboard and the lightweight of the ship.
- 21 *Lightweight* is the displacement of a ship in tonnes without cargo, fuel, lubricating oil, ballast water, fresh water and feedwater in tanks, consumable stores, and passengers and crew and their effects.
- 22 *Oil tanker* is the oil tanker defined in regulation 1 of Annex I of the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973.
- 23 *Ro-ro passenger ship* means a passenger ship with ro-ro spaces or special category spaces as defined in regulation II-2/3.
- 24 *Bulk carrier* means a bulk carrier as defined in regulation XII/1.1.
- 25 *Keel line* is a line parallel to the slope of the keel passing amidships through:
- .1 the top of the keel at centreline or line of intersection of the inside of shell plating with the keel if a bar keel extends below that line, on a ship with a metal shell; or
 - .2 in wood and composite ships, the distance is measured from the lower edge of the keel rabbet. When the form at the lower part of the midship section is of a hollow character, or where thick garboards are fitted, the distance is measured from the point where the line of the flat of the bottom continued inward intersects the centreline amidships.
- 26 *Amidship* is at the middle of the length (*L*).

Regulation 3 **Definitions relating to parts C, D and E**

For the purpose of parts C, D and E, unless expressly provided otherwise:

- 1 *Steering gear control system* is the equipment by which orders are transmitted from the navigating bridge to the steering gear power units. Steering gear control systems comprise transmitters, receivers, hydraulic control pumps and their associated motors, motor controllers, piping and cables.
- 2 *Main steering gear* is the machinery, rudder actuators, steering gear, power units, if any, and ancillary equipment and the means of applying torque to the rudder stock (e.g. tiller or quadrant) necessary for effecting movement of the rudder for the purpose of steering the ship under normal service conditions.
- 3 *Steering gear power unit* is:
- .1 in the case of electric steering gear, an electric motor and its associated electrical equipment;
 - .2 in the case of electrohydraulic steering gear, an electric motor and its associated electrical equipment and connected pump; or

.3 in the case of other hydraulic steering gear, a driving engine and connected pump.

4 *Auxiliary steering gear* is the equipment other than any part of the main steering gear necessary to steer the ship in the event of failure of the main steering gear but not including the tiller, quadrant or components serving the same purpose.

5 *Normal operational and habitable condition* is a condition under which the ship as a whole, the machinery, services, means and aids ensuring propulsion, ability to steer, safe navigation, fire and flooding safety, internal and external communications and signals, means of escape, and emergency boat winches, as well as the designed comfortable conditions of habitability are in working order and functioning normally.

6 *Emergency condition* is a condition under which any services needed for normal operational and habitable conditions are not in working order due to failure of the main source of electrical power.

7 *Main source of electrical power* is a source intended to supply electrical power to the main switchboard for distribution to all services necessary for maintaining the ship in normal operational and habitable conditions.

8 *Dead ship condition* is the condition under which the main propulsion plant, boilers and auxiliaries are not in operation due to the absence of power.

9 *Main generating station* is the space in which the main source of electrical power is situated.

10 *Main switchboard* is a switchboard which is directly supplied by the main source of electrical power and is intended to distribute electrical energy to the ship's services.

11 *Emergency switchboard* is a switchboard which in the event of failure of the main electrical power supply system is directly supplied by the emergency source of electrical power or the transitional source of emergency power and is intended to distribute electrical energy to the emergency services.

12 *Emergency source of electrical power* is a source of electrical power, intended to supply the emergency switchboard in the event of a failure of the supply from the main source of electrical power.

13 *Power actuating system* is the hydraulic equipment provided for supplying power to turn the rudder stock, comprising a steering gear power unit or units, together with the associated pipes and fittings, and a rudder actuator. The power actuating systems may share common mechanical components (i.e. tiller, quadrant and rudder stock) or components serving the same purpose.

14 *Maximum ahead service speed* is the greatest speed which the ship is designed to maintain in service at sea at the deepest seagoing draught.

15 *Maximum astern speed* is the speed which it is estimated the ship can attain at the designed maximum astern power at the deepest seagoing draught.

16 *Machinery spaces* are all machinery spaces of category A and all other spaces containing propelling machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces.

17 *Machinery spaces of category A* are those spaces and trunks to such spaces which contain:

- .1 internal combustion machinery used for main propulsion;
- .2 internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW; or
- .3 any oil-fired boiler or oil fuel unit.

18 *Control stations* are those spaces in which the ship's radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralized.

19 *Chemical tanker* is a cargo ship constructed or adapted and used for the carriage in bulk of any liquid product listed in either:

- .1 chapter 17 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Maritime Safety Committee by resolution MSC.4(48), hereinafter referred to as "the International Bulk Chemical Code", as may be amended by the Organization; or
- .2 chapter VI of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Assembly of the Organization by resolution A.212(VII), hereinafter referred to as "the Bulk Chemical Code", as has been or may be amended by the Organization,

whichever is applicable.

20 *Gas carrier* is a cargo ship constructed or adapted and used for the carriage in bulk of any liquefied gas or other products listed in either:

- .1 chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Maritime Safety Committee by resolution MSC.5(48), hereinafter referred to as "the International Gas Carrier Code", as may be amended by the Organization; or
- .2 chapter XIX of the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Organization by resolution A.328(IX), hereinafter referred to as "the Gas Carrier Code", as has been or may be amended by the Organization,

whichever is applicable.

PART B
SUBDIVISION AND STABILITY

Regulation 4
General

1 The damage stability requirements in parts B-1 through B-4 shall apply to cargo ships of 80 m in length (L) and upwards and to all passenger ships regardless of length but shall exclude those cargo ships which are shown to comply with subdivision and damage stability regulations in other instruments developed by the Organization.

2 The Administration may, for a particular ship or group of ships, accept alternative methodologies if it is satisfied that at least the same degree of safety as represented by these regulations is achieved. Any Administration which allows such alternative methodologies shall communicate to the Organization particulars thereof.

3 Ships shall be as efficiently subdivided as is possible having regard to the nature of the service for which they are intended. The degree of subdivision shall vary with the subdivision length (L_s) of the ship and with the service, in such manner that the highest degree of subdivision corresponds with the ships of greatest subdivision length (L_s), primarily engaged in the carriage of passengers.

4 Where it is proposed to fit decks, inner skins or longitudinal bulkheads of sufficient tightness to seriously restrict the flow of water, the Administration shall be satisfied that proper consideration is given to beneficial or adverse effects of such structures in the calculations.

PART B-1
STABILITY

Regulation 5
Intact stability information

1 Every passenger ship regardless of size and every cargo ship having a length (L) of 24 m and upwards, shall be inclined upon its completion and the elements of its stability determined.

2 The Administration may allow the inclining test of an individual cargo ship to be dispensed with provided basic stability data are available from the inclining test of a sister ship and it is shown to the satisfaction of the Administration that reliable stability information for the exempted ship can be obtained from such basic data, as required by regulation 5-1. A weight survey shall be carried out upon completion and the ship shall be inclined whenever in comparison with the data derived from the sister ship, a deviation from the lightship displacement exceeding 1% for ships of 160 m or more in length and 2% for ships of 50 m or less in length and as determined by linear interpolation for intermediate lengths or a deviation from the lightship longitudinal centre of gravity exceeding 0.5% of L_s is found.

3 The Administration may also allow the inclining test of an individual ship or class of ships especially designed for the carriage of liquids or ore in bulk to be dispensed with when reference to existing data for similar ships clearly indicates that due to the ship's proportions and arrangements more than sufficient metacentric height will be available in all probable loading conditions.

4 Where any alterations are made to a ship so as to materially affect the stability information supplied to the master, amended stability information shall be provided. If necessary the ship shall be re-inclined. The ship shall be re-inclined if anticipated deviations exceed one of the values specified in paragraph 5.

5 At periodical intervals not exceeding five years, a lightweight survey shall be carried out on all passenger ships to verify any changes in lightship displacement and longitudinal centre of gravity. The ship shall be re-inclined whenever, in comparison with the approved stability information, a deviation from the lightship displacement exceeding 2% or a deviation of the longitudinal centre of gravity exceeding 1% of L_s is found or anticipated.

6 Every ship shall have scales of draughts marked clearly at the bow and stern. In the case where the draught marks are not located where they are easily readable, or operational constraints for a particular trade make it difficult to read the draught marks, then the ship shall also be fitted with a reliable draught indicating system by which the bow and stern draughts can be determined.

Regulation 5-1 **Stability information to be supplied to the master**

1 The master shall be supplied with such information satisfactory to the Administration as is necessary to enable him by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service. A copy of the stability information shall be furnished to the Administration.

2 The information should include:

- .1 curves or tables of minimum operational metacentric height (GM) versus draught which assures compliance with the relevant intact and damage stability requirements, alternatively corresponding curves or tables of the maximum allowable vertical centre of gravity (KG) versus draught, or with the equivalents of either of these curves;
- .2 instructions concerning the operation of cross-flooding arrangements; and
- .3 all other data and aids which might be necessary to maintain the required intact stability and stability after damage.

3 The stability information shall show the influence of various trims in cases where the operational trim range exceeds $\pm 0.5\%$ of L_s .

4 For ships which have to fulfil the stability requirements of part B-1, information referred to in paragraph 2 are determined from considerations related to the subdivision index, in the following manner: Minimum required GM (or maximum permissible vertical position of centre of gravity KG) for the three draughts d_s , d_p and d_l are equal to the GM (or KG values) of corresponding loading cases used for the calculation of survival factor s_i . For intermediate draughts, values to be used shall be obtained by linear interpolation applied to the GM value only between the deepest subdivision draught and the partial subdivision draught and between the partial load line and the light service draught respectively. Intact stability criteria will also be taken into account by retaining for each draft the maximum among minimum required GM values or the minimum of maximum permissible KG values for both criteria. If the subdivision index is calculated for different trims, several required GM curves will be established in the same way.

5 When curves or tables of minimum operational metacentric height (*GM*) versus draught are not appropriate, the master should ensure that the operating condition does not deviate from a studied loading condition, or verify by calculation that the stability criteria are satisfied for this loading condition.

Regulation 6 **Required subdivision index *R***

1 The subdivision of a ship is considered sufficient if the attained subdivision index *A*, determined in accordance with regulation 7, is not less than the required subdivision index *R* calculated in accordance with this regulation and if, in addition, the partial indices *A_s*, *A_p* and *A_l* are not less than 0.9*R* for passenger ships and 0.5*R* for cargo ships.

2 For all ships to which the damage stability requirements of this chapter apply, the degree of subdivision to be provided shall be determined by the required subdivision index *R*, as follows:

.1 In the case of cargo ships greater than 100 m in length (*L_s*):

$$R = 1 - \frac{128}{L_s + 152}$$

.2 In the case of cargo ships not less than 80 m in length (*L_s*) and not greater than 100 m in length (*L_s*):

$$R = 1 - \left[1 / \left(1 + \frac{L_s}{100} \times \frac{R_o}{1 - R_o} \right) \right]$$

where *R_o* is the value *R* as calculated in accordance with the formula in subparagraph .1.

.3 In the case of passenger ships:

$$R = 1 - \frac{5,000}{L_s + 2.5N + 15,225}$$

where:

$$N = N_1 + 2N_2$$

N₁ = number of persons for whom lifeboats are provided

N₂ = number of persons (including officers and crew) the ship is permitted to carry in excess of *N₁*.

.4 Where the conditions of service are such that compliance with paragraph 2.3 of this regulation on the basis of $N = N_1 + 2N_2$ is impracticable and where the Administration considers that a suitably reduced degree of hazard exists, a lesser value of *N* may be taken but in no case less than $N = N_1 + N_2$.

Regulation 7

Attained subdivision index A

1 The attained subdivision index A is obtained by the summation of the partial indices A_s , A_p and A_l , (weighted as shown) calculated for the draughts d_s , d_p and d_l defined in regulation 2 in accordance with the following formula:

$$A = 0.4A_s + 0.4A_p + 0.2A_l$$

Each partial index is a summation of contributions from all damage cases taken in consideration, using the following formula:

$$A = \sum p_i s_i$$

where:

- i represents each compartment or group of compartments under consideration,
- p_i accounts for the probability that only the compartment or group of compartments under consideration may be flooded, disregarding any horizontal subdivision, as defined in regulation 7-1,
- s_i accounts for the probability of survival after flooding the compartment or group of compartments under consideration, and includes the effect of any horizontal subdivision, as defined in regulation 7-2.

2 In the calculation of A , the level trim shall be used for the deepest subdivision draught and the partial subdivision draught. The actual service trim shall be used for the light service draught. If in any service condition, the trim variation in comparison with the calculated trim is greater than 0.5% of L_s , one or more additional calculations of A are to be submitted for the same draughts but different trims so that, for all service conditions, the difference in trim in comparison with the reference trim used for one calculation will be less than 0.5% of L_s .

3 When determining the positive righting lever (GZ) of the residual stability curve, the displacement used should be that of the intact condition. That is, the constant displacement method of calculation should be used.

4 The summation indicated by the above formula shall be taken over the ship's subdivision length (L_s) for all cases of flooding in which a single compartment or two or more adjacent compartments are involved. In the case of unsymmetrical arrangements, the calculated A value should be the mean value obtained from calculations involving both sides. Alternatively, it should be taken as that corresponding to the side which evidently gives the least favourable result.

5 Wherever wing compartments are fitted, contribution to the summation indicated by the formula shall be taken for all cases of flooding in which wing compartments are involved. Additionally, cases of simultaneous flooding of a wing compartment or group of compartments and the adjacent inboard compartment or group of compartments, but excluding damage of transverse extent greater than one half of the ship breadth B , may be added. For the purpose of this regulation, transverse extent is measured inboard from ship's side, at right angle to the centreline at the level of the deepest subdivision draught.

6 In the flooding calculations carried out according to the regulations, only one breach of the hull and only one free surface need to be assumed. The assumed vertical extent of damage is to extend from the baseline upwards to any watertight horizontal subdivision above the waterline or higher. However, if a lesser extent of damage will give a more severe result, such extent is to be assumed.

7 If pipes, ducts or tunnels are situated within the assumed extent of damage, arrangements are to be made to ensure that progressive flooding cannot thereby extend to compartments other than those assumed flooded. However, the Administration may permit minor progressive flooding if it is demonstrated that its effects can be easily controlled and the safety of the ship is not impaired.

Regulation 7-1 **Calculation of the factor p_i**

1 The factor p_i for a compartment or group of compartments shall be calculated in accordance with paragraphs 1.1 and 1.2 using the following notations:

j = the aftmost damage zone number involved in the damage starting with No.1 at the stern;

n = the number of adjacent damage zones involved in the damage;

k = is the number of a particular longitudinal bulkhead as barrier for transverse penetration in a damage zone counted from shell towards the centre line. The shell has $k = 0$;

$x1$ = the distance from the aft terminal of L_s to the aft end of the zone in question;

$x2$ = the distance from the aft terminal of L_s to the forward end of the zone in question;

b = the mean transverse distance in metres measured at right angles to the centreline at the deepest subdivision loadline between the shell and an assumed vertical plane extended between the longitudinal limits used in calculating the factor p_i and which is a tangent to, or common with, all or part of the outermost portion of the longitudinal bulkhead under consideration. This vertical plane shall be so orientated that the mean transverse distance to the shell is a maximum, but not more than twice the least distance between the plane and the shell. If the upper part of a longitudinal bulkhead is below the deepest subdivision loadline the vertical plane used for determination of b is assumed to extend upwards to the deepest subdivision waterline. In any case, b is not to be taken greater than $B/2$.

If the damage involves a single zone only:

$$p_i = p(x1_j, x2_j) \cdot [r(x1_j, x2_j, b_k) - r(x1_j, x2_j, b_{k-1})]$$

If the damage involves two adjacent zones:

$$\begin{aligned} p_i = & p(x1_j, x2_{j+1}) \cdot [r(x1_j, x2_{j+1}, b_k) - r(x1_j, x2_{j+1}, b_{k-1})] \\ & - p(x1_j, x2_j) \cdot [r(x1_j, x2_j, b_k) - r(x1_j, x2_j, b_{k-1})] \\ & - p(x1_{j+1}, x2_{j+1}) \cdot [r(x1_{j+1}, x2_{j+1}, b_k) - r(x1_{j+1}, x2_{j+1}, b_{k-1})] \end{aligned}$$

If the damage involves three or more adjacent zones:

$$\begin{aligned}
 p_i = & p(x1_j, x2_{j+n-1}) \cdot [r(x1_j, x2_{j+n-1}, b_k) - r(x1_j, x2_{j+n-1}, b_{k-1})] \\
 & - p(x1_j, x2_{j+n-2}) \cdot [r(x1_j, x2_{j+n-2}, b_k) - r(x1_j, x2_{j+n-2}, b_{k-1})] \\
 & - p(x1_{j+1}, x2_{j+n-1}) \cdot [r(x1_{j+1}, x2_{j+n-1}, b_k) - r(x1_{j+1}, x2_{j+n-1}, b_{k-1})] \\
 & + p(x1_{j+1}, x2_{j+n-2}) \cdot [r(x1_{j+1}, x2_{j+n-2}, b_k) - r(x1_{j+1}, x2_{j+n-2}, b_{k-1})]
 \end{aligned}$$

and where $r(x1, x2, b0) = 0$

1.1 The factor $p(x1, x2)$ is to be calculated according to the following formulae:

Overall normalized max damage length:	J_{\max}	=	10/33
Knuckle point in the distribution:	J_{kn}	=	5/33
Cumulative probability at J_{kn} :	p_k	=	11/12
Maximum absolute damage length:	l_{\max}	=	60 m
Length where normalized distribution ends:	L^*	=	260 m

Probability density at $J = 0$:

$$b_0 = 2 \left(\frac{p_k}{J_{kn}} - \frac{1-p_k}{J_{\max} - J_{kn}} \right)$$

When $L_s \leq L^*$:

$$J_m = \min \left\{ J_{\max}, \frac{l_{\max}}{L_s} \right\}$$

$$J_k = \frac{J_m}{2} + \frac{1 - \sqrt{1 + (1 - 2p_k)b_0 J_m + \frac{1}{4}b_0^2 J_m^2}}{b_0}$$

$$b_{12} = b_0$$

When $L_s > L^*$:

$$J_m^* = \min \left\{ J_{\max}, \frac{l_{\max}}{L^*} \right\}$$

$$J_k^* = \frac{J_m^*}{2} + \frac{1 - \sqrt{1 + (1 - 2p_k)b_0 J_m^* + \frac{1}{4}b_0^2 J_m^{*2}}}{b_0}$$

$$J_m = \frac{J_m^* \cdot L^*}{L_s}$$

$$J_k = \frac{J_k^* \cdot L^*}{L_s}$$

$$b_{12} = 2 \left(\frac{p_k}{J_k} - \frac{1-p_k}{J_m - J_k} \right)$$

$$b_{11} = 4 \frac{1 - p_k}{(J_m - J_k) J_k} - 2 \frac{p_k}{J_k^2}$$

$$b_{21} = -2 \frac{1 - p_k}{(J_m - J_k)^2}$$

$$b_{22} = -b_{21} J_m$$

The non-dimensional damage length:

$$J = \frac{(x_2 - x_1)}{L_s}$$

The normalized length of a compartment or group of compartments:

J_n is to be taken as the lesser of J and J_m

1.1.1 Where neither limits of the compartment or group of compartments under consideration coincides with the aft or forward terminals:

$J \leq J_k$:

$$p(x_1, x_2) = p_1 = \frac{1}{6} J^2 (b_{11} J + 3b_{12})$$

$J > J_k$:

$$p(x_1, x_2) = p_2 = -\frac{1}{3} b_{11} J_k^3 + \frac{1}{2} (b_{11} J - b_{12}) J_k^2 + b_{12} J J_k - \frac{1}{3} b_{21} (J_n^3 - J_k^3) + \frac{1}{2} (b_{21} J - b_{22}) (J_n^2 - J_k^2) + b_{22} J (J_n - J_k)$$

1.1.2 Where the aft limit of the compartment or group of compartments under consideration coincides with the aft terminal or the forward limit of the compartment or group of compartments under consideration coincides with the forward terminal:

$J \leq J_k$:

$$p(x_1, x_2) = \frac{1}{2} (p_1 + J)$$

$J > J_k$:

$$p(x_1, x_2) = \frac{1}{2} (p_2 + J)$$

1.1.3 Where the compartment or groups of compartments considered extends over the entire subdivision length (L_s):

$$p(x_1, x_2) = 1$$

1.2 The factor $r(x_1, x_2, b)$ shall be determined by the following formulae:

$$r(x_1, x_2, b) = 1 - (1 - C) \cdot \left[1 - \frac{G}{p(x_1, x_2)} \right]$$

where:

$$C = 12 \cdot J_b \cdot (-45 \cdot J_b + 4), \text{ where}$$

$$J_b = \frac{b}{15 \cdot B}$$

1.2.1 Where the compartment or groups of compartments considered extends over the entire subdivision length (L_s):

$$G = G_1 = \frac{1}{2} b_{11} J_b^2 + b_{12} J_b$$

1.2.2 Where neither limits of the compartment or group of compartments under consideration coincides with the aft or forward terminals:

$$G = G_2 = -\frac{1}{3} b_{11} J_0^3 + \frac{1}{2} (b_{11} J - b_{12}) J_0^2 + b_{12} J J_0, \text{ where}$$

$$J_0 = \min(J, J_b)$$

1.2.3 Where the aft limit of the compartment or group of compartments under consideration coincides with the aft terminal or the forward limit of the compartment or group of compartments under consideration coincides with the forward terminal:

$$G = \frac{1}{2} \cdot (G_2 + G_1 \cdot J)$$

Regulation 7-2 **Calculation of the factor s_i**

1 The factor s_i shall be determined for each case of assumed flooding, involving a compartment or group of compartments, in accordance with the following notations and the provisions in this regulation:

θ_e is the equilibrium heel angle in any stage of flooding, in degrees;

θ_v is the angle, in any stage of flooding, where the righting lever becomes negative, or the angle at which an opening incapable of being closed weathertight becomes submerged;

GZ_{\max} is the maximum positive righting lever, in metres, up to the angle θ_e ;

Range is the range of positive righting levers, in degrees, measured from the angle θ_e . The positive range is to be taken up to the angle θ_v ;

Flooding stage is any discrete step during the flooding process, including the stage before equalization (if any) until final equilibrium has been reached.

1.1 The factor s_i , for any damage case at any initial loading condition, d_i , shall be obtained from the formula:

$$s_i = \text{minimum} \{ s_{\text{intermediate},i} \text{ OR } s_{\text{final},i} \cdot s_{\text{mom},i} \}$$

where:

$s_{\text{intermediate},i}$ is the probability to survive all intermediate flooding stages until the final equilibrium stage, and is calculated in accordance with paragraph 2;

$s_{\text{final},i}$ is the probability to survive in the final equilibrium stage of flooding. It is calculated in accordance with paragraph 3;

$s_{\text{mom},i}$ is the probability to survive heeling moments, and is calculated in accordance with paragraph 4.

2 The factor $s_{\text{intermediate},i}$ is applicable only to passenger ships (for cargo ships $s_{\text{intermediate},i}$ should be taken as unity) and shall be taken as the least of the s-factors obtained from all flooding stages including the stage before equalization, if any, and is to be calculated as follows:

$$s_{\text{intermediate},i} = \left[\frac{GZ_{\text{max}} \cdot \text{Range}}{0.05 \cdot 7} \right]^{\frac{1}{4}}$$

where GZ_{max} is not to be taken as more than 0.05 m and Range as not more than 7° . $s_{\text{intermediate}} = 0$, if the intermediate heel angle exceeds 15° . Where cross-flooding fittings are required, the time for equalization shall not exceed 10 min.

3 The factor $s_{\text{final},i}$ shall be obtained from the formula:

$$s_{\text{final},i} = K \cdot \left[\frac{GZ_{\text{max}} \cdot \text{Range}}{0.12 \cdot 16} \right]^{\frac{1}{4}}$$

where:

GZ_{max} is not to be taken as more than 0.12 m;

Range is not to be taken as more than 16° ;

$$K = 1 \quad \text{if } \theta_e \leq \theta_{\text{min}}$$

$$K = 0 \quad \text{if } \theta_e \geq \theta_{\text{max}}$$

$$K = \sqrt{\frac{\theta_{\text{max}} - \theta_e}{\theta_{\text{max}} - \theta_{\text{min}}}} \quad \text{otherwise,}$$

where:

θ_{min} is 7° for passenger ships and 25° for cargo ships; and

θ_{max} is 15° for passenger ships and 30° for cargo ships.

4 The factor $s_{\text{mom},i}$ is applicable only to passenger ships (for cargo ships $s_{\text{mom},i}$ shall be taken as unity) and shall be calculated at the final equilibrium from the formula:

$$s_{\text{mom},i} = \frac{(GZ_{\text{max}} - 0.04) \cdot \text{Displacement}}{M_{\text{heel}}}$$

where:

Displacement is the intact displacement at the subdivision draught;

M_{heel} is the maximum assumed heeling moment as calculated in accordance with paragraph 4.1; and

$$s_{\text{mom},i} \leq 1$$

4.1 The heeling moment M_{heel} is to be calculated as follows:

$$M_{\text{heel}} = \text{maximum} \{M_{\text{passenger}} \text{ or } M_{\text{wind}} \text{ or } M_{\text{Survivalcraft}}\}$$

4.1.1 $M_{\text{passenger}}$ is the maximum assumed heeling moment resulting from movement of passengers, and is to be obtained as follows:

$$M_{\text{passenger}} = (0.075 \cdot N_p) \cdot (0.45 \cdot B) \text{ (tm)}$$

where:

N_p is the maximum number of passengers permitted to be on board in the service condition corresponding to the deepest subdivision draught under consideration; and

B is the beam of the ship.

Alternatively, the heeling moment may be calculated assuming the passengers are distributed with 4 persons per square metre on available deck areas towards one side of the ship on the decks where muster stations are located and in such a way that they produce the most adverse heeling moment. In doing so, a weight of 75 kg per passenger is to be assumed.

4.1.2 M_{wind} is the maximum assumed wind force acting in a damage situation:

$$M_{\text{wind}} = (P \cdot A \cdot Z) / 9,806 \text{ (tm)}$$

where:

$$P = 120 \text{ N/m}^2;$$

A = projected lateral area above waterline;

Z = distance from centre of lateral projected area above waterline to $T/2$; and

T = ship's draught, d_i .

4.1.3 $M_{\text{Survivalcraft}}$ is the maximum assumed heeling moment due to the launching of all fully loaded davit-launched survival craft on one side of the ship. It shall be calculated using the following assumptions:

- .1 all lifeboats and rescue boats fitted on the side to which the ship has heeled after having sustained damage shall be assumed to be swung out fully loaded and ready for lowering;
- .2 for lifeboats which are arranged to be launched fully loaded from the stowed position, the maximum heeling moment during launching shall be taken;
- .3 a fully loaded davit-launched liferaft attached to each davit on the side to which the ship has heeled after having sustained damage shall be assumed to be swung out ready for lowering;
- .4 persons not in the life-saving appliances which are swung out shall not provide either additional heeling or righting moment; and
- .5 life-saving appliances on the side of the ship opposite to the side to which the ship has heeled shall be assumed to be in a stowed position.

5 Unsymmetrical flooding is to be kept to a minimum consistent with the efficient arrangements. Where it is necessary to correct large angles of heel, the means adopted shall, where practicable, be self-acting, but in any case where controls to equalization devices are provided they shall be operable from above the bulkhead deck. These fittings together with their controls shall be acceptable to the Administration. Suitable information concerning the use of equalization devices shall be supplied to the master of the ship.

5.1 Tanks and compartments taking part in such equalization shall be fitted with air pipes or equivalent means of sufficient cross-section to ensure that the flow of water into the equalization compartments is not delayed.

5.2 In all cases, s_i is to be taken as zero in those cases where the final waterline, taking into account sinkage, heel and trim, immerses:

- .1 the lower edge of openings through which progressive flooding may take place and such flooding is not accounted for in the calculation of factor s_i . Such openings shall include air-pipes, ventilators and openings which are closed by means of weathertight doors or hatch covers; and
- .2 any part of the bulkhead deck in passenger ships considered a horizontal evacuation route for compliance with chapter II-2.

5.3 The factor s_i is to be taken as zero if, taking into account sinkage, heel and trim, any of the following occur in any intermediate stage or in the final stage of flooding:

- .1 immersion of any vertical escape hatch in the bulkhead deck intended for compliance with chapter II-2;
- .2 any controls intended for the operation of watertight doors, equalization devices, valves on piping or on ventilation ducts intended to maintain the integrity of watertight bulkheads from above the bulkhead deck become inaccessible or inoperable;

- .3 immersion of any part of piping or ventilation ducts carried through a watertight boundary that is located within any compartment included in damage cases contributing to the attained index A , if not fitted with watertight means of closure at each boundary.

5.4 However, where compartments assumed flooded due to progressive flooding are taken into account in the damage stability calculations multiple values of $S_{\text{intermediate},i}$ may be calculated assuming equalization in additional flooding phases.

5.5 Except as provided in paragraph 5.3.1, openings closed by means of watertight manhole covers and flush scuttles, small watertight hatch covers, remotely operated sliding watertight doors, side scuttles of the non-opening type as well as watertight access doors and hatch covers required to be kept closed at sea need not be considered.

6 Where horizontal watertight boundaries are fitted above the waterline under consideration the s -value calculated for the lower compartment or group of compartments shall be obtained by multiplying the value as determined in paragraph 1.1 by the reduction factor v_m according to paragraph 6.1, which represents the probability that the spaces above the horizontal subdivision will not be flooded.

6.1 The factor v_m shall be obtained from the formula:

$$v_m = v(H_{j, n, m}, d) - v(H_{j, n, m-1}, d)$$

where:

$H_{j, n, m}$ is the least height above the baseline, in metres, within the longitudinal range of $x_{1(j)} \dots x_{2(j+n-1)}$ of the m^{th} horizontal boundary which is assumed to limit the vertical extent of flooding for the damaged compartments under consideration;

$H_{j, n, m-1}$ is the least height above the baseline, in metres, within the longitudinal range of $x_{1(j)} \dots x_{2(j+n-1)}$ of the $(m-1)^{\text{th}}$ horizontal boundary which is assumed to limit the vertical extent of flooding for the damaged compartments under consideration;

j signifies the aft terminal of the damaged compartments under consideration;

m represents each horizontal boundary counted upwards from the waterline under consideration;

d is the draught in question as defined in regulation 2; and

x_1 and x_2 represent the terminals of the compartment or group of compartments considered in regulation 7-1.

6.1.1 The factors $v(H_{j, n, m}, d)$ and $v(H_{j, n, m-1}, d)$ shall be obtained from the formulae:

$$v(H, d) = 0.8 \frac{(H - d)}{7.8}, \text{ if } (H_m - d) \text{ is less than, or equal to, } 7.8 \text{ m;}$$

$$v(H, d) = 0.8 + 0.2 \left[\frac{(H - d) - 7.8}{4.7} \right] \text{ in all other cases,}$$

where:

$v(H_j, n, m, d)$ is to be taken as 1, if H_m coincides with the uppermost watertight boundary of the ship within the range $(x1_{(j)} \dots x2_{(j+n-1)})$, and

$v(H_j, n, 0, d)$ is to be taken as 0.

In no case is v_m to be taken as less than zero or more than 1.

6.2 In general, each contribution dA to the index A in the case of horizontal subdivisions is obtained from the formula:

$$dA = p_i \cdot [v_1 \cdot s_{\min 1} + (v_2 - v_1) \cdot s_{\min 2} + \dots + (1 - v_{m-1}) \cdot s_{\min m}]$$

where:

v_m = the v -value calculated in accordance with paragraph 6.1;
 s_{\min} = the least s -factor for all combinations of damages obtained when the assumed damage extends from the assumed damage height H_m downwards.

Regulation 7-3 Permeability

1 For the purpose of the subdivision and damage stability calculations of the regulations, the permeability of each general compartment or part of a compartment shall be as follows:

Spaces	Permeability
Appropriated to stores	0.60
Occupied by accommodation	0.95
Occupied by machinery	0.85
Void spaces	0.95
Intended for liquids	0 or 0.95 ¹

¹ Whichever results in the more severe requirement.

2 For the purpose of the subdivision and damage stability calculations of the regulations, the permeability of each cargo compartment or part of a compartment shall be as follows:

Spaces	Permeability at draught d_s	Permeability at draught d_p	Permeability at draught d_l
Dry cargo spaces	0.70	0.80	0.95
Container spaces	0.70	0.80	0.95
Ro-ro spaces	0.90	0.90	0.95
Cargo liquids	0.70	0.80	0.95

3 Other figures for permeability may be used if substantiated by calculations.

Regulation 8

Special requirements concerning passenger ship stability

- 1 A passenger ship intended to carry 400 or more persons shall have watertight subdivision abaft the collision bulkhead so that $s_i = 1$ for the three loading conditions on which is based the calculation of the subdivision index and for a damage involving all the compartments within $0.08L$ measured from the forward perpendicular.
- 2 A passenger ship intended to carry 36 or more persons is to be capable of withstanding damage along the side shell to an extent specified in paragraph 3. Compliance with this regulation is to be achieved by demonstrating that s_i , as defined in regulation 7-2, is not less than 0.9 for the three loading conditions on which is based the calculation of the subdivision index.
- 3 The damage extent to be assumed when demonstrating compliance with paragraph 2, is to be dependent on both N as defined in regulation 6, and L_s as defined in regulation 2, such that:
 - .1 the vertical extent of damage is to extend from the ship's moulded baseline to a position up to 12.5 m above the position of the deepest subdivision draught as defined in regulation 2, unless a lesser vertical extent of damage were to give a lower value of s_i , in which case this reduced extent is to be used;
 - .2 where 400 or more persons are to be carried, a damage length of $0.03L_s$ but not less than 3 m is to be assumed at any position along the side shell, in conjunction with a penetration inboard of $0.1B$ but not less than 0.75 m measured inboard from the ship side, at right angle to the centreline at the level of the deepest subdivision draught;
 - .3 where less than 400 persons are carried, damage length is to be assumed at any position along the shell side between transverse watertight bulkheads provided that the distance between two adjacent transverse watertight bulkheads is not less than the assumed damage length. If the distance between adjacent transverse watertight bulkheads is less than the assumed damage length, only one of these bulkheads shall be considered effective for the purpose of demonstrating compliance with paragraph 2;
 - .4 where 36 persons are carried, a damage length of $0.015L_s$ but not less than 3 m is to be assumed, in conjunction with a penetration inboard of $0.05B$ but not less than 0.75 m; and
 - .5 where more than 36, but fewer than 400 persons are carried the values of damage length and penetration inboard, used in the determination of the assumed extent of damage, are to be obtained by linear interpolation between the values of damage length and penetration which apply for ships carrying 36 persons and 400 persons as specified in subparagraphs .4 and .2.

PART B-2
SUBDIVISION, WATERTIGHT AND WEATHERTIGHT INTEGRITY

Regulation 9
Double bottoms in passenger ships and cargo ships other than tankers

1 A double bottom shall be fitted extending from the collision bulkhead to the afterpeak bulkhead, as far as this is practicable and compatible with the design and proper working of the ship.

2 Where a double bottom is required to be fitted the inner bottom shall be continued out to the ship's sides in such a manner as to protect the bottom to the turn of the bilge. Such protection will be deemed satisfactory if the inner bottom is not lower at any part than a plane parallel with the keel line and which is located not less than a vertical distance h measured from the keel line, as calculated by the formula:

$$h = B/20$$

However, in no case is the value of h to be less than 760 mm, and need not be taken as more than 2,000 mm.

3 Small wells constructed in the double bottom in connection with drainage arrangements of holds, etc., shall not extend downward more than necessary. A well extending to the outer bottom is, however, permitted at the after end of the shaft tunnel. Other wells (e.g. for lubricating oil under main engines) may be permitted by the Administration if satisfied that the arrangements give protection equivalent to that afforded by a double bottom complying with this regulation. In no case shall the vertical distance from the bottom of such a well to a plane coinciding with the keel line be less than 500 mm.

4 A double bottom need not be fitted in way of watertight tanks, including dry tanks of moderate size, provided the safety of the ship is not impaired in the event of bottom or side damage.

5 In the case of passenger ships to which the provisions of regulation 1.5 apply and which are engaged on regular service within the limits of a short international voyage as defined in regulation III/3.22, the Administration may permit a double bottom to be dispensed with if satisfied that the fitting of a double bottom in that part would not be compatible with the design and proper working of the ship.

6 Any part of a passenger ship or a cargo ship that is not fitted with a double bottom in accordance with paragraphs 1, 4 or 5 shall be capable of withstanding bottom damages, as specified in paragraph 8, in that part of the ship.

7 In the case of unusual bottom arrangements in a passenger ship or a cargo ship, it shall be demonstrated that the ship is capable of withstanding bottom damages as specified in paragraph 8.

8 Compliance with paragraphs 6 or 7 is to be achieved by demonstrating that s_i , when calculated in accordance with regulation 7-2, is not less than 1 for all service conditions when subject to a bottom damage assumed at any position along the ship's bottom and with an extent specified in subparagraph .2 for the affected part of the ship:

- .1 Flooding of such spaces shall not render emergency power and lighting, internal communication, signals or other emergency devices inoperable in other parts of the ship.
- .2 Assumed extent of damage shall be as follows:

	For 0.3 L from the forward perpendicular of the ship	Any other part of the ship
Longitudinal extent	$1/3 L^{2/3}$ or 14.5 m, whichever is less	$1/3 L^{2/3}$ or 14.5 m, whichever is less
Transverse extent	$B/6$ or 10 m, whichever is less	$B/6$ or 5 m, whichever is less
Vertical extent, measured from the keel line	$B/20$ or 2 m, whichever is less	$B/20$ or 2 m, whichever is less

- .3 If any damage of a lesser extent than the maximum damage specified in subparagraph .2 would result in a more severe condition, such damage should be considered.

9 In case of large lower holds in passenger ships, the Administration may require an increased double bottom height of not more than $B/10$ or 3 m, whichever is less, measured from the keel line. Alternatively, bottom damages may be calculated for these areas, in accordance with paragraph 8, but assuming an increased vertical extent.

Regulation 10 **Construction of watertight bulkheads**

- 1 Each watertight subdivision bulkhead, whether transverse or longitudinal, shall be constructed having scantlings as specified in regulation 2.17. In all cases, watertight subdivision bulkheads shall be capable of supporting at least the pressure due to a head of water up to the bulkhead deck.
- 2 Steps and recesses in watertight bulkheads shall be as strong as the bulkhead at the place where each occurs.

Regulation 11 **Initial testing of watertight bulkheads, etc.**

- 1 Testing watertight spaces not intended to hold liquids and cargo holds intended to hold ballast by filling them with water is not compulsory. When testing by filling with water is not carried out, a hose test shall be carried out where practicable. This test shall be carried out in the most advanced stage of the fitting out of the ship. Where a hose test is not practicable because of possible damage to machinery, electrical equipment insulation or outfitting items, it may be replaced by a careful visual examination of welded connections, supported where deemed necessary by means such as a dye penetrant test or an ultrasonic leak test or an equivalent test. In any case a thorough inspection of the watertight bulkheads shall be carried out.
- 2 The forepeak, double bottom (including duct keels) and inner skins shall be tested with water to a head corresponding to the requirements of regulation 10.1.

3 Tanks which are intended to hold liquids, and which form part of the watertight subdivision of the ship, shall be tested for tightness and structural strength with water to a head corresponding to its design pressure. The water head is in no case to be less than the top of the air pipes or to a level of 2.4 m above the top of the tank, whichever is the greater.

4 The tests referred to in paragraphs 2 and 3 are for the purpose of ensuring that the subdivision structural arrangements are watertight and are not to be regarded as a test of the fitness of any compartment for the storage of oil fuel or for other special purposes for which a test of a superior character may be required depending on the height to which the liquid has access in the tank or its connections.

Regulation 12

Peak and machinery space bulkheads, shaft tunnels, etc.

1 A collision bulkhead shall be fitted which shall be watertight up to the bulkhead deck. This bulkhead shall be located at a distance from the forward perpendicular of not less than $0.05L$ or 10 m, whichever is the less, and, except as may be permitted by the Administration, not more than $0.08L$ or $0.05L + 3$ m, whichever is the greater.

2 Where any part of the ship below the waterline extends forward of the forward perpendicular, e.g. a bulbous bow, the distances stipulated in paragraph 1 shall be measured from a point either:

- .1 at the mid-length of such extension;
- .2 at a distance $0.015L$ forward of the forward perpendicular; or
- .3 at a distance 3 m forward of the forward perpendicular,

whichever gives the smallest measurement.

3 The bulkhead may have steps or recesses provided they are within the limits prescribed in paragraph 1 or 2.

4 No doors, manholes, access openings, ventilation ducts or any other openings shall be fitted in the collision bulkhead below the bulkhead deck.

5.1 Except as provided in paragraph 5.2, the collision bulkhead may be pierced below the bulkhead deck by not more than one pipe for dealing with fluid in the forepeak tank, provided that the pipe is fitted with a screw-down valve capable of being operated from above the bulkhead deck, the valve chest being secured inside the forepeak to the collision bulkhead. The Administration may, however, authorize the fitting of this valve on the after side of the collision bulkhead provided that the valve is readily accessible under all service conditions and the space in which it is located is not a cargo space. All valves shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable.

5.2 If the forepeak is divided to hold two different kinds of liquids the Administration may allow the collision bulkhead to be pierced below the bulkhead deck by two pipes, each of which is fitted as required by paragraph 5.1, provided the Administration is satisfied that there is no practical alternative to the fitting of such a second pipe and that, having regard to the additional subdivision provided in the forepeak, the safety of the ship is maintained.

6 Where a long forward superstructure is fitted the collision bulkhead shall be extended weathertight to the deck next above the bulkhead deck. The extension need not be fitted directly above the bulkhead below provided it is located within the limits prescribed in paragraph 1 or 2 with the exception permitted by paragraph 7 and that the part of the deck which forms the step is made effectively weathertight. The extension shall be so arranged as to preclude the possibility of the bow door causing damage to it in the case of damage to, or detachment of, a bow door.

7 Where bow doors are fitted and a sloping loading ramp forms part of the extension of the collision bulkhead above the bulkhead deck the ramp shall be weathertight over its complete length. In cargo ships the part of the ramp which is more than 2.3 m above the bulkhead deck may extend forward of the limit specified in paragraph 1 or 2. Ramps not meeting the above requirements shall be disregarded as an extension of the collision bulkhead.

8 The number of openings in the extension of the collision bulkhead above the freeboard deck shall be restricted to the minimum compatible with the design and normal operation of the ship. All such openings shall be capable of being closed weathertight.

9 Bulkheads shall be fitted separating the machinery space from cargo and accommodation spaces forward and aft and made watertight up to the bulkhead deck. In passenger ships an afterpeak bulkhead shall also be fitted and made watertight up to the bulkhead deck. The afterpeak bulkhead may, however, be stepped below the bulkhead deck, provided the degree of safety of the ship as regards subdivision is not thereby diminished.

10 In all cases stern tubes shall be enclosed in watertight spaces of moderate volume. In passenger ships the stern gland shall be situated in a watertight shaft tunnel or other watertight space separate from the stern tube compartment and of such volume that, if flooded by leakage through the stern gland, the bulkhead deck will not be immersed. In cargo ships other measures to minimize the danger of water penetrating into the ship in case of damage to stern tube arrangements may be taken at the discretion of the Administration.

Regulation 13

Openings in watertight bulkheads below the bulkhead deck in passenger ships

1 The number of openings in watertight bulkheads shall be reduced to the minimum compatible with the design and proper working of the ship, satisfactory means shall be provided for closing these openings.

2.1 Where pipes, scuppers, electric cables, etc., are carried through watertight bulkheads, arrangements shall be made to ensure the watertight integrity of the bulkheads.

2.2 Valves not forming part of a piping system shall not be permitted in watertight bulkheads.

2.3 Lead or other heat sensitive materials shall not be used in systems which penetrate watertight bulkheads, where deterioration of such systems in the event of fire would impair the watertight integrity of the bulkheads.

3 No doors, manholes, or access openings are permitted in watertight transverse bulkheads dividing a cargo space from an adjoining cargo space, except as provided in paragraph 9.1 and in regulation 14.

4 Subject to paragraph 10, not more than one door, apart from the doors to shaft tunnels, may be fitted in each watertight bulkhead within spaces containing the main and auxiliary propulsion machinery including boilers serving the needs of propulsion. Where two or more shafts are fitted, the tunnels shall be connected by an intercommunicating passage. There shall be only one door between the machinery space and the tunnel spaces where two shafts are fitted and only two doors where there are more than two shafts. All these doors shall be of the sliding type and shall be so located as to have their sills as high as practicable. The hand gear for operating these doors from above the bulkhead deck shall be situated outside the spaces containing the machinery.

5.1 Watertight doors, except as provided in paragraph 9.1 or regulation 14, shall be power-operated sliding doors complying with the requirements of paragraph 7 capable of being closed simultaneously from the central operating console at the navigation bridge in not more than 60 s with the ship in the upright position.

5.2 The means of operation whether by power or by hand of any power-operated sliding watertight door shall be capable of closing the door with the ship listed to 15° either way. Consideration shall also be given to the forces which may act on either side of the door as may be experienced when water is flowing through the opening applying a static head equivalent to a water height of at least 1 m above the sill on the centreline of the door.

5.3 Watertight door controls, including hydraulic piping and electric cables, shall be kept as close as practicable to the bulkhead in which the doors are fitted, in order to minimize the likelihood of them being involved in any damage which the ship may sustain. The positioning of watertight doors and their controls shall be such that if the ship sustains damage within one fifth of the breadth of the ship, as defined in regulation 2, such distance being measured at right angles to the centreline at the level of the deepest subdivision draught, the operation of the watertight doors clear of the damaged portion of the ship is not impaired.

6 All power-operated sliding watertight doors shall be provided with means of indication which will show at all remote operating positions whether the doors are open or closed. Remote operating positions shall only be at the navigation bridge as required by paragraph 7.1.5 and at the location where hand operation above the bulkhead deck is required by paragraph 7.1.4.

7.1 Each power-operated sliding watertight door:

- .1 shall have a vertical or horizontal motion;
- .2 shall, subject to paragraph 10, be normally limited to a maximum clear opening width of 1.2 m. The Administration may permit larger doors only to the extent considered necessary for the effective operation of the ship provided that other safety measures, including the following, are taken into consideration:
 - .1 special consideration shall be given to the strength of the door and its closing appliances in order to prevent leakages; and
 - .2 the door shall be located inboard the damage zone $B/5$;

- .3 shall be fitted with the necessary equipment to open and close the door using electric power, hydraulic power, or any other form of power that is acceptable to the Administration;
- .4 shall be provided with an individual hand-operated mechanism. It shall be possible to open and close the door by hand at the door itself from either side, and in addition, close the door from an accessible position above the bulkhead deck with an all round crank motion or some other movement providing the same degree of safety acceptable to the Administration. Direction of rotation or other movement is to be clearly indicated at all operating positions. The time necessary for the complete closure of the door, when operating by hand gear, shall not exceed 90 s with the ship in the upright position;
- .5 shall be provided with controls for opening and closing the door by power from both sides of the door and also for closing the door by power from the central operating console at the navigation bridge;
- .6 shall be provided with an audible alarm, distinct from any other alarm in the area, which will sound whenever the door is closed remotely by power and which shall sound for at least 5 s but no more than 10 s before the door begins to move and shall continue sounding until the door is completely closed. In the case of remote hand operation it is sufficient for the audible alarm to sound only when the door is moving. Additionally, in passenger areas and areas of high ambient noise the Administration may require the audible alarm to be supplemented by an intermittent visual signal at the door; and
- .7 shall have an approximately uniform rate of closure under power. The closure time, from the time the door begins to move to the time it reaches the completely closed position, shall in no case be less than 20 s or more than 40 s with the ship in the upright position.

7.2 The electrical power required for power-operated sliding watertight doors shall be supplied from the emergency switchboard either directly or by a dedicated distribution board situated above the bulkhead deck. The associated control, indication and alarm circuits shall be supplied from the emergency switchboard either directly or by a dedicated distribution board situated above the bulkhead deck and be capable of being automatically supplied by the transitional source of emergency electrical power required by regulation 42.3.1.3 in the event of failure of either the main or emergency source of electrical power.

7.3 Power-operated sliding watertight doors shall have either:

- .1 a centralized hydraulic system with two independent power sources each consisting of a motor and pump capable of simultaneously closing all doors. In addition, there shall be for the whole installation hydraulic accumulators of sufficient capacity to operate all the doors at least three times, i.e. closed-open-closed, against an adverse list of 15°. This operating cycle shall be capable of being carried out when the accumulator is at the pump cut-in pressure. The fluid used shall be chosen considering the temperatures liable to be encountered by the installation during its service. The power operating system shall be designed to minimize the possibility of having a single failure in the hydraulic piping adversely affect the operation of more than one door. The hydraulic system shall be

provided with a low-level alarm for hydraulic fluid reservoirs serving the power-operated system and a low gas pressure alarm or other effective means of monitoring loss of stored energy in hydraulic accumulators. These alarms are to be audible and visual and shall be situated on the central operating console at the navigation bridge; or

- .2 an independent hydraulic system for each door with each power source consisting of a motor and pump capable of opening and closing the door. In addition, there shall be a hydraulic accumulator of sufficient capacity to operate the door at least three times, i.e. closed-open-closed, against an adverse list of 15°. This operating cycle shall be capable of being carried out when the accumulator is at the pump cut-in pressure. The fluid used shall be chosen considering the temperatures liable to be encountered by the installation during its service. A low gas pressure group alarm or other effective means of monitoring loss of stored energy in hydraulic accumulators shall be provided at the central operating console on the navigation bridge. Loss of stored energy indication at each local operating position shall also be provided; or
- .3 an independent electrical system and motor for each door with each power source consisting of a motor capable of opening and closing the door. The power source shall be capable of being automatically supplied by the transitional source of emergency electrical power as required by regulation 42.4.2 – in the event of failure of either the main or emergency source of electrical power and with sufficient capacity to operate the door at least three times, i.e. closed-open-closed, against an adverse list of 15°.

For the systems specified in paragraphs 7.3.1, 7.3.2 and 7.3.3, provision should be made as follows: Power systems for power-operated watertight sliding doors shall be separate from any other power system. A single failure in the electric or hydraulic power-operated systems excluding the hydraulic actuator shall not prevent the hand operation of any door.

7.4 Control handles shall be provided at each side of the bulkhead at a minimum height of 1.6 m above the floor and shall be so arranged as to enable persons passing through the doorway to hold both handles in the open position without being able to set the power closing mechanism in operation accidentally. The direction of movement of the handles in opening and closing the door shall be in the direction of door movement and shall be clearly indicated.

7.5 As far as practicable, electrical equipment and components for watertight doors shall be situated above the bulkhead deck and outside hazardous areas and spaces.

7.6 The enclosures of electrical components necessarily situated below the bulkhead deck shall provide suitable protection against the ingress of water.

7.7 Electric power, control, indication and alarm circuits shall be protected against fault in such a way that a failure in one door circuit will not cause a failure in any other door circuit. Short circuits or other faults in the alarm or indicator circuits of a door shall not result in a loss of power operation of that door. Arrangements shall be such that leakage of water into the electrical equipment located below the bulkhead deck will not cause the door to open.

7.8 A single electrical failure in the power operating or control system of a power-operated sliding watertight door shall not result in a closed door opening. Availability of the power supply should be continuously monitored at a point in the electrical circuit as near as practicable to each of the motors required by paragraph 7.3. Loss of any such power supply should activate an audible and visual alarm at the central operating console at the navigation bridge.

8.1 The central operating console at the navigation bridge shall have a "master mode" switch with two modes of control: a "local control" mode which shall allow any door to be locally opened and locally closed after use without automatic closure, and a "doors closed" mode which shall automatically close any door that is open. The "doors closed" mode shall automatically close any door that is open. The "doors closed" mode shall permit doors to be opened locally and shall automatically re-close the doors upon release of the local control mechanism. The "master mode" switch shall normally be in the "local control" mode. The "doors closed" mode shall only be used in an emergency or for testing purposes. Special consideration shall be given to the reliability of the "master mode" switch.

8.2 The central operating console at the navigation bridge shall be provided with a diagram showing the location of each door, with visual indicators to show whether each door is open or closed. A red light shall indicate a door is fully open and a green light shall indicate a door is fully closed. When the door is closed remotely the red light shall indicate the intermediate position by flashing. The indicating circuit shall be independent of the control circuit for each door.

8.3 It shall not be possible to remotely open any door from the central operating console.

9.1 If the Administration is satisfied that such doors are essential, watertight doors of satisfactory construction may be fitted in watertight bulkheads dividing cargo between deck spaces. Such doors may be hinged, rolling or sliding doors but shall not be remotely controlled. They shall be fitted at the highest level and as far from the shell plating as practicable, but in no case shall the outboard vertical edges be situated at a distance from the shell plating which is less than one fifth of the breadth of the ship, as defined in regulation 2, such distance being measured at right angles to the centreline at the level of the deepest subdivision draught.

9.2 Should any such doors be accessible during the voyage, they shall be fitted with a device which prevents unauthorized opening. When it is proposed to fit such doors, the number and arrangements shall receive the special consideration of the Administration.

10 Portable plates on bulkheads shall not be permitted except in machinery spaces. The Administration may permit not more than one power-operated sliding watertight door in each watertight bulkhead larger than those specified in paragraph 7.1.2 to be substituted for these portable plates, provided these doors are intended to remain closed during navigation except in case of urgent necessity at the discretion of the master. These doors need not meet the requirements of paragraph 7.1.4 regarding complete closure by hand-operated gear in 90 s.

11.1 Where trunkways or tunnels for access from crew accommodation to the stokehold, for piping, or for any other purpose are carried through watertight bulkheads, they shall be watertight and in accordance with the requirements of regulation 16-1. The access to at least one end of each such tunnel or trunkway, if used as a passage at sea, shall be through a trunk extending watertight to a height sufficient to permit access above

the bulkhead deck. The access to the other end of the trunkway or tunnel may be through a watertight door of the type required by its location in the ship. Such trunkways or tunnels shall not extend through the first subdivision bulkhead abaft the collision bulkhead.

11.2 Where it is proposed to fit tunnels piercing watertight bulkheads, these shall receive the special consideration of the Administration.

11.3 Where trunkways in connection with refrigerated cargo and ventilation or forced draught trunks are carried through more than one watertight bulkhead, the means of closure at such openings shall be operated by power and be capable of being closed from a central position situated above the bulkhead deck.

Regulation 13-1

Openings in watertight bulkheads and internal decks in cargo ships

1 The number of openings in watertight subdivisions is to be kept to a minimum compatible with the design and proper working of the ship. Where penetrations of watertight bulkheads and internal decks are necessary for access, piping, ventilation, electrical cables, etc., arrangements are to be made to maintain the watertight integrity. The Administration may permit relaxation in the watertightness of openings above the freeboard deck, provided that it is demonstrated that any progressive flooding can be easily controlled and that the safety of the ship is not impaired.

2 Doors provided to ensure the watertight integrity of internal openings which are used while at sea are to be sliding watertight doors capable of being remotely closed from the bridge and are also to be operable locally from each side of the bulkhead. Indicators are to be provided at the control position showing whether the doors are open or closed, and an audible alarm is to be provided at the door closure. The power, control and indicators are to be operable in the event of main power failure. Particular attention is to be paid to minimizing the effect of control system failure. Each power-operated sliding watertight door shall be provided with an individual hand-operated mechanism. It shall be possible to open and close the door by hand at the door itself from both sides.

3 Access doors and access hatch covers normally closed at sea, intended to ensure the watertight integrity of internal openings, shall be provided with means of indication locally and on the bridge showing whether these doors or hatch covers are open or closed. A notice is to be affixed to each such door or hatch cover to the effect that it is not to be left open.

4 Watertight doors or ramps of satisfactory construction may be fitted to internally subdivide large cargo spaces, provided that the Administration is satisfied that such doors or ramps are essential. These doors or ramps may be hinged, rolling or sliding doors or ramps, but shall not be remotely controlled. Should any of the doors or ramps be accessible during the voyage, they shall be fitted with a device which prevents unauthorized opening.

5 Other closing appliances which are kept permanently closed at sea to ensure the watertight integrity of internal openings shall be provided with a notice which is to be affixed to each such closing appliance to the effect that it is to be kept closed. Manholes fitted with closely bolted covers need not be so marked.

Regulation 14

Passenger ships carrying goods vehicles and accompanying personnel

1 This regulation applies to passenger ships designed or adapted for the carriage of goods vehicles and accompanying personnel.

2 If in such a ship the total number of passengers which include personnel accompanying vehicles does not exceed $12 + A_d/25$, where A_d = total deck area (square metres) of spaces available for the stowage of goods vehicles and where the clear height at the stowage position and at the entrance to such spaces is not less than 4 m, the provisions of regulations 13.9.1 and 13.9.2 in respect of watertight doors apply except that the doors may be fitted at any level in watertight bulkheads dividing cargo spaces. Additionally, indicators are required on the navigation bridge to show automatically when each door is closed and all door fastenings are secured.

3 The ship may not be certified for a higher number of passengers than assumed in paragraph 2, if a watertight door has been fitted in accordance with this regulation.

Regulation 15

Openings in the shell plating below the bulkhead deck of passenger ships and the freeboard deck of cargo ships

1 The number of openings in the shell plating shall be reduced to the minimum compatible with the design and proper working of the ship.

2 The arrangement and efficiency of the means for closing any opening in the shell plating shall be consistent with its intended purpose and the position in which it is fitted and generally to the satisfaction of the Administration.

3.1 Subject to the requirements of the International Convention on Load Lines in force, no sidescuttle shall be fitted in such a position that its sill is below a line drawn parallel to the bulkhead deck at side and having its lowest point 2.5% of the breadth of the ship above the deepest subdivision draught, or 500 mm, whichever is the greater.

3.2 All sidescuttles the sills of which are below the bulkhead deck of passenger ships and the freeboard deck of cargo ships, as permitted by paragraph 3.1, shall be of such construction as will effectively prevent any person opening them without the consent of the master of the ship.

4 Efficient hinged inside deadlights so arranged that they can be easily and effectively closed and secured watertight, shall be fitted to all sidescuttles except that abaft one eighth of the ship's length from the forward perpendicular and above a line drawn parallel to the bulkhead deck at side and having its lowest point at a height of 3.7 m plus 2.5% of the breadth of the ship above the deepest subdivision draught, the deadlights may be portable in passenger accommodation other than that for steerage passengers, unless the deadlights are required by the International Convention on Load Lines in force to be permanently attached in their proper positions. Such portable deadlights shall be stowed adjacent to the sidescuttles they serve.

5.1 No sidescuttles shall be fitted in any spaces which are appropriated exclusively to the carriage of cargo or coal.

5.2 Sidescuttles may, however, be fitted in spaces appropriated alternatively to the carriage of cargo or passengers, but they shall be of such construction as will effectively prevent any person opening them or their deadlights without the consent of the master.

6 Automatic ventilating sidescuttles shall not be fitted in the shell plating below the bulkhead deck of passenger ships and the freeboard deck of cargo ships without the special sanction of the Administration.

7 The number of scuppers, sanitary discharges and other similar openings in the shell plating shall be reduced to the minimum either by making each discharge serve for as many as possible of the sanitary and other pipes, or in any other satisfactory manner.

8.1 All inlets and discharges in the shell plating shall be fitted with efficient and accessible arrangements for preventing the accidental admission of water into the ship.

8.2.1 Subject to the requirements of the International Convention on Load Lines in force, and except as provided in paragraph 8.3, each separate discharge led through the shell plating from spaces below the bulkhead deck of passenger ships and the freeboard deck of cargo ships shall be provided with either one automatic non-return valve fitted with a positive means of closing it from above the bulkhead deck or with two automatic non-return valves without positive means of closing, provided that the inboard valve is situated above the deepest subdivision draught and is always accessible for examination under service conditions. Where a valve with positive means of closing is fitted, the operating position above the bulkhead deck shall always be readily accessible and means shall be provided for indicating whether the valve is open or closed.

8.2.2 The requirements of the International Convention on Load Lines in force shall apply to discharges led through the shell plating from spaces above the bulkhead deck of passenger ships and the freeboard deck of cargo ships.

8.3 Machinery space, main and auxiliary sea inlets and discharges in connection with the operation of machinery shall be fitted with readily accessible valves between the pipes and the shell plating or between the pipes and fabricated boxes attached to the shell plating. In manned machinery spaces the valves may be controlled locally and shall be provided with indicators showing whether they are open or closed.

8.4 Moving parts penetrating the shell plating below the deepest subdivision draught shall be fitted with a watertight sealing arrangement acceptable to the Administration. The inboard gland shall be located within a watertight space of such volume that, if flooded, the bulkhead deck will not be submerged. The Administration may require that if such compartment is flooded, essential or emergency power and lighting, internal communication, signals or other emergency devices must remain available in other parts of the ship.

8.5 All shell fittings and valves required by this regulation shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable. All pipes to which this regulation refers shall be of steel or other equivalent material to the satisfaction of the Administration.

9 Gangway, cargo and fuelling ports fitted below the bulkhead deck of passenger ships and the freeboard deck of cargo ships shall be watertight and in no case be so fitted as to have their lowest point below the deepest subdivision draught.

10.1 The inboard opening of each ash-chute, rubbish-chute, etc., shall be fitted with an efficient cover.

10.2 If the inboard opening is situated below the bulkhead deck of passenger ships and the freeboard deck of cargo ships, the cover shall be watertight and, in addition, an automatic non-return valve shall be fitted in the chute in an easily accessible position above the deepest subdivision draught.

Regulation 15-1 **External openings in cargo ships**

1 All external openings leading to compartments assumed intact in the damage analysis, which are below the final damage waterline, are required to be watertight.

2 External openings required to be watertight in accordance with paragraph 1 shall, except for cargo hatch covers, be fitted with indicators on the bridge.

3 Openings in the shell plating below the deck limiting the vertical extent of damage shall be fitted with a device that prevents unauthorized opening if they are accessible during the voyage.

4 Other closing appliances which are kept permanently closed at sea to ensure the watertight integrity of external openings shall be provided with a notice affixed to each appliance to the effect that it is to be kept closed. Manholes fitted with closely bolted covers need not be so marked.

Regulation 16 **Construction and initial tests of watertight doors, sidescuttles, etc.**

1 In all ships:

- .1 the design, materials and construction of all watertight doors, sidescuttles, gangway and cargo ports, valves, pipes, ash-chutes and rubbish-chutes referred to in these regulations shall be to the satisfaction of the Administration;
- .2 such valves, doors and mechanisms shall be suitably marked to ensure that they may be properly used to provide maximum safety; and
- .3 the frames of vertical watertight doors shall have no groove at the bottom in which dirt might lodge and prevent the door closing properly.

2 In passenger ships and cargo ships watertight doors shall be tested by water pressure to a head of water they might sustain in a final or intermediate stage of flooding. Where testing of individual doors is not carried out because of possible damage to insulation or outfitting items, testing of individual doors may be replaced by a prototype pressure test of each type and size of door with a test pressure corresponding at least to the head required for the intended location. The prototype test shall be carried out before the door is fitted. The installation method and procedure for fitting the door on board shall correspond to that of the prototype test. When fitted on board, each door shall be checked for proper seating between the bulkhead, the frame and the door.

Regulation 16-1

Construction and initial tests of watertight decks, trunks, etc.

- 1 Watertight decks, trunks, tunnels, duct keels and ventilators shall be of the same strength as watertight bulkheads at corresponding levels. The means used for making them watertight, and the arrangements adopted for closing openings in them, shall be to the satisfaction of the Administration. Watertight ventilators and trunks shall be carried at least up to the bulkhead deck in passenger ships and up to the freeboard deck in cargo ships.
- 2 Where a ventilation trunk passing through a structure penetrates the bulkhead deck, the trunk shall be capable of withstanding the water pressure that may be present within the trunk, after having taken into account the maximum heel angle allowable during intermediate stages of flooding, in accordance with regulation 7-2.
- 3 Where all or part of the penetration of the bulkhead deck is on the main ro-ro deck, the trunk shall be capable of withstanding impact pressure due to internal water motions (sloshing) of water trapped on the ro-ro deck.
- 4 After completion, a hose or flooding test shall be applied to watertight decks and a hose test to watertight trunks, tunnels and ventilators.

Regulation 17

Internal watertight integrity of passenger ships above the bulkhead deck

- 1 The Administration may require that all reasonable and practicable measures shall be taken to limit the entry and spread of water above the bulkhead deck. Such measures may include partial bulkheads or webs. When partial watertight bulkheads and webs are fitted on the bulkhead deck, above or in the immediate vicinity of watertight bulkheads, they shall have watertight shell and bulkhead deck connections so as to restrict the flow of water along the deck when the ship is in a heeled damaged condition. Where the partial watertight bulkhead does not line up with the bulkhead below, the bulkhead deck between shall be made effectively watertight. Where openings, pipes, scuppers, electric cables etc. are carried through the partial watertight bulkheads or decks within the immersed part of the bulkhead deck, arrangements shall be made to ensure the watertight integrity of the structure above the bulkhead deck.
- 2 All openings in the exposed weather deck shall have coamings of ample height and strength and shall be provided with efficient means for expeditiously closing them weathertight. Freeing ports, open rails and scuppers shall be fitted as necessary for rapidly clearing the weather deck of water under all weather conditions.
- 3 The open end of air pipes terminating within a superstructure shall be at least 1 m above the waterline when the ship heels to an angle of 15°, or the maximum angle of heel during intermediate stages of flooding, as determined by direct calculation, whichever is the greater. Alternatively, air pipes from tanks other than oil tanks may discharge through the side of the superstructure. The provisions of this paragraph are without prejudice to the provisions of the International Convention on Load Lines in force.
- 4 Sidescuttles, gangway, cargo and fuelling ports and other means for closing openings in the shell plating above the bulkhead deck shall be of efficient design and construction and of sufficient strength having regard to the spaces in which they are fitted and their positions relative to the deepest subdivision draught.

5 Efficient inside deadlights, so arranged that they can be easily and effectively closed and secured watertight, shall be provided for all sidescuttles to spaces below the first deck above the bulkhead deck.

Regulation 17-1
Integrity of the hull and superstructure, damage prevention
and control on ro-ro passenger ships

1.1 Subject to the provisions of paragraphs 1.2 and 1.3, all accesses that lead to spaces below the bulkhead deck shall have a lowest point which is not less than 2.5 m above the bulkhead deck.

1.2 Where vehicle ramps are installed to give access to spaces below the bulkhead deck, their openings shall be able to be closed weathertight to prevent ingress of water below, alarmed and indicated to the navigation bridge.

1.3 The Administration may permit the fitting of particular accesses to spaces below the bulkhead deck provided they are necessary for the essential working of the ship, e.g. the movement of machinery and stores, subject to such accesses being made watertight, alarmed and indicated on the navigation bridge.

2 Indicators shall be provided on the navigation bridge for all shell doors, loading doors and other closing appliances which, if left open or not properly secured, could, in the opinion of the Administration, lead to flooding of a special category space or ro-ro space. The indicator system shall be designed on the fail-safe principle and shall show by visual alarms if the door is not fully closed or if any of the securing arrangements are not in place and fully locked and by audible alarms if such door or closing appliances become open or the securing arrangements become unsecured. The indicator panel on the navigation bridge shall be equipped with a mode selection function "harbour/sea voyage" so arranged that an audible alarm is given on the navigation bridge if the ship leaves harbour with the bow doors, inner doors, stern ramp or any other side shell doors not closed or any closing device not in the correct position. The power supply for the indicator system shall be independent of the power supply for operating and securing the doors.

3 Television surveillance and a water leakage detection system shall be arranged to provide an indication to the navigation bridge and to the engine control station of any leakage through inner and outer bow doors, stern doors or any other shell doors which could lead to flooding of special category spaces or ro-ro spaces.

PART B-3
SUBDIVISION LOAD LINE ASSIGNMENT FOR PASSENGER SHIPS

Regulation 18
Assigning, marking and recording of subdivision load lines for passenger ships

1 In order that the required degree of subdivision shall be maintained, a load line corresponding to the approved subdivision draught shall be assigned and marked on the ship's sides. A ship intended for alternating modes of operation may, if the owners desire, have one or more additional load lines assigned and marked to correspond with the subdivision draughts which the Administration may approve for the alternative service configurations. Each service configuration so approved shall comply with part B-1 of this chapter independently of the results obtained for other modes of operation.

2 The subdivision load lines assigned and marked shall be recorded in the Passenger Ship Safety Certificate, and shall be distinguished by the notation P1 for the principal passenger service configuration, and P2, P3, etc., for the alternative configurations. The principal passenger configuration shall be taken as the mode of operation in which the required subdivision index R will have the highest value.

3 The freeboard corresponding to each of these load lines shall be measured at the same position and from the same deck line as the freeboards determined in accordance with the International Convention on Load Lines in force.

4 The freeboard corresponding to each approved subdivision load line and the service configuration, for which it is approved, shall be clearly indicated on the Passenger Ship Safety Certificate.

5 In no case shall any subdivision load line mark be placed above the deepest load line in salt water as determined by the strength of the ship or the International Convention on Load Lines in force.

6 Whatever may be the position of the subdivision load line marks, a ship shall in no case be loaded so as to submerge the load line mark appropriate to the season and locality as determined in accordance with the International Convention on Load Lines in force.

7 A ship shall in no case be so loaded that when it is in salt water the subdivision load line mark appropriate to the particular voyage and service configuration is submerged.

PART B-4

STABILITY MANAGEMENT

Regulation 19

Damage control information

1 There shall be permanently exhibited, or readily available on the navigation bridge, for the guidance of the officer in charge of the ship, plans showing clearly for each deck and hold the boundaries of the watertight compartments, the openings therein with the means of closure and position of any controls thereof, and the arrangements for the correction of any list due to flooding. In addition, booklets containing the aforementioned information shall be made available to the officers of the ship.

2 Watertight doors in passenger ships permitted to remain open during navigation shall be clearly indicated in the ship's stability information.

3 General precautions to be included shall consist of a listing of equipment, conditions, and operational procedures, considered by the Administration to be necessary to maintain watertight integrity under normal ship operations.

4 Specific precautions to be included shall consist of a listing of elements (i.e. closures, security of cargo, sounding of alarms, etc.) considered by the Administration to be vital to the survival of the ship, passengers and crew.

5 In case of ships to which damage stability requirements of part B-1 apply, damage stability information shall provide the master a simple and easily understandable way of assessing the ship's survivability in all damage cases involving a compartment or group of compartments.

Regulation 20

Loading of passenger ships

1 On completion of loading of the ship and prior to its departure, the master shall determine the ship's trim and stability and also ascertain and record that the ship is in compliance with stability criteria in relevant regulations. The determination of the ship's stability shall always be made by calculation. The Administration may accept the use of an electronic loading and stability computer or equivalent means for this purpose.

2 Water ballast should not in general be carried in tanks intended for oil fuel. In ships in which it is not practicable to avoid putting water in oil fuel tanks, oily-water separating equipment to the satisfaction of the Administration shall be fitted, or other alternative means, such as discharge to shore facilities, acceptable to the Administration shall be provided for disposing of the oily-water ballast.

3 The provisions of this regulation are without prejudice to the provisions of the International Convention for the Prevention of Pollution from Ships in force.

Regulation 21

Periodical operation and inspection of watertight doors, etc. in passenger ships

1 Drills for the operating of watertight doors, sidescuttles, valves and closing mechanisms of scuppers, ash-chutes and rubbish-chutes shall take place weekly. In ships in which the voyage exceeds one week in duration a complete drill shall be held before leaving port, and others thereafter at least once a week during the voyage.

2 All watertight doors, both hinged and power-operated, in watertight bulkheads, in use at sea, shall be operated daily.

3 The watertight doors and all mechanisms and indicators connected therewith, all valves, the closing of which is necessary to make a compartment watertight, and all valves the operation of which is necessary for damage control cross connections shall be periodically inspected at sea at least once a week.

4 A record of all drills and inspections required by this regulation shall be entered in the log-book with an explicit record of any defects which may be disclosed.

Regulation 22

Prevention and control of water ingress, etc.

1 All watertight doors shall be kept closed during navigation except that they may be opened during navigation as specified in paragraphs 3 and 4. Watertight doors of a width of more than 1.2 m in machinery spaces as permitted by regulation 13.10 may only be opened in the circumstances detailed in that regulation. Any door which is opened in accordance with this paragraph shall be ready to be immediately closed.

2 Watertight doors located below the bulkhead deck having a maximum clear opening width of more than 1.2 m shall be kept closed when the ship is at sea, except for limited periods when absolutely necessary as determined by the Administration.

3 A watertight door may be opened during navigation to permit the passage of passengers or crew, or when work in the immediate vicinity of the door necessitates it being opened. The door must be immediately closed when transit through the door is complete or when the task which necessitated it being open is finished.

4 Certain watertight doors may be permitted to remain open during navigation only if considered absolutely necessary; that is, being open is determined essential to the safe and effective operation of the ship's machinery or to permit passengers normally unrestricted access throughout the passenger area. Such determination shall be made by the Administration only after careful consideration of the impact on ship operations and survivability. A watertight door permitted to remain thus open shall be clearly indicated in the ship's stability information and shall always be ready to be immediately closed.

5 Portable plates on bulkheads shall always be in place before the ship leaves port, and shall not be removed during navigation except in case of urgent necessity at the discretion of the master. The necessary precautions shall be taken in replacing them to ensure that the joints are watertight. Power-operated sliding watertight doors permitted in machinery spaces in accordance with regulation 13.10 shall be closed before the ship leaves port and shall remain closed during navigation except in case of urgent necessity at the discretion of the master.

6 Watertight doors fitted in watertight bulkheads dividing cargo between deck spaces in accordance with regulation 13.9.1 shall be closed before the voyage commences and shall be kept closed during navigation; the time of opening such doors in port and of closing them before the ship leaves port shall be entered in the log-book.

7 Gangway, cargo and fuelling ports fitted below the bulkhead deck shall be effectively closed and secured watertight before the ship leaves port, and shall be kept closed during navigation.

8 The following doors, located above the bulkhead deck, shall be closed and locked before the ship proceeds on any voyage and shall remain closed and locked until the ship is at its next berth:

- .1 cargo loading doors in the shell or the boundaries of enclosed superstructures;
- .2 bow visors fitted in positions as indicated in paragraph 8.1;
- .3 cargo loading doors in the collision bulkhead; and
- .4 ramps forming an alternative closure to those defined in paragraphs 8.1 to 8.3 inclusive.

9 Provided that where a door cannot be opened or closed while the ship is at the berth such a door may be opened or left open while the ship approaches or draws away from the berth, but only so far as may be necessary to enable the door to be immediately operated. In any case, the inner bow door must be kept closed.

10 Notwithstanding the requirements of paragraphs 8.1 and 8.4, the Administration may authorize that particular doors can be opened at the discretion of the master, if necessary for the operation of the ship or the embarking and disembarking of passengers when the ship is at safe anchorage and provided that the safety of the ship is not impaired.

11 The master shall ensure that an effective system of supervision and reporting of the closing and opening of the doors referred to in paragraph 8 is implemented.

12 The master shall ensure, before the ship proceeds on any voyage, that an entry in the log-book is made of the time of the last closing of the doors specified in paragraph 13 and the time of any opening of particular doors in accordance with paragraph 14.

13 Hinged doors, portable plates, sidescuttles, gangway, cargo and bunkering ports and other openings, which are required by these regulations to be kept closed during navigation, shall be closed before the ship leaves port. The time of closing and the time of opening (if permissible under these regulations) shall be recorded in such log-book as may be prescribed by the Administration.

14 Where in a between-decks, the sills of any of the sidescuttles referred to in regulation 15.3.2 are below a line drawn parallel to the bulkhead deck at side and having its lowest point 1.4 m plus 2.5% of the breadth of the ship above the water when the ship departs from any port, all the sidescuttles in that between-decks shall be closed watertight and locked before the ship leaves port, and they shall not be opened before the ship arrives at the next port. In the application of this paragraph the appropriate allowance for fresh water may be made when applicable.

- .1 The time of opening such sidescuttles in port and of closing and locking them before the ship leaves port shall be entered in such log-book as may be prescribed by the Administration.
- .2 For any ship that has one or more sidescuttles so placed that the requirements of paragraph 14 would apply when it was floating at its deepest subdivision draught, the Administration may indicate the limiting mean draught at which these sidescuttles will have their sills above the line drawn parallel to the bulkhead deck at side, and having its lowest point 1.4 m plus 2.5% of the breadth of the ship above the waterline corresponding to the limiting mean draught, and at which it will therefore be permissible to depart from port without previously closing and locking them and to open them at sea on the responsibility of the master during the voyage to the next port. In tropical zones as defined in the International Convention on Load Lines in force, this limiting draught may be increased by 0.3 m.

15 Sidescuttles and their deadlights which will not be accessible during navigation shall be closed and secured before the ship leaves port.

16 If cargo is carried in spaces referred to in regulation 15.5.2, the sidescuttles and their deadlights shall be closed watertight and locked before the cargo is shipped and such closing and locking shall be recorded in such log-book as may be prescribed by the Administration.

17 When a rubbish-chute, etc. is not in use, both the cover and the valve required by regulation 15.10.2 shall be kept closed and secured.

Regulation 23

Special requirements for ro-ro passenger ships

1 Special category spaces and ro-ro spaces shall be continuously patrolled or monitored by effective means, such as television surveillance, so that any movement of vehicles in adverse weather conditions and unauthorized access by passengers thereto can be detected whilst the ship is underway.

2 Documented operating procedures for closing and securing all shell doors, loading doors and other closing appliances which, if left open or not properly secured, could, in the opinion of the Administration, lead to flooding of a special category space or ro-ro space, shall be kept on board and posted at an appropriate place.

3 All accesses from the ro-ro deck and vehicle ramps that lead to spaces below the bulkhead deck shall be closed before the ship leaves the berth on any voyage and shall remain closed until the ship is at its next berth.

4 The master shall ensure that an effective system of supervision and reporting of the closing and opening of such accesses referred to in paragraph 3 is implemented.

5 The master shall ensure, before the ship leaves the berth on any voyage, that an entry in the log-book, as required by regulation 22.13, is made of the time of the last closing of the accesses referred to in paragraph 3.

6 Notwithstanding the requirements of paragraph 3, the Administration may permit some accesses to be opened during the voyage, but only for a period sufficient to permit through passage and, if required, for the essential working of the ship.

7 All transverse or longitudinal bulkheads which are taken into account as effective to confine the seawater accumulated on the ro-ro deck shall be in place and secured before the ship leaves the berth and remain in place and secured until the ship is at its next berth.

8 Notwithstanding the requirements of paragraph 7, the Administration may permit some accesses within such bulkheads to be opened during the voyage but only for sufficient time to permit through passage and, if required, for the essential working of the ship.

9 In all ro-ro passenger ships, the master or the designated officer shall ensure that, without the expressed consent of the master or the designated officer, no passengers are allowed access to an enclosed ro-ro deck when the ship is under way.

Regulation 24 **Prevention and control of water ingress, etc. in cargo ships**

1 Openings in the shell plating below the deck limiting the vertical extent of damage shall be kept permanently closed while at sea.

2 Notwithstanding the requirements of paragraph 3, the Administration may authorize that particular doors may be opened at the discretion of the master, if necessary for the operation of the ship and provided that the safety of the ship is not impaired.

3 Watertight doors or ramps fitted to internally subdivide large cargo spaces shall be closed before the voyage commences and shall be kept closed during navigation; the time of opening such doors in port and of closing them before the ship leaves port shall be entered in the log-book.

4 The use of access doors and hatch covers intended to ensure the watertight integrity of internal openings shall be authorized by the officer of the watch.

Regulation 25

Water level detectors on single hold cargo ships other than bulk carriers

1 Single hold cargo ships other than bulk carriers constructed before 1 January 2007 shall comply with the requirements of this regulation not later than 31 December 2009.

2 Ships having a length (L) of less than 80 m, or 100 m if constructed before 1 July 1998, and a single cargo hold below the freeboard deck or cargo holds below the freeboard deck which are not separated by at least one bulkhead made watertight up to that deck, shall be fitted in such space or spaces with water level detectors.

3 The water level detectors required by paragraph 2 shall:

- .1 give an audible and visual alarm at the navigation bridge when the water level above the inner bottom in the cargo hold reaches a height of not less than 0.3 m, and another when such level reaches not more than 15% of the mean depth of the cargo hold; and
- .2 be fitted at the aft end of the hold, or above its lowest part where the inner bottom is not parallel to the designed waterline. Where webs or partial watertight bulkheads are fitted above the inner bottom, Administrations may require the fitting of additional detectors.

4 The water level detectors required by paragraph 2 need not be fitted in ships complying with regulation XII/12, or in ships having watertight side compartments each side of the cargo hold length extending vertically at least from inner bottom to freeboard deck.”

PART C

MACHINERY INSTALLATIONS

2 The following new regulation 35-1 is inserted after existing regulation 35:

“Regulation 35-1

Bilge pumping arrangements

1 This regulation applies to ships constructed on or after 1 January 2009.

2 Passenger ships and cargo ships

2.1 An efficient bilge pumping system shall be provided, capable of pumping from and draining any watertight compartment other than a space permanently appropriated for the carriage of fresh water, water ballast, oil fuel or liquid cargo and for which other efficient means of pumping are provided, under all practical conditions. Efficient means shall be provided for draining water from insulated holds.

2.2 Sanitary, ballast and general service pumps may be accepted as independent power bilge pumps if fitted with the necessary connections to the bilge pumping system.

2.3 All bilge pipes used in or under coal bunkers or fuel storage tanks or in boiler or machinery spaces, including spaces in which oil-settling tanks or oil fuel pumping units are situated, shall be of steel or other suitable material.

2.4 The arrangement of the bilge and ballast pumping system shall be such as to prevent the possibility of water passing from the sea and from water ballast spaces into the cargo and machinery spaces, or from one compartment to another. Provision shall be made to prevent any deep tank having bilge and ballast connections being inadvertently flooded from the sea when containing cargo, or being discharged through a bilge pump when containing water ballast.

2.5 All distribution boxes and manually operated valves in connection with the bilge pumping arrangements shall be in positions which are accessible under ordinary circumstances.

2.6 Provision shall be made for the drainage of enclosed cargo spaces situated on the bulkhead deck of a passenger ship and on the freeboard deck of a cargo ship, provided that the Administration may permit the means of drainage to be dispensed with in any particular compartment of any ship or class of ship if it is satisfied that by reason of size or internal subdivision of those spaces the safety of the ship is not thereby impaired.

2.6.1 Where the freeboard to the bulkhead deck or the freeboard deck, respectively, is such that the deck edge is immersed when the ship heels more than 5°, the drainage shall be by means of a sufficient number of scuppers of suitable size discharging directly overboard, fitted in accordance with the requirements of regulation 15 in the case of a passenger ship and the requirements for scuppers, inlets and discharges of the International Convention on Load Lines in force in the case of a cargo ship.

2.6.2 Where the freeboard is such that the edge of the bulkhead deck or the edge of the freeboard deck, respectively, is immersed when the ship heels 5° or less, the drainage of the enclosed cargo spaces on the bulkhead deck or on the freeboard deck, respectively, shall be led to a suitable space, or spaces, of adequate capacity, having a high water level alarm and provided with suitable arrangements for discharge overboard. In addition it shall be ensured that:

- .1 the number, size and disposition of the scuppers are such as to prevent unreasonable accumulation of free water;
- .2 the pumping arrangements required by this regulation for passenger ships or cargo ships, as applicable, take account of the requirements for any fixed pressure water-spraying fire extinguishing system;
- .3 water contaminated with petrol or other dangerous substances is not drained to machinery spaces or other spaces where sources of ignition may be present; and
- .4 where the enclosed cargo space is protected by a carbon dioxide fire extinguishing system the deck scuppers are fitted with means to prevent the escape of the smothering gas.

3 Passenger ships

3.1 The bilge pumping system required by paragraph 2.1 shall be capable of operation under all practicable conditions after a casualty whether the ship is upright or listed. For this purpose wing suction shall generally be fitted except in narrow compartments at the end of the ship where one suction may be sufficient. In compartments of unusual form, additional suction may be required. Arrangements shall be made whereby water in the compartment may find its way to the suction pipes. Where, for particular compartments,

the Administration is satisfied that the provision of drainage may be undesirable, it may allow such provision to be dispensed with if calculations made in accordance with the conditions laid down in regulations 7 and 8 show that the survival capability of the ship will not be impaired.

3.2 At least three power pumps shall be fitted connected to the bilge main, one of which may be driven by the propulsion machinery. Where the bilge pump numeral is 30 or more, one additional independent power pump shall be provided.

The bilge pump numeral shall be calculated as follows:

$$\text{when } P_1 \text{ is greater than } P: \quad \text{bilge pump numeral} = 72 \cdot \left[\frac{M + 2P_1}{V + P_1 - P} \right]$$

$$\text{in other cases:} \quad \text{bilge pump numeral} = 72 \cdot \left[\frac{M + 2P}{V} \right]$$

where:

L = the length of the ship (metres), as defined in regulation 2;

M = the volume of the machinery space (cubic metres), as defined in regulation 2, that is below the bulkhead deck; with the addition thereto of the volume of any permanent oil fuel bunkers which may be situated above the inner bottom and forward of, or abaft, the machinery space;

P = the whole volume of the passenger and crew spaces below the bulkhead deck (cubic metres), which are provided for the accommodation and use of passengers and crew, excluding baggage, store, provision and mail rooms;

V = the whole volume of the ship below the bulkhead deck (cubic metres);

$P_1 = KN$,

where:

N = the number of passengers for which the ship is to be certified; and

$K = 0.056L$

However, where the value of KN is greater than the sum of P and the whole volume of the actual passenger spaces above the bulkhead deck, the figure to be taken as P_1 is that sum or two-thirds KN , whichever is the greater.

3.3 Where practicable, the power bilge pumps shall be placed in separate watertight compartments and so arranged or situated that these compartments will not be flooded by the same damage. If the main propulsion machinery, auxiliary machinery and boilers are in two or more watertight compartments, the pumps available for bilge service shall be distributed as far as is possible throughout these compartments.

3.4 On a ship of 91.5 m in length and upwards or having a bilge pump numeral, calculated in accordance with paragraph 3.2, of 30 or more, the arrangements shall be such that at least one power bilge pump shall be available for use in all flooding conditions which the ship is required to withstand, as follows:

- .1 one of the required bilge pumps shall be an emergency pump of a reliable submersible type having a source of power situated above the bulkhead deck; or
- .2 the bilge pumps and their sources of power shall be so distributed throughout the length of the ship that at least one pump in an undamaged compartment will be available.

3.5 With the exception of additional pumps which may be provided for peak compartments only, each required bilge pump shall be so arranged as to draw water from any space required to be drained by paragraph 2.1.

3.6 Each power bilge pump shall be capable of pumping water through the required main bilge pipe at a speed of not less than 2 m/s. Independent power bilge pumps situated in machinery spaces shall have direct suctions from these spaces, except that not more than two such suctions shall be required in any one space. Where two or more such suctions are provided, there shall be at least one on each side of the ship. The Administration may require independent power bilge pumps situated in other spaces to have separate direct suctions. Direct suctions shall be suitably arranged and those in a machinery space shall be of a diameter not less than that required for the bilge main.

3.7.1 In addition to the direct bilge suction or suctions required by paragraph 3.6, a direct suction from the main circulating pump leading to the drainage level of the machinery space and fitted with a non-return valve shall be provided in the machinery space. The diameter of this direct suction pipe shall be at least two thirds of the diameter of the pump inlet in the case of steamships, and of the same diameter as the pump inlet in the case of motorships.

3.7.2 Where in the opinion of the Administration the main circulating pump is not suitable for this purpose, a direct emergency bilge suction shall be led from the largest available independent power driven pump to the drainage level of the machinery space; the suction shall be of the same diameter as the main inlet of the pump used. The capacity of the pump so connected shall exceed that of a required bilge pump by an amount deemed satisfactory by the Administration.

3.7.3 The spindles of the sea inlet and direct suction valves shall extend well above the engine-room platform.

3.8 All bilge suction piping up to the connection to the pumps shall be independent of other piping.

3.9 The diameter d of the bilge main shall be calculated according to the following formula. However, the actual internal diameter of the bilge main may be rounded off to the nearest standard size acceptable to the Administration:

$$d = 25 + 1.68\sqrt{L(B + D)}$$

where:

d is the internal diameter of the bilge main (millimetres);

L and B are the length and the breadth of the ship (metres) as defined in regulation 2; and

D is the moulded depth of the ship to the bulkhead deck (metres) provided that, in a ship having an enclosed cargo space on the bulkhead deck which is internally drained in accordance with the requirements of paragraph 2.6.2 and which extends for the full length of the ship, *D* shall be measured to the next deck above the bulkhead deck. Where the enclosed cargo spaces cover a lesser length, *D* shall be taken as the moulded depth to the bulkhead deck plus lh/L where *l* and *h* are the aggregate length and height respectively of the enclosed cargo spaces (metres). The diameter of the bilge branch pipes shall meet the requirements of the Administration.

3.10 Provision shall be made to prevent the compartment served by any bilge suction pipe being flooded in the event of the pipe being severed or otherwise damaged by collision or grounding in any other compartment. For this purpose, where the pipe is at any part situated nearer the side of the ship than one fifth of the breadth of the ship (as defined in regulation 2 and measured at right angles to the centreline at the level of the deepest subdivision load line), or is in a duct keel, a non-return valve shall be fitted to the pipe in the compartment containing the open end.

3.11 Distribution boxes, cocks and valves in connection with the bilge pumping system shall be so arranged that, in the event of flooding, one of the bilge pumps may be operative on any compartment; in addition, damage to a pump or its pipe connecting to the bilge main outboard of a line drawn at one fifth of the breadth of the ship shall not put the bilge system out of action. If there is only one system of pipes common to all the pumps, the necessary valves for controlling the bilge suction must be capable of being operated from above the bulkhead deck. Where in addition to the main bilge pumping system an emergency bilge pumping system is provided, it shall be independent of the main system and so arranged that a pump is capable of operating on any compartment under flooding condition as specified in paragraph 3.1; in that case only the valves necessary for the operation of the emergency system need be capable of being operated from above the bulkhead deck.

3.12 All cocks and valves referred to in paragraph 3.11 which can be operated from above the bulkhead deck shall have their controls at their place of operation clearly marked and shall be provided with means to indicate whether they are open or closed.

4 Cargo ships

At least two power pumps connected to the main bilge system shall be provided, one of which may be driven by the propulsion machinery. If the Administration is satisfied that the safety of the ship is not impaired, bilge pumping arrangements may be dispensed with in particular compartments.”

CHAPTER II-2 CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

Regulation 4 – Probability of ignition

3 In paragraph 5.2.4, the reference to “regulation II-1/25-9.2” is replaced by the reference to “regulation II-1/13-1.2”.

Regulation 10 – Fire fighting

4 In paragraph 2.2.4.1.2, the reference to “regulation II-1/21” is replaced by the reference to “regulation II-1/35-1”.

Regulation 20 – Protection of vehicle, special category and ro-ro spaces

5 In paragraph 6.1.4.1.3, the reference to “regulation II-1/21” is replaced by the reference to “regulation II-1/35-1”, and in paragraph 6.1.4.2, the reference to “regulation II-1/22” is replaced by the reference to “regulation II-1/5-1”.

CHAPTER VI CARRIAGE OF CARGOES

Regulation 7 – Loading, unloading and stowage of bulk cargoes

6 In paragraph 2.1, the reference to “regulation II-1/22” is replaced by the reference to “regulation II-1/5-1”.

CHAPTER IX MANAGEMENT FOR THE SAFE OPERATION OF SHIPS

Regulation 1 – Definitions

7 In paragraph 3, the reference to “regulation II-1/2.12” is replaced by the reference to “regulation II-1/2.22”.

CHAPTER XI-1 SPECIAL MEASURES TO ENHANCE MARITIME SAFETY

Regulation 2 – Enhanced surveys

8 The reference to “regulation II-1/2.12” is replaced by the reference to “regulation II-1/2.22”.

9 The following new regulation 3-1 is added after the existing regulation 3:

“Regulation 3-1 Company and registered owner identification number

1 This regulation applies to Companies and registered owners of ships to which chapter I applies.

2 For the purpose of this regulation, registered owner shall be as specified by the Administration and Company as defined in regulation IX/1.

3 Every Company and registered owner shall be provided with an identification number which conforms to the IMO Unique Company and Registered Owner Identification Number Scheme adopted by the Organization.

4 The Company identification number shall be inserted on the certificates and certified copies thereof issued under regulation IX/4 and section A/19.2 or A/19.4 of the ISPS Code.

5 This regulation shall take effect when the certificates referred to in paragraph 4 are issued or renewed on or after 1 January 2009.”

Regulation 5 – Continuous Synopsis Record

10 In paragraph 3, in the first sentence, after the word “information”, the following words are inserted:

“(The Continuous Synopsis Record shall contain the information in paragraphs 3.7 and 3.10 when it is issued or updated on or after 1 January 2009)”;

and the following new subparagraphs .7 and .10 are inserted as follows:

“.7 the registered owner identification number;” and

“.10 the Company identification number;”.

11 In paragraph 3, existing subparagraphs .7 and .8 are renumbered as subparagraphs .8 and .9, and existing subparagraphs .9 to .13 are renumbered as subparagraphs .11 to .15.

CHAPTER XI-2 SPECIAL MEASURES TO ENHANCE MARITIME SECURITY

Regulation 1 – Definitions

12 In paragraph 1.6, the reference to “regulation II-1/2.12” is replaced by the reference to “regulation II-1/2.22”.

APPENDIX CERTIFICATES

Form of Safety Certificate for Passenger Ships

13 In the table of paragraph 2.1.3, in the section commencing with the words “THIS IS TO CERTIFY:”, the reference to “regulation II-1/13” is replaced by the reference to “regulation II-1/18”.

RESOLUTION MSC.194(80)
(adopted on 20 May 2005)

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

RESOLUTION MSC.216(82)
(adopted on 8 December 2006)

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

RESOLUTION MSC.216(82)

(adopted on 8 December 2006)

**AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF
LIFE AT SEA, 1974, AS AMENDED**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as “the Convention”), concerning the amendment procedure applicable to the Annex to the Convention, other than to the provisions of chapter I thereof,

HAVING CONSIDERED, at its eighty-second session, amendments to the Convention, proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the Convention, the text of which is set out in Annexes 1, 2 and 3 to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that:
 - (a) the said amendments, set out in Annex 1, shall be deemed to have been accepted on 1 January 2008;
 - (b) the said amendments, set out in Annex 2, shall be deemed to have been accepted on 1 July 2008; and
 - (c) the said amendments, set out in Annex 3, shall be deemed to have been accepted on 1 January 2010,

unless, prior to those dates, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world’s merchant fleet, have notified their objections to the amendments;

3. INVITES SOLAS Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention:
 - (a) the amendments, set out in Annex 1, shall enter into force on 1 July 2008;
 - (b) the amendments, set out in Annex 2, shall enter into force on 1 January 2009; and
 - (c) the amendments, set out in Annex 3, shall enter into force on 1 July 2010,

upon their acceptance in accordance with paragraph 2 above;

4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in Annexes 1, 2 and 3 to all Contracting Governments to the Convention;

5. FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its Annexes 1, 2 and 3 to Members of the Organization, which are not Contracting Governments to the Convention.

ANNEX 1

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

CHAPTER II-1 CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

PART A-1 STRUCTURE OF SHIPS

Regulation 3-2 – Corrosion prevention of seawater ballast tanks in oil tankers and bulk carriers

1 The existing text and the heading of regulation 3-2 are replaced by the following:

**“Protective coatings of dedicated seawater ballast tanks in all types of ships
and double-side skin spaces of bulk carriers**

1 Paragraphs 2 and 4 of this regulation shall apply to ships of not less than 500 gross tonnage:

- .1 for which the building contract is placed on or after 1 July 2008; or
- .2 in the absence of a building contract, the keels of which are laid or which are at a similar stage of construction on or after 1 January 2009; or
- .3 the delivery of which is on or after 1 July 2012.

2 All dedicated seawater ballast tanks arranged in ships and double-side skin spaces arranged in bulk carriers of 150 m in length and upwards shall be coated during construction in accordance with the Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers, adopted by the Maritime Safety Committee by resolution MSC.215(82), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I.

3 All dedicated seawater ballast tanks arranged in oil tankers and bulk carriers constructed on or after 1 July 1998, for which paragraph 2 is not applicable, shall comply with the requirements of regulation II-1/3-2 adopted by resolution MSC.47(66).

4 Maintenance of the protective coating system shall be included in the overall ship's maintenance scheme. The effectiveness of the protective coating system shall be verified during the life of a ship by the Administration or an organization recognized by the Administration, based on the guidelines developed by the Organization.”

CHAPTER II-2 CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

Regulation 1 – Application

- 2 In paragraph 2.2.3, the second occurrence of the word “and” is deleted.
- 3 In paragraph 2.2.4, “.” is replaced by “; and”.
- 4 In paragraph 2.2, the following new subparagraph .5 is added after the existing subparagraph .4:
- “.5 regulations 5.3.1.3.2 and 5.3.4 to passenger ships not later than the date of the first survey after 1 July 2008.”

Regulation 3 – Definitions

- 5 The following new paragraph 53 is added after the existing paragraph 52:
- “53 *Cabin balcony* is an open deck space which is provided for the exclusive use of the occupants of a single cabin and has direct access from such a cabin.”

Regulation 4 – Probability of ignition

- 6 The following text is added at the end of paragraph 5.2.3:
- “except that “A-0” class standard is acceptable for windows and sidescuttles outside the limit specified in regulation 9.2.4.2.5.”
- 7 In paragraph 4.4, the words “or if applied on cabin balconies of passenger ships constructed on or after 1 July 2008,” are added between the words “stations” and “shall”.

Regulation 5 – Fire growth potential

- 8 In paragraph 3.1.2.1, the last sentence is deleted.
- 9 The following new paragraph 3.1.3 is inserted:
- “3.1.3 *Partial bulkheads and decks on passenger ships*
- 3.1.3.1 Partial bulkheads or decks used to subdivide a space for utility or artistic treatment shall be of non-combustible materials.
- 3.1.3.2 Linings, ceilings and partial bulkheads or decks used to screen or to separate adjacent cabin balconies shall be of non-combustible materials. Cabin balconies on passenger ships constructed before 1 July 2008 shall comply with the requirements of this paragraph by the first survey after 1 July 2008.”

10 In the first sentence of paragraph 3.2.1.1, the words “and cabin balconies” are added between the words “spaces” and “which”, and the following new sentence is added at the end of the paragraph:

“However, the provisions of paragraph 3.2.3 need not be applied to cabin balconies.”

11 The following new subparagraph .3 is added to the existing paragraph 3.2.4.1:

“.3 exposed surfaces of cabin balconies, except for natural hard wood decking systems.”

12 The following new paragraph 3.4 is added after the existing paragraph 3.3:

“3.4 *Furniture and furnishings on cabin balconies of passenger ships*

On passenger ships, furniture and furnishings on cabin balconies shall comply with regulations 3.40.1, 3.40.2, 3.40.3, 3.40.6 and 3.40.7 unless such balconies are protected by a fixed pressure water-spraying and fixed fire detection and fire alarm systems complying with regulations 7.10 and 10.6.1.3. Passenger ships constructed before 1 July 2008 shall comply with the requirements of this paragraph by the first survey after 1 July 2008.”

Regulation 6 – Smoke generation potential and toxicity

13 The existing paragraph 2 is renumbered as paragraph 2.1.

14 The following new paragraph 2.2 is added after the renumbered paragraph 2.1:

“2.2 On passenger ships constructed on or after 1 July 2008, paints, varnishes and other finishes used on exposed surfaces of cabin balconies, excluding natural hard wood decking systems, shall not be capable of producing excessive quantities of smoke and toxic products, this being determined in accordance with the Fire Test Procedures Code.”

15 The existing paragraph 3 is renumbered as paragraph 3.1.

16 The following new paragraph 3.2 is added after the renumbered paragraph 3.1:

“3.2 On passenger ships constructed on or after 1 July 2008, primary deck coverings on cabin balconies shall not give rise to smoke, toxic or explosive hazards at elevated temperatures, this being determined in accordance with the Fire Test Procedures Code.”

Regulation 7 – Detection and alarm

17 The following new paragraph 10 is added after the existing paragraph 9.4:

“10 Protection of cabin balconies on passenger ships

A fixed fire detection and fire alarm system complying with the provisions of the Fire Safety Systems Code shall be installed on cabin balconies of ships to which regulation 5.3.4 applies, when furniture and furnishings on such balconies are not as defined in regulations 3.40.1, 3.40.2, 3.40.3, 3.40.6 and 3.40.7.”

Regulation 9 – Containment of fire

18 The following new paragraph 2.2.6 is added after the existing paragraph 2.2.5.2:

“2.2.6 Arrangement of cabin balconies

On passenger ships constructed on or after 1 July 2008, non-load bearing partial bulkheads which separate adjacent cabin balconies shall be capable of being opened by the crew from each side for the purpose of fighting fires.”

Regulation 10 – Fire fighting

19 The heading of paragraph 6.1 is replaced by the following:

“6.1 Sprinkler and water-spraying systems in passenger ships”

20 The following new paragraph 6.1.3 is added after the existing paragraph 6.1.2:

“6.1.3 A fixed pressure water-spraying fire-extinguishing system complying with the provisions of the Fire Safety Systems Code shall be installed on cabin balconies of ships to which regulation 5.3.4 applies, where furniture and furnishings on such balconies are not as defined in regulations 3.40.1, 3.40.2, 3.40.3, 3.40.6 and 3.40.7.”

CHAPTER III LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Regulation 6 – Communications

21 Paragraph 4.3 is replaced by the following:

“4.3 The general emergency alarm system shall be audible throughout all the accommodation and normal crew working spaces. On passenger ships, the system shall also be audible on all open decks.”

Regulation 11 – Survival craft muster and embarkation arrangements

22 In the first sentence of paragraph 7, the word “unfavourable” is replaced by the word “all” and the unit “°” is inserted after the terms “10” and “20”.

Regulation 14 – Stowage of rescue boats

23 The words “, and if the inflated type, in a fully inflated condition at all times” are added at the end of subparagraph .1.

Regulation 19 – Emergency training and drills

24 Paragraph 3.3.4 is replaced by the following:

“3.3.4 In the case of a lifeboat arranged for free-fall launching, at least once every three months during an abandon ship drill, the crew shall board the lifeboat, properly secure themselves in their seats and commence launch procedures up to, but not including, the actual release of the lifeboat (i.e., the release hook shall not be released). The lifeboat shall then either be free-fall launched with only the required operating crew on board, or lowered into the water by means of the secondary means of launching with or without the

operating crew on board. In both cases, the lifeboat shall thereafter be manoeuvred in the water by the operating crew. At intervals of not more than six months, the lifeboat shall either be launched by free-fall with only the operating crew on board, or simulated launching shall be carried out in accordance with the guidelines developed by the Organization.”

Regulation 20 – Operational readiness, maintenance and inspections

25 Paragraphs 4.1 and 4.2 are replaced by the following:

“Falls used in launching shall be inspected periodically with special regard for areas passing through sheaves, and renewed when necessary due to deterioration of the falls or at intervals of not more than 5 years, whichever is the earlier.”

26 In the third sentence of paragraph 6.2, the words “it should be run for such period as prescribed in the manufacturer’s handbook” are replaced by the words “a suitable water supply may be provided”.

27 The heading of paragraph 8 is replaced by the following:

“8 Servicing of inflatable liferafts, inflatable lifejackets, marine evacuation systems and maintenance and repair of inflated rescue boats”

28 The second sentence of paragraph 11.1.3 is replaced by the following:

“The load to be applied shall be the mass of the survival craft or rescue boat without persons on board, except that, at intervals not exceeding five years, the test shall be carried out with a proof load equal to 1.1 times the weight of the survival craft or rescue boat and its full complement of persons and equipment.”

29 The chapeau of paragraph 11.2 is replaced by the following:

“11.2 Lifeboat or rescue boat on-load release gear, including free-fall lifeboat release systems, shall be:”

30 In the first sentence of paragraph 11.2.3, the word “lifeboat” is replaced by the word “boat”.

31 The following new paragraph 11.3 is added to the regulation:

“11.3 Davit-launched liferaft automatic release hooks shall be:

- .1 maintained in accordance with instructions for on-board maintenance as required by regulation 36;
- .2 subject to a thorough examination and operational test during the annual surveys required by regulations I/7 and I/8 by properly trained personnel familiar with the system; and
- .3 operationally tested under a load of 1.1 times the total mass of the liferaft when loaded with its full complement of persons and equipment whenever the automatic release hook is overhauled. Such over-hauling and test shall be carried out at least once every five years.”

Regulation 21 – Survival craft and rescue boats

32 The chapeau of paragraph 1.2 is replaced by the following:

“1.2 Passenger ships engaged on short international voyages shall carry:”

33 Paragraph 1.3 is deleted and the remaining paragraphs are renumbered accordingly.

34 In paragraph 1.4, the words “after all persons have been assembled, with lifejackets donned” are added at the end of the paragraph.

35 Paragraph 2.3 is replaced by the following:

“2.3 A lifeboat may be accepted as a rescue boat provided that it and its launching and recovery arrangements also comply with the requirements for a rescue boat.”

36 In paragraph 3.2, the words “and complying with the special standards of subdivision prescribed by regulation II-1/6.5” are deleted.

Regulation 26 – Additional requirements for ro-ro passenger ships

37 In paragraph 3.1, the words “approved by the Administration having regard for the recommendations approved by the Organization” are replaced by the words “complying with section 5.1.4 of the Code”.

38 In paragraph 3.2, all the words after the word “appliance” are replaced by the words “complying with section 6.1.7 of the Code”.

Regulation 31 – Survival craft and rescue boats

39 Subparagraph .2 of paragraph 1.1 is replaced by the following:

“.2 in addition, one or more inflatable or rigid liferafts, complying with the requirements of section 4.2 or 4.3 of the Code, of a mass of less than 185 kg and stowed in a position providing for easy side-to-side transfer at a single open deck level, and of such aggregate capacity as will accommodate the total number of persons on board. If the liferaft or liferafts are not of a mass of less than 185 kg and stowed in a position providing for easy side-to-side transfer at a single open deck level, the total capacity available on each side shall be sufficient to accommodate the total number of persons on board.”

40 Subparagraph .2 of paragraph 1.3 is replaced by the following:

“.2 unless the liferafts required by paragraph 1.3.1 are of a mass of less than 185 kg and stowed in a position providing for easy side-to-side transfer at a single open deck level, additional liferafts shall be provided so that the total capacity available on each side will accommodate 150% of the total number of persons on board;”

41 Subparagraph .4 of paragraph 1.3 is replaced by the following:

“.4 in the event of any one survival craft being lost or rendered unserviceable, there shall be sufficient survival craft available for use on each side, including any which are of a mass of less than 185 kg and stowed in a position providing for easy side-to-side transfer at a single open deck level, to accommodate the total number of persons on board.”

42 The second sentence of paragraph 2 is replaced by the following:

“A lifeboat may be accepted as a rescue boat, provided that it and its launching and recovery arrangements also comply with the requirements for a rescue boat.”

Regulation 32 – Personal life-saving appliances

43 In the first sentence of paragraph 3.2, the words “of an appropriate size,” are inserted between the words “suit” and “complying”.

44 In paragraph 3.3, the words “including remotely located survival craft carried in accordance with regulation 31.1.4”, are inserted between the words “stowed,” and “additional” and the words “of an appropriate size” are inserted between the words “suits” and “shall”.

Regulation 35 – Training manual and on-board training aids

45 The following new paragraph 5 is added after the existing paragraph 4:

“5 The training manual shall be written in the working language of the ship.”

CHAPTER XII ADDITIONAL SAFETY MEASURES FOR BULK CARRIERS

Regulation 6 – Structural and other requirements for bulk carriers

46 The existing paragraph 3 is deleted and the existing paragraphs 4 and 5 are renumbered as paragraphs 3 and 4.

Regulation 12 – Hold, ballast and dry space water ingress alarms

47 In paragraph 1.2, the reference to “regulation II-1/11” is replaced by the reference to “regulation II-1/12”.

Regulation 13 – Availability of pumping systems

48 In paragraph 1, the reference to “regulation II-1/11.4” is replaced by the reference to “regulation II-1/12”.

APPENDIX CERTIFICATES

49 In the Passenger Ship Safety Certificate, Cargo Ship Safety Construction Certificate and Cargo Ship Safety Certificate, the phrase “Date on which keel was laid or ship was at a similar stage of construction or, where applicable, date on which work for a conversion or an alteration or modification of a major character was commenced” is replaced by the following:

“Date of build:

- Date of building contract
- Date on which keel was laid or ship was at similar stage of construction
- Date of delivery
- Date on which work for a conversion or an alteration or modification of a major character was commenced (where applicable)

All applicable dates shall be completed.”

Record of Equipment for the Passenger Ship Safety Certificate (Form P)

50 In the Record of Equipment for the Passenger Ship Safety Certificate (Form P), the following new item 4.2 is inserted in section 5 after item 4:

“4.2 Long-range identification and tracking system”,

and item 4 (Automatic identification system (AIS)) is renumbered as item 4.1.

Record of Equipment for the Cargo Ship Safety Equipment Certificate (Form E)

51 In the Record of Equipment for the Cargo Ship Safety Equipment Certificate (Form E), the following new item 4.2 is inserted in section 3 after item 4:

“4.2 Long-range identification and tracking system”,

and item 4 (Automatic identification system (AIS)) is renumbered as item 4.1.

Record of Equipment for the Cargo Ship Safety Certificate (Form C)

52 In the Record of Equipment for the Cargo Ship Safety Certificate (Form C), the following new item 4.2 is inserted in section 5 after item 4:

“4.2 Long-range identification and tracking system”,

and item 4 (Automatic identification system (AIS)) is renumbered as item 4.1.

Form of Safety Certificate for Nuclear Passenger Ships

53 In the table of paragraph 2.1.3, in the section commencing with the words “THIS IS TO CERTIFY:”, the reference to “regulation II-1/13” is replaced by the reference to “regulation II-1/18”.

ANNEX 2

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

CHAPTER II-1 CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

- 1 The existing text of parts A, B and B-1 of the chapter is replaced by the following:

“PART A GENERAL

Regulation 1 Application

1.1 Unless expressly provided otherwise, this chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 January 2009.

1.2 For the purpose of this chapter, the term *a similar stage of construction* means the stage at which:

- .1 construction identifiable with a specific ship begins; and
- .2 assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is less.

1.3 For the purpose of this chapter:

- .1 the expression *ships constructed* means ships the keels of which are laid or which are at a similar stage of construction;
- .2 the expression *all ships* means ships constructed before, on or after 1 January 2009;
- .3 a cargo ship, whenever built, which is converted to a passenger ship shall be treated as a passenger ship constructed on the date on which such a conversion commences;
- .4 the expression *alterations and modifications of a major character* means, in the context of cargo ship subdivision and stability, any modification to the construction which affects the level of subdivision of that ship. Where a cargo ship is subject to such modification, it shall be demonstrated that the *A/R* ratio calculated for the ship after such modifications is not less than the *A/R* ratio calculated for the ship before the modification. However, in those cases where the ship's *A/R* ratio before modification is equal to or greater than unity, it is only necessary that the ship after modification has an *A* value which is not less than *R*, calculated for the modified ship.

2 Unless expressly provided otherwise, for ships constructed before 1 January 2009, the Administration shall ensure that the requirements which are applicable under chapter II-1 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolutions MSC.1(XLV), MSC.6(48), MSC.11(55), MSC.12(56), MSC.13(57), MSC.19(58), MSC.26(60), MSC.27(61), Resolution 1 of the 1995 SOLAS Conference, MSC.47(66), MSC.57(67), MSC.65(68), MSC.69(69), MSC.99(73), MSC.134(76), MSC.151(78) and MSC.170(79) are complied with.

3 All ships which undergo repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to these ships. Such ships, if constructed before the date on which any relevant amendments enter into force, shall, as a rule, comply with the requirements for ships constructed on or after that date to at least the same extent as they did before undergoing such repairs, alterations, modifications or outfitting. Repairs, alterations and modifications of a major character and outfitting related thereto shall meet the requirements for ships constructed on or after the date on which any relevant amendments enter into force, in so far as the Administration deems reasonable and practicable.

4 The Administration of a State may, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of this chapter unreasonable or unnecessary, exempt from those requirements individual ships or classes of ships entitled to fly the flag of that State which, in the course of their voyage, do not proceed more than 20 miles from the nearest land.

5 In the case of passenger ships which are employed in special trades for the carriage of large numbers of special trade passengers, such as the pilgrim trade, the Administration of the State whose flag such ships are entitled to fly, if satisfied that it is impracticable to enforce compliance with the requirements of this chapter, may exempt such ships from those requirements, provided that they comply fully with the provisions of:

- .1 the rules annexed to the Special Trade Passenger Ships Agreement, 1971; and
- .2 the rules annexed to the Protocol on Space Requirements for Special Trade Passenger Ships, 1973.

Regulation 2 **Definitions**

For the purpose of this chapter, unless expressly provided otherwise:

1 *Subdivision length (L_s)* of the ship is the greatest projected moulded length of that part of the ship at or below deck or decks limiting the vertical extent of flooding with the ship at the deepest subdivision draught.

2 *Mid-length* is the mid-point of the subdivision length of the ship.

3 *Aft terminal* is the aft limit of the subdivision length.

4 *Forward terminal* is the forward limit of the subdivision length.

5 *Length (L)* is the length as defined in the International Convention on Load Lines in force.

6 *Freeboard deck* is the deck as defined in the International Convention on Load Lines in force.

7 *Forward perpendicular* is the forward perpendicular as defined in the International Convention on Load Lines in force.

8 *Breadth (B)* is the greatest moulded breadth of the ship at or below the deepest subdivision draught.

9 *Draught (d)* is the vertical distance from the keel line at mid-length to the waterline in question.

10 *Deepest subdivision draught (d_s)* is the waterline which corresponds to the summer load line draught of the ship.

11 *Light service draught (d_l)* is the service draught corresponding to the lightest anticipated loading and associated tankage, including, however, such ballast as may be necessary for stability and/or immersion. Passenger ships should include the full complement of passengers and crew on board.

12 *Partial subdivision draught (d_p)* is the light service draught plus 60% of the difference between the light service draught and the deepest subdivision draught.

13 *Trim* is the difference between the draught forward and the draught aft, where the draughts are measured at the forward and aft terminals respectively, disregarding any rake of keel.

14 *Permeability (μ)* of a space is the proportion of the immersed volume of that space which can be occupied by water.

15 *Machinery spaces* are spaces between the watertight boundaries of a space containing the main and auxiliary propulsion machinery, including boilers, generators and electric motors primarily intended for propulsion. In the case of unusual arrangements, the Administration may define the limits of the machinery spaces.

16 *Weathertight* means that in any sea conditions water will not penetrate into the ship.

17 *Watertight* means having scantlings and arrangements capable of preventing the passage of water in any direction under the head of water likely to occur in intact and damaged conditions. In the damaged condition, the head of water is to be considered in the worst situation at equilibrium, including intermediate stages of flooding.

18 *Design pressure* means the hydrostatic pressure for which each structure or appliance assumed watertight in the intact and damage stability calculations is designed to withstand.

19 *Bulkhead deck* in a passenger ship means the uppermost deck at any point in the subdivision length (L_s) to which the main bulkheads and the ship's shell are carried watertight and the lowermost deck from which passenger and crew evacuation will not be impeded by water in any stage of flooding for damage cases defined in regulation 8 and in part B-2 of this chapter. The bulkhead deck may be a stepped deck. In a cargo ship the freeboard deck may be taken as the bulkhead deck.

20 *Deadweight* is the difference in tonnes between the displacement of a ship in water of a specific gravity of 1.025 at the draught corresponding to the assigned summer freeboard and the lightweight of the ship.

21 *Lightweight* is the displacement of a ship in tonnes without cargo, fuel, lubricating oil, ballast water, fresh water and feedwater in tanks, consumable stores, and passengers and crew and their effects.

22 *Oil tanker* is the oil tanker defined in regulation 1 of Annex I of the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973.

23 *Ro-ro passenger ship* means a passenger ship with ro-ro spaces or special category spaces as defined in regulation II-2/3.

24 *Bulk carrier* means a bulk carrier as defined in regulation XII/1.1.

25 *Keel line* is a line parallel to the slope of the keel passing amidships through:

- .1 the top of the keel at centreline or line of intersection of the inside of shell plating with the keel if a bar keel extends below that line, on a ship with a metal shell; or
- .2 in wood and composite ships, the distance is measured from the lower edge of the keel rabbet. When the form at the lower part of the midship section is of a hollow character, or where thick garboards are fitted, the distance is measured from the point where the line of the flat of the bottom continued inward intersects the centreline amidships.

26 *Amidship* is at the middle of the length (*L*).

Regulation 3 **Definitions relating to parts C, D and E**

For the purpose of parts C, D and E, unless expressly provided otherwise:

1 *Steering gear control system* is the equipment by which orders are transmitted from the navigating bridge to the steering gear power units. Steering gear control systems comprise transmitters, receivers, hydraulic control pumps and their associated motors, motor controllers, piping and cables.

2 *Main steering gear* is the machinery, rudder actuators, steering gear, power units, if any, and ancillary equipment and the means of applying torque to the rudder stock (e.g., tiller or quadrant) necessary for effecting movement of the rudder for the purpose of steering the ship under normal service conditions.

3 *Steering gear power unit* is:

- .1 in the case of electric steering gear, an electric motor and its associated electrical equipment;

- .2 in the case of electrohydraulic steering gear, an electric motor and its associated electrical equipment and connected pump; or
- .3 in the case of other hydraulic steering gear, a driving engine and connected pump.

4 *Auxiliary steering gear* is the equipment other than any part of the main steering gear necessary to steer the ship in the event of failure of the main steering gear but not including the tiller, quadrant or components serving the same purpose.

5 *Normal operational and habitable condition* is a condition under which the ship as a whole, the machinery, services, means and aids ensuring propulsion, ability to steer, safe navigation, fire and flooding safety, internal and external communications and signals, means of escape, and emergency boat winches, as well as the designed comfortable conditions of habitability are in working order and functioning normally.

6 *Emergency condition* is a condition under which any services needed for normal operational and habitable conditions are not in working order due to failure of the main source of electrical power.

7 *Main source of electrical power* is a source intended to supply electrical power to the main switchboard for distribution to all services necessary for maintaining the ship in normal operational and habitable conditions.

8 *Dead ship condition* is the condition under which the main propulsion plant, boilers and auxiliaries are not in operation due to the absence of power.

9 *Main generating station* is the space in which the main source of electrical power is situated.

10 *Main switchboard* is a switchboard which is directly supplied by the main source of electrical power and is intended to distribute electrical energy to the ship's services.

11 *Emergency switchboard* is a switchboard which in the event of failure of the main electrical power supply system is directly supplied by the emergency source of electrical power or the transitional source of emergency power and is intended to distribute electrical energy to the emergency services.

12 *Emergency source of electrical power* is a source of electrical power, intended to supply the emergency switchboard in the event of a failure of the supply from the main source of electrical power.

13 *Power actuating system* is the hydraulic equipment provided for supplying power to turn the rudder stock, comprising a steering gear power unit or units, together with the associated pipes and fittings, and a rudder actuator. The power actuating systems may share common mechanical components (i.e. tiller, quadrant and rudder stock) or components serving the same purpose.

14 *Maximum ahead service speed* is the greatest speed which the ship is designed to maintain in service at sea at the deepest seagoing draught.

15 *Maximum astern speed* is the speed which it is estimated the ship can attain at the designed maximum astern power at the deepest seagoing draught.

16 *Machinery spaces* are all machinery spaces of category A and all other spaces containing propelling machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces.

17 *Machinery spaces of category A* are those spaces and trunks to such spaces which contain:

- .1 internal combustion machinery used for main propulsion;
- .2 internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW; or
- .3 any oil-fired boiler or oil fuel unit.

18 *Control stations* are those spaces in which the ship's radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralized.

19 *Chemical tanker* is a cargo ship constructed or adapted and used for the carriage in bulk of any liquid product listed in either:

- .1 chapter 17 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Maritime Safety Committee by resolution MSC.4(48), hereinafter referred to as "the International Bulk Chemical Code", as may be amended by the Organization; or
- .2 chapter VI of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Assembly of the Organization by resolution A.212(VII), hereinafter referred to as "the Bulk Chemical Code", as has been or may be amended by the Organization,

whichever is applicable.

20 *Gas carrier* is a cargo ship constructed or adapted and used for the carriage in bulk of any liquefied gas or other products listed in either:

- .1 chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Maritime Safety Committee by resolution MSC.5(48), hereinafter referred to as "the International Gas Carrier Code", as may be amended by the Organization; or
- .2 chapter XIX of the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Organization by resolution A.328(IX), hereinafter referred to as "the Gas Carrier Code", as has been or may be amended by the Organization,

whichever is applicable.

PART B
SUBDIVISION AND STABILITY

Regulation 4
General

1 The damage stability requirements in parts B-1 through B-4 shall apply to cargo ships of 80 m in length (L) and upwards and to all passenger ships regardless of length but shall exclude those cargo ships which are shown to comply with subdivision and damage stability regulations in other instruments developed by the Organization.

2 The Administration may, for a particular ship or group of ships, accept alternative methodologies if it is satisfied that at least the same degree of safety as represented by these regulations is achieved. Any Administration which allows such alternative methodologies shall communicate to the Organization particulars thereof.

3 Ships shall be as efficiently subdivided as is possible having regard to the nature of the service for which they are intended. The degree of subdivision shall vary with the subdivision length (L_s) of the ship and with the service, in such manner that the highest degree of subdivision corresponds with the ships of greatest subdivision length (L_s), primarily engaged in the carriage of passengers.

4 Where it is proposed to fit decks, inner skins or longitudinal bulkheads of sufficient tightness to seriously restrict the flow of water, the Administration shall be satisfied that proper consideration is given to beneficial or adverse effects of such structures in the calculations.

PART B-1
STABILITY

Regulation 5
Intact stability information

1 Every passenger ship regardless of size and every cargo ship having a length (L) of 24 m and upwards, shall be inclined upon its completion and the elements of its stability determined.

2 The Administration may allow the inclining test of an individual cargo ship to be dispensed with provided basic stability data are available from the inclining test of a sister ship and it is shown to the satisfaction of the Administration that reliable stability information for the exempted ship can be obtained from such basic data, as required by regulation 5-1. A weight survey shall be carried out upon completion and the ship shall be inclined whenever in comparison with the data derived from the sister ship, a deviation from the lightship displacement exceeding 1% for ships of 160 m or more in length and 2% for ships of 50 m or less in length and as determined by linear interpolation for intermediate lengths or a deviation from the lightship longitudinal centre of gravity exceeding 0.5% of L_s is found.

3 The Administration may also allow the inclining test of an individual ship or class of ships especially designed for the carriage of liquids or ore in bulk to be dispensed with when reference to existing data for similar ships clearly indicates that due to the ship's proportions and arrangements more than sufficient metacentric height will be available in all probable loading conditions.

4 Where any alterations are made to a ship so as to materially affect the stability information supplied to the master, amended stability information shall be provided. If necessary the ship shall be re-inclined. The ship shall be re-inclined if anticipated deviations exceed one of the values specified in paragraph 5.

5 At periodical intervals not exceeding five years, a lightweight survey shall be carried out on all passenger ships to verify any changes in lightship displacement and longitudinal centre of gravity. The ship shall be re-inclined whenever, in comparison with the approved stability information, a deviation from the lightship displacement exceeding 2% or a deviation of the longitudinal centre of gravity exceeding 1% of L_s is found or anticipated.

6 Every ship shall have scales of draughts marked clearly at the bow and stern. In the case where the draught marks are not located where they are easily readable, or operational constraints for a particular trade make it difficult to read the draught marks, then the ship shall also be fitted with a reliable draught indicating system by which the bow and stern draughts can be determined.

Regulation 5-1 **Stability information to be supplied to the master**

1 The master shall be supplied with such information satisfactory to the Administration as is necessary to enable him by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service. A copy of the stability information shall be furnished to the Administration.

2 The information should include:

- .1 curves or tables of minimum operational metacentric height (GM) versus draught which assures compliance with the relevant intact and damage stability requirements, alternatively corresponding curves or tables of the maximum allowable vertical centre of gravity (KG) versus draught, or with the equivalents of either of these curves;
- .2 instructions concerning the operation of cross-flooding arrangements; and
- .3 all other data and aids which might be necessary to maintain the required intact stability and stability after damage.

3 The stability information shall show the influence of various trims in cases where the operational trim range exceeds +/- 0.5% of L_s .

4 For ships which have to fulfil the stability requirements of part B-1, information referred to in paragraph 2 are determined from considerations related to the subdivision index, in the following manner: Minimum required GM (or maximum permissible vertical position of centre of gravity KG) for the three draughts d_s , d_p and d_l are equal to the GM (or KG values) of corresponding loading cases used for the calculation of survival factor s_i . For intermediate draughts, values to be used shall be obtained by linear interpolation applied to the GM value only between the deepest subdivision draught and the partial subdivision draught and between the partial load line and the light service draught respectively. Intact stability criteria will also be taken into account by retaining for each draft the maximum among minimum required GM values or the minimum of maximum permissible KG values for both criteria. If the subdivision index is calculated for different trims, several required GM curves will be established in the same way.

5 When curves or tables of minimum operational metacentric height (GM) versus draught are not appropriate, the master should ensure that the operating condition does not deviate from a studied loading condition, or verify by calculation that the stability criteria are satisfied for this loading condition.

Regulation 6 **Required subdivision index R**

1 The subdivision of a ship is considered sufficient if the attained subdivision index A , determined in accordance with regulation 7, is not less than the required subdivision index R calculated in accordance with this regulation and if, in addition, the partial indices A_s , A_p and A_l are not less than $0.9R$ for passenger ships and $0.5R$ for cargo ships.

2 For all ships to which the damage stability requirements of this chapter apply, the degree of subdivision to be provided shall be determined by the required subdivision index R , as follows:

.1 In the case of cargo ships greater than 100 m in length (L_s):

$$R = 1 - \frac{128}{L_s + 152}$$

.2 In the case of cargo ships not less than 80 m in length (L_s) and not greater than 100 m in length (L_s):

$$R = 1 - \left[1 / \left(1 + \frac{L_s}{100} \times \frac{R_o}{1 - R_o} \right) \right]$$

where R_o is the value R as calculated in accordance with the formula in subparagraph .1.

.3 In the case of passenger ships:

$$R = 1 - \frac{5,000}{L_s + 2.5N + 15,225}$$

where:

$$N = N_1 + 2N_2$$

N_1 = number of persons for whom lifeboats are provided

N_2 = number of persons (including officers and crew) the ship is permitted to carry in excess of N_1 .

.4 Where the conditions of service are such that compliance with paragraph 2.3 of this regulation on the basis of $N = N_1 + 2N_2$ is impracticable and where the Administration considers that a suitably reduced degree of hazard exists, a lesser value of N may be taken but in no case less than $N = N_1 + N_2$.

Regulation 7

Attained subdivision index *A*

1 The attained subdivision index *A* is obtained by the summation of the partial indices A_s , A_p and A_l , (weighted as shown) calculated for the draughts d_s , d_p and d_l defined in regulation 2 in accordance with the following formula:

$$A = 0.4A_s + 0.4A_p + 0.2A_l$$

Each partial index is a summation of contributions from all damage cases taken in consideration, using the following formula:

$$A = \sum p_i s_i$$

where:

- i represents each compartment or group of compartments under consideration,
- p_i accounts for the probability that only the compartment or group of compartments under consideration may be flooded, disregarding any horizontal subdivision, as defined in regulation 7-1,
- s_i accounts for the probability of survival after flooding the compartment or group of compartments under consideration, and includes the effect of any horizontal subdivision, as defined in regulation 7-2.

2 In the calculation of *A*, the level trim shall be used for the deepest subdivision draught and the partial subdivision draught. The actual service trim shall be used for the light service draught. If in any service condition, the trim variation in comparison with the calculated trim is greater than 0.5% of L_s , one or more additional calculations of *A* are to be submitted for the same draughts but different trims so that, for all service conditions, the difference in trim in comparison with the reference trim used for one calculation will be less than 0.5% of L_s .

3 When determining the positive righting lever (*GZ*) of the residual stability curve, the displacement used should be that of the intact condition. That is, the constant displacement method of calculation should be used.

4 The summation indicated by the above formula shall be taken over the ship's subdivision length (L_s) for all cases of flooding in which a single compartment or two or more adjacent compartments are involved. In the case of unsymmetrical arrangements, the calculated *A* value should be the mean value obtained from calculations involving both sides. Alternatively, it should be taken as that corresponding to the side which evidently gives the least favourable result.

5 Wherever wing compartments are fitted, contribution to the summation indicated by the formula shall be taken for all cases of flooding in which wing compartments are involved. Additionally, cases of simultaneous flooding of a wing compartment or group of compartments and the adjacent inboard compartment or group of compartments, but excluding damage of transverse extent greater than one half of the ship breadth *B*, may be added. For the purpose of this regulation, transverse extent is measured inboard from ship's side, at right angle to the centreline at the level of the deepest subdivision draught.

6 In the flooding calculations carried out according to the regulations, only one breach of the hull and only one free surface need to be assumed. The assumed vertical extent of damage is to extend from the baseline upwards to any watertight horizontal subdivision above the waterline or higher. However, if a lesser extent of damage will give a more severe result, such extent is to be assumed.

7 If pipes, ducts or tunnels are situated within the assumed extent of damage, arrangements are to be made to ensure that progressive flooding cannot thereby extend to compartments other than those assumed flooded. However, the Administration may permit minor progressive flooding if it is demonstrated that its effects can be easily controlled and the safety of the ship is not impaired.

Regulation 7-1 **Calculation of the factor p_i**

1 The factor p_i for a compartment or group of compartments shall be calculated in accordance with paragraphs 1.1 and 1.2 using the following notations:

j = the aftmost damage zone number involved in the damage starting with No.1 at the stern;

n = the number of adjacent damage zones involved in the damage;

k = is the number of a particular longitudinal bulkhead as barrier for transverse penetration in a damage zone counted from shell towards the centre line. The shell has $k = 0$;

$x1$ = the distance from the aft terminal of L_s to the aft end of the zone in question;

$x2$ = the distance from the aft terminal of L_s to the forward end of the zone in question;

b = the mean transverse distance in metres measured at right angles to the centreline at the deepest subdivision loadline between the shell and an assumed vertical plane extended between the longitudinal limits used in calculating the factor p_i and which is a tangent to, or common with, all or part of the outermost portion of the longitudinal bulkhead under consideration. This vertical plane shall be so orientated that the mean transverse distance to the shell is a maximum, but not more than twice the least distance between the plane and the shell. If the upper part of a longitudinal bulkhead is below the deepest subdivision loadline the vertical plane used for determination of b is assumed to extend upwards to the deepest subdivision waterline. In any case, b is not to be taken greater than $B/2$.

If the damage involves a single zone only:

$$p_i = p(x1_j, x2_j) \cdot [r(x1_j, x2_j, b_k) - r(x1_j, x2_j, b_{k-1})]$$

If the damage involves two adjacent zones:

$$p_i = p(x1_j, x2_{j+1}) \cdot [r(x1_j, x2_{j+1}, b_k) - r(x1_j, x2_{j+1}, b_{k-1})] \\ - p(x1_j, x2_j) \cdot [r(x1_j, x2_j, b_k) - r(x1_j, x2_j, b_{k-1})] \\ - p(x1_{j+1}, x2_{j+1}) \cdot [r(x1_{j+1}, x2_{j+1}, b_k) - r(x1_{j+1}, x2_{j+1}, b_{k-1})]$$

If the damage involves three or more adjacent zones:

$$p_i = p(x1_j, x2_{j+n-1}) \cdot [r(x1_j, x2_{j+n-1}, b_k) - r(x1_j, x2_{j+n-1}, b_{k-1})] \\ - p(x1_j, x2_{j+n-2}) \cdot [r(x1_j, x2_{j+n-2}, b_k) - r(x1_j, x2_{j+n-2}, b_{k-1})] \\ - p(x1_{j+1}, x2_{j+n-1}) \cdot [r(x1_{j+1}, x2_{j+n-1}, b_k) - r(x1_{j+1}, x2_{j+n-1}, b_{k-1})] \\ + p(x1_{j+1}, x2_{j+n-2}) \cdot [r(x1_{j+1}, x2_{j+n-2}, b_k) - r(x1_{j+1}, x2_{j+n-2}, b_{k-1})]$$

and where $r(x1, x2, b_0) = 0$

1.1 The factor $p(x1, x2)$ is to be calculated according to the following formulae:

Overall normalized max damage length:	J_{\max}	= 10/33
Knuckle point in the distribution:	J_{kn}	= 5/33
Cumulative probability at J_{kn} :	p_k	= 11/12
Maximum absolute damage length:	l_{\max}	= 60 m
Length where normalized distribution ends:	L^*	= 260 m

Probability density at $J = 0$:

$$b_0 = 2 \left(\frac{p_k}{J_{kn}} - \frac{1 - p_k}{J_{\max} - J_{kn}} \right)$$

When $L_s \leq L^*$:

$$J_m = \min \left\{ J_{\max}, \frac{l_{\max}}{L_s} \right\}$$

$$J_k = \frac{J_m}{2} + \frac{1 - \sqrt{1 + (1 - 2p_k)b_0 J_m + \frac{1}{4}b_0^2 J_m^2}}{b_0}$$

$$b_{12} = b_0$$

When $L_s > L^*$:

$$J_m^* = \min \left\{ J_{\max}, \frac{l_{\max}}{L^*} \right\}$$

$$J_k^* = \frac{J_m^*}{2} + \frac{1 - \sqrt{1 + (1 - 2p_k)b_0 J_m^* + \frac{1}{4}b_0^2 J_m^{*2}}}{b_0}$$

$$J_m = \frac{J_m^* \cdot L^*}{L_s}$$

$$J_k = \frac{J_k^* \cdot L^*}{L_s}$$

$$b_{12} = 2 \left(\frac{p_k}{J_k} - \frac{1-p_k}{J_m - J_k} \right)$$

$$b_{11} = 4 \frac{1-p_k}{(J_m - J_k)J_k} - 2 \frac{p_k}{J_k^2}$$

$$b_{21} = -2 \frac{1-p_k}{(J_m - J_k)^2}$$

$$b_{22} = -b_{21}J_m$$

The non-dimensional damage length:

$$J = \frac{(x_2 - x_1)}{L_s}$$

The normalized length of a compartment or group of compartments:

J_n is to be taken as the lesser of J and J_m

1.1.1 Where neither limits of the compartment or group of compartments under consideration coincides with the aft or forward terminals:

$J \leq J_k$:

$$p(x_1, x_2) = p_1 = \frac{1}{6} J^2 (b_{11}J + 3b_{12})$$

$J > J_k$:

$$p(x_1, x_2) = p_2 = -\frac{1}{3} b_{11} J_k^3 + \frac{1}{2} (b_{11}J - b_{12}) J_k^2 + b_{12} J J_k - \frac{1}{3} b_{21} (J_n^3 - J_k^3) \\ + \frac{1}{2} (b_{21}J - b_{22}) (J_n^2 - J_k^2) + b_{22} J (J_n - J_k)$$

1.1.2 Where the aft limit of the compartment or group of compartments under consideration coincides with the aft terminal or the forward limit of the compartment or group of compartments under consideration coincides with the forward terminal:

$J \leq J_k$:

$$p(x_1, x_2) = \frac{1}{2} (p_1 + J)$$

$J > J_k$:

$$p(x_1, x_2) = \frac{1}{2} (p_2 + J)$$

1.1.3 Where the compartment or groups of compartments considered extends over the entire subdivision length (L_s):

$$p(x1, x2) = 1$$

1.2 The factor $r(x1, x2, b)$ shall be determined by the following formulae:

$$r(x1, x2, b) = 1 - (1 - C) \cdot \left[1 - \frac{G}{p(x1, x2)} \right]$$

where:

$$C = 12 \cdot J_b \cdot (-45 \cdot J_b + 4), \text{ where}$$

$$J_b = \frac{b}{15 \cdot B}$$

1.2.1 Where the compartment or groups of compartments considered extends over the entire subdivision length (L_s):

$$G = G_1 = \frac{1}{2} b_{11} J_b^2 + b_{12} J_b$$

1.2.2 Where neither limits of the compartment or group of compartments under consideration coincides with the aft or forward terminals:

$$G = G_2 = -\frac{1}{3} b_{11} J_0^3 + \frac{1}{2} (b_{11} J - b_{12}) J_0^2 + b_{12} J J_0, \text{ where}$$

$$J_0 = \min(J, J_b)$$

1.2.3 Where the aft limit of the compartment or group of compartments under consideration coincides with the aft terminal or the forward limit of the compartment or group of compartments under consideration coincides with the forward terminal:

$$G = \frac{1}{2} \cdot (G_2 + G_1 \cdot J)$$

Regulation 7-2 **Calculation of the factor s_i**

1 The factor s_i shall be determined for each case of assumed flooding, involving a compartment or group of compartments, in accordance with the following notations and the provisions in this regulation.

θ_e is the equilibrium heel angle in any stage of flooding, in degrees;

θ_v is the angle, in any stage of flooding, where the righting lever becomes negative, or the angle at which an opening incapable of being closed weathertight becomes submerged;

GZ_{\max} is the maximum positive righting lever, in metres, up to the angle θ_v ;

Range is the range of positive righting levers, in degrees, measured from the angle θ_e . The positive range is to be taken up to the angle θ_v ;

Flooding stage is any discrete step during the flooding process, including the stage before equalization (if any) until final equilibrium has been reached.

1.1 The factor s_i , for any damage case at any initial loading condition, d_i , shall be obtained from the formula:

$$s_i = \text{minimum} \{ s_{\text{intermediate},i} \text{ Or } s_{\text{final},i} \cdot s_{\text{mom},i} \}$$

where:

$s_{\text{intermediate},i}$ is the probability to survive all intermediate flooding stages until the final equilibrium stage, and is calculated in accordance with paragraph 2;

$s_{\text{final},i}$ is the probability to survive in the final equilibrium stage of flooding. It is calculated in accordance with paragraph 3;

1.

$s_{\text{mom},i}$ is the probability to survive heeling moments, and is calculated in accordance with paragraph 4.

2 The factor $s_{\text{intermediate},i}$ is applicable only to passenger ships (for cargo ships $s_{\text{intermediate},i}$ should be taken as unity) and shall be taken as the least of the s-factors obtained from all flooding stages including the stage before equalization, if any, and is to be calculated as follows:

$$s_{\text{intermediate},i} = \left[\frac{GZ_{\text{max}}}{0.05} \cdot \frac{\text{Range}}{7} \right]^{\frac{1}{4}}$$

where GZ_{max} is not to be taken as more than 0.05 m and *Range* as not more than 7°. $s_{\text{intermediate}} = 0$, if the intermediate heel angle exceeds 15°. Where cross-flooding fittings are required, the time for equalization shall not exceed 10 min.

3 The factor $s_{\text{final},i}$ shall be obtained from the formula:

$$s_{\text{final},i} = K \cdot \left[\frac{GZ_{\text{max}}}{0.12} \cdot \frac{\text{Range}}{16} \right]^{\frac{1}{4}}$$

where:

GZ_{max} is not to be taken as more than 0.12 m;

Range is not to be taken as more than 16°;

$$K = 1 \quad \text{if } \theta_e \leq \theta_{\text{min}}$$

$$K = 0 \quad \text{if } \theta_e \geq \theta_{\text{max}}$$

$$K = \sqrt{\frac{\theta_{\max} - \theta_e}{\theta_{\max} - \theta_{\min}}} \text{ otherwise,}$$

where:

θ_{\min} is 7° for passenger ships and 25° for cargo ships; and

θ_{\max} is 15° for passenger ships and 30° for cargo ships.

4 The factor $s_{\text{mom},i}$ is applicable only to passenger ships (for cargo ships $s_{\text{mom},i}$ shall be taken as unity) and shall be calculated at the final equilibrium from the formula:

$$s_{\text{mom},i} = \frac{(GZ_{\max} - 0.04) \cdot \text{Displacement}}{M_{\text{heel}}}$$

where:

Displacement is the intact displacement at the subdivision draught;

M_{heel} is the maximum assumed heeling moment as calculated in accordance with paragraph 4.1; and

$$s_{\text{mom},i} \leq 1$$

4.1 The heeling moment M_{heel} is to be calculated as follows:

$$M_{\text{heel}} = \text{maximum} \{ M_{\text{passenger}} \text{ or } M_{\text{wind}} \text{ or } M_{\text{Survivalcraft}} \}$$

4.1.1 $M_{\text{passenger}}$ is the maximum assumed heeling moment resulting from movement of passengers, and is to be obtained as follows:

$$M_{\text{passenger}} = (0.075 \cdot N_p) \cdot (0.45 \cdot B) \text{ (tm)}$$

where:

N_p is the maximum number of passengers permitted to be on board in the service condition corresponding to the deepest subdivision draught under consideration; and

B is the beam of the ship.

Alternatively, the heeling moment may be calculated assuming the passengers are distributed with 4 persons per square metre on available deck areas towards one side of the ship on the decks where muster stations are located and in such a way that they produce the most adverse heeling moment. In doing so, a weight of 75 kg per passenger is to be assumed.

4.1.2 M_{wind} is the maximum assumed wind force acting in a damage situation:

$$M_{\text{wind}} = (P \cdot A \cdot Z) / 9,806 \text{ (tm)}$$

where:

$$P = 120 \text{ N/m}^2;$$

A = projected lateral area above waterline;

Z = distance from centre of lateral projected area above waterline to $T/2$; and

T = ship's draught, d_i .

4.1.3 $M_{\text{Survivalcraft}}$ is the maximum assumed heeling moment due to the launching of all fully loaded davit-launched survival craft on one side of the ship. It shall be calculated using the following assumptions:

- .1 all lifeboats and rescue boats fitted on the side to which the ship has heeled after having sustained damage shall be assumed to be swung out fully loaded and ready for lowering;
- .2 for lifeboats which are arranged to be launched fully loaded from the stowed position, the maximum heeling moment during launching shall be taken;
- .3 a fully loaded davit-launched liferaft attached to each davit on the side to which the ship has heeled after having sustained damage shall be assumed to be swung out ready for lowering;
- .4 persons not in the life-saving appliances which are swung out shall not provide either additional heeling or righting moment; and
- .5 life-saving appliances on the side of the ship opposite to the side to which the ship has heeled shall be assumed to be in a stowed position.

5 Unsymmetrical flooding is to be kept to a minimum consistent with the efficient arrangements. Where it is necessary to correct large angles of heel, the means adopted shall, where practicable, be self-acting, but in any case where controls to equalization devices are provided they shall be operable from above the bulkhead deck. These fittings together with their controls shall be acceptable to the Administration. Suitable information concerning the use of equalization devices shall be supplied to the master of the ship.

5.1 Tanks and compartments taking part in such equalization shall be fitted with air pipes or equivalent means of sufficient cross-section to ensure that the flow of water into the equalization compartments is not delayed.

5.2 In all cases, s_i is to be taken as zero in those cases where the final waterline, taking into account sinkage, heel and trim, immerses:

- .1 the lower edge of openings through which progressive flooding may take place and such flooding is not accounted for in the calculation of factor s_i . Such openings shall include air-pipes, ventilators and openings which are closed by means of weathertight doors or hatch covers; and

- .2 any part of the bulkhead deck in passenger ships considered a horizontal evacuation route for compliance with chapter II-2.

5.3 The factor s_i is to be taken as zero if, taking into account sinkage, heel and trim, any of the following occur in any intermediate stage or in the final stage of flooding:

- .1 immersion of any vertical escape hatch in the bulkhead deck intended for compliance with chapter II-2;
- .2 any controls intended for the operation of watertight doors, equalization devices, valves on piping or on ventilation ducts intended to maintain the integrity of watertight bulkheads from above the bulkhead deck become inaccessible or inoperable;
- .3 immersion of any part of piping or ventilation ducts carried through a watertight boundary that is located within any compartment included in damage cases contributing to the attained index A , if not fitted with watertight means of closure at each boundary.

5.4 However, where compartments assumed flooded due to progressive flooding are taken into account in the damage stability calculations multiple values of $S_{\text{intermediate},i}$ may be calculated assuming equalization in additional flooding phases.

5.5 Except as provided in paragraph 5.3.1, openings closed by means of watertight manhole covers and flush scuttles, small watertight hatch covers, remotely operated sliding watertight doors, side scuttles of the non-opening type as well as watertight access doors and hatch covers required to be kept closed at sea need not be considered.

6 Where horizontal watertight boundaries are fitted above the waterline under consideration the s -value calculated for the lower compartment or group of compartments shall be obtained by multiplying the value as determined in paragraph 1.1 by the reduction factor v_m according to paragraph 6.1, which represents the probability that the spaces above the horizontal subdivision will not be flooded.

6.1 The factor v_m shall be obtained from the formula:

$$v_m = v(H_{j, n, m}, d) - v(H_{j, n, m-1}, d)$$

where:

$H_{j, n, m}$ is the least height above the baseline, in metres, within the longitudinal range of $x_{1(j)} \dots x_{2(j+n-1)}$ of the m^{th} horizontal boundary which is assumed to limit the vertical extent of flooding for the damaged compartments under consideration;

$H_{j, n, m-1}$ is the least height above the baseline, in metres, within the longitudinal range of $x_{1(j)} \dots x_{2(j+n-1)}$ of the $(m-1)^{\text{th}}$ horizontal boundary which is assumed to limit the vertical extent of flooding for the damaged compartments under consideration;

j signifies the aft terminal of the damaged compartments under consideration;

m represents each horizontal boundary counted upwards from the waterline under consideration;

d is the draught in question as defined in regulation 2; and

x_1 and x_2 represent the terminals of the compartment or group of compartments considered in regulation 7-1.

6.1.1 The factors $v(H_j, n, m, d)$ and $v(H_j, n, m-1, d)$ shall be obtained from the formulae:

$$v(H, d) = 0.8 \frac{(H - d)}{7.8}, \text{ if } (H_m - d) \text{ is less than, or equal to, } 7.8 \text{ m;}$$

$$v(H, d) = 0.8 + 0.2 \left[\frac{(H - d) - 7.8}{4.7} \right] \text{ in all other cases,}$$

where:

$v(H_j, n, m, d)$ is to be taken as 1, if H_m coincides with the uppermost watertight boundary of the ship within the range $(x_1^{(j)} \dots x_2^{(j+n-1)})$, and

$v(H_j, n, 0, d)$ is to be taken as 0.

In no case is v_m to be taken as less than zero or more than 1.

6.2 In general, each contribution dA to the index A in the case of horizontal subdivisions is obtained from the formula:

$$dA = p_i \cdot [v_1 \cdot s_{\min 1} + (v_2 - v_1) \cdot s_{\min 2} + \dots + (1 - v_{m-1}) \cdot s_{\min m}]$$

where:

v_m = the v -value calculated in accordance with paragraph 6.1;

s_{\min} = the least s -factor for all combinations of damages obtained when the assumed damage extends from the assumed damage height H_m downwards.

Regulation 7-3 Permeability

1 For the purpose of the subdivision and damage stability calculations of the regulations, the permeability of each general compartment or part of a compartment shall be as follows:

Spaces	Permeability
Appropriated to stores	0.60
Occupied by accommodation	0.95
Occupied by machinery	0.85
Void spaces	0.95
Intended for liquids	0 or 0.95 ¹

¹ Whichever results in the more severe requirement.

2 For the purpose of the subdivision and damage stability calculations of the regulations, the permeability of each cargo compartment or part of a compartment shall be as follows:

Spaces	Permeability at draught d_s	Permeability at draught d_p	Permeability at draught d_1
Dry cargo spaces	0.70	0.80	0.95
Container spaces	0.70	0.80	0.95
Ro-ro spaces	0.90	0.90	0.95
Cargo liquids	0.70	0.80	0.95

3 Other figures for permeability may be used if substantiated by calculations.

Regulation 8 **Special requirements concerning passenger ship stability**

1 A passenger ship intended to carry 400 or more persons shall have watertight subdivision abaft the collision bulkhead so that $s_i = 1$ for the three loading conditions on which is based the calculation of the subdivision index and for a damage involving all the compartments within $0.08L$ measured from the forward perpendicular.

2 A passenger ship intended to carry 36 or more persons is to be capable of withstanding damage along the side shell to an extent specified in paragraph 3. Compliance with this regulation is to be achieved by demonstrating that s_i , as defined in regulation 7-2, is not less than 0.9 for the three loading conditions on which is based the calculation of the subdivision index.

3 The damage extent to be assumed when demonstrating compliance with paragraph 2, is to be dependent on both N as defined in regulation 6, and L_s as defined in regulation 2, such that:

- .1 the vertical extent of damage is to extend from the ship's moulded baseline to a position up to 12.5 m above the position of the deepest subdivision draught as defined in regulation 2, unless a lesser vertical extent of damage were to give a lower value of s_i , in which case this reduced extent is to be used;
- .2 where 400 or more persons are to be carried, a damage length of $0.03L_s$ but not less than 3 m is to be assumed at any position along the side shell, in conjunction with a penetration inboard of $0.1B$ but not less than 0.75 m measured inboard from the ship side, at right angle to the centreline at the level of the deepest subdivision draught;
- .3 where less than 400 persons are carried, damage length is to be assumed at any position along the shell side between transverse watertight bulkheads provided that the distance between two adjacent transverse watertight bulkheads is not less than the assumed damage length. If the distance between adjacent transverse watertight bulkheads is less than the assumed damage length, only one of these bulkheads shall be considered effective for the purpose of demonstrating compliance with paragraph 2;

- .4 where 36 persons are carried, a damage length of $0.015L_s$, but not less than 3 m is to be assumed, in conjunction with a penetration inboard of $0.05B$ but not less than 0.75 m; and
- .5 where more than 36, but fewer than 400 persons are carried the values of damage length and penetration inboard, used in the determination of the assumed extent of damage, are to be obtained by linear interpolation between the values of damage length and penetration which apply for ships carrying 36 persons and 400 persons as specified in subparagraphs .4 and .2.

Regulation 8-1

System capabilities after a flooding casualty on passenger ships

1 Application

This regulation applies to passenger ships constructed on or after 1 July 2010 to which regulation II-2/21 applies.

2 Availability of essential systems in case of flooding damage

A passenger ship shall be designed so that the systems specified in regulation II-2/21.4 remain operational when the ship is subject to flooding of any single watertight compartment.

PART B-2

SUBDIVISION, WATERTIGHT AND WEATHERTIGHT INTEGRITY

Regulation 9

Double bottoms in passenger ships and cargo ships other than tankers

1 A double bottom shall be fitted extending from the collision bulkhead to the afterpeak bulkhead, as far as this is practicable and compatible with the design and proper working of the ship.

2 Where a double bottom is required to be fitted the inner bottom shall be continued out to the ship's sides in such a manner as to protect the bottom to the turn of the bilge. Such protection will be deemed satisfactory if the inner bottom is not lower at any part than a plane parallel with the keel line and which is located not less than a vertical distance h measured from the keel line, as calculated by the formula:

$$h = B/20$$

However, in no case is the value of h to be less than 760 mm, and need not be taken as more than 2,000 mm.

3 Small wells constructed in the double bottom in connection with drainage arrangements of holds, etc., shall not extend downward more than necessary. A well extending to the outer bottom is, however, permitted at the after end of the shaft tunnel. Other wells (e.g., for lubricating oil under main engines) may be permitted by the Administration if satisfied that the arrangements give protection equivalent to that afforded by a double bottom complying with this regulation. In no case shall the vertical distance from the bottom of such a well to a plane coinciding with the keel line be less than 500 mm.

4 A double bottom need not be fitted in way of watertight tanks, including dry tanks of moderate size, provided the safety of the ship is not impaired in the event of bottom or side damage.

5 In the case of passenger ships to which the provisions of regulation 1.5 apply and which are engaged on regular service within the limits of a short international voyage as defined in regulation III/3.22, the Administration may permit a double bottom to be dispensed with if satisfied that the fitting of a double bottom in that part would not be compatible with the design and proper working of the ship.

6 Any part of a passenger ship or a cargo ship that is not fitted with a double bottom in accordance with paragraphs 1, 4 or 5 shall be capable of withstanding bottom damages, as specified in paragraph 8, in that part of the ship.

7 In the case of unusual bottom arrangements in a passenger ship or a cargo ship, it shall be demonstrated that the ship is capable of withstanding bottom damages as specified in paragraph 8.

8 Compliance with paragraphs 6 or 7 is to be achieved by demonstrating that s_i , when calculated in accordance with regulation 7-2, is not less than 1 for all service conditions when subject to a bottom damage assumed at any position along the ship's bottom and with an extent specified in subparagraph .2 for the affected part of the ship:

.1 Flooding of such spaces shall not render emergency power and lighting, internal communication, signals or other emergency devices inoperable in other parts of the ship.

.2 Assumed extent of damage shall be as follows:

	For 0.3 L from the forward perpendicular of the ship	Any other part of the ship
Longitudinal extent	$1/3 L^{2/3}$ or 14.5 m, whichever is less	$1/3 L^{2/3}$ or 14.5 m, whichever is less
Transverse extent	$B/6$ or 10 m, whichever is less	$B/6$ or 5 m, whichever is less
Vertical extent, measured from the keel line	$B/20$ or 2 m, whichever is less	$B/20$ or 2 m, whichever is less

.3 If any damage of a lesser extent than the maximum damage specified in subparagraph .2 would result in a more severe condition, such damage should be considered.

9 In case of large lower holds in passenger ships, the Administration may require an increased double bottom height of not more than $B/10$ or 3 m, whichever is less, measured from the keel line. Alternatively, bottom damages may be calculated for these areas, in accordance with paragraph 8, but assuming an increased vertical extent.

Regulation 10
Construction of watertight bulkheads

1 Each watertight subdivision bulkhead, whether transverse or longitudinal, shall be constructed having scantlings as specified in regulation 2.17. In all cases, watertight subdivision bulkheads shall be capable of supporting at least the pressure due to a head of water up to the bulkhead deck.

2 Steps and recesses in watertight bulkheads shall be as strong as the bulkhead at the place where each occurs.

Regulation 11
Initial testing of watertight bulkheads, etc.

1 Testing watertight spaces not intended to hold liquids and cargo holds intended to hold ballast by filling them with water is not compulsory. When testing by filling with water is not carried out, a hose test shall be carried out where practicable. This test shall be carried out in the most advanced stage of the fitting out of the ship. Where a hose test is not practicable because of possible damage to machinery, electrical equipment insulation or outfitting items, it may be replaced by a careful visual examination of welded connections, supported where deemed necessary by means such as a dye penetrant test or an ultrasonic leak test or an equivalent test. In any case a thorough inspection of the watertight bulkheads shall be carried out.

2 The forepeak, double bottom (including duct keels) and inner skins shall be tested with water to a head corresponding to the requirements of regulation 10.1.

3 Tanks which are intended to hold liquids, and which form part of the watertight subdivision of the ship, shall be tested for tightness and structural strength with water to a head corresponding to its design pressure. The water head is in no case to be less than the top of the air pipes or to a level of 2.4 m above the top of the tank, whichever is the greater.

4 The tests referred to in paragraphs 2 and 3 are for the purpose of ensuring that the subdivision structural arrangements are watertight and are not to be regarded as a test of the fitness of any compartment for the storage of oil fuel or for other special purposes for which a test of a superior character may be required depending on the height to which the liquid has access in the tank or its connections.

Regulation 12
Peak and machinery space bulkheads, shaft tunnels, etc.

1 A collision bulkhead shall be fitted which shall be watertight up to the bulkhead deck. This bulkhead shall be located at a distance from the forward perpendicular of not less than $0.05L$ or 10 m, whichever is the less, and, except as may be permitted by the Administration, not more than $0.08L$ or $0.05L + 3$ m, whichever is the greater.

2 Where any part of the ship below the waterline extends forward of the forward perpendicular, e.g., a bulbous bow, the distances stipulated in paragraph 1 shall be measured from a point either:

- .1 at the mid-length of such extension;
- .2 at a distance $0.015L$ forward of the forward perpendicular; or

.3 at a distance 3 m forward of the forward perpendicular,

whichever gives the smallest measurement.

3 The bulkhead may have steps or recesses provided they are within the limits prescribed in paragraph 1 or 2.

4 No doors, manholes, access openings, ventilation ducts or any other openings shall be fitted in the collision bulkhead below the bulkhead deck.

5.1 Except as provided in paragraph 5.2, the collision bulkhead may be pierced below the bulkhead deck by not more than one pipe for dealing with fluid in the forepeak tank, provided that the pipe is fitted with a screw-down valve capable of being operated from above the bulkhead deck, the valve chest being secured inside the forepeak to the collision bulkhead. The Administration may, however, authorize the fitting of this valve on the after side of the collision bulkhead provided that the valve is readily accessible under all service conditions and the space in which it is located is not a cargo space. All valves shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable.

5.2 If the forepeak is divided to hold two different kinds of liquids the Administration may allow the collision bulkhead to be pierced below the bulkhead deck by two pipes, each of which is fitted as required by paragraph 5.1, provided the Administration is satisfied that there is no practical alternative to the fitting of such a second pipe and that, having regard to the additional subdivision provided in the forepeak, the safety of the ship is maintained.

6 Where a long forward superstructure is fitted the collision bulkhead shall be extended weathertight to the deck next above the bulkhead deck. The extension need not be fitted directly above the bulkhead below provided it is located within the limits prescribed in paragraph 1 or 2 with the exception permitted by paragraph 7 and that the part of the deck which forms the step is made effectively weathertight. The extension shall be so arranged as to preclude the possibility of the bow door causing damage to it in the case of damage to, or detachment of, a bow door.

7 Where bow doors are fitted and a sloping loading ramp forms part of the extension of the collision bulkhead above the bulkhead deck the ramp shall be weathertight over its complete length. In cargo ships the part of the ramp which is more than 2.3 m above the bulkhead deck may extend forward of the limit specified in paragraph 1 or 2. Ramps not meeting the above requirements shall be disregarded as an extension of the collision bulkhead.

8 The number of openings in the extension of the collision bulkhead above the freeboard deck shall be restricted to the minimum compatible with the design and normal operation of the ship. All such openings shall be capable of being closed weathertight.

9 Bulkheads shall be fitted separating the machinery space from cargo and accommodation spaces forward and aft and made watertight up to the bulkhead deck. In passenger ships an afterpeak bulkhead shall also be fitted and made watertight up to the bulkhead deck. The afterpeak bulkhead may, however, be stepped below the bulkhead deck, provided the degree of safety of the ship as regards subdivision is not thereby diminished.

10 In all cases stern tubes shall be enclosed in watertight spaces of moderate volume. In passenger ships the stern gland shall be situated in a watertight shaft tunnel or other watertight space separate from the stern tube compartment and of such volume that, if flooded by leakage through the stern gland, the bulkhead deck will not be immersed. In cargo ships other measures to minimize the danger of water penetrating into the ship in case of damage to stern tube arrangements may be taken at the discretion of the Administration.

Regulation 13

Openings in watertight bulkheads below the bulkhead deck in passenger ships

1 The number of openings in watertight bulkheads shall be reduced to the minimum compatible with the design and proper working of the ship, satisfactory means shall be provided for closing these openings.

2.1 Where pipes, scuppers, electric cables, etc., are carried through watertight bulkheads, arrangements shall be made to ensure the watertight integrity of the bulkheads.

2.2 Valves not forming part of a piping system shall not be permitted in watertight bulkheads.

2.3 Lead or other heat sensitive materials shall not be used in systems which penetrate watertight bulkheads, where deterioration of such systems in the event of fire would impair the watertight integrity of the bulkheads.

3 No doors, manholes, or access openings are permitted in watertight transverse bulkheads dividing a cargo space from an adjoining cargo space, except as provided in paragraph 9.1 and in regulation 14.

4 Subject to paragraph 10, not more than one door, apart from the doors to shaft tunnels, may be fitted in each watertight bulkhead within spaces containing the main and auxiliary propulsion machinery including boilers serving the needs of propulsion. Where two or more shafts are fitted, the tunnels shall be connected by an intercommunicating passage. There shall be only one door between the machinery space and the tunnel spaces where two shafts are fitted and only two doors where there are more than two shafts. All these doors shall be of the sliding type and shall be so located as to have their sills as high as practicable. The hand gear for operating these doors from above the bulkhead deck shall be situated outside the spaces containing the machinery.

5.1 Watertight doors, except as provided in paragraph 9.1 or regulation 14, shall be power-operated sliding doors complying with the requirements of paragraph 7 capable of being closed simultaneously from the central operating console at the navigation bridge in not more than 60 s with the ship in the upright position.

5.2 The means of operation whether by power or by hand of any power-operated sliding watertight door shall be capable of closing the door with the ship listed to 15° either way. Consideration shall also be given to the forces which may act on either side of the door as may be experienced when water is flowing through the opening applying a static head equivalent to a water height of at least 1 m above the sill on the centreline of the door.

5.3 Watertight door controls, including hydraulic piping and electric cables, shall be kept as close as practicable to the bulkhead in which the doors are fitted, in order to minimize the likelihood of them being involved in any damage which the ship may sustain. The positioning of watertight doors and their controls shall be such that if the ship sustains damage within one fifth of the breadth of the ship, as defined in regulation 2, such distance being measured at right angles to the centreline at the level of the deepest subdivision draught, the operation of the watertight doors clear of the damaged portion of the ship is not impaired.

6 All power-operated sliding watertight doors shall be provided with means of indication which will show at all remote operating positions whether the doors are open or closed. Remote operating positions shall only be at the navigation bridge as required by paragraph 7.1.5 and at the location where hand operation above the bulkhead deck is required by paragraph 7.1.4.

7.1 Each power-operated sliding watertight door:

- .1 shall have a vertical or horizontal motion;
- .2 shall, subject to paragraph 10, be normally limited to a maximum clear opening width of 1.2 m. The Administration may permit larger doors only to the extent considered necessary for the effective operation of the ship provided that other safety measures, including the following, are taken into consideration:
 - .1 special consideration shall be given to the strength of the door and its closing appliances in order to prevent leakages; and
 - .2 the door shall be located inboard the damage zone $B/5$;
- .3 shall be fitted with the necessary equipment to open and close the door using electric power, hydraulic power, or any other form of power that is acceptable to the Administration;
- .4 shall be provided with an individual hand-operated mechanism. It shall be possible to open and close the door by hand at the door itself from either side, and in addition, close the door from an accessible position above the bulkhead deck with an all round crank motion or some other movement providing the same degree of safety acceptable to the Administration. Direction of rotation or other movement is to be clearly indicated at all operating positions. The time necessary for the complete closure of the door, when operating by hand gear, shall not exceed 90 s with the ship in the upright position;
- .5 shall be provided with controls for opening and closing the door by power from both sides of the door and also for closing the door by power from the central operating console at the navigation bridge;
- .6 shall be provided with an audible alarm, distinct from any other alarm in the area, which will sound whenever the door is closed remotely by power and which shall sound for at least 5 s but no more than 10 s before the door begins to move and shall continue sounding until the door is completely closed. In the case of remote hand operation it is sufficient for the audible alarm to

sound only when the door is moving. Additionally, in passenger areas and areas of high ambient noise the Administration may require the audible alarm to be supplemented by an intermittent visual signal at the door; and

- .7 shall have an approximately uniform rate of closure under power. The closure time, from the time the door begins to move to the time it reaches the completely closed position, shall in no case be less than 20 s or more than 40 s with the ship in the upright position.

7.2 The electrical power required for power-operated sliding watertight doors shall be supplied from the emergency switchboard either directly or by a dedicated distribution board situated above the bulkhead deck. The associated control, indication and alarm circuits shall be supplied from the emergency switchboard either directly or by a dedicated distribution board situated above the bulkhead deck and be capable of being automatically supplied by the transitional source of emergency electrical power required by regulation 42.3.1.3 in the event of failure of either the main or emergency source of electrical power.

7.3 Power-operated sliding watertight doors shall have either:

- .1 a centralized hydraulic system with two independent power sources each consisting of a motor and pump capable of simultaneously closing all doors. In addition, there shall be for the whole installation hydraulic accumulators of sufficient capacity to operate all the doors at least three times, i.e. closed-open-closed, against an adverse list of 15°. This operating cycle shall be capable of being carried out when the accumulator is at the pump cut-in pressure. The fluid used shall be chosen considering the temperatures liable to be encountered by the installation during its service. The power operating system shall be designed to minimize the possibility of having a single failure in the hydraulic piping adversely affect the operation of more than one door. The hydraulic system shall be provided with a low-level alarm for hydraulic fluid reservoirs serving the power-operated system and a low gas pressure alarm or other effective means of monitoring loss of stored energy in hydraulic accumulators. These alarms are to be audible and visual and shall be situated on the central operating console at the navigation bridge; or
- .2 an independent hydraulic system for each door with each power source consisting of a motor and pump capable of opening and closing the door. In addition, there shall be a hydraulic accumulator of sufficient capacity to operate the door at least three times, i.e. closed-open-closed, against an adverse list of 15°. This operating cycle shall be capable of being carried out when the accumulator is at the pump cut-in pressure. The fluid used shall be chosen considering the temperatures liable to be encountered by the installation during its service. A low gas pressure group alarm or other effective means of monitoring loss of stored energy in hydraulic accumulators shall be provided at the central operating console on the navigation bridge. Loss of stored energy indication at each local operating position shall also be provided; or
- .3 an independent electrical system and motor for each door with each power source consisting of a motor capable of opening and closing the door. The power source shall be capable of being automatically supplied by the transitional source of emergency electrical power as required by

regulation 42.4.2 – in the event of failure of either the main or emergency source of electrical power and with sufficient capacity to operate the door at least three times, i.e. closed-open-closed, against an adverse list of 15°.

For the systems specified in paragraphs 7.3.1, 7.3.2 and 7.3.3, provision should be made as follows: Power systems for power-operated watertight sliding doors shall be separate from any other power system. A single failure in the electric or hydraulic power-operated systems excluding the hydraulic actuator shall not prevent the hand operation of any door.

7.4 Control handles shall be provided at each side of the bulkhead at a minimum height of 1.6 m above the floor and shall be so arranged as to enable persons passing through the doorway to hold both handles in the open position without being able to set the power closing mechanism in operation accidentally. The direction of movement of the handles in opening and closing the door shall be in the direction of door movement and shall be clearly indicated.

7.5 As far as practicable, electrical equipment and components for watertight doors shall be situated above the bulkhead deck and outside hazardous areas and spaces.

7.6 The enclosures of electrical components necessarily situated below the bulkhead deck shall provide suitable protection against the ingress of water.

7.7 Electric power, control, indication and alarm circuits shall be protected against fault in such a way that a failure in one door circuit will not cause a failure in any other door circuit. Short circuits or other faults in the alarm or indicator circuits of a door shall not result in a loss of power operation of that door. Arrangements shall be such that leakage of water into the electrical equipment located below the bulkhead deck will not cause the door to open.

7.8 A single electrical failure in the power operating or control system of a power-operated sliding watertight door shall not result in a closed door opening. Availability of the power supply should be continuously monitored at a point in the electrical circuit as near as practicable to each of the motors required by paragraph 7.3. Loss of any such power supply should activate an audible and visual alarm at the central operating console at the navigation bridge.

8.1 The central operating console at the navigation bridge shall have a “master mode” switch with two modes of control: a “local control” mode which shall allow any door to be locally opened and locally closed after use without automatic closure, and a “doors closed” mode which shall automatically close any door that is open. The “doors closed” mode shall automatically close any door that is open. The “doors closed” mode shall permit doors to be opened locally and shall automatically re-close the doors upon release of the local control mechanism. The “master mode” switch shall normally be in the “local control” mode. The “doors closed” mode shall only be used in an emergency or for testing purposes. Special consideration shall be given to the reliability of the “master mode” switch.

8.2 The central operating console at the navigation bridge shall be provided with a diagram showing the location of each door, with visual indicators to show whether each door is open or closed. A red light shall indicate a door is fully open and a green light shall indicate a door is fully closed. When the door is closed remotely the red light shall indicate the intermediate position by flashing. The indicating circuit shall be independent of the control circuit for each door.

8.3 It shall not be possible to remotely open any door from the central operating console.

9.1 If the Administration is satisfied that such doors are essential, watertight doors of satisfactory construction may be fitted in watertight bulkheads dividing cargo between deck spaces. Such doors may be hinged, rolling or sliding doors but shall not be remotely controlled. They shall be fitted at the highest level and as far from the shell plating as practicable, but in no case shall the outboard vertical edges be situated at a distance from the shell plating which is less than one fifth of the breadth of the ship, as defined in regulation 2, such distance being measured at right angles to the centreline at the level of the deepest subdivision draught.

9.2 Should any such doors be accessible during the voyage, they shall be fitted with a device which prevents unauthorized opening. When it is proposed to fit such doors, the number and arrangements shall receive the special consideration of the Administration.

10 Portable plates on bulkheads shall not be permitted except in machinery spaces. The Administration may permit not more than one power-operated sliding watertight door in each watertight bulkhead larger than those specified in paragraph 7.1.2 to be substituted for these portable plates, provided these doors are intended to remain closed during navigation except in case of urgent necessity at the discretion of the master. These doors need not meet the requirements of paragraph 7.1.4 regarding complete closure by hand-operated gear in 90 s.

11.1 Where trunkways or tunnels for access from crew accommodation to the stokehold, for piping, or for any other purpose are carried through watertight bulkheads, they shall be watertight and in accordance with the requirements of regulation 16-1. The access to at least one end of each such tunnel or trunkway, if used as a passage at sea, shall be through a trunk extending watertight to a height sufficient to permit access above the bulkhead deck. The access to the other end of the trunkway or tunnel may be through a watertight door of the type required by its location in the ship. Such trunkways or tunnels shall not extend through the first subdivision bulkhead abaft the collision bulkhead.

11.2 Where it is proposed to fit tunnels piercing watertight bulkheads, these shall receive the special consideration of the Administration.

11.3 Where trunkways in connection with refrigerated cargo and ventilation or forced draught trunks are carried through more than one watertight bulkhead, the means of closure at such openings shall be operated by power and be capable of being closed from a central position situated above the bulkhead deck.

Regulation 13-1

Openings in watertight bulkheads and internal decks in cargo ships

1 The number of openings in watertight subdivisions is to be kept to a minimum compatible with the design and proper working of the ship. Where penetrations of watertight bulkheads and internal decks are necessary for access, piping, ventilation, electrical cables, etc., arrangements are to be made to maintain the watertight integrity. The Administration may permit relaxation in the watertightness of openings above the freeboard deck, provided that it is demonstrated that any progressive flooding can be easily controlled and that the safety of the ship is not impaired.

2 Doors provided to ensure the watertight integrity of internal openings which are used while at sea are to be sliding watertight doors capable of being remotely closed from the bridge and are also to be operable locally from each side of the bulkhead. Indicators are to be provided at the control position showing whether the doors are open or closed, and an audible alarm is to be provided at the door closure. The power, control and indicators are to be operable in the event of main power failure. Particular attention is to be paid to minimizing the effect of control system failure. Each power-operated sliding watertight door shall be provided with an individual hand-operated mechanism. It shall be possible to open and close the door by hand at the door itself from both sides.

3 Access doors and access hatch covers normally closed at sea, intended to ensure the watertight integrity of internal openings, shall be provided with means of indication locally and on the bridge showing whether these doors or hatch covers are open or closed. A notice is to be affixed to each such door or hatch cover to the effect that it is not to be left open.

4 Watertight doors or ramps of satisfactory construction may be fitted to internally subdivide large cargo spaces, provided that the Administration is satisfied that such doors or ramps are essential. These doors or ramps may be hinged, rolling or sliding doors or ramps, but shall not be remotely controlled. Should any of the doors or ramps be accessible during the voyage, they shall be fitted with a device which prevents unauthorized opening.

5 Other closing appliances which are kept permanently closed at sea to ensure the watertight integrity of internal openings shall be provided with a notice which is to be affixed to each such closing appliance to the effect that it is to be kept closed. Manholes fitted with closely bolted covers need not be so marked.

Regulation 14

Passenger ships carrying goods vehicles and accompanying personnel

1 This regulation applies to passenger ships designed or adapted for the carriage of goods vehicles and accompanying personnel.

2 If in such a ship the total number of passengers which include personnel accompanying vehicles does not exceed $12 + A_d/25$, where A_d = total deck area (square metres) of spaces available for the stowage of goods vehicles and where the clear height at the stowage position and at the entrance to such spaces is not less than 4 m, the provisions of regulations 13.9.1 and 13.9.2 in respect of watertight doors apply except that the doors may be fitted at any level in watertight bulkheads dividing cargo spaces. Additionally, indicators are required on the navigation bridge to show automatically when each door is closed and all door fastenings are secured.

3 The ship may not be certified for a higher number of passengers than assumed in paragraph 2, if a watertight door has been fitted in accordance with this regulation.

Regulation 15

Openings in the shell plating below the bulkhead deck of passenger ships and the freeboard deck of cargo ships

1 The number of openings in the shell plating shall be reduced to the minimum compatible with the design and proper working of the ship.

2 The arrangement and efficiency of the means for closing any opening in the shell plating shall be consistent with its intended purpose and the position in which it is fitted and generally to the satisfaction of the Administration.

3.1 Subject to the requirements of the International Convention on Load Lines in force, no sidescuttle shall be fitted in such a position that its sill is below a line drawn parallel to the bulkhead deck at side and having its lowest point 2.5% of the breadth of the ship above the deepest subdivision draught, or 500 mm, whichever is the greater.

3.2 All sidescuttles the sills of which are below the bulkhead deck of passenger ships and the freeboard deck of cargo ships, as permitted by paragraph 3.1, shall be of such construction as will effectively prevent any person opening them without the consent of the master of the ship.

4 Efficient hinged inside deadlights so arranged that they can be easily and effectively closed and secured watertight, shall be fitted to all sidescuttles except that abaft one eighth of the ship's length from the forward perpendicular and above a line drawn parallel to the bulkhead deck at side and having its lowest point at a height of 3.7 m plus 2.5% of the breadth of the ship above the deepest subdivision draught, the deadlights may be portable in passenger accommodation other than that for steerage passengers, unless the deadlights are required by the International Convention on Load Lines in force to be permanently attached in their proper positions. Such portable deadlights shall be stowed adjacent to the sidescuttles they serve.

5.1 No sidescuttles shall be fitted in any spaces which are appropriated exclusively to the carriage of cargo or coal.

5.2 Sidescuttles may, however, be fitted in spaces appropriated alternatively to the carriage of cargo or passengers, but they shall be of such construction as will effectively prevent any person opening them or their deadlights without the consent of the master.

6 Automatic ventilating sidescuttles shall not be fitted in the shell plating below the bulkhead deck of passenger ships and the freeboard deck of cargo ships without the special sanction of the Administration.

7 The number of scuppers, sanitary discharges and other similar openings in the shell plating shall be reduced to the minimum either by making each discharge serve for as many as possible of the sanitary and other pipes, or in any other satisfactory manner.

8.1 All inlets and discharges in the shell plating shall be fitted with efficient and accessible arrangements for preventing the accidental admission of water into the ship.

8.2.1 Subject to the requirements of the International Convention on Load Lines in force, and except as provided in paragraph 8.3, each separate discharge led through the shell plating from spaces below the bulkhead deck of passenger ships and the freeboard deck of cargo ships shall be provided with either one automatic non-return valve fitted with a positive means of closing it from above the bulkhead deck or with two automatic non-return valves without positive means of closing, provided that the inboard valve is situated above the deepest subdivision draught and is always accessible for examination under service conditions. Where a valve with positive means of closing is fitted, the operating position above the bulkhead deck shall always be readily accessible and means shall be provided for indicating whether the valve is open or closed.

8.2.2 The requirements of the International Convention on Load Lines in force shall apply to discharges led through the shell plating from spaces above the bulkhead deck of passenger ships and the freeboard deck of cargo ships.

8.3 Machinery space, main and auxiliary sea inlets and discharges in connection with the operation of machinery shall be fitted with readily accessible valves between the pipes and the shell plating or between the pipes and fabricated boxes attached to the shell plating. In manned machinery spaces the valves may be controlled locally and shall be provided with indicators showing whether they are open or closed.

8.4 Moving parts penetrating the shell plating below the deepest subdivision draught shall be fitted with a watertight sealing arrangement acceptable to the Administration. The inboard gland shall be located within a watertight space of such volume that, if flooded, the bulkhead deck will not be submerged. The Administration may require that if such compartment is flooded, essential or emergency power and lighting, internal communication, signals or other emergency devices must remain available in other parts of the ship.

8.5 All shell fittings and valves required by this regulation shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable. All pipes to which this regulation refers shall be of steel or other equivalent material to the satisfaction of the Administration.

9 Gangway, cargo and fuelling ports fitted below the bulkhead deck of passenger ships and the freeboard deck of cargo ships shall be watertight and in no case be so fitted as to have their lowest point below the deepest subdivision draught.

10.1 The inboard opening of each ash-chute, rubbish-chute, etc., shall be fitted with an efficient cover.

10.2 If the inboard opening is situated below the bulkhead deck of passenger ships and the freeboard deck of cargo ships, the cover shall be watertight and, in addition, an automatic non-return valve shall be fitted in the chute in an easily accessible position above the deepest subdivision draught.

Regulation 15-1 **External openings in cargo ships**

1 All external openings leading to compartments assumed intact in the damage analysis, which are below the final damage waterline, are required to be watertight.

2 External openings required to be watertight in accordance with paragraph 1 shall, except for cargo hatch covers, be fitted with indicators on the bridge.

3 Openings in the shell plating below the deck limiting the vertical extent of damage shall be fitted with a device that prevents unauthorized opening if they are accessible during the voyage.

4 Other closing appliances which are kept permanently closed at sea to ensure the watertight integrity of external openings shall be provided with a notice affixed to each appliance to the effect that it is to be kept closed. Manholes fitted with closely bolted covers need not be so marked.

Regulation 16
Construction and initial tests of watertight doors, sidescuttles, etc.

- 1 In all ships:
 - .1 the design, materials and construction of all watertight doors, sidescuttles, gangway and cargo ports, valves, pipes, ash-chutes and rubbish-chutes referred to in these regulations shall be to the satisfaction of the Administration;
 - .2 such valves, doors and mechanisms shall be suitably marked to ensure that they may be properly used to provide maximum safety; and
 - .3 the frames of vertical watertight doors shall have no groove at the bottom in which dirt might lodge and prevent the door closing properly.
- 2 In passenger ships and cargo ships watertight doors shall be tested by water pressure to a head of water they might sustain in a final or intermediate stage of flooding. Where testing of individual doors is not carried out because of possible damage to insulation or outfitting items, testing of individual doors may be replaced by a prototype pressure test of each type and size of door with a test pressure corresponding at least to the head required for the intended location. The prototype test shall be carried out before the door is fitted. The installation method and procedure for fitting the door on board shall correspond to that of the prototype test. When fitted on board, each door shall be checked for proper seating between the bulkhead, the frame and the door.

Regulation 16-1
Construction and initial tests of watertight decks, trunks, etc.

- 1 Watertight decks, trunks, tunnels, duct keels and ventilators shall be of the same strength as watertight bulkheads at corresponding levels. The means used for making them watertight, and the arrangements adopted for closing openings in them, shall be to the satisfaction of the Administration. Watertight ventilators and trunks shall be carried at least up to the bulkhead deck in passenger ships and up to the freeboard deck in cargo ships.
- 2 Where a ventilation trunk passing through a structure penetrates the bulkhead deck, the trunk shall be capable of withstanding the water pressure that may be present within the trunk, after having taken into account the maximum heel angle allowable during intermediate stages of flooding, in accordance with regulation 7-2.
- 3 Where all or part of the penetration of the bulkhead deck is on the main ro-ro deck, the trunk shall be capable of withstanding impact pressure due to internal water motions (sloshing) of water trapped on the ro-ro deck.
- 4 After completion, a hose or flooding test shall be applied to watertight decks and a hose test to watertight trunks, tunnels and ventilators.

Regulation 17
Internal watertight integrity of passenger ships above the bulkhead deck

- 1 The Administration may require that all reasonable and practicable measures shall be taken to limit the entry and spread of water above the bulkhead deck. Such measures may include partial bulkheads or webs. When partial watertight bulkheads and webs are

fitted on the bulkhead deck, above or in the immediate vicinity of watertight bulkheads, they shall have watertight shell and bulkhead deck connections so as to restrict the flow of water along the deck when the ship is in a heeled damaged condition. Where the partial watertight bulkhead does not line up with the bulkhead below, the bulkhead deck between shall be made effectively watertight. Where openings, pipes, scuppers, electric cables etc. are carried through the partial watertight bulkheads or decks within the immersed part of the bulkhead deck, arrangements shall be made to ensure the watertight integrity of the structure above the bulkhead deck.

2 All openings in the exposed weather deck shall have coamings of ample height and strength and shall be provided with efficient means for expeditiously closing them weathertight. Freeing ports, open rails and scuppers shall be fitted as necessary for rapidly clearing the weather deck of water under all weather conditions.

3 The open end of air pipes terminating within a superstructure shall be at least 1 m above the waterline when the ship heels to an angle of 15°, or the maximum angle of heel during intermediate stages of flooding, as determined by direct calculation, whichever is the greater. Alternatively, air pipes from tanks other than oil tanks may discharge through the side of the superstructure. The provisions of this paragraph are without prejudice to the provisions of the International Convention on Load Lines in force.

4 Sidescuttles, gangway, cargo and fuelling ports and other means for closing openings in the shell plating above the bulkhead deck shall be of efficient design and construction and of sufficient strength having regard to the spaces in which they are fitted and their positions relative to the deepest subdivision draught.

5 Efficient inside deadlights, so arranged that they can be easily and effectively closed and secured watertight, shall be provided for all sidescuttles to spaces below the first deck above the bulkhead deck.

Regulation 17-1
Integrity of the hull and superstructure, damage prevention
and control on ro-ro passenger ships

1.1 Subject to the provisions of paragraphs 1.2 and 1.3, all accesses that lead to spaces below the bulkhead deck shall have a lowest point which is not less than 2.5 m above the bulkhead deck.

1.2 Where vehicle ramps are installed to give access to spaces below the bulkhead deck, their openings shall be able to be closed weathertight to prevent ingress of water below, alarmed and indicated to the navigation bridge.

1.3 The Administration may permit the fitting of particular accesses to spaces below the bulkhead deck provided they are necessary for the essential working of the ship, e.g., the movement of machinery and stores, subject to such accesses being made watertight, alarmed and indicated on the navigation bridge.

2 Indicators shall be provided on the navigation bridge for all shell doors, loading doors and other closing appliances which, if left open or not properly secured, could, in the opinion of the Administration, lead to flooding of a special category space or ro-ro space. The indicator system shall be designed on the fail-safe principle and shall show by visual alarms if the door is not fully closed or if any of the securing arrangements are not in place and fully locked and by audible alarms if such door or closing appliances become

open or the securing arrangements become unsecured. The indicator panel on the navigation bridge shall be equipped with a mode selection function "harbour/sea voyage" so arranged that an audible alarm is given on the navigation bridge if the ship leaves harbour with the bow doors, inner doors, stern ramp or any other side shell doors not closed or any closing device not in the correct position. The power supply for the indicator system shall be independent of the power supply for operating and securing the doors.

3 Television surveillance and a water leakage detection system shall be arranged to provide an indication to the navigation bridge and to the engine control station of any leakage through inner and outer bow doors, stern doors or any other shell doors which could lead to flooding of special category spaces or ro-ro spaces.

PART B-3

SUBDIVISION LOAD LINE ASSIGNMENT FOR PASSENGER SHIPS

Regulation 18

Assigning, marking and recording of subdivision load lines for passenger ships

1 In order that the required degree of subdivision shall be maintained, a load line corresponding to the approved subdivision draught shall be assigned and marked on the ship's sides. A ship intended for alternating modes of operation may, if the owners desire, have one or more additional load lines assigned and marked to correspond with the subdivision draughts which the Administration may approve for the alternative service configurations. Each service configuration so approved shall comply with part B-1 of this chapter independently of the results obtained for other modes of operation.

2 The subdivision load lines assigned and marked shall be recorded in the Passenger Ship Safety Certificate, and shall be distinguished by the notation P1 for the principal passenger service configuration, and P2, P3, etc., for the alternative configurations. The principal passenger configuration shall be taken as the mode of operation in which the required subdivision index *R* will have the highest value.

3 The freeboard corresponding to each of these load lines shall be measured at the same position and from the same deck line as the freeboards determined in accordance with the International Convention on Load Lines in force.

4 The freeboard corresponding to each approved subdivision load line and the service configuration, for which it is approved, shall be clearly indicated on the Passenger Ship Safety Certificate.

5 In no case shall any subdivision load line mark be placed above the deepest load line in salt water as determined by the strength of the ship or the International Convention on Load Lines in force.

6 Whatever may be the position of the subdivision load line marks, a ship shall in no case be loaded so as to submerge the load line mark appropriate to the season and locality as determined in accordance with the International Convention on Load Lines in force.

7 A ship shall in no case be so loaded that when it is in salt water the subdivision load line mark appropriate to the particular voyage and service configuration is submerged.

PART B-4
STABILITY MANAGEMENT

Regulation 19
Damage control information

1 There shall be permanently exhibited, or readily available on the navigation bridge, for the guidance of the officer in charge of the ship, plans showing clearly for each deck and hold the boundaries of the watertight compartments, the openings therein with the means of closure and position of any controls thereof, and the arrangements for the correction of any list due to flooding. In addition, booklets containing the aforementioned information shall be made available to the officers of the ship.

2 Watertight doors in passenger ships permitted to remain open during navigation shall be clearly indicated in the ship's stability information.

3 General precautions to be included shall consist of a listing of equipment, conditions, and operational procedures, considered by the Administration to be necessary to maintain watertight integrity under normal ship operations.

4 Specific precautions to be included shall consist of a listing of elements (i.e. closures, security of cargo, sounding of alarms, etc.) considered by the Administration to be vital to the survival of the ship, passengers and crew.

5 In case of ships to which damage stability requirements of part B-1 apply, damage stability information shall provide the master a simple and easily understandable way of assessing the ship's survivability in all damage cases involving a compartment or group of compartments.

Regulation 20
Loading of passenger ships

1 On completion of loading of the ship and prior to its departure, the master shall determine the ship's trim and stability and also ascertain and record that the ship is in compliance with stability criteria in relevant regulations. The determination of the ship's stability shall always be made by calculation. The Administration may accept the use of an electronic loading and stability computer or equivalent means for this purpose.

2 Water ballast should not in general be carried in tanks intended for oil fuel. In ships in which it is not practicable to avoid putting water in oil fuel tanks, oily-water separating equipment to the satisfaction of the Administration shall be fitted, or other alternative means, such as discharge to shore facilities, acceptable to the Administration shall be provided for disposing of the oily-water ballast.

3 The provisions of this regulation are without prejudice to the provisions of the International Convention for the Prevention of Pollution from Ships in force.

Regulation 21

Periodical operation and inspection of watertight doors, etc., in passenger ships

- 1 Drills for the operating of watertight doors, sidescuttles, valves and closing mechanisms of scuppers, ash-chutes and rubbish-chutes shall take place weekly. In ships in which the voyage exceeds one week in duration a complete drill shall be held before leaving port, and others thereafter at least once a week during the voyage.
- 2 All watertight doors, both hinged and power-operated, in watertight bulkheads, in use at sea, shall be operated daily.
- 3 The watertight doors and all mechanisms and indicators connected therewith, all valves, the closing of which is necessary to make a compartment watertight, and all valves the operation of which is necessary for damage control cross connections shall be periodically inspected at sea at least once a week.
- 4 A record of all drills and inspections required by this regulation shall be entered in the log-book with an explicit record of any defects which may be disclosed.

Regulation 22

Prevention and control of water ingress, etc.

- 1 All watertight doors shall be kept closed during navigation except that they may be opened during navigation as specified in paragraphs 3 and 4. Watertight doors of a width of more than 1.2 m in machinery spaces as permitted by regulation 13.10 may only be opened in the circumstances detailed in that regulation. Any door which is opened in accordance with this paragraph shall be ready to be immediately closed.
- 2 Watertight doors located below the bulkhead deck having a maximum clear opening width of more than 1.2 m shall be kept closed when the ship is at sea, except for limited periods when absolutely necessary as determined by the Administration.
- 3 A watertight door may be opened during navigation to permit the passage of passengers or crew, or when work in the immediate vicinity of the door necessitates it being opened. The door must be immediately closed when transit through the door is complete or when the task which necessitated it being open is finished.
- 4 Certain watertight doors may be permitted to remain open during navigation only if considered absolutely necessary; that is, being open is determined essential to the safe and effective operation of the ship's machinery or to permit passengers normally unrestricted access throughout the passenger area. Such determination shall be made by the Administration only after careful consideration of the impact on ship operations and survivability. A watertight door permitted to remain thus open shall be clearly indicated in the ship's stability information and shall always be ready to be immediately closed.
- 5 Portable plates on bulkheads shall always be in place before the ship leaves port, and shall not be removed during navigation except in case of urgent necessity at the discretion of the master. The necessary precautions shall be taken in replacing them to ensure that the joints are watertight. Power-operated sliding watertight doors permitted in machinery spaces in accordance with regulation 13.10 shall be closed before the ship leaves port and shall remain closed during navigation except in case of urgent necessity at the discretion of the master.

6 Watertight doors fitted in watertight bulkheads dividing cargo between deck spaces in accordance with regulation 13.9.1 shall be closed before the voyage commences and shall be kept closed during navigation; the time of opening such doors in port and of closing them before the ship leaves port shall be entered in the logbook.

7 Gangway, cargo and fuelling ports fitted below the bulkhead deck shall be effectively closed and secured watertight before the ship leaves port, and shall be kept closed during navigation.

8 The following doors, located above the bulkhead deck, shall be closed and locked before the ship proceeds on any voyage and shall remain closed and locked until the ship is at its next berth:

- .1 cargo loading doors in the shell or the boundaries of enclosed superstructures;
- .2 bow visors fitted in positions as indicated in paragraph 8.1;
- .3 cargo loading doors in the collision bulkhead; and
- .4 ramps forming an alternative closure to those defined in paragraphs 8.1 to 8.3 inclusive.

9 Provided that where a door cannot be opened or closed while the ship is at the berth such a door may be opened or left open while the ship approaches or draws away from the berth, but only so far as may be necessary to enable the door to be immediately operated. In any case, the inner bow door must be kept closed.

10 Notwithstanding the requirements of paragraphs 8.1 and 8.4, the Administration may authorize that particular doors can be opened at the discretion of the master, if necessary for the operation of the ship or the embarking and disembarking of passengers when the ship is at safe anchorage and provided that the safety of the ship is not impaired.

11 The master shall ensure that an effective system of supervision and reporting of the closing and opening of the doors referred to in paragraph 8 is implemented.

12 The master shall ensure, before the ship proceeds on any voyage, that an entry in the log-book is made of the time of the last closing of the doors specified in paragraph 13 and the time of any opening of particular doors in accordance with paragraph 14.

13 Hinged doors, portable plates, sidescuttles, gangway, cargo and bunkering ports and other openings, which are required by these regulations to be kept closed during navigation, shall be closed before the ship leaves port. The time of closing and the time of opening (if permissible under these regulations) shall be recorded in such log-book as may be prescribed by the Administration.

14 Where in a between-decks, the sills of any of the sidescuttles referred to in regulation 15.3.2 are below a line drawn parallel to the bulkhead deck at side and having its lowest point 1.4 m plus 2.5% of the breadth of the ship above the water when the ship departs from any port, all the sidescuttles in that between-decks shall be closed watertight and locked before the ship leaves port, and they shall not be opened before the ship

arrives at the next port. In the application of this paragraph the appropriate allowance for fresh water may be made when applicable.

- .1 The time of opening such sidescuttles in port and of closing and locking them before the ship leaves port shall be entered in such log-book as may be prescribed by the Administration.
- .2 For any ship that has one or more sidescuttles so placed that the requirements of paragraph 14 would apply when it was floating at its deepest subdivision draught, the Administration may indicate the limiting mean draught at which these sidescuttles will have their sills above the line drawn parallel to the bulkhead deck at side, and having its lowest point 1.4 m plus 2.5% of the breadth of the ship above the waterline corresponding to the limiting mean draught, and at which it will therefore be permissible to depart from port without previously closing and locking them and to open them at sea on the responsibility of the master during the voyage to the next port. In tropical zones as defined in the International Convention on Load Lines in force, this limiting draught may be increased by 0.3 m.

15 Sidescuttles and their deadlights which will not be accessible during navigation shall be closed and secured before the ship leaves port.

16 If cargo is carried in spaces referred to in regulation 15.5.2, the sidescuttles and their deadlights shall be closed watertight and locked before the cargo is shipped and such closing and locking shall be recorded in such log-book as may be prescribed by the Administration.

17 When a rubbish-chute, etc., is not in use, both the cover and the valve required by regulation 15.10.2 shall be kept closed and secured.

Regulation 22-1
Flooding detection systems for passenger ships carrying 36 or more persons
constructed on or after 1 July 2010

A flooding detection system for watertight spaces below the bulkhead deck shall be provided based on the guidelines developed by the Organization.

Regulation 23
Special requirements for ro-ro passenger ships

1 Special category spaces and ro-ro spaces shall be continuously patrolled or monitored by effective means, such as television surveillance, so that any movement of vehicles in adverse weather conditions and unauthorized access by passengers thereto can be detected whilst the ship is underway.

2 Documented operating procedures for closing and securing all shell doors, loading doors and other closing appliances which, if left open or not properly secured, could, in the opinion of the Administration, lead to flooding of a special category space or ro-ro space, shall be kept on board and posted at an appropriate place.

3 All accesses from the ro-ro deck and vehicle ramps that lead to spaces below the bulkhead deck shall be closed before the ship leaves the berth on any voyage and shall remain closed until the ship is at its next berth.

4 The master shall ensure that an effective system of supervision and reporting of the closing and opening of such accesses referred to in paragraph 3 is implemented.

5 The master shall ensure, before the ship leaves the berth on any voyage, that an entry in the log-book, as required by regulation 22.13, is made of the time of the last closing of the accesses referred to in paragraph 3.

6 Notwithstanding the requirements of paragraph 3, the Administration may permit some accesses to be opened during the voyage, but only for a period sufficient to permit through passage and, if required, for the essential working of the ship.

7 All transverse or longitudinal bulkheads which are taken into account as effective to confine the seawater accumulated on the ro-ro deck shall be in place and secured before the ship leaves the berth and remain in place and secured until the ship is at its next berth.

8 Notwithstanding the requirements of paragraph 7, the Administration may permit some accesses within such bulkheads to be opened during the voyage but only for sufficient time to permit through passage and, if required, for the essential working of the ship.

9 In all ro-ro passenger ships, the master or the designated officer shall ensure that, without the expressed consent of the master or the designated officer, no passengers are allowed access to an enclosed ro-ro deck when the ship is under way.

Regulation 24

Prevention and control of water ingress, etc., in cargo ships

1 Openings in the shell plating below the deck limiting the vertical extent of damage shall be kept permanently closed while at sea.

2 Notwithstanding the requirements of paragraph 3, the Administration may authorize that particular doors may be opened at the discretion of the master, if necessary for the operation of the ship and provided that the safety of the ship is not impaired.

3 Watertight doors or ramps fitted to internally subdivide large cargo spaces shall be closed before the voyage commences and shall be kept closed during navigation; the time of opening such doors in port and of closing them before the ship leaves port shall be entered in the logbook.

4 The use of access doors and hatch covers intended to ensure the watertight integrity of internal openings shall be authorized by the officer of the watch.

Regulation 25

Water level detectors on single hold cargo ships other than bulk carriers

1 Single hold cargo ships other than bulk carriers constructed before 1 January 2007 shall comply with the requirements of this regulation not later than 31 December 2009.

2 Ships having a length (*L*) of less than 80 m, or 100 m if constructed before 1 July 1998, and a single cargo hold below the freeboard deck or cargo holds below the freeboard deck which are not separated by at least one bulkhead made watertight up to that deck, shall be fitted in such space or spaces with water level detectors.

3 The water level detectors required by paragraph 2 shall:

- .1 give an audible and visual alarm at the navigation bridge when the water level above the inner bottom in the cargo hold reaches a height of not less than 0.3 m, and another when such level reaches not more than 15% of the mean depth of the cargo hold; and
- .2 be fitted at the aft end of the hold, or above its lowest part where the inner bottom is not parallel to the designed waterline. Where webs or partial watertight bulkheads are fitted above the inner bottom, Administrations may require the fitting of additional detectors.

4 The water level detectors required by paragraph 2 need not be fitted in ships complying with regulation XII/12, or in ships having watertight side compartments each side of the cargo hold length extending vertically at least from inner bottom to freeboard deck.”

ANNEX 3

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

CHAPTER II-1 CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

PART D ELECTRICAL INSTALLATIONS

Regulation 41 – Main source of electrical power and lighting systems

- 1 The following new paragraph 6 is added after the existing paragraph 5:

“6 In passenger ships, supplementary lighting shall be provided in all cabins to clearly indicate the exit so that occupants will be able to find their way to the door. Such lighting, which may be connected to an emergency source of power or have a self-contained source of electrical power in each cabin, shall automatically illuminate when power to the normal cabin lighting is lost and remain on for a minimum of 30 min.”

- 2 The following new part F is added after the existing regulation 54:

“PART F ALTERNATIVE DESIGN AND ARRANGEMENTS

Regulation 55 Alternative design and arrangements

1 Purpose

The purpose of this regulation is to provide a methodology for alternative design and arrangements for machinery and electrical installations.

2 General

2.1 Machinery and electrical installation design and arrangements may deviate from the requirements set out in parts C, D and E, provided that the alternative design and arrangements meet the intent of the requirements concerned and provide an equivalent level of safety to this chapter.

2.2 When alternative design or arrangements deviate from the prescriptive requirements of parts C, D and E, an engineering analysis, evaluation and approval of the design and arrangements shall be carried out in accordance with this regulation.

3 Engineering analysis

The engineering analysis shall be prepared and submitted to the Administration, based on the guidelines developed by the Organization and shall include, as a minimum, the following elements:

- .1 determination of the ship type, machinery, electrical installations and space(s) concerned;

- .2 identification of the prescriptive requirement(s) with which the machinery and electrical installations will not comply;
- .3 identification of the reason the proposed design will not meet the prescriptive requirements supported by compliance with other recognized engineering or industry standards;
- .4 determination of the performance criteria for the ship, machinery, electrical installation or the space(s) concerned addressed by the relevant prescriptive requirement(s):
 - .1 performance criteria shall provide a level of safety not inferior to the relevant prescriptive requirements contained in parts C, D and E; and
 - .2 performance criteria shall be quantifiable and measurable;
- .5 detailed description of the alternative design and arrangements, including a list of the assumptions used in the design and any proposed operational restrictions or conditions;
- .6 technical justification demonstrating that the alternative design and arrangements meet the safety performance criteria; and
- .7 risk assessment based on identification of the potential faults and hazards associated with the proposal.

4 Evaluation of the alternative design and arrangements

- 4.1 The engineering analysis required in paragraph 3 shall be evaluated and approved by the Administration, taking into account the guidelines developed by the Organization.
- 4.2 A copy of the documentation, as approved by the Administration, indicating that the alternative design and arrangements comply with this regulation, shall be carried on board the ship.

5 Exchange of information

The Administration shall communicate to the Organization pertinent information concerning alternative design and arrangements approved by them for circulation to all Contracting Governments.

6 Re-evaluation due to change of conditions

If the assumptions and operational restrictions that were stipulated in the alternative design and arrangements are changed, the engineering analysis shall be carried out under the changed condition and shall be approved by the Administration.”

CHAPTER II-2 CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

Regulation 3 – Definitions

3 The following new paragraphs 51 and 52 are added after the existing paragraph 50:

“51 *Safe area in the context of a casualty* is, from the perspective of habitability, any area(s) which is not flooded or which is outside the main vertical zone(s) in which a fire has occurred such that it can safely accommodate all persons onboard to protect them from hazards to life or health and provide them with basic services.

52 *Safety centre* is a control station dedicated to the management of emergency situations. Safety systems’ operation, control and/or monitoring are an integral part of the safety centre.”

Regulation 7 – Detection and alarm

4 The following new paragraph 2.4 is added after the existing paragraph 2.3:

“2.4 A fixed fire detection and fire alarm system for passenger ships shall be capable of remotely and individually identifying each detector and manually operated call point.”

5 In paragraphs 5.2 and 5.3.1, the following new text is added at the end of the paragraphs:

“Detectors fitted in cabins, when activated, shall also be capable of emitting, or cause to be emitted, an audible alarm within the space where they are located.”

Regulation 8 – Control of smoke spread

6 In paragraph 2, the following new sentence is added at the end of the paragraph:

“The ventilation system serving safety centres may be derived from the ventilation system serving the navigation bridge, unless located in an adjacent main vertical zone.”

Regulation 9 – Containment of fire

7 In paragraph 2.2.3.2.2 (7), the words “Sale shops” are deleted.

8 In paragraph 2.2.3.2.2 (8), the words “Sale shops” are added.

9 In the notes for tables 9.3 and 9.4, the following sentence is added at the end of subscript “c”:

“No fire rating is required for those partitions separating the navigation bridge and the safety centre when the latter is within the navigation bridge.”

10 The following new paragraph 2.2.7 is added after paragraph 2.2.6:

“2.2.7 Protection of atriums

2.2.7.1 Atriums shall be within enclosures formed of “A” class divisions having a fire rating determined in accordance with tables 9.2 and 9.4, as applicable.

2.2.7.2 Decks separating spaces within atriums shall have a fire rating determined in accordance with tables 9.2 and 9.4, as applicable.”

11 The existing paragraph 7.5.1 is renumbered as paragraph 7.5.1.1 and the following new paragraph 7.5.1.2 is added thereafter:

“7.5.1.2 Exhaust ducts from ranges for cooking equipment installed on open decks shall conform to paragraph 7.5.1.1, as applicable, when passing through accommodation spaces or spaces containing combustible materials.”

12 The following new paragraph 7.6 is added after the existing paragraph 7.5.2.1:

“7.6 Ventilation systems for main laundries in ships carrying more than 36 passengers

Exhaust ducts from main laundries shall be fitted with:

- .1 filters readily removable for cleaning purposes;
- .2 a fire damper located in the lower end of the duct which is automatically and remotely operated;
- .3 remote-control arrangements for shutting off the exhaust fans and supply fans from within the space and for operating the fire damper mentioned in paragraph 7.6.2; and
- .4 suitably located hatches for inspection and cleaning.”

Regulation 10 – Fire fighting

13 In the first sentence of paragraph 6.4, between the words “equipment” and “shall”, the words “installed in enclosed spaces or on open decks” are added.

Regulation 13 – Means of escape

14 In paragraph 3.2.3, the words “public spaces” in the third sentence are deleted and the following new sentence is added before the fourth sentence:

“Public spaces may also have direct access to stairway enclosures except for the backstage of a theatre.”

15 The following new paragraph 3.2.5.3 is added after the existing paragraph 3.2.5.2:

“3.2.5.3 In lieu of the escape route lighting system required by paragraph 3.2.5.1, alternative evacuation guidance systems may be accepted if approved by the Administration based on the guidelines developed by the Organization.”

16 The following new regulations 21, 22 and 23 are added after the existing regulation 20:

“Regulation 21 Casualty threshold, safe return to port and safe areas

1 Application

Passenger ships constructed on or after 1 July 2010 having a length, as defined in regulation II-1/2.5, of 120 m or more or having three or more main vertical zones shall comply with the provisions of this regulation.

2 Purpose

The purpose of this regulation is to establish design criteria for a ship's safe return to port under its own propulsion after a casualty that does not exceed the casualty threshold stipulated in paragraph 3 and also provides functional requirements and performance standards for safe areas.

3 Casualty threshold

The casualty threshold, in the context of a fire, includes:

- .1 loss of space of origin up to the nearest “A” class boundaries, which may be a part of the space of origin, if the space of origin is protected by a fixed fire-extinguishing system; or
- .2 loss of the space of origin and adjacent spaces up to the nearest “A” class boundaries, which are not part of the space of origin.

4 Safe return to port

When fire damage does not exceed the casualty threshold indicated in paragraph 3, the ship shall be capable of returning to port while providing a safe area as defined in regulation 3.51. To be deemed capable of returning to port, the following systems shall remain operational in the remaining part of the ship not affected by fire:

- .1 propulsion;
- .2 steering systems and steering-control systems;
- .3 navigational systems;
- .4 systems for fill, transfer and service of fuel oil;
- .5 internal communication between the bridge, engineering spaces, safety centre, fire-fighting and damage control teams, and as required for passenger and crew notification and mustering;
- .6 external communication;
- .7 fire main system;
- .8 fixed fire-extinguishing systems;

- .9 fire and smoke detection system;
- .10 bilge and ballast system;
- .11 power-operated watertight and semi-watertight doors;
- .12 systems intended to support “safe areas” as indicated in paragraph 5.1.2;
- .13 flooding detection systems; and
- .14 other systems determined by the Administration to be vital to damage control efforts.

5 Safe area(s)

5.1 *Functional requirements:*

- .1 the safe area(s) shall generally be an internal space(s); however, the use of an external space as a safe area may be allowed by the Administration taking into account any restriction due to the area of operation and relevant expected environmental conditions;
- .2 the safe area(s) shall provide all occupants with the following basic services to ensure that the health of passengers and crew is maintained:
 - .1 sanitation;
 - .2 water;
 - .3 food;
 - .4 alternate space for medical care;
 - .5 shelter from the weather;
 - .6 means of preventing heat stress and hypothermia;
 - .7 light; and
 - .8 ventilation;
- .3 ventilation design shall reduce the risk of smoke and hot gases that could affect the use of the safe area(s); and
- .4 means of access to life-saving appliances shall be provided from each area identified or used as a safe area, taking into account that a main vertical zone may not be available for internal transit.

5.2 *Alternate space for medical care*

Alternate space for medical care shall conform to a standard acceptable to the Administration.

Regulation 22

Design criteria for systems to remain operational after a fire casualty

1 Application

Passenger ships constructed on or after 1 July 2010 having a length, as defined in regulation II-1/2.2, of 120 m or more or having three or more main vertical zones shall comply with the provisions of this regulation.

2 Purpose

The purpose of this regulation is to provide design criteria for systems required to remain operational for supporting the orderly evacuation and abandonment of a ship, if the casualty threshold, as defined in regulation 21.3, is exceeded.

3 Systems

3.1 In case any one main vertical zone is unserviceable due to fire, the following systems shall be so arranged and segregated as to remain operational:

- .1 fire main;
- .2 internal communications (in support of fire-fighting as required for passenger and crew notification and evacuation);
- .3 means of external communications;
- .4 bilge systems for removal of fire-fighting water;
- .5 lighting along escape routes, at assembly stations and at embarkation stations of life-saving appliances; and
- .6 guidance systems for evacuation shall be available.

3.2 The above systems shall be capable of operation for at least 3 h based on the assumption of no damage outside the unserviceable main vertical zone. These systems are not required to remain operational within the unserviceable main vertical zones.

3.3 Cabling and piping within a trunk constructed to an "A-60" standard shall be deemed to remain intact and serviceable while passing through the unserviceable main vertical zone for the purposes of paragraph 3.1. An equivalent degree of protection for cabling and piping may be approved by the Administration.

Regulation 23

Safety centre on passenger ships

1 Application

Passenger ships constructed on or after 1 July 2010 shall have on board a safety centre complying with the requirements of this regulation.

2 Purpose

The purpose of this regulation is to provide a space to assist with the management of emergency situations.

3 Location and arrangement

The safety centre shall either be a part of the navigation bridge or be located in a separate space adjacent, but having direct access, to the navigation bridge, so that the management of emergencies can be performed without distracting watch officers from their navigational duties.

4 Layout and ergonomic design

The layout and ergonomic design of the safety centre shall take into account the guidelines developed by the Organization, as appropriate.

5 Communications

Means of communication between the safety centre, the central control station, the navigation bridge, the engine control room, the storage room(s) for fire-extinguishing system(s) and fire equipment lockers shall be provided.

6 Control and monitoring of safety systems

Notwithstanding the requirements set out elsewhere in the Convention, the full functionality (operation, control, monitoring or any combination thereof, as required) of the safety systems listed below shall be available from the safety centre:

- .1 all powered ventilation systems;
- .2 fire doors;
- .3 general emergency alarm system;
- .4 public address system;
- .5 electrically powered evacuation guidance systems;
- .6 watertight and semi-watertight doors;
- .7 indicators for shell doors, loading doors and other closing appliances;
- .8 water leakage of inner/outer bow doors, stern doors and any other shell door;
- .9 television surveillance system;
- .10 fire detection and alarm system;
- .11 fixed fire-fighting local application system(s);
- .12 sprinkler and equivalent systems;

- .13 water-based fire-extinguishing systems for machinery spaces;
- .14 alarm to summon the crew;
- .15 atrium smoke extraction system;
- .16 flooding detection systems; and
- .17 fire pumps and emergency fire pumps.”

CHAPTER III LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Regulation 4 – Evaluation, testing and approval of life-saving appliances and arrangements

17 Paragraph 3 is replaced by the following:

“3 Before giving approval to novel life-saving appliances or arrangements, the Administration shall ensure that such:

- .1 appliances provide safety standards at least equivalent to the requirements of this chapter and the Code and have been evaluated and tested based on the guidelines developed by the Organization; or
- .2 arrangements have successfully undergone an engineering analysis, evaluation and approval in accordance with regulation 38.”

18 The following new part C is added after the existing regulation 37:

“PART C ALTERNATIVE DESIGN AND ARRANGEMENTS

Regulation 38 Alternative design and arrangements

1 Purpose

The purpose of this regulation is to provide a methodology for alternative design and arrangements for life-saving appliances and arrangements.

2 General

2.1 Life-saving appliances and arrangements may deviate from the requirements set out in part B, provided that the alternative design and arrangements meet the intent of the requirements concerned and provide an equivalent level of safety to this chapter.

2.2 When alternative design or arrangements deviate from the prescriptive requirements of part B, an engineering analysis, evaluation and approval of the design and arrangements shall be carried out in accordance with this regulation.

3 Engineering analysis

The engineering analysis shall be prepared and submitted to the Administration, based on the guidelines developed by the Organization and shall include, as a minimum, the following elements:

- .1 determination of the ship type and the life-saving appliance and arrangements concerned;
- .2 identification of the prescriptive requirement(s) with which the life-saving appliance and arrangements will not comply;
- .3 identification of the reason the proposed design will not meet the prescriptive requirements supported by compliance with other recognized engineering or industry standards;
- .4 determination of the performance criteria for the ship and the life-saving appliance and arrangements concerned addressed by the relevant prescriptive requirement(s):
 - .4.1 performance criteria shall provide a level of safety not inferior to the relevant prescriptive requirements contained in part B; and
 - .4.2 performance criteria shall be quantifiable and measurable;
- .5 detailed description of the alternative design and arrangements, including a list of the assumptions used in the design and any proposed operational restrictions or conditions;
- .6 technical justification demonstrating that the alternative design and arrangements meet the safety performance criteria; and
- .7 risk assessment based on identification of the potential faults and hazards associated with the proposal.

4 Evaluation of the alternative design and arrangements

4.1 The engineering analysis required in paragraph 3 shall be evaluated and approved by the Administration, taking into account the guidelines developed by the Organization.

4.2 A copy of the documentation, as approved by the Administration, indicating that the alternative design and arrangements comply with this regulation, shall be carried on board the ship.

5 Exchange of information

The Administration shall communicate to the Organization pertinent information concerning alternative design and arrangements approved by them for circulation to all Contracting Governments.

6 Re-evaluation due to change of conditions

If the assumptions and operational restrictions that were stipulated in the alternative design and arrangements are changed, the engineering analysis shall be carried out under the changed condition and shall be approved by the Administration.”

RESOLUTION MSC.216(82)
(adopted on 8 December 2006)

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

RESOLUTION MSC.256(84)

(adopted on 16 May 2008)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

RESOLUTION MSC.256(84)
(adopted on 16 May 2008)

**ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR
THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as “the Convention”), concerning the amendment procedure applicable to the Annex to the Convention, other than to the provisions of chapter I thereof,

HAVING CONSIDERED, at its eighty-fourth session, amendments to the Convention, proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the Convention, the text of which is set out in the Annex to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the said amendments shall be deemed to have been accepted on 1 July 2009, unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world’s merchant fleet, have notified their objections to the amendments;
3. INVITES SOLAS Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2010 upon their acceptance in accordance with paragraph 2 above;
4. RECOMMENDS the Contracting Governments concerned to issue certificates complying with the annexed amendments at the first renewal survey on or after 1 January 2010;
5. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;
6. FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its Annex to Members of the Organization, which are not Contracting Governments to the Convention.

ANNEX**AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED****CHAPTER II-1
CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY,
MACHINERY AND ELECTRICAL INSTALLATIONS****Regulation 3-4 – Emergency towing arrangements on tankers**

1 The existing regulation 3-4 is replaced by the following:

**“Regulation 3-4
Emergency towing arrangements and procedures****1 Emergency towing arrangements on tankers**

1.1 Emergency towing arrangements shall be fitted at both ends on board every tanker of not less than 20,000 tonnes deadweight.

1.2 For tankers constructed on or after 1 July 2002:

- .1 the arrangements shall, at all times, be capable of rapid deployment in the absence of main power on the ship to be towed and easy connection to the towing ship. At least one of the emergency towing arrangements shall be pre-rigged ready for rapid deployment; and
- .2 emergency towing arrangements at both ends shall be of adequate strength taking into account the size and deadweight of the ship, and the expected forces during bad weather conditions. The design and construction and prototype testing of emergency towing arrangements shall be approved by the Administration, based on the Guidelines developed by the Organization.

1.3 For tankers constructed before 1 July 2002, the design and construction of emergency towing arrangements shall be approved by the Administration, based on the Guidelines developed by the Organization.

2 Emergency towing procedures on ships

2.1 This paragraph applies to:

- .1 all passenger ships, not later than 1 January 2010;
- .2 cargo ships constructed on or after 1 January 2010; and
- .3 cargo ships constructed before 1 January 2010, not later than 1 January 2012.

2.2 Ships shall be provided with a ship-specific emergency towing procedure. Such a procedure shall be carried aboard the ship for use in emergency situations and shall be based on existing arrangements and equipment available on board the ship.

2.3 The procedure shall include:

- .1 drawings of fore and aft deck showing possible emergency towing arrangements;
- .2 inventory of equipment on board that can be used for emergency towing;
- .3 means and methods of communication; and
- .4 sample procedures to facilitate the preparation for and conducting of emergency towing operations.”

2 The following new regulation 3-9 is added after the existing regulation 3-8:

“Regulation 3-9

Means of embarkation on and disembarkation from ships

1 Ships constructed on or after 1 January 2010 shall be provided with means of embarkation on and disembarkation from ships for use in port and in port-related operations, such as gangways and accommodation ladders, in accordance with paragraph 2, unless the Administration deems that compliance with a particular provision is unreasonable or impractical.

2 The means of embarkation and disembarkation required in paragraph 1 shall be constructed and installed based on the guidelines developed by the Organization.

3 For all ships the means of embarkation and disembarkation shall be inspected and maintained in suitable condition for their intended purpose, taking into account any restrictions related to safe loading. All wires used to support the means of embarkation and disembarkation shall be maintained as specified in regulation III/20.4.”

CHAPTER II-2

**CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND
FIRE EXTINCTION**

Regulation 10 – Fire fighting

3 The following new paragraph 4.1.5 is added after the existing paragraph 4.1.4:

“4.1.5 By the first scheduled dry-docking after 1 January 2010, fixed carbon dioxide fire-extinguishing systems for the protection of machinery spaces and cargo pump-rooms on ships constructed before 1 July 2002 shall comply with the provisions of paragraph 2.2.2 of chapter 5 of the Fire Safety Systems Code.”

Regulation 19 – Carriage of dangerous goods

4 In paragraph 4, the words “, as defined in regulation VII/2,” are deleted.

Regulation 20 – Protection of vehicle, special category and ro-ro spaces

5 The existing paragraph 6.1.4 is replaced by the following paragraph 6.1.4 and new paragraph 6.1.5 is added after paragraph 6.1.4 as follows:

“6.1.4 The requirement of this paragraph shall apply to ships constructed on or after 1 January 2010. Ships constructed on or after 1 July 2002 and before 1 January 2010 shall comply with the previously applicable requirements of paragraph 6.1.4, as amended by resolution MSC.99(73). When fixed pressure water spraying systems are fitted, in view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or decks during the operation of the fixed pressure water-spraying system, the following arrangements shall be provided:

- .1 in passenger ships:
 - .1.1 in the spaces above the bulkhead deck, scuppers shall be fitted so as to ensure that such water is rapidly discharged directly overboard, taking into account the guidelines developed by the Organization;
 - .1.2.1 in ro-ro passenger ships, discharge valves for scuppers, fitted with positive means of closing operable from a position above the bulkhead deck in accordance with the requirements of the International Convention on Load Lines in force, shall be kept open while the ships are at sea;
 - .1.2.2 any operation of valves referred to in paragraph 6.1.4.1.2.1 shall be recorded in the log-book;
 - .1.3 in the spaces below the bulkhead deck, the Administration may require pumping and drainage facilities to be provided additional to the requirements of regulation II-1/35-1. In such case, the drainage system shall be sized to remove no less than 125% of the combined capacity of both the water-spraying system pumps and the required number of fire hose nozzles, taking into account the guidelines developed by the Organization. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of not more than 40 m in each watertight compartment;
- .2 in cargo ships, the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. In such case, the drainage system shall be sized to remove no less than 125% of the combined capacity of both the water-spraying system pumps and the required number of fire hose nozzles, taking into account the guidelines developed by the Organization. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of not more than 40 m in each watertight compartment. If this is not possible, the adverse effect upon stability of the added weight and free surface of water

shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information. Such information shall be included in the stability information supplied to the master as required by regulation II-1/5-1.

6.1.5 On all ships, for closed vehicles and ro-ro spaces and special category spaces, where fixed pressure water-spraying systems are fitted, means shall be provided to prevent the blockage of drainage arrangements, taking into account the guidelines developed by the Organization. Ships constructed before 1 January 2010 shall comply with the requirements of this paragraph by the first survey after 1 January 2010.”

CHAPTER III LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Regulation 6 – Communications

6 The existing paragraph 2.2 is replaced by the following:

“2.2 Search and rescue locating devices

At least one search and rescue locating device shall be carried on each side of every passenger ship and of every cargo ship of 500 gross tonnage and upwards. At least one search and rescue locating device shall be carried on every cargo ship of 300 gross tonnage and upwards but less than 500 gross tonnage. Such search and rescue locating devices shall conform to the applicable performance standards not inferior to those adopted by the Organization. The search and rescue locating devices shall be stowed in such location that they can be rapidly placed in any survival craft other than the liferaft or liferafts required by regulation 31.1.4. Alternatively one search and rescue locating device shall be stowed in each survival craft other than those required by regulation 31.1.4. On ships carrying at least two search and rescue locating devices and equipped with free-fall lifeboats one of the search and rescue locating devices shall be stowed in a free-fall lifeboat and the other located in the immediate vicinity of the navigation bridge so that it can be utilized on board and ready for transfer to any of the other survival craft.”

Regulation 26 – Additional requirements for ro-ro passenger ships

7 The existing paragraph 2.5 is replaced by the following:

“2.5 Liferafts carried on ro-ro passenger ships shall be fitted with a search and rescue locating device in the ratio of one search and rescue locating device for every four liferafts. The search and rescue locating device shall be mounted inside the liferaft so its antenna is more than one metre above the sea level when the liferaft is deployed, except that for canopied reversible liferafts the search and rescue locating device shall be so arranged as to be readily accessed and erected by survivors. Each search and rescue locating device shall be arranged to be manually erected when the liferaft is deployed. Containers of liferafts fitted with search and rescue locating devices shall be clearly marked.”

CHAPTER IV RADIOCOMMUNICATIONS

Regulation 7 – Radio equipment: General

8 In paragraph 1, subparagraph .3 is replaced by the following:

“.3 a search and rescue locating device capable of operating either in the 9 GHz band or on frequencies dedicated for AIS, which:”

APPENDIX CERTIFICATES

Record of Equipment for Passenger Ship Safety Certificate (Form P)

9 In the Record of Equipment for Passenger Ship Safety Certificate (Form P), in section 2, the existing item 11.1 is replaced by the following:

“11.1 Number of search and rescue locating devices
11.1.1 Radar search and rescue transponders (SART)
11.1.2 AIS search and rescue transmitters (AIS-SART)”

and in section 3, the existing item 6 is replaced by the following:

“6 Ship’s search and rescue locating device
6.1 Radar search and rescue transponder (SART)
6.2 AIS search and rescue transmitter (AIS-SART)”

Record of Equipment for Cargo Ship Safety Equipment Certificate (Form E)

10 In the Record of Equipment for Cargo Ship Safety Equipment Certificate (Form E), in section 2, the existing item 9.1 is replaced by the following:

“9.1 Number of search and rescue locating devices
9.1.1 Radar search and rescue transponders (SART)
9.1.2 AIS search and rescue transmitters (AIS-SART)”

Record of Equipment for Cargo Ship Radio Certificate (Form R)

11 In the Record of Equipment for Cargo Ship Safety Radio Certificate (Form R), in section 2, the existing item 6 is replaced by the following:

“6 Ship’s search and rescue locating device
6.1 Radar search and rescue transponder (SART)
6.2 AIS search and rescue transmitter (AIS-SART)”

Record of Equipment for the Nuclear Passenger Ship Safety Certificate (Form PNUC)

12 In the Record of Equipment for Nuclear Passenger Ship Safety Certificate (Form PNUC), in section 2, the existing item 11.1 is replaced by the following:

- “11.1 Number of search and rescue locating devices
- 11.1.1 Radar search and rescue transponders (SART)
- 11.1.2 AIS search and rescue transmitters (AIS-SART)”,

and in section 3, the existing item 6 is replaced by the following:

- “6 Ship’s search and rescue locating device
- 6.1 Radar search and rescue transponder (SART)
- 6.2 AIS search and rescue transmitter (AIS-SART)”.

Record of Equipment for the Nuclear Cargo Ship Safety Certificate (Form CNUC)

13 In the Record of Equipment for Nuclear Cargo Ship Safety Certificate (Form CNUC), in section 2, item 9 is deleted and items 10, 10.1 and 10.2 are renumbered as items 9, 9.1 and 9.2 respectively; and the renumbered item 9.1 is replaced by the following:

- “9.1 Number of search and rescue locating devices
- 9.1.1 Radar search and rescue transponders (SART)
- 9.1.2 AIS search and rescue transmitters (AIS-SART)”,

and in section 3, the existing item 6 is replaced by the following:

- “6 Ship’s search and rescue locating device
- 6.1 Radar search and rescue transponder (SART)
- 6.2 AIS search and rescue transmitter (AIS-SART)”.

RESOLUTION MSC.256(84)

(adopted on 16 May 2008)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

RESOLUTION MSC.269(85)
(adopted on 4 December 2008)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR
THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

RESOLUTION MSC.269(85)
(adopted on 4 December 2008)

**ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR
THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as "the Convention"), concerning the amendment procedure applicable to the Annex to the Convention, other than to the provisions of chapter I thereof,

HAVING CONSIDERED, at its eighty-fifth session, amendments to the Convention, proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the Convention, the text of which is set out in Annexes 1 and 2 to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that:
 - (a) the said amendments, set out in Annex 1, shall be deemed to have been accepted on 1 January 2010; and
 - (b) the said amendments, set out in Annex 2, shall be deemed to have been accepted on 1 July 2010,

unless, prior to those dates, more than one third of the Contracting Governments to the Convention or Contracting Governments, the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3. INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention:
 - (a) the amendments, set out in Annex 1, shall enter into force on 1 July 2010; and
 - (b) the amendments, set out in Annex 2, shall enter into force on 1 January 2011,

upon their acceptance in accordance with paragraph 2 above;

4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in Annexes 1 and 2 to all Contracting Governments to the Convention;

5. FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its Annexes 1 and 2 to Members of the Organization, which are not Contracting Governments to the Convention.

ANNEX 1

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

CHAPTER II-1 CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

Part A General

Regulation 2 – Definitions

1 The following new paragraph 27 is added after the existing paragraph 26:

“27 *2008 IS Code* means the International Code on Intact Stability, 2008, consisting of an introduction, part A (the provisions of which shall be treated as mandatory) and part B (the provisions of which shall be treated as recommendatory), as adopted by resolution MSC.267(85), provided that:

- .1 amendments to the introduction and part A of the Code are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I thereof; and
- .2 amendments to part B of the Code are adopted by the Maritime Safety Committee in accordance with its Rules of Procedure.”

Part B-1 Stability

Regulation 5 – Intact stability information

2 In the existing title of the regulation, the word “information” is deleted.

3 In paragraph 1, the following new sentence is added after the existing sentence:

“In addition to any other applicable requirements of the present regulations, ships having a length of 24 m and upwards constructed on or after 1 July 2010 shall as a minimum comply with the requirements of part A of the 2008 IS Code.”

CHAPTER II-2 CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

Part A General

Regulation 1 – Application

4 The following new paragraph 2.3 is added:

“2.3 Ships constructed on or after 1 July 2002 and before 1 July 2010 shall comply with paragraphs 7.1.1, 7.4.4.2, 7.4.4.3 and 7.5.2.1.2 of regulation 9, as adopted by resolution MSC.99(73).”

Part C Suppression of fire

Regulation 9 – Containment of fire

5 The last sentence of paragraph 4.1.1.2 is moved to a new separate paragraph 4.1.1.3 and the existing following paragraphs are renumbered accordingly.

6 The following text is added at the end of paragraph 4.1.1.2:

“Doors approved without the sill being part of the frame, which are installed on or after 1 July 2010, shall be installed such that the gap under the door does not exceed 12 mm. A non-combustible sill shall be installed under the door such that floor coverings do not extend beneath the closed door.”

7 The following text is added at the end of paragraph 4.1.2.1:

“Doors approved without the sill being part of the frame, which are installed on or after 1 July 2010, shall be installed such that the gap under the door does not exceed 25 mm.”

8 In paragraph 4.2.1, the following text is added after the first sentence:

“Doors approved as “A” class without the sill being part of the frame, which are installed on or after 1 July 2010, shall be installed such that the gap under the door does not exceed 12 mm and a non-combustible sill shall be installed under the door such that floor coverings do not extend beneath the closed door. Doors approved as “B” class without the sill being part of the frame, which are installed on or after 1 July 2010, shall be installed such that the gap under the door does not exceed 25 mm.”

9 In paragraph 7.1.1, in the first and second sentences, the words “non-combustible” are replaced by the words “steel or equivalent”.

10 At the beginning of paragraph 7.1.1.1, the words “subject to paragraph 7.1.1.2” are added and the word “a” before the word “material” is replaced by the word “any”.

11 The following new subparagraph .2 is added after the existing paragraph 7.1.1.1 and the existing subsequent subparagraphs are renumbered accordingly:

“.2 on ships constructed on or after 1 July 2010, the ducts shall be made of heat resisting non-combustible material, which may be faced internally and externally with membranes having low flame-spread characteristics and, in each case, a calorific value not exceeding 45 MJ/m² of their surface area for the thickness used;”

12 In paragraph 7.4.4.2, the words “non-combustible” are replaced by the words “steel or equivalent”.

13 In paragraph 7.4.4.3, the words “non-combustible” are replaced by the words “steel or equivalent”.

14 At the beginning of paragraph 7.4.4.3.1, the words “subject to paragraph 7.4.4.3.2” are added and the word “a” before the word “material” is replaced by the word “any”.

15 The following new subparagraph .3.2 is added after the existing paragraph 7.4.4.3.1 and the existing subsequent subparagraphs are renumbered accordingly:

“.3.2 on ships constructed on or after 1 July 2010, the ducts shall be made of heat resisting non-combustible material, which may be faced internally and externally with membranes having low flame-spread characteristics and, in each case, a calorific value not exceeding 45 MJ/m² of their surface area for the thickness used;”

16 At the end of paragraph 7.5.2.1.2, the words “and, in addition, a fire damper in the upper end of the duct” are added.

Regulation 10 – Fire fighting

17 The following new paragraph 10.2.6 is inserted after the existing paragraph 10.2.5:

“10.2.6 Passenger ships carrying more than 36 passengers constructed on or after 1 July 2010 shall be fitted with a suitably located means for fully recharging breathing air cylinders, free from contamination. The means for recharging shall be either:

- .1 breathing air compressors supplied from the main and emergency switchboard, or independently driven, with a minimum capacity of 60 l/min per required breathing apparatus, not to exceed 420 l/min; or
- .2 self-contained high-pressure storage systems of suitable pressure to recharge the breathing apparatus used on board, with a capacity of at least 1,200 l per required breathing apparatus, not to exceed 50,000 l of free air.”

ANNEX 2

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

CHAPTER II-2 CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

Part A General

Regulation 1 – Application

1 The following new paragraph 2.4 is added after the existing paragraph 2.3:

“2.4 The following ships, with cargo spaces intended for the carriage of packaged dangerous goods, shall comply with regulation 19.3, except when carrying dangerous goods specified as classes 6.2 and 7 and dangerous goods in limited quantities and excepted quantities in accordance with tables 19.1 and 19.3, not later than the date of the first renewal survey on or after the 1 January 2011:

- .1 cargo ships of 500 gross tonnage and upwards and passenger ships constructed on or after 1 September 1984 but before 1 January 2011; and
- .2 cargo ships of less than 500 gross tonnage constructed on or after 1 February 1992 but before 1 January 2011,

and notwithstanding these provisions:

- .3 cargo ships of 500 gross tonnage and upwards and passenger ships constructed on or after 1 September 1984 but before 1 July 1986 need not comply with regulation 19.3.3 provided that they comply with regulation 54.2.3 as adopted by resolution MSC.1(XLV);
- .4 cargo ships of 500 gross tonnage and upwards and passenger ships constructed on or after 1 July 1986 but before 1 February 1992 need not comply with regulation 19.3.3 provided that they comply with regulation 54.2.3 as adopted by resolution MSC.6(48);
- .5 cargo ships of 500 gross tonnage and upwards and passenger ships constructed on or after 1 September 1984 but before 1 July 1998 need not comply with regulations 19.3.10.1 and 19.3.10.2; and
- .6 cargo ships of less than 500 gross tonnage constructed on or after 1 February 1992 but before 1 July 1998 need not comply with regulations 19.3.10.1 and 19.3.10.2.”

Part E
Operational requirements

Regulation 16 – Operations

2 In paragraph 2.1, the reference to “the Code of Safe Practice for Solid Bulk Cargoes” is replaced by the reference to “the International Maritime Solid Bulk Cargoes (IMSBC) Code”.

Part G
Special requirements

Regulation 19 – Carriage of dangerous goods

3 The existing note 1 to table 19.1 is replaced by the following:

“¹ For classes 4 and 5.1 solids not applicable to closed freight containers. For classes 2, 3, 6.1 and 8 when carried in closed freight containers, the ventilation rate may be reduced to not less than two air changes per hour. For classes 4 and 5.1 liquids when carried in closed freight containers, the ventilation rate may be reduced to not less than two air changes per hour. For the purpose of this requirement, a portable tank is a closed freight container.”

4 In note 10 to table 19.2, the words “the Code of Safe Practice for Solid Bulk Cargoes, adopted by resolution A.434(XI)” are replaced by the words “the International Maritime Solid Bulk Cargoes (IMSBC) Code”.

5 The existing table 19.3 is replaced by the following table:

“Table 19.3 – Application of the requirements to different classes of dangerous goods except solid dangerous goods in bulk

Class	Regulation 19																							
	1.1 to 1.6	1.4S	2.1	2.2	2.3 flammable ²⁰	2.3 non-flammable	3 FP ¹⁵ < 23°C	3 FP ¹⁵ ≥ 23°C to ≤ 60°C	4.1	4.2	4.3 liquids ²¹	4.3 solids	5.1	5.2 ¹⁶	6.1 liquids FP ¹⁵ < 23°C	6.1 liquids FP ¹⁵ ≥ 23°C to ≤ 60°C	6.1 liquids	6.1 solids	8 liquids FP ¹⁵ < 23°C	8 liquids FP ¹⁵ ≥ 23°C to ≤ 60°C	8 liquids	8 solids	9	
3.1.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.1.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
3.1.3	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.1.4	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.2	X	-	X	-	X	-	X	-	-	-	X ¹⁸	-	-	-	X	-	-	-	X	-	-	-	X ¹⁷	
3.3	X	X	X	X	-	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	X	-
3.4.1	-	-	X	-	-	X	X	-	X ¹¹	X ¹¹	X	X	X ¹¹	-	X	X	-	X ¹¹	X	X	-	-	X ¹¹	
3.4.2	-	-	X	-	-	-	X	-	-	-	-	-	-	-	X	-	-	-	X	-	-	-	X ¹⁷	
3.5	-	-	-	-	-	-	X	-	-	-	-	-	-	-	X	X	X	-	X	X ¹⁹	X ¹⁹	-	-	
3.6	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X ¹⁴
3.7	-	-	-	-	-	-	X	X	X	X	X	X	X	-	X	X	-	-	X	X	-	-	-	
3.8	X ¹²	-	X	X	X	X	X	X	X	X	X	X	X ¹³	X	X	X	-	-	X	X	-	-	-	
3.9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.10.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.10.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

¹¹ When “mechanically-ventilated spaces” are required by the IMDG Code.

¹² Stow 3 m horizontally away from the machinery space boundaries in all cases.

¹³ Refer to the IMDG Code.

¹⁴ As appropriate for the goods to be carried.

¹⁵ FP means flashpoint.

¹⁶ Under the provisions of the IMDG Code, stowage of class 5.2 dangerous goods under deck or in enclosed ro-ro spaces is prohibited.

¹⁷ Only applicable to dangerous goods evolving flammable vapour listed in the IMDG Code.

- ¹⁸ Only applicable to dangerous goods having a flashpoint less than 23°C listed in the IMDG Code.
- ¹⁹ Only applicable to dangerous goods having a subsidiary risk class 6.1.
- ²⁰ Under the provisions of the IMDG Code, stowage of class 2.3 having subsidiary risk class 2.1 under deck or in enclosed ro-ro spaces is prohibited.
- ²¹ Under the provisions of the IMDG Code, stowage of class 4.3 liquids having a flashpoint less than 23°C under deck or in enclosed ro-ro spaces is prohibited.”
- 6 In paragraph 2.1, after the words “except when carrying dangerous goods in limited quantities”, the following words are added:
“and excepted quantities”.
- 7 In paragraph 3.4, the existing title is replaced as follows:
“3.4 *Ventilation arrangement*”.
- 8 The following text is added at the end of the first sentence of paragraph 3.6.1:
“and shall be selected taking into account the hazards associated with the chemicals being transported and the standards developed by the Organization according to the class and physical state.”
- 9 At the end of paragraph 4, the words “and excepted quantities” are added.

CHAPTER VI CARRIAGE OF CARGOES

Part A General provisions

- 10 The following new regulations 1-1 and 1-2 are added after the existing regulation 1:

“Regulation 1-1 Definitions

For the purpose of this chapter, unless expressly provided otherwise, the following definitions shall apply:

1 *IMSBC Code* means the International Maritime Solid Bulk Cargoes (IMSBC) Code adopted by the Maritime Safety Committee of the Organization by resolution MSC.268(85), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I.

2 *Solid bulk cargo* means any cargo, other than liquid or gas, consisting of a combination of particles, granules or any larger pieces of material generally uniform in composition, which is loaded directly into the cargo spaces of a ship without any intermediate form of containment.

Regulation 1-2

Requirements for the carriage of solid bulk cargoes other than grain

The carriage of solid bulk cargoes other than grain shall be in compliance with the relevant provisions of the IMSBC Code.”

Regulation 2 – Cargo information

11 The existing subparagraph .2 of paragraph 2 is replaced by the following:

“.2 in the case of solid bulk cargo, information as required by section 4 of the IMSBC Code.”

12 The existing paragraph 2.3 is deleted.

Regulation 3 – Oxygen analysis and gas detection equipment

13 In paragraph 1, the word “solid” is inserted in the first sentence, after the words “When transporting a”.

Part B

Special provisions for bulk cargoes other than grain

14 The title of part B is replaced as follows:

“Special provisions for solid bulk cargoes”

Regulation 6 – Acceptability for shipment

15 In existing paragraph 1, the word “solid” is inserted in the first sentence after the words “Prior to loading a”.

16 The existing paragraphs 2 and 3 are deleted.

Regulation 7 – Loading, unloading and stowage of bulk cargoes

- 17 In the heading of the regulation, the word “solid” is inserted after the words “stowage of”.
- 18 The existing paragraphs 4 and 5 are deleted and the subsequent paragraphs are renumbered accordingly.

**CHAPTER VII
CARRIAGE OF DANGEROUS GOODS**

**Part A-1
Carriage of dangerous goods in solid form in bulk**

Regulation 7-1 – Application

- 19 In paragraph 3 of the regulation, the words “detailed instructions on the safe carriage of dangerous goods in solid form in bulk which shall include” are deleted.
- 20 The following new regulation 7-5 is inserted after regulation 7-4:

**“Regulation 7-5
Requirements for the carriage of dangerous goods in solid form in bulk**

The carriage of dangerous goods in solid form in bulk shall be in compliance with the relevant provisions of the IMSBC Code, as defined in regulation VI/1-1.1.”

RESOLUTION MSC.269(85)
(adopted on 4 December 2008)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR
THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

ANEXO 5

**RESOLUCIÓN MSC.291(87)
(adoptada el 21 de mayo de 2010)**

**ADOPCIÓN DE ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO ASIMISMO el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar (SOLAS), 1974 (en adelante denominado "el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, excepto las disposiciones de su capítulo I,

HABIENDO EXAMINADO, en su 87º periodo de sesiones, enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del mismo,

1. ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;
2. DECIDE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que las enmiendas se considerarán aceptadas el 1 de julio de 2011, a menos que, antes de dicha fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del tonelaje bruto de la flota mercante mundial hayan notificado que recusan las enmiendas;
3. INVITA a los Gobiernos Contratantes del Convenio a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del mismo, las enmiendas entrarán en vigor el 1 de enero de 2012, una vez aceptadas de conformidad con lo dispuesto en el párrafo 2 anterior;
4. PIDE al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;
5. PIDE ADEMÁS al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no sean Gobiernos Contratantes del Convenio.

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO II-1
CONSTRUCCIÓN – ESTRUCTURA, COMPARTIMENTADO Y ESTABILIDAD,
INSTALACIONES DE MÁQUINAS E INSTALACIONES ELÉCTRICAS

Parte A-1
Estructura de los buques

- 1 Se añade la siguiente nueva regla 3-11 a continuación de la regla 3-10 existente:

"Regla 3-11

**Protección contra la corrosión de los tanques de carga de hidrocarburos
de los petroleros para crudos**

1 El párrafo 3 se aplicará a los petroleros para crudos*, tal como se definen éstos en la regla 1 del Anexo I del Convenio internacional para prevenir la contaminación por los buques, 1973, modificado por el Protocolo de 1978, de peso muerto igual o superior a 5 000 toneladas:

- .1 cuyo contrato de construcción se adjudique el 1 de enero de 2013 o posteriormente; o
- .2 en ausencia de un contrato de construcción, cuya quilla se coloque, o cuya construcción se halle en una fase equivalente, el 1 de julio de 2013 o posteriormente; o
- .3 cuya entrega tenga lugar el 1 de enero de 2016 o posteriormente.

2 El párrafo 3 no se aplicará a los buques de carga combinados ni a los buques tanque quimiqueros, tal como se definen éstos en la regla 1 de los Anexos I y II, respectivamente, del Convenio internacional para prevenir la contaminación por los buques, 1973, modificado por el Protocolo de 1978. A los efectos de la presente regla, los buques tanque quimiqueros incluirán igualmente los buques tanque quimiqueros certificados para transportar hidrocarburos.

3 Todos los tanques de carga de hidrocarburos de los petroleros para crudos:

- .1 se revestirán durante la construcción del buque de conformidad con lo dispuesto en la Norma de rendimiento de los revestimientos protectores de los tanques de carga de hidrocarburos de los petroleros para crudos, adoptada por el Comité de Seguridad Marítima mediante la resolución MSC.288(87), según sea enmendada por la Organización, a condición de que tales enmiendas se adopten y hagan entrar en vigor de conformidad con lo dispuesto en el artículo VIII del presente Convenio respecto de los procedimientos de enmienda aplicables al anexo, con excepción del capítulo I; o

.2 se protegerán con otros medios de protección contra la corrosión o utilizando material resistente a la corrosión para mantener la integridad estructural requerida durante 25 años con arreglo a lo dispuesto en la Norma de rendimiento de los medios alternativos de protección contra la corrosión de los tanques de carga de hidrocarburos de los petroleros para crudos, adoptada por el Comité de Seguridad Marítima mediante la resolución MSC.289(87), según sea enmendada por la Organización, a condición de que tales enmiendas se adopten y hagan entrar en vigor de conformidad con lo dispuesto en el artículo VIII del presente Convenio respecto de los procedimientos de enmienda aplicables al anexo, con excepción del capítulo I.

4 La Administración podrá eximir a un petrolero para crudos del cumplimiento de las prescripciones del párrafo 3 para permitir que se utilicen prototipos innovadores como alternativa al sistema de revestimiento especificado en el párrafo 3.1, con carácter experimental, a condición de que dichos prototipos se sometan a controles adecuados, y a evaluaciones periódicas y que se reconozca la necesidad de adoptar medidas correctivas inmediatas si el sistema falla o parece fallar. Dicha exención se registrará en un certificado de exención.

5 La Administración podrá eximir a un petrolero para crudos del cumplimiento de las prescripciones del párrafo 3, si el buque está construido para que se dedique exclusivamente al transporte y la manipulación de cargas que no provoquen corrosión^{**}. Dicha exención y las condiciones para las que se concede se registrarán en un certificado de exención.

* Véanse los puntos 1.11.1 ó 1.11.4 del Suplemento del Certificado internacional de prevención de la contaminación por hidrocarburos (Modelo B)

** Véanse las directrices que elaborará la Organización."

CAPÍTULO II-2 CONSTRUCCIÓN – PREVENCIÓN, DETECCIÓN Y EXTINCIÓN DE INCENDIOS

Parte A Generalidades

Regla 1 – Ámbito de aplicación

2 En el apartado .4 del párrafo 2.2, se suprime la palabra "y"; en el apartado .5 se añade la palabra "y" al final, y se añade el siguiente nuevo apartado .6 a continuación del apartado .5:

"6 la regla 4.5.7.1."

Parte B
Prevención de incendios y explosiones

Regla 4 – Probabilidad de ignición

3 Se sustituye el párrafo 5.7 por el siguiente:

"5.7 Medición y detección de los gases

5.7.1 Instrumentos portátiles

Los buques tanque dispondrán, como mínimo, de un instrumento portátil para medir el oxígeno y otro para medir las concentraciones de vapores inflamables, así como de suficientes piezas de respeto. Se facilitarán los medios adecuados para calibrar dichos instrumentos.

5.7.2 Disposiciones para la medición de los gases en los espacios del doble casco y del doble fondo

5.7.2.1 Se dispondrá de instrumentos portátiles adecuados para medir las concentraciones de oxígeno y de vapores inflamables en los espacios del doble casco y del doble fondo. Al elegir dichos instrumentos, se tendrá debidamente en cuenta su utilización en combinación con los sistemas fijos de conductos de muestreo de gases a que se hace referencia en el párrafo 5.7.2.2.

5.7.2.2 Cuando la atmósfera de los espacios del doble casco no se pueda medir de forma fiable utilizando tuberías flexibles de muestreo de gases, dichos espacios estarán provistos de conductos permanentes de muestreo de gases. La configuración de tales conductos de muestreo de gases se adaptará al proyecto de dichos espacios.

5.7.2.3 Los materiales de construcción y las dimensiones de los conductos de muestreo de gases serán tales que impidan que se formen obstrucciones. Cuando se utilicen materiales plásticos, éstos deberán ser conductores de electricidad.

5.7.3 Disposiciones para los sistemas fijos de detección de gases de hidrocarburos en los espacios del doble casco y del doble fondo de los petroleros

5.7.3.1 Además de lo prescrito en los párrafos 5.7.1 y 5.7.2, los petroleros de peso muerto igual o superior a 20 000 toneladas, construidos el 1 de enero de 2012 o posteriormente, estarán provistos de un sistema fijo de detección de gases de hidrocarburos que cumpla lo dispuesto en el Código de Sistemas de Seguridad contra Incendios para medir las concentraciones de gases de hidrocarburos en todos los tanques de lastre y espacios vacíos de los espacios del doble casco y del doble fondo adyacentes a los tanques de carga, incluidos el tanque de pique de proa y cualesquiera otros tanques y espacios por debajo de la cubierta de cierre adyacentes a los tanques de carga.

5.7.3.2 Los petroleros provistos de sistemas de inertización de funcionamiento constante para dichos espacios no tienen que estar equipados con equipo fijo de detección de gases de hidrocarburos.

5.7.3.3 No obstante lo anterior, las cámaras de bombas de carga objeto de las disposiciones del párrafo 5.10 no tienen que cumplir las prescripciones del presente párrafo."

ANEXO 2

RESOLUCIÓN MSC.308(88) (adoptada el 3 de diciembre de 2010)

ADOPCIÓN DE ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO ASIMISMO el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar (SOLAS), 1974 (en adelante denominado "el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, excepto las enmiendas referidas al capítulo I,

HABIENDO EXAMINADO, en su 88º periodo de sesiones, las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del mismo,

1. ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;
2. DECIDE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de enero de 2012, a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del tonelaje bruto de la flota mercante mundial, hayan notificado que recusan las enmiendas;
3. INVITA a los Gobiernos Contratantes del Convenio SOLAS a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de julio de 2012, una vez aceptadas con arreglo a lo dispuesto en el párrafo 2 anterior;
4. PIDE al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;
5. PIDE ADEMÁS al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO II-1
CONSTRUCCIÓN – ESTRUCTURA, COMPARTIMENTADO Y ESTABILIDAD,
INSTALACIONES DE MÁQUINAS E INSTALACIONES ELÉCTRICAS

Parte D
Instalaciones eléctricas

Regla 41

Fuente de energía eléctrica principal y red de alumbrado

1 En el párrafo 6, a continuación de las palabras "En los buques de pasaje" se añaden las palabras "construidos el 1 de julio de 2010 o posteriormente".

CAPÍTULO II-2 CONSTRUCCIÓN – PREVENCIÓN, DETECCIÓN Y EXTINCIÓN DE INCENDIOS

Parte A Generalidades

Regla 1 Ámbito de aplicación

- 2 En el párrafo 1.1, la fecha "1 de julio de 2002" se sustituye por "1 de julio de 2012".
- 3 En el párrafo 1.2.2, la fecha "1 de julio de 2002" se sustituye por "1 de julio de 2012".
- 4 El párrafo 2.1 actual se sustituye por el siguiente:

"2.1 Salvo disposición expresa en otro sentido, la Administración se asegurará de que los buques construidos antes del 1 de julio de 2012 cumplen las prescripciones que sean aplicables en virtud del capítulo II-2 del Convenio internacional para la seguridad de la vida humana en el mar, 1974, enmendado por las resoluciones MSC.1(XLV), MSC.6(48), MSC.13(57), MSC.22(59), MSC.24(60), MSC.27(61), MSC.31(63), MSC.57(67), MSC.99(73), MSC.134(76), MSC.194(80), MSC.201(81), MSC.216(82), MSC.256(84), MSC.269(85) y MSC.291(87)."
- 5 En el párrafo 3.1, la fecha "1 de julio de 2002" se sustituye por "1 de julio de 2012".
- 6 En el párrafo 3.2, la fecha "1 de julio de 2002" se sustituye por "1 de julio de 2012".

Regla 3 Definiciones

- 7 El párrafo 23 actual se sustituye por el texto siguiente:

"23 *Código de Procedimientos de Ensayo de Exposición al Fuego*: Código internacional para la aplicación de procedimientos de ensayo de exposición al fuego, 2010 (Código PEF 2010), adoptado por el Comité de Seguridad Marítima de la Organización mediante la resolución MSC.307(88), según sea enmendado por la Organización, siempre que tales enmiendas se adopten, entren en vigor y pasen a tener efecto de conformidad con lo dispuesto en el artículo VIII del presente Convenio, relativo a los procedimientos de enmienda aplicables al Anexo, con excepción del capítulo I."

Parte C Control de incendios

Regla 7 Detección y alarma

- 8 En el párrafo 4.1, al final del apartado .1, se suprime la palabra "y"; al final del apartado .2.2, se sustituye el punto "." por "; y"; y se añade el nuevo apartado .3 a continuación del apartado .2.2 actual:

".3 los espacios cerrados que contengan incineradores."

CAPÍTULO V SEGURIDAD DE LA NAVEGACIÓN

Regla 18

Aprobación, reconocimientos y normas de funcionamiento de los sistemas y aparatos náuticos y del registrador de datos de la travesía

9 Se añade el nuevo párrafo 9 a continuación del párrafo 8 actual:

"9 El sistema de identificación automática (SIA) se someterá a una prueba anual. Dicha prueba será realizada por un inspector aprobado o en una instalación de prueba o de servicio aprobada. En la prueba se verificará que la información estática del buque se ha programado correctamente, se corregirá el intercambio de datos con los sensores conectados y se comprobará también que el equipo radioeléctrico funciona correctamente a través de la medición de las frecuencias radioeléctricas y de una prueba de transmisión utilizando, por ejemplo, un servicio de tráfico marítimo (STM). Se conservará a bordo del buque una copia del informe sobre la prueba."

Regla 23

Medios para el transbordo de prácticos

10 El texto actual de la regla 23 se sustituye por el siguiente:

"1 ÁMBITO DE APLICACIÓN

1.1 Los buques que realicen viajes en el curso de los cuales exista la posibilidad de que haya que tomar prácticos irán provistos de medios para efectuar el transbordo de éstos.

1.2 El equipo y los medios para el transbordo de prácticos instalados¹ el 1 de julio de 2012, o posteriormente, cumplirán las prescripciones de la presente regla, y en ellos se tendrán debidamente en cuenta las normas adoptadas por la Organización².

1.3 Salvo que se disponga lo contrario, el equipo y los medios para el transbordo de prácticos instalados en los buques antes del 1 de julio de 2012 cumplirán al menos las prescripciones de las reglas 17³ o 23, según proceda, del Convenio internacional para la seguridad de la vida humana en el mar, 1974, que estuviera en vigor antes de esa fecha, y en ellos se tendrán debidamente en cuenta las normas adoptadas por la Organización antes de dicha fecha.

1.4 El equipo y los medios que se instalen el 1 de julio de 2012, o posteriormente, y sustituyan al equipo y medios instalados en los buques antes del 1 de julio de 2012 cumplirán, siempre que sea razonable y factible, las prescripciones de la presente regla.

¹ Véase la Interpretación unificada de la regla V/23 del Convenio SOLAS (circular MSC.1/Circ.1375).

² Véase la resolución de la Asamblea sobre los Medios para el transbordo de prácticos, que adoptará la Organización.

³ Véase la resolución MSC.99(73), en la que la anterior regla 17 pasó a ser la regla 23, que entró en vigor el 1 de julio de 2002.

1.5 Por lo que respecta a los buques construidos antes del 1 de enero de 1994, el párrafo 5 se aplicará a más tardar en la fecha del primer reconocimiento⁴ efectuado a partir del 1 de julio de 2012.

1.6 El párrafo 6 es aplicable a todos los buques.

2 GENERALIDADES

2.1 Todos los medios destinados a facilitar el transbordo de prácticos estarán concebidos de modo que éstos puedan embarcar y desembarcar con seguridad. Los dispositivos se conservarán limpios y correctamente estibados, siendo objeto del adecuado mantenimiento y de inspecciones regulares a fin de garantizar su seguridad. Los dispositivos se utilizarán exclusivamente para el embarco y desembarco de personal.

2.2 La colocación de los medios para el transbordo de prácticos y la maniobra de embarco estarán supervisadas por un oficial del buque que disponga de medios de comunicación con el puente, el cual dispondrá también lo necesario para que se acompañe al práctico hasta el puente de navegación, y desde éste, por un camino seguro. El personal que intervenga en la colocación y maniobra de cualquier equipo mecánico habrá sido adiestrado y deberá conocer las medidas de seguridad que quepa adoptar. El equipo será sometido a prueba antes de su utilización.

2.3 El fabricante certificará que la escala de práctico cumple la presente regla o una norma internacional aceptable para la Organización⁵. Las escalas se inspeccionarán de conformidad con lo dispuesto en las reglas 6, 7 y 8 del capítulo I.

2.4 Todas las escalas de práctico que se utilicen para el transbordo de prácticos se señalarán claramente con marbetes u otro marcado permanente de modo que cada dispositivo pueda identificarse a efectos de reconocimiento, inspección y mantenimiento de registros. Se conservará un registro en el buque sobre la fecha en la que se ponga en servicio la escala identificada y se efectúe cualquier reparación.

2.5 Toda referencia en la presente regla a las escalas reales incluye las escalas inclinadas utilizadas como parte de los medios para el transbordo de prácticos.

3 MEDIOS PARA EL TRANSBORDO

3.1 Se dispondrán los medios necesarios para que el práctico pueda embarcar y desembarcar con seguridad por ambas bandas del buque.

3.2 En todos los buques en los que la distancia desde el nivel del mar hasta el punto de acceso, o de salida, sea superior a 9 metros, y cuando se tenga el propósito de que los prácticos embarquen y desembarquen con la ayuda de una escala real,⁶ u otro medio igualmente seguro y cómodo en combinación con una escala de práctico, se deberá llevar tal equipo en ambas bandas, a menos que éste pueda ser trasladado de una banda a la otra.

⁴ Véase la Interpretación unificada de la expresión "primer reconocimiento" utilizada en reglas del Convenio SOLAS (circular MSC.1/Circ.1290).

⁵ Véanse las recomendaciones de la Organización Internacional de Normalización, en particular la publicación ISO 799:2004, *Ships and marine technology — Pilot ladders*.

⁶ Véase la regla II-1/3-9 del Convenio SOLAS (Medios de embarco y desembarco de los buques), adoptada mediante la resolución MSC.256(84), junto con las Directrices conexas (MSC.1/Circ.1331).

3.3 Se habilitarán medios seguros y cómodos de acceso al buque y de salida de éste, consistentes en:

- .1 una escala de práctico cuando no sea necesario trepar menos de 1,5 metros ni más de 9 metros desde la superficie del agua, colocada y fijada de modo que:
 - .1 quede a resguardo de cualquier posible descarga del buque;
 - .2 quede situada en la parte del buque en que los costados son paralelos y, en la medida de lo posible, dentro de la mitad central del buque;
 - .3 cada peldaño esté asentado firmemente contra el costado del buque; cuando haya elementos estructurales del buque, tales como cintones, que impidan el cumplimiento de esta disposición, se habilitarán los medios necesarios para garantizar de manera satisfactoria a juicio de la Administración el embarco y desembarco de las personas en condiciones de seguridad;
 - .4 la escala, de un solo tramo, baste para alcanzar el agua desde el lugar de acceso al buque, o de salida de éste, y se tomen las medidas necesarias para que esta condición se cumpla en cualquier estado de carga y asiento del buque y con una escora a la banda contraria de 15°; los puntos de sujeción reforzados, los grilletes y los cabos de sujeción serán al menos tan resistentes como los cabos laterales; o
- .2 una escala real en combinación con la escala de práctico (es decir, un medio combinado), u otro medio igualmente seguro y cómodo, siempre que la distancia desde el nivel del mar hasta el punto de acceso al buque sea superior a 9 metros. La escala real se emplazará orientada hacia popa. Cuando se utilice, se proveerán medios para sujetar la plataforma inferior de la escala real al costado del buque para garantizar que el extremo inferior de la escala real y la plataforma inferior estén firmemente unidos al costado en la parte del buque en que los costados son paralelos y, en la medida de lo posible, dentro de la mitad central y alejados de toda descarga;
 - .1 cuando se utilice un medio combinado para el acceso del práctico, se proveerán medios para sujetar la escala de práctico y los guardamancebos al costado del buque en un punto situado nominalmente 1,5 metros por encima de la plataforma inferior de la escala real. En el caso de que un medio combinado utilice una escala real con un escotillón de acceso en la plataforma inferior (es decir, plataforma de embarco), la escala de práctico y los guardamancebos se colocarán a través del escotillón de acceso de manera que sobresalgan de la plataforma hasta la altura del pasamanos.

4 ACCESO A LA CUBIERTA DEL BUQUE

Se dispondrán los medios necesarios para garantizar el paso seguro, cómodo y expedito de toda persona que embarque o desembarque, entre la parte alta de la escala de práctico, la escala real u otro medio, y la cubierta del buque. Cuando tal paso se efectúe a través de:

- .1 una porta abierta en la barandilla o amurada, se colocarán asideros adecuados;
- .2 una escala de amurada, se colocarán dos candeleros bien fijos a la estructura del buque por la base o por un punto próximo a ésta, y por otros puntos más altos. La escala de amurada se afirmará al buque de modo seguro para impedir que se revire.

5 PORTAS DEL COSTADO DEL BUQUE

Las portas del costado del buque utilizadas para el transbordo de prácticos no abrirán hacia afuera.

6 ELEVADOR MECÁNICO DE PRÁCTICO

No se utilizarán elevadores mecánicos de práctico.

7 EQUIPO CONEXO

7.1 Se tendrá a mano y listo para su utilización inmediata para el transbordo de personas el siguiente equipo conexo:

- .1 dos guardamancebos firmemente sujetos al buque, si lo pide el práctico, de diámetro no inferior a 28 mm y no superior a 32 mm; los guardamancebos estarán atados por el extremo del cabo a la placa con anilla sujeta a la cubierta y estarán disponibles para su uso cuando desembarque el práctico o cuando lo solicite un práctico que se esté aproximando al buque (los guardamancebos llegarán a la altura de los candeleros o las amuradas en el punto de acceso a la cubierta antes de terminar en la placa con anilla de la cubierta);
- .2 un aro salvavidas con una luz de encendido automático; y
- .3 una guía.

7.2 Cuando lo exija el párrafo 4 anterior, se colocarán candeleros y escalas de amurada.

8 ALUMBRADO

Habrá alumbrado para iluminar adecuadamente los medios de transbordo en el costado y la parte de la cubierta por donde embarquen o desembarquen las personas."

APÉNDICE

CERTIFICADOS

Modelo de Certificado de seguridad para buques de pasaje

- 11 Se añaden los nuevos párrafos 2.10 y 2.11 a continuación del párrafo 2.9 actual:
- "2.10 Que el buque cuenta/no cuenta¹ con un proyecto y disposiciones alternativos en virtud de las reglas II-1/55, II-2/17 y III/38¹ del Convenio.
- 2.11 Que se adjunta/no se adjunta¹ al presente certificado un documento de aprobación de proyectos y disposiciones alternativos para las instalaciones eléctricas y de máquinas/la protección contra incendios/los dispositivos y medios de salvamento¹.

¹ Táchese según proceda."

Modelo de Certificado de seguridad de construcción para buques de carga

- 12 Se añaden los nuevos párrafos 4 y 5 a continuación del párrafo 3 actual:
- "4 Que el buque cuenta/no cuenta⁴ con un proyecto y disposiciones alternativos en virtud de las reglas II-1/55 y II-2/17⁴ del Convenio.
- 5 Que se adjunta/no se adjunta⁴ al presente certificado un documento de aprobación de proyectos y disposiciones alternativos para las instalaciones eléctricas y de máquinas/la protección contra incendios⁴.

⁴ Táchese según proceda."

Modelo de Certificado de seguridad del equipo para buques de carga

- 13 Se añaden los nuevos párrafos 2.7 y 2.8 a continuación del párrafo 2.6 actual:
- "2.7 Que el buque cuenta/no cuenta⁴ con un proyecto y disposiciones alternativos en virtud de las reglas II-2/17 y III/38⁴ del Convenio.
- 2.8 Que se adjunta/no se adjunta⁴ al presente certificado un documento de aprobación de proyectos y disposiciones alternativos para la protección contra incendios/ los dispositivos y medios de salvamento⁴.

⁴ Táchese según proceda."

Modelo de Certificado de seguridad para buques nucleares de pasaje

14 Se sustituyen los párrafos 2.11 y 2.12 actuales por los siguientes:

"2.11 el buque cuenta/no cuenta¹ con un proyecto y disposiciones alternativos en virtud de las reglas II-1/55, II-2/17 y III/38¹ del Convenio;

2.12 se adjunta/no se adjunta¹ al presente certificado un documento de aprobación de proyectos y disposiciones alternativos para las instalaciones eléctricas y de máquinas/la protección contra incendios/los dispositivos y medios de salvamento¹.

¹ Táchese según proceda."

Modelo de Certificado de seguridad para buques nucleares de carga

15 Se sustituyen los párrafos 2.10 y 2.11 actuales por los siguientes:

"2.10 el buque cuenta/no cuenta³ con un proyecto y disposiciones alternativos en virtud de las reglas II-1/55, II-2/17 y III/38³ del Convenio;

2.11 se adjunta/no se adjunta³ al presente certificado un documento de aprobación de proyectos y disposiciones alternativos para las instalaciones eléctricas y de máquinas/la protección contra incendios/los dispositivos y medios de salvamento³.

³ Táchese según proceda."

ANEXO 2

RESOLUCIÓN MSC.338(91) (adoptada el 30 de noviembre de 2012)

ADOPCIÓN DE ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO TAMBIÉN el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar, 1974 (Convenio SOLAS) (en adelante denominado "el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, excepto las disposiciones de su capítulo I,

HABIENDO EXAMINADO, en su 91º periodo de sesiones, las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del Convenio,

1. ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;
2. DECIDE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de enero de 2014, a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del arqueo bruto de la flota mercante mundial hayan notificado que recusan las enmiendas;
3. INVITA a los Gobiernos Contratantes del Convenio SOLAS a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de julio de 2014, una vez aceptadas con arreglo a lo dispuesto en el párrafo 2 anterior;
4. PIDE al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;
5. PIDE TAMBIÉN al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no sean Gobiernos Contratantes del Convenio.

* * *

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO II-1
CONSTRUCCIÓN – ESTRUCTURA, COMPARTIMENTADO Y ESTABILIDAD,
INSTALACIONES DE MÁQUINAS E INSTALACIONES ELÉCTRICAS

Parte A-1
Estructura de los buques

- 1 Se añade la siguiente nueva regla 3-12 a continuación de la regla 3-11 existente:

"Regla 3-12
Protección contra el ruido

- 1 Esta regla será aplicable a los buques de arqueo bruto igual o superior a 1 600:
- .1 cuyo contrato de construcción se adjudique el 1 de julio de 2014 o posteriormente; o
 - .2 de no haberse formalizado un contrato de construcción, cuya quilla haya sido colocada o cuya construcción se halle en una fase equivalente el 1 de enero de 2015 o posteriormente; o
 - .3 cuya entrega tenga lugar el 1 de julio de 2018 o posteriormente,

a menos que la Administración juzgue que el cumplimiento de una disposición particular no es razonable ni práctico.

- 2 En el caso de los buques entregados antes del 1 de julio de 2018 y:
- .1 cuyo contrato de construcción se firme antes del 1 de julio de 2014 y cuya quilla haya sido colocada o cuya construcción se halle en una fase equivalente el 1 de enero de 2009 o posteriormente pero antes del 1 de enero de 2015; o
 - .2 de no haberse formalizado un contrato de construcción, cuya quilla haya sido colocada o cuya construcción se halle en una fase equivalente el 1 de enero de 2009 o posteriormente pero antes del 1 de enero de 2015,

se adoptarán medidas* para reducir en los espacios de máquinas el ruido de éstas a los niveles admisibles que determine la Administración. Cuando no sea posible reducir en grado suficiente este ruido, la fuente que lo origine en exceso se insonorizará o aislará adecuadamente, o bien se habilitará un refugio a salvo del ruido si en el espacio de que se trate ha de haber dotación. El personal que haya de entrar en dichos espacios dispondrá de protectores de oídos, si es necesario.

3 Los buques se construirán de forma que se reduzca el ruido a bordo y se proteja al personal contra el ruido de conformidad con lo dispuesto en el Código sobre niveles de ruido a bordo de los buques, adoptado por el Comité de Seguridad Marítima mediante la resolución MSC.337(91), según sea enmendado por la Organización, a condición de que tales enmiendas se adopten, entren en vigor y se hagan efectivas de conformidad con lo dispuesto en el artículo VIII del presente convenio, relativo a los procedimientos de enmienda aplicables al anexo, con excepción del capítulo I. A los efectos de esta regla, si bien el Código sobre niveles de ruido a bordo de los buques es un instrumento de obligado cumplimiento, se entenderá que las partes recomendatorias especificadas en el capítulo I del mismo no son obligatorias, a condición de que las enmiendas a dichas partes recomendatorias sean adoptadas por el Comité de Seguridad Marítima de conformidad con su Reglamento interior.

4 No obstante lo dispuesto en el párrafo 1, esta regla no es aplicable a los tipos de buques enumerados en el párrafo 1.3.4 del Código sobre niveles de ruido a bordo de los buques.

* Véase el Código sobre niveles de ruido a bordo de los buques, adoptado por la Organización mediante la resolución A.468(XII)."

Parte C Instalaciones de máquinas

2 La actual regla 36 se suprime y se deja en blanco.

CAPÍTULO II-2 CONSTRUCCIÓN – PREVENCIÓN, DETECCIÓN Y EXTINCIÓN DE INCENDIOS

Parte A Generalidades

Regla 1

Ámbito de aplicación

3 Se añade la siguiente nota a pie de página en el título de la regla 1:

"* La fecha de aplicación del 1 de julio de 2012 se introdujo mediante la resolución MSC.308(88). No obstante, dicha resolución enmendó, en el capítulo II-2, el párrafo 23 de la regla 3 (definición de "Código de Procedimientos de Ensayo de Exposición al Fuego") y el párrafo 4.1 de la regla 7 (nuevo subpárrafo .3) únicamente, no enmendándose todas las demás reglas con la fecha original de aplicación del 1 de julio de 2002."

4 En el párrafo 2.4 existente, se añaden los apartados nuevos siguientes a continuación del apartado .6 existente:

".7 los buques de carga de arqueado bruto igual o superior a 500 y los buques de pasaje construidos el 1 de febrero de 1992 o posteriormente, pero antes del 1 de julio de 2002, no están obligados a cumplir lo dispuesto en la regla 19.3.3 siempre y cuando cumplan lo prescrito en la regla 54.2.3, adoptada mediante la resolución MSC.13(57); y

.8 los buques de carga de arqueo bruto igual o superior a 500 y los buques de pasaje construidos el 1 de septiembre de 1984 o posteriormente, pero antes del 1 de julio de 2002, no están obligados a cumplir lo dispuesto en las reglas 19.3.1, 19.3.5, 19.3.6 y 19.3.9, siempre y cuando cumplan lo prescrito en las reglas 54.2.1, 54.2.5, 54.2.6 y 54.2.9, adoptadas mediante la resolución MSC.1(XLV)."

5 Se añade el siguiente nuevo párrafo 2.5:

"2.5 Los buques construidos antes del 1 de julio de 2012, también cumplirán lo dispuesto en la regla 10.1.2, adoptada mediante la resolución MSC.338(91)."

Parte C **Control de incendios**

Regla 9

Contención del incendio

6 En la tabla 9.3, columna (11) (Espacios de categoría especial y espacios de carga rodada), fila (2) (Pasillos), se sustituye el símbolo "A-15" por el símbolo "A-30⁹".

7 En la tabla 9.3, columna (11) (Espacios de categoría especial y espacios de carga rodada), fila (4) (Escaleras), se sustituye el símbolo "A-15" por el símbolo "A-30⁹".

8 En la tabla 9.3, columna y fila (11) (Espacios de categoría especial y espacios de carga rodada), se sustituye el símbolo "A-0" por el símbolo "A-30⁹".

9 En la tabla 9.4, columna (11) (Espacios de categoría especial y de carga rodada), fila (1) (Puestos de control), se sustituye el símbolo "A-30" por el símbolo "A-60⁹".

10 En la tabla 9.4, columna (11) (Espacios de categoría especial y de carga rodada), fila (2) (Pasillos), se sustituye el símbolo "A-0" por el símbolo "A-30⁹".

11 En la tabla 9.4, columna (11) (Espacios de categoría especial y de carga rodada), fila (4) (Escaleras), se sustituye el símbolo "A-0" por el símbolo "A-30⁹".

12 En la tabla 9.4, columna y fila (11) (Espacios de categoría especial y de carga rodada), se sustituye el símbolo "A-0" por el símbolo "A-30⁹".

13 En la tabla 9.4, columna (2) (Pasillos), fila (11) (Espacios de categoría especial y de carga rodada), se sustituye el símbolo "A-15" por el símbolo "A-30⁹".

14 En la tabla 9.4, columna (4) (Escaleras), fila (11) (Espacios de categoría especial y de carga rodada), se sustituye el símbolo "A-15" por el símbolo "A-30⁹".

15 En la tabla 9.4, columna (6) (Espacios de categoría A para máquinas), fila (11) (Espacios de categoría especial y de carga rodada), se sustituye el símbolo "A-30" por el símbolo "A-60⁹".

16 En el cuadro 9.4, se añade la siguiente nueva nota:

⁹ Los buques construidos antes del 1 de julio de 2014 cumplirán, como mínimo, las prescripciones previas aplicables en el momento de construirse el buque, según se especifica en la regla 1.2."

17 En la tabla 9.5, columna y fila (11) (Espacios de carga rodada y espacios para vehículos), se sustituye el símbolo "h" por el símbolo "A-30".

18 En la tabla 9.6, columna (11) (Espacios de carga rodada y espacios para vehículos), fila (10) (Cubiertas expuestas), se sustituye el símbolo "h" por el símbolo "A-0".

19 En la tabla 9.6, columna y fila (11) (Espacios de carga rodada y espacios para vehículos), se sustituye el símbolo "h" por el símbolo "A-30".

20 En la tabla 9.6, columna (10) (Cubiertas expuestas), fila (11) (Espacios de carga rodada y espacios para vehículos), se sustituye el símbolo "h" por el símbolo "A-0".

21 En el cuadro 9.6, el texto actual de la nota "h" se sustituye por la palabra "suprimido".

22 En el cuadro 9.6, se añade la siguiente nueva nota:

^{ij} Los buques construidos antes del 1 de julio de 2014 cumplirán, como mínimo, las prescripciones previas aplicables en el momento de construirse el buque, según se especifica en la regla 1.2."

23 Se suprimen los párrafos 6.2 y 6.3 y la numeración de los párrafos siguientes se modifica en consecuencia.

Regla 10

Lucha contra incendios

24 En el párrafo 5.6.3, el apartado .1 existente se sustituye por el siguiente:

".1 las partes con riesgo de incendio de la maquinaria de combustión interna o, en el caso de los buques construidos antes del 1 de julio de 2014, las partes con riesgo de incendio de la maquinaria de combustión interna utilizadas para la propulsión principal del buque y la producción de energía;"

25 El actual párrafo 10.1 se sustituye por el siguiente:

"10.1 Tipos de equipo de bombero

.1 los equipos de bombero cumplirán lo prescrito en el Código de Sistemas de Seguridad contra Incendios; y

.2 el aparato respiratorio autónomo de aire comprimido de los equipos de bombero cumplirá lo dispuesto en el párrafo 2.1.2.2 del capítulo 3 del Código de Sistemas de Seguridad contra Incendios a más tardar el 1 de julio de 2019."

26 A continuación del párrafo 10.3 existente se añade el siguiente nuevo párrafo:

"10.4 Comunicaciones entre los bomberos

En el caso de los buques construidos el 1 de julio de 2014 o posteriormente, se llevarán a bordo como mínimo dos aparatos radiotelefónicos portátiles bidireccionales para cada cuadrilla de lucha contra incendios, para las comunicaciones entre los bomberos. Dichos aparatos radiotelefónicos portátiles bidireccionales serán de tipo antideflagrante o intrínsecamente seguros. Los buques construidos antes del 1 de julio de 2014 cumplirán lo dispuesto en este párrafo a más tardar en la fecha del primer reconocimiento que se efectúe después del 1 de julio de 2018."

**Parte E
Prescripciones operacionales**

Regla 15

Instrucciones, formación y ejercicios a bordo

27 A continuación del párrafo 2.2.5 existente se añade el siguiente nuevo párrafo:

"2.2.6 Se proveerán medios a bordo para recargar las botellas de los aparatos respiratorios utilizadas durante los ejercicios o se llevará a bordo un número adecuado de botellas de respeto para sustituir a las que se hayan utilizado."

**Parte G
Prescripciones especiales**

Regla 20

Protección de los espacios para vehículos, espacios de categoría especial y espacios de carga rodada

28 El actual párrafo 6.1, incluidos los subpárrafos 6.1.1 y 6.1.2, se sustituyen por los siguientes:

"6.1 Sistemas fijos de extinción de incendios

(Las prescripciones de los párrafos 6.1.1 y 6.1.2 serán aplicables a los buques construidos el 1 de julio de 2014 o posteriormente. Los buques construidos antes del 1 de julio de 2014 cumplirán las prescripciones de los párrafos 6.1.1 y 6.1.2 aplicables previamente.)

6.1.1 Los espacios para vehículos y los espacios de carga rodada, que no sean espacios de categoría especial y que puedan sellarse desde un lugar situado fuera de los espacios de carga, estarán equipados con uno de los siguientes sistemas fijos de extinción de incendios:

- .1 un sistema fijo de extinción de incendios por gas que cumpla lo dispuesto en el Código de Sistemas de Seguridad contra Incendios;
- .2 un sistema fijo de extinción de incendios de espuma de alta expansión que cumpla lo dispuesto en el Código de Sistemas de Seguridad contra Incendios; o

- .3 un sistema fijo de extinción de incendios a base de agua para espacios de carga rodada y espacios de categoría especial que cumpla lo dispuesto en el Código de Sistemas de Seguridad contra Incendios y en los párrafos 6.1.2.1 a 6.1.2.4.

6.1.2 Los espacios para vehículos y los espacios de carga rodada que no puedan sellarse y los espacios de categoría especial estarán equipados con un sistema fijo de extinción de incendios a base de agua para espacios de carga rodada y espacios de categoría especial que cumpla lo dispuesto en el Código de Sistemas de Seguridad contra Incendios que protegerá todas las partes de las cubiertas y la plataforma para vehículos de dichos espacios. Dicho sistema de extinción de incendios a base de agua contará con:

- .1 un manómetro en el cabezal de válvulas;
- .2 una clara indicación en cada válvula de los espacios que abarca;
- .3 instrucciones de mantenimiento y operación situadas en la sala de válvulas; y
- .4 un número suficiente de válvulas de desagüe para garantizar el drenaje completo del sistema."

CAPÍTULO III DISPOSITIVOS Y MEDIOS DE SALVAMENTO

Parte B

Prescripciones relativas a los buques y a los dispositivos de salvamento

29 A continuación de la regla 17 existente se añade la siguiente nueva regla 17-1:

"Regla 17-1

Rescate de personas del agua

1 Todos los buques tendrán planes y procedimientos específicos para el rescate de personas del agua, teniendo en cuenta las directrices elaboradas por la Organización.* En los planes y procedimientos se indicará el equipo previsto para utilizarse con fines del rescate y las medidas que deben adoptarse para reducir al mínimo los riesgos al personal de a bordo que participa en las operaciones de rescate. Los buques construidos antes del 1 de julio de 2014 cumplirán esta prescripción a más tardar cuando se efectúe el primer reconocimiento periódico o el primer reconocimiento de renovación del equipo de seguridad después del 1 de julio de 2014, si éste es anterior.

2 Se considerará que los buques de pasaje de transbordo rodado que se ajustan a lo dispuesto en la regla 26.4 cumplen la presente regla.

* Véanse las Directrices para la elaboración de planes y procedimientos para el rescate de personas del agua (MSC.1/Circ.1412)."

APÉNDICE CERTIFICADOS

30 Todos los modelos de certificados e inventarios de equipos se sustituyen por los siguientes:

MODELO DE CERTIFICADO DE SEGURIDAD PARA BUQUE DE PASAJE

CERTIFICADO DE SEGURIDAD PARA BUQUE DE PASAJE

El presente certificado llevará como suplemento un Inventario del equipo de seguridad para buque de pasaje (Modelo P)

(Sello oficial)

(Estado)

para viaje internacional/viaje internacional corto¹

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974,
enmendado,

con la autoridad conferida por el Gobierno de

_____ *(nombre del Estado)*

por

_____ *(persona u organización autorizada)*

Datos relativos al buque²

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Zonas marítimas en las que el buque está autorizado a operar
según su certificado (regla IV/2)

Número IMO³

Fecha de construcción:

Fecha del contrato de construcción

Fecha en que se colocó la quilla o en que la construcción
se hallaba en una fase equivalente

Fecha de entrega

Fecha en que comenzaron las obras de transformación,
reforma o modificación de carácter importante (cuando proceda)

Se deberán cumplimentar todas las fechas aplicables.

¹ Táchese según proceda.

² Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

³ De conformidad con el Sistema de asignación de un número de la OMI a los buques para su identificación, adoptado por la Organización mediante la resolución A.600(15).

SE CERTIFICA:

- 1 Que el buque ha sido objeto de reconocimiento de conformidad con lo prescrito en la regla I/7 del Convenio.
- 2 Que el reconocimiento ha puesto de manifiesto lo siguiente:
 - 2.1 que el buque cumple con las prescripciones del Convenio en lo que respecta a:
 - .1 la estructura, las máquinas principales y auxiliares, las calderas y otros recipientes de presión;
 - .2 la disposición del compartimentado estanco y los detalles correspondientes;
 - .3 las líneas de carga de compartimentado siguientes:

Líneas de carga de compartimentado asignadas y marcadas en el costado, en el centro del buque (regla II-1/18) ⁴	Francobordo	Utilícese cuando los espacios destinados a los pasajeros comprendan los siguientes espacios alternativos
P1
P2
P3

- 2.2 que el buque cumple con las prescripciones del Convenio en lo que respecta a la protección estructural contra incendios, los sistemas y dispositivos de seguridad contra incendios y los planos de lucha contra incendios;
- 2.3 que se han provisto los dispositivos de salvamento y el equipo de los botes salvavidas, las balsas salvavidas y los botes de rescate de conformidad con las prescripciones del Convenio;
- 2.4 que el buque va provisto de aparato lanzacabos y de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento de conformidad con las prescripciones del Convenio;
- 2.5 que el buque cumple con las prescripciones del Convenio en lo que respecta a las instalaciones radioeléctricas;
- 2.6 que el funcionamiento de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento cumple con las prescripciones del Convenio;
- 2.7 que el buque cumple con las prescripciones del Convenio en lo que respecta a los aparatos náuticos de a bordo, los medios de embarco para prácticos y las publicaciones náuticas;
- 2.8 que el buque está provisto de luces, marcas, medios emisores de señales acústicas y de señales de socorro, de conformidad con las prescripciones del Convenio y del Reglamento internacional para prevenir los abordajes en vigor;

⁴ Para los buques construidos antes del 1 de enero de 2009, se utilizará la notación de compartimentado "C.1, C.2 y C.3" aplicable.

2.9 que en todos los demás aspectos, el buque cumple con las prescripciones pertinentes del Convenio;

2.10 que el buque cuenta/no cuenta¹ con un proyecto y disposiciones alternativas en virtud de la(s) regla(s) II-1/55 / II-2/17 / III/38¹ del Convenio;

2.11 que se adjunta/no se adjunta¹ al presente certificado un Documento de aprobación de proyectos y disposiciones alternativas para las instalaciones eléctricas y de máquinas/la protección contra incendios/los dispositivos y medios de salvamento.¹

3 Que se ha/no se ha¹ expedido un Certificado de exención.

El presente certificado es válido hasta

Fecha de terminación del reconocimiento en el que se basa el presente certificado:
(dd/mm/aaaa)

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(Sello o estampilla de la autoridad expedidora, según proceda)

¹ Táchese según proceda.

INVENTARIO DEL EQUIPO DE SEGURIDAD PARA BUQUE DE PASAJE (MODELO P)

INVENTARIO DEL EQUIPO NECESARIO PARA CUMPLIR CON EL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

1 *Datos relativos al buque*

Nombre del buque

Número o letras distintivos

Número máximo de pasajeros que está autorizado a llevar

Número mínimo de personas con la competencia necesaria
 para manejar las instalaciones radioeléctricas

2 *Pormenores de los dispositivos de salvamento*

1	Número total de personas para las que se han provisto dispositivos de salvamento	A babor	A estribor
2	Número total de botes salvavidas	.....	.....
2.1	Número total de personas a las que se puede dar cabida	.....	.....
2.2	Número de botes salvavidas parcialmente cerrados (regla III/21 y sección 4.5 del Código IDS)	.....	.....
2.3	Número de botes salvavidas parcialmente cerrados autoadrizables (regla III/43) ¹	.....	.....
2.4	Número de botes salvavidas totalmente cerrados (regla III/21 y sección 4.6 del Código IDS)	.....	.....
2.5	Otros botes salvavidas	.....	.....
2.5.1	Número	.....	.....
2.5.2	Tipo	.....	.....
3	Número total de botes salvavidas a motor (comprendidos en el total de botes salvavidas que se acaba de indicar)	.....	.....
3.1	Número de botes salvavidas provistos de proyector	.....	.....
4	Número de botes de rescate	.....	.....
4.1	Número de botes comprendidos en el total de botes salvavidas que se acaba de indicar	.....	.....
4.2	Número de botes que son botes de rescate rápidos	.....	.....
5	Balsas salvavidas	.....	.....
5.1	Balsas salvavidas para las que se necesitan dispositivos aprobados de puesta a flote	.....	.....
5.1.1	Número de balsas salvavidas	.....	.....
5.1.2	Número de personas a las que se puede dar cabida	.....	.....
5.2	Balsas salvavidas para las que no se necesitan dispositivos aprobados de puesta a flote	.....	.....

¹ Véanse las enmiendas de 1983 al Convenio SOLAS (MSC.6(48)), aplicables a los buques construidos el 1 de julio de 1986, o posteriormente, pero antes del 1 de julio de 1998.

2 Pormenores de los dispositivos de salvamento (continuación)

5.2.1	Número de balsas salvavidas	.....
5.2.2	Número de personas a las que se puede dar cabida	.....
6	Número de sistemas marinos de evacuación (MES)	.....
6.1	Número de balsas salvavidas a las que prestan servicio	.....
6.2	Número de personas a las que se puede dar cabida	.....
7	Aparatos flotantes	.....
7.1	Número de aparatos	.....
7.2	Número de personas que los aparatos son capaces de sostener	.....
8	Número de aros salvavidas	.....
9	Número total de chalecos salvavidas	.....
9.1	Número de chalecos salvavidas para adultos	.....
9.2	Número de chalecos salvavidas para niños	.....
9.3	Número de chalecos salvavidas para bebés	.....
10	Trajes de inmersión	.....
10.1	Número total	.....
10.2	Número de trajes que cumplen con las prescripciones aplicables a los chalecos salvavidas	.....
11	Número de trajes de protección contra la intemperie	.....
12	Número de ayudas térmicas ²	.....
13	Instalaciones radioeléctricas utilizadas en los dispositivos de salvamento	.....
13.1	Número de dispositivos de localización de búsqueda y salvamento	.....
13.1.1	Número de respondedores de radar de búsqueda y salvamento (SART)	.....
13.1.2	Número de transmisores de búsqueda y salvamento del SIA (AIS-SART)	.....
13.2	Número de aparatos radiotelefónicos bidireccionales de ondas métricas	.....

3 Pormenores de las instalaciones radioeléctricas

Elemento		Disposiciones y equipos existentes a bordo
1	Sistemas primarios	.....
1.1	Instalación radioeléctrica de ondas métricas	.....
1.1.1	Codificador de LSD	.....
1.1.2	Receptor de escucha de LSD	.....
1.1.3	Radiotelefonía	.....
1.2	Instalación radioeléctrica de ondas hectométricas	.....
1.2.1	Codificador de LSD	.....
1.2.2	Receptor de escucha de LSD	.....

² Excluidas las prescritas en los párrafos 4.1.5.1.24, 4.4.8.31 y 5.1.2.2.13 del Código IDS.

3 Pormenores de las instalaciones radioeléctricas (continuación)

Elemento		Disposiciones y equipos existentes a bordo
1.2.3	Radiotelefonía	.....
1.3	Instalación radioeléctrica de ondas hectométricas/decamétricas	.....
1.3.1	Codificador de LSD	.....
1.3.2	Receptor de escucha de LSD	.....
1.3.3	Radiotelefonía	.....
1.3.4	Radiotelegrafía de impresión directa	.....
1.4	Estación terrena de buque de Inmarsat	.....
2	Medios secundarios para emitir alertas	.....
3	Instalaciones para la recepción de información sobre seguridad marítima	.....
3.1	Receptor NAVTEX	.....
3.2	Receptor de LIG	.....
3.3	Receptor radiotelegráfico de impresión directa de ondas decamétricas	.....
4	RLS satelitaria	.....
4.1	Cospas-Sarsat	.....
5	RLS de ondas métricas	.....
6	Número de dispositivos de localización de búsqueda y salvamento	.....
6.1	Número de respondedores de radar de búsqueda y salvamento (SART)	.....
6.2	Número de transmisores de búsqueda y salvamento del SIA (AIS-SART)	.....

4 Métodos utilizados para garantizar la disponibilidad de las instalaciones radioeléctricas (reglas IV/15.6 y 15.7)

4.1	Duplicación del equipo
4.2	Mantenimiento en tierra
4.3	Capacidad de mantenimiento en el mar

5 Pormenores de los sistemas y aparatos náuticos

Elemento		Disposiciones y equipos existentes a bordo
1.1	Compás magnético magistral ³	.....
1.2	Compás magnético de respeto ³	.....
1.3	Girocompás ³	.....
1.4	Repetidor del rumbo indicado por el girocompás ³	.....
1.5	Repetidor de las marcaciones indicadas por el girocompás ³	.....
1.6	Sistema de control del rumbo o de la derrota ³	.....
1.7	Taxímetro o dispositivo de marcación de compás ³	.....
1.8	Medios para corregir el rumbo y la demora	.....
1.9	Dispositivo transmisor del rumbo (DTR) ³	.....

³ En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.

5 Pormenores de los sistemas y aparatos náuticos (continuación)

Elemento		Disposiciones y equipos existentes a bordo
2.1	Cartas náuticas/Sistema de información y visualización de cartas electrónicas (SIVCE) ⁴	.....
2.2	Medios auxiliares para los SIVCE	.....
2.3	Publicaciones náuticas	.....
2.4	Medios auxiliares para las publicaciones náuticas electrónicas	.....
3.1	Receptor para un sistema mundial de navegación por satélite/sistema de radionavegación terrena ^{3,4}	.....
3.2	Radar de 9 GHz ³	.....
3.3	Segundo radar (3 GHz/9 GHz) ⁴ ³	.....
3.4	Ayuda de punteo radar automática (APRA) ³	.....
3.5	Ayuda de seguimiento automática ³	.....
3.6	Segunda ayuda de seguimiento automática ³	.....
3.7	Ayuda de punteo electrónica ³	.....
4.1	Sistema de identificación automática (SIA)	.....
4.2	Sistema de identificación y seguimiento de largo alcance	.....
5	Registrador de datos de la travesía (RDT)	.....
6.1	Dispositivo medidor de la velocidad y la distancia (en el agua) ³	.....
6.2	Dispositivo medidor de la velocidad y la distancia (con respecto al fondo en dirección de proa y de través) ³	.....
7	Ecosonda ³	.....
8.1	Indicadores de la posición del timón, del sentido de giro, empuje y paso de la hélice y de la modalidad de funcionamiento ³	.....
8.2	Indicador de la velocidad de giro ³	.....
9	Sistema de recepción de señales acústicas ³	.....
10	Teléfono para comunicar con el puesto de gobierno de emergencia ³	.....
11	Lámpara de señales diurnas ³	.....
12	Reflector de radar ³	.....
13	Código internacional de señales	.....
14	Manual IAMSAR, Volumen III	.....
15	Sistema de alarma para la guardia de navegación en el puente (BNWAS)	.....

SE CERTIFICA que este inventario es correcto en su totalidad.

Expedido en
(lugar de expedición del inventario)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el inventario)

(Sello o estampilla de la autoridad expedidora, según proceda)

³ En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.

⁴ Táchese según proceda.

**MODELO DE CERTIFICADO DE SEGURIDAD DE
CONSTRUCCIÓN PARA BUQUE DE CARGA**

CERTIFICADO DE SEGURIDAD DE CONSTRUCCIÓN PARA BUQUE DE CARGA

(Sello oficial)

(Estado)

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974,
enmendado,

con la autoridad conferida por el Gobierno de

_____ *(nombre del Estado)*

por

_____ *(persona u organización autorizada)*

Datos relativos al buque¹

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Peso muerto del buque (toneladas métricas)²

Número IMO³

Tipo de buque⁴

- Granelero
- Petrolero
- Buque tanque quimiquero
- Buque gasero
- Buque de carga distinto de los anteriores

Fecha de construcción:

Fecha del contrato de construcción

Fecha en que se colocó la quilla o en que la construcción
se hallaba en una fase equivalente

Fecha de entrega

Fecha en que comenzaron las obras de transformación,
reforma o modificación de carácter importante (cuando proceda)

Se deberán cumplimentar todas las fechas aplicables.

¹ Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

² Únicamente si se trata de petroleros, buques tanque quimiqueros y buques gaseros.

³ De conformidad con el Sistema de asignación de un número de la OMI a los buques para su identificación, adoptado por la Organización mediante la resolución A.600(15).

⁴ Táchese según proceda.

SE CERTIFICA:

- 1 Que el buque ha sido objeto de reconocimiento, de conformidad con lo prescrito en la regla I/10 del Convenio.
- 2 Que el reconocimiento ha puesto de manifiesto que el estado de la estructura, las máquinas y el equipo, según lo definido en la expresada regla, es satisfactorio, y que el buque cumple con las prescripciones pertinentes de los capítulos II-1 y II-2 del Convenio (sin que entren aquí las relativas a sistemas y dispositivos de seguridad contra incendios y planos de lucha contra incendios).
- 3 Que se ha/no se ha⁴ expedido un Certificado de exención.
- 4 Que el buque cuenta/no cuenta⁴ con un proyecto y disposiciones alternativas en virtud de la(s) regla(s) II-1/55 / II-2/17⁴ del Convenio.
- 5 Que se adjunta/no se adjunta⁴ al presente certificado un Documento de aprobación de proyectos y disposiciones alternativas para las instalaciones eléctricas y de máquinas/la protección contra incendios.⁴

El presente certificado es válido hasta

Fecha de terminación del reconocimiento en el que se basa el presente certificado:
(dd/mm/aaaa)

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(Sello o estampilla de la autoridad expedidora, según proceda)

⁴ Táchese según proceda.

MODELO DE CERTIFICADO DE SEGURIDAD DEL EQUIPO PARA BUQUE DE CARGA

CERTIFICADO DE SEGURIDAD DEL EQUIPO PARA BUQUE DE CARGA

El presente certificado llevará como suplemento un Inventario
del equipo de seguridad para buque de carga (Modelo E)

(Sello oficial)

(Estado)

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974,
enmendado

con la autoridad conferida por el Gobierno de

(nombre del Estado)

por

(persona u organización autorizada)

Datos relativos al buque¹

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Peso muerto del buque (toneladas métricas)²

Eslora del buque (regla III/3.12)

Número IMO³

Tipo de buque⁴

- Granelero
- Petrolero
- Buque tanque quimiquero
- Buque gasero
- Buque de carga distinto de los anteriores

Fecha en la que se colocó la quilla del buque o en la que su construcción se hallaba en una fase equivalente o, cuando proceda, fecha en la que comenzaron las obras de transformación, reforma o modificación de carácter importante:

¹ Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

² Únicamente si se trata de petroleros, buques tanque quimiqueros y buques gaseros.

³ De conformidad con el Sistema de asignación de un número de la OMI a los buques para su identificación, adoptado por la Organización mediante la resolución A.600(15).

⁴ Táchese según proceda.

SE CERTIFICA:

- 1 Que el buque ha sido objeto de reconocimiento, de conformidad con lo prescrito en la regla I/8 del Convenio.
- 2 Que el reconocimiento ha puesto de manifiesto lo siguiente:
 - 2.1 que el buque cumple con las prescripciones del Convenio en lo que respecta a los sistemas y dispositivos de seguridad contra incendios y los planos de lucha contra incendios;
 - 2.2 que se han provisto los dispositivos de salvamento y el equipo de los botes salvavidas, las balsas salvavidas y los botes de rescate, de conformidad con las prescripciones del Convenio;
 - 2.3 que el buque va provisto de aparato lanzacabos y de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento de conformidad con las prescripciones del Convenio;
 - 2.4 que el buque cumple con las prescripciones del Convenio en lo que respecta a los aparatos náuticos de a bordo, los medios de embarco para prácticos y las publicaciones náuticas;
 - 2.5 que el buque está provisto de luces, marcas, medios emisores de señales acústicas y de señales de socorro de conformidad con las prescripciones del Convenio y del Reglamento internacional para prevenir los abordajes en vigor;
 - 2.6 que en todos los demás aspectos, el buque cumple con las prescripciones pertinentes del Convenio;
 - 2.7 que el buque cuenta/no cuenta⁴ con un proyecto y disposiciones alternativos en virtud de la(s) regla(s) II-2/17 / III/38⁴ del Convenio;
 - 2.8 que se adjunta/no se adjunta⁴ al presente certificado un Documento de aprobación de proyectos y disposiciones alternativos de protección contra incendios/dispositivos y medios de salvamento.⁴
- 3 Que el buque opera, de conformidad con lo dispuesto en la regla III/26.1.1.1,⁵ dentro de los límites de la zona de tráfico
- 4 Que se ha/no se ha⁴ expedido un Certificado de exención.

El presente certificado es válido hasta

Fecha de terminación del reconocimiento en el que se basa el presente certificado:
(dd/mm/aaaa)

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(Sello o estampilla de la autoridad expedidora, según proceda)

⁴ Táchese según proceda.

⁵ Véanse las enmiendas de 1983 al Convenio SOLAS (MSC.6(48)), aplicables a los buques construidos el 1 de julio de 1986, o posteriormente, pero antes del 1 de julio de 1998 en el caso de los botes salvavidas parcialmente cerrados autoadrizables a bordo.

INVENTARIO DEL EQUIPO DE SEGURIDAD PARA BUQUE DE CARGA (MODELO E)

INVENTARIO DEL EQUIPO NECESARIO PARA CUMPLIR CON EL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

1 *Datos relativos al buque*

Nombre del buque

Número o letras distintivos

2 *Pormenores de los dispositivos de salvamento*

1	Número total de personas para las que se han provisto dispositivos de salvamento	A babor	A estribor
2	Número total de botes salvavidas	.....	.....
2.1	Número total de personas a las que se puede dar cabida	.....	.....
2.2	Número de botes salvavidas parcialmente cerrados autoadrizables (regla III/43) ¹	.....	.....
2.3	Número de botes salvavidas totalmente cerrados (regla III/31 y sección 4.6 del Código IDS)	.....	.....
2.4	Número de botes salvavidas provistos de un sistema autónomo de abastecimiento de aire (regla III/31 y sección 4.8 del Código IDS)	.....	.....
2.5	Número de botes salvavidas protegidos contra incendios (regla III/31 y sección 4.9 del Código IDS)	.....	.....
2.6	Otros botes salvavidas	.....	.....
2.6.1	Número	.....	.....
2.6.2	Tipo	.....	.....
2.7	Número de botes salvavidas de caída libre	.....	.....
2.7.1	Totalmente cerrados (regla III/31 y sección 4.7 del Código IDS)	.....	.....
2.7.2	Provistos de un sistema autónomo (regla III/31 y sección 4.8 del Código IDS)	.....	.....
2.7.3	Protegidos contra incendios (regla III/31 y sección 4.9 del Código IDS)	.....	.....
3	Número total de botes salvavidas a motor (comprendidos en el total de botes salvavidas que se acaba de indicar)	.....	.....
3.1	Número de botes salvavidas provistos de proyector	.....	.....
4	Número de botes de rescate	.....	.....
4.1	Número de botes comprendidos en el total de botes salvavidas que se acaba de indicar	.....	.....
5	Balsas salvavidas	.....	.....
5.1	Balsas salvavidas para las que se necesitan dispositivos aprobados de puesta a flote	.....	.....
5.1.1	Número de balsas salvavidas	.....	.....

¹ Véanse las enmiendas de 1983 al Convenio SOLAS (MSC.6(48)), aplicables a los buques construidos el 1 de julio de 1986, o posteriormente, pero antes del 1 de julio de 1998.

2 Pormenores de los dispositivos de salvamento (continuación)

5.1.2	Número de personas a las que se puede dar cabida	.....
5.2	Balsas salvavidas para las que no se necesitan dispositivos aprobados de puesta a flote	.....
5.2.1	Número de balsas salvavidas	.....
5.2.2	Número de personas a las que se puede dar cabida	.....
5.3	Número de balsas salvavidas prescritas en la regla III/31.1.4	.....
6	Número de aros salvavidas	.....
7	Número de chalecos salvavidas	.....
8	Trajes de inmersión	.....
8.1	Número total	.....
8.2	Número de trajes que cumplen con las prescripciones aplicables a los chalecos salvavidas	.....
9	Número de trajes de protección contra la intemperie	.....
10	Instalaciones radioeléctricas utilizadas en los dispositivos de salvamento	.....
10.1	Número de dispositivos de localización de búsqueda y salvamento	.....
10.1.1	Número de respondedores de radar de búsqueda y salvamento (SART)	.....
10.1.2	Número de transmisores de búsqueda y salvamento del SIA (AIS-SART)	.....
10.2	Número de aparatos radiotelefónicos bidireccionales de ondas métricas	.....

3 Pormenores de los sistemas y aparatos náuticos

Elemento		Disposiciones y equipos existentes a bordo
1.1	Compas magnético magistral ²	.....
1.2	Compas magnético de respeto ²	.....
1.3	Girocompás ²	.....
1.4	Repetidor del rumbo indicado por el girocompás ²	.....
1.5	Repetidor de las marcaciones indicadas por el girocompás ²	.....
1.6	Sistema de control del rumbo o de la derrota ²	.....
1.7	Taxímetro o dispositivo de marcación de compas ²	.....
1.8	Medios para corregir el rumbo y la demora	.....
1.9	Dispositivo transmisor del rumbo (DTR) ²	.....
2.1	Cartas náuticas/Sistema de información y visualización de cartas electrónicas (SIVCE) ³	.....
2.2	Medios auxiliares para los SIVCE	.....
2.3	Publicaciones náuticas	.....
2.4	Medios auxiliares para las publicaciones náuticas electrónicas	.....
3.1	Receptor para un sistema mundial de navegación por satélite/sistema de radionavegación terrenal ^{2,3}	.....

² En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.

³ Táchese según proceda.

3 Pormenores de los sistemas y aparatos náuticos (continuación)

Elemento		Disposiciones y equipos existentes a bordo
3.2	Radar de 9 GHz ²	.....
3.3	Segundo radar (3 GHz/9 GHz ³) ²	.....
3.4	Ayuda de punteo radar automática (APRA) ²	.....
3.5	Ayuda de seguimiento automática ²	.....
3.6	Segunda ayuda de seguimiento automática ²	.....
3.7	Ayuda de punteo electrónica ²	.....
4.1	Sistema de identificación automática (SIA)	.....
4.2	Sistema de identificación y seguimiento de largo alcance	.....
5.1	Registrador de datos de la travesía (RDT) ³	.....
5.2	Registrador de datos de la travesía simplificado (RDT-S) ³	.....
6.1	Dispositivo medidor de la velocidad y la distancia (en el agua) ²	.....
6.2	Dispositivo medidor de la velocidad y la distancia (con respecto al fondo en dirección de proa y de través) ²	.....
7	Ecosonda ²	.....
8.1	Indicadores de la posición del timón, del sentido de giro, empuje y paso de la hélice y de la modalidad de funcionamiento ²	.....
8.2	Indicador de la velocidad de giro ²	.....
9	Sistema de recepción de señales acústicas ²	.....
10	Teléfono para comunicar con el puesto de gobierno de emergencia ²	.....
11	Lámpara de señales diurnas ²	.....
12	Reflector de radar ²	.....
13	Código internacional de señales	.....
14	Manual IAMSAR, Volumen III	.....
15	Sistema de alarma para la guardia de navegación en el puente (BNWAS)	.....

SE CERTIFICA que este inventario es correcto en su totalidad.

Expedido en
 (lugar de expedición del inventario)

.....
 (fecha de expedición)

.....
 (firma del funcionario autorizado para expedir el inventario)

(Sello o estampilla de la autoridad expedidora, según proceda)

² En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.
³ Táchese según proceda.

**MODELO DE CERTIFICADO DE SEGURIDAD RADIOELÉCTRICA
PARA BUQUE DE CARGA**

CERTIFICADO DE SEGURIDAD RADIOELÉCTRICA PARA BUQUE DE CARGA

El presente certificado llevará como suplemento un Inventario del equipo de seguridad radioeléctrica para buque de carga (Modelo R)

(Sello oficial)

(Estado)

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974,
enmendado

con la autoridad conferida por el Gobierno de

_____ *(nombre del Estado)*

por

_____ *(persona u organización autorizada)*

Datos relativos al buque¹

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Zonas marítimas en las que el buque está autorizado a operar
según su certificado (regla IV/2)

Número IMO²

Fecha en la que se colocó la quilla del buque o en la que su construcción se hallaba en una fase equivalente o, cuando proceda, fecha en la que comenzaron las obras de transformación, reforma o modificación de carácter importante:

¹ Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

² De conformidad con el Sistema de asignación de un número de la OMI a los buques para su identificación, adoptado por la Organización mediante la resolución A.600(15).

SE CERTIFICA:

- 1 Que el buque ha sido objeto de reconocimiento, de conformidad con lo prescrito en la regla I/9 del Convenio.
- 2 Que el reconocimiento ha puesto de manifiesto lo siguiente:
 - 2.1 que el buque cumple con las prescripciones del Convenio en lo que respecta a las instalaciones radioeléctricas;
 - 2.2 que el funcionamiento de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento cumple con las prescripciones del Convenio.
- 3 Que se ha/no se ha³ expedido un Certificado de exención.

El presente certificado es válido hasta

Fecha de terminación del reconocimiento en el que se basa el presente certificado:
(dd/mm/aaaa)

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(Sello o estampilla de la autoridad expedidora, según proceda)

³ Táchese según proceda.

**INVENTARIO DEL EQUIPO DE SEGURIDAD RADIOELÉCTRICA
PARA BUQUE DE CARGA (MODELO R)**

INVENTARIO DEL EQUIPO NECESARIO PARA CUMPLIR CON EL
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA
HUMANA EN EL MAR, 1974, ENMENDADO

1 Datos relativos al buque

Nombre del buque

Número o letras distintivos

Número mínimo de personas con la competencia necesaria
para manejar las instalaciones radioeléctricas

2 Pormenores de las instalaciones radioeléctricas

Elemento		Disposiciones y equipos existentes a bordo
1	Sistemas primarios	.....
1.1	Instalación radioeléctrica de ondas métricas	.....
1.1.1	Codificador de LSD	.....
1.1.2	Receptor de escucha de LSD	.....
1.1.3	Radiotelefonía	.....
1.2	Instalación radioeléctrica de ondas hectométricas	.....
1.2.1	Codificador de LSD	.....
1.2.2	Receptor de escucha de LSD	.....
1.2.3	Radiotelefonía	.....
1.3	Instalación radioeléctrica de ondas hectométricas/decamétricas	.....
1.3.1	Codificador de LSD	.....
1.3.2	Receptor de escucha de LSD	.....
1.3.3	Radiotelefonía	.....
1.3.4	Telegrafía de impresión directa	.....
1.4	Estación terrena de buque de Inmarsat	.....
2	Medios secundarios para emitir el alerta	.....
3	Instalaciones para la recepción de información sobre seguridad marítima	.....
3.1	Receptor NAVTEX	.....
3.2	Receptor de LIG	.....
3.3	Receptor radiotelegráfico de impresión directa de ondas decamétricas	.....
4	RLS satelitaria	.....
4.1	Cospas-Sarsat	.....
5	RLS de ondas métricas	.....
6	Dispositivo de localización de búsqueda y salvamento de buque	.....
6.1	Respondedor de radar de búsqueda y salvamento (SART)	.....
6.2	Transmisor de búsqueda y salvamento del SIA (AIS-SART)	.....

3 Métodos utilizados para garantizar la disponibilidad de las instalaciones radioeléctricas (reglas IV/15.6 y 15.7)

3.1 Duplicación del equipo

3.2 Mantenimiento en tierra

3.3 Capacidad de mantenimiento en el mar

SE CERTIFICA que este inventario es correcto en su totalidad.

Expedido en
(lugar de expedición del inventario)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el inventario)

(Sello o estampilla de la autoridad expedidora, según proceda)

MODELO DE CERTIFICADO DE EXENCIÓN
CERTIFICADO DE EXENCIÓN

(Sello oficial)

(Estado)

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974,
enmendado,

con la autoridad conferida por el Gobierno de

_____ *(nombre del Estado)*

por

_____ *(persona u organización autorizada)*

Datos relativos al buque¹

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Número IMO²

SE CERTIFICA:

Que, por aplicación de lo prescrito en la regla
del Convenio, el buque queda exento de las prescripciones relativas a
..... del Convenio.

Condiciones, si las hubiere, en que se otorga el Certificado de exención:

.....
.....

Viajes, si los hubiere, para los que se otorga el Certificado de exención:

.....
.....

El presente certificado es válido hasta
a condición de que siga siendo válido el Certificado de
al que se adjunta el presente certificado.

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(Sello o estampilla de la autoridad expedidora, según proceda)

¹ Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

² De conformidad con el Sistema de asignación de un número de la OMI a los buques para su identificación, adoptado por la Organización mediante la resolución A.600(15).

MODELO DE CERTIFICADO DE SEGURIDAD PARA BUQUE NUCLEAR DE PASAJE
CERTIFICADO DE SEGURIDAD PARA BUQUE NUCLEAR DE PASAJE

El presente certificado llevará como suplemento un Inventario
del equipo de seguridad para buque de pasaje (Modelo P)

(Sello oficial)

(Estado)

para viaje internacional/viaje internacional corto¹

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974,
enmendado,

con la autoridad conferida por el Gobierno de

_____ *(nombre del Estado)*

por

_____ *(persona u organización autorizada)*

Datos relativos al buque²

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Zonas marítimas en las que el buque está autorizado a operar
según su certificado (regla IV/2)

Número IMO³

Fecha de construcción:

Fecha del contrato de construcción

Fecha en que se colocó la quilla o en que la construcción
se hallaba en una fase equivalente

Fecha de entrega

Fecha en que comenzaron las obras de transformación,
reforma o modificación de carácter importante (cuando proceda)

Se deberán cumplimentar todas las fechas aplicables.

¹ Táchese según proceda.

² Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

³ De conformidad con el Sistema de asignación de un número de la OMI a los buques para su identificación, adoptado por la Organización mediante la resolución A.600(15).

SE CERTIFICA:

- 1 Que el buque ha sido objeto de reconocimiento, de conformidad con lo prescrito en la regla VIII/9 del Convenio.
- 2 Que este buque, que se trata de un buque nuclear, cumple plenamente las prescripciones del capítulo VIII del Convenio y se ajusta al expediente de seguridad aprobado para él, y que:
 - 2.1 cumple las prescripciones del Convenio en lo que respecta a:
 - .1 la estructura, las máquinas principales y auxiliares, las calderas y otros recipientes a presión, incluidas la planta de propulsión nuclear y la estructura de protección contra abordajes;
 - .2 la disposición del compartimentado estanco y los detalles correspondientes;
 - .3 las líneas de carga de compartimentado siguientes:

Líneas de carga de compartimentado asignadas y marcadas en el costado, en el centro del buque (regla II-1/18) ⁴	Francobordo	Utilícese cuando los espacios destinados a los pasajeros comprendan los siguientes espacios alternativos
P1 P2 P3

- 2.2 cumple las prescripciones del Convenio en lo que respecta a la protección estructural contra incendios, los sistemas y dispositivos de seguridad contra incendios y los planos de lucha contra incendios;
- 2.3 cumple las prescripciones del Convenio en lo que respecta a los sistemas y al equipo de protección contra las radiaciones;
- 2.4 los dispositivos de salvamento y el equipo de los botes salvavidas, las balsas salvavidas y los botes de rescate se han provisto de conformidad con las prescripciones del Convenio;
- 2.5 está provisto de un aparato lanzacabos y de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento, de conformidad con las prescripciones del Convenio;
- 2.6 cumple las prescripciones del Convenio, en lo que respecta a las instalaciones radioeléctricas;
- 2.7 el funcionamiento de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento cumple las prescripciones del Convenio;
- 2.8 cumple las prescripciones del Convenio en lo que respecta al equipo náutico de a bordo, los medios de embarco para prácticos y las publicaciones náuticas;

⁴ Para los buques construidos antes del 1 de enero de 2009, se utilizará la notación de compartimentado "C.1, C.2 y C.3" aplicable.

- 2.9 está provisto de luces, marcas, medios emisores de señales acústicas y de señales de socorro, de conformidad con las prescripciones del Convenio y del Reglamento internacional para prevenir los abordajes en vigor;
- 2.10 en todos sus demás aspectos, el buque se ajusta a las prescripciones pertinentes del Convenio;
- 2.11 el buque cuenta/no cuenta¹ con un proyecto y disposiciones alternativos en virtud de la(s) regla(s) II-1/55 / II-2/17 / III/38¹ del Convenio; y
- 2.12 se adjunta/no se adjunta¹ al presente certificado un Documento de aprobación de proyectos y disposiciones alternativos para las instalaciones eléctricas y de máquinas/la protección contra incendios/los dispositivos y medios de salvamento.¹

El presente certificado es válido hasta

Fecha de terminación del reconocimiento en el que se basa el presente certificado:
(dd/mm/aaaa)

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(Sello o estampilla de la autoridad expedidora, según proceda)

¹ Táchese según proceda.

MODELO DE CERTIFICADO DE SEGURIDAD PARA BUQUE NUCLEAR DE CARGA

CERTIFICADO DE SEGURIDAD PARA BUQUE NUCLEAR DE CARGA

El presente certificado llevará como suplemento un Inventario
del equipo de seguridad para buque de carga (Modelo C)

(Sello oficial)

(Estado)

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974,
enmendado

con la autoridad conferida por el Gobierno de

_____ *(nombre del Estado)*

por

_____ *(persona u organización autorizada)*

Datos relativos al buque¹

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Peso muerto del buque (toneladas métricas)²

Eslora del buque (regla III/3.12)

Zonas marítimas en las que el buque está autorizado a operar
según su certificado (regla IV/2)

Número IMO³

Tipo de buque⁴

Granelero

Petrolero

Buque tanque quimiquero

Buque gasero

Buque de carga distinto de los anteriores

¹ Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

² Únicamente si se trata de petroleros, buques tanque quimiqueros y buques gaseros.

³ De conformidad con el Sistema de asignación de un número de la OMI a los buques para su identificación, adoptado por la Organización mediante la resolución A.600(15).

⁴ Táchese según proceda.

Fecha de construcción:

Fecha del contrato de construcción
Fecha en que se colocó la quilla o en que la construcción
se hallaba en una fase equivalente
Fecha de entrega
Fecha en que comenzaron las obras de transformación,
reforma o modificación de carácter importante (cuando proceda)

Se deberán cumplimentar todas las fechas aplicables.

SE CERTIFICA:

- 1 Que el buque ha sido objeto de reconocimiento, de conformidad con lo prescrito en la regla VIII/9 del Convenio.
- 2 Que este buque, que se trata de un buque nuclear, cumple plenamente las prescripciones del capítulo VIII del Convenio y se ajusta al expediente de seguridad aprobado para él, y que:
 - 2.1 el estado de la estructura, las máquinas y el equipo, según las definiciones de la regla I/10 (cuando corresponda cumplir lo dispuesto en la regla VIII/9), incluidas la planta de propulsión nuclear y la estructura de protección contra abordajes, es satisfactorio, y que el buque cumple las prescripciones pertinentes de los capítulos II-1 y II-2 del Convenio (excluidas las relativas a sistemas y dispositivos de seguridad contra incendios y a planos de lucha contra incendios);
 - 2.2 cumple las prescripciones del Convenio en lo que se refiere a los sistemas y dispositivos de seguridad contra incendios y los planos de lucha contra incendios;
 - 2.3 los dispositivos de salvamento y el equipo para los botes salvavidas, las balsas salvavidas y los botes de rescate se han provisto de conformidad con las prescripciones del Convenio;
 - 2.4 está provisto de un aparato lanzacabos y de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento, de conformidad con las prescripciones del Convenio;
 - 2.5 cumple las prescripciones del Convenio, en lo que respecta a las instalaciones radioeléctricas;
 - 2.6 el funcionamiento de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento cumple las prescripciones del Convenio;
 - 2.7 cumple las prescripciones del Convenio en lo que respecta al equipo náutico de a bordo, los medios de embarco para prácticos y las publicaciones náuticas;
 - 2.8 está provisto de luces, marcas, medios emisores de señales acústicas y de señales de socorro, de conformidad con las prescripciones del Convenio y del Reglamento internacional para prevenir los abordajes, en vigor;

- 2.9 en todos sus demás aspectos, el buque se ajusta a las prescripciones pertinentes de las reglas en la medida en que le son aplicables;
- 2.10 el buque cuenta/no cuenta³ con un proyecto y disposiciones alternativos en virtud de la(s) regla(s) II-1/55 / II-2/17 / III/38³ del Convenio; y
- 2.11 se adjunta/no se adjunta³ al presente certificado un Documento de aprobación de proyectos y disposiciones alternativos para las instalaciones eléctricas y de máquinas/la protección contra incendios/los dispositivos y medios de salvamento.³

El presente certificado es válido hasta

Fecha de ultimación del reconocimiento en el que se basa el presente certificado:
(dd/mm/aaaa)

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(Sello o estampilla de la autoridad expedidora, según proceda)

³ Táchese según proceda.

**INVENTARIO DEL EQUIPO DE SEGURIDAD PARA BUQUE DE CARGA
 (MODELO C)**

INVENTARIO DEL EQUIPO NECESARIO PARA CUMPLIR CON EL
 CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA
 HUMANA EN EL MAR, 1974, ENMENDADO

1 Datos relativos al buque

Nombre del buque

Número o letras distintivos

Número mínimo de personas con la competencia necesaria
 para manejar las instalaciones radioeléctricas

2 Pormenores de los dispositivos de salvamento

1	Número total de personas para las que se han provisto dispositivos de salvamento		
		A babor	A estribor
2	Número total de botes salvavidas	.....	.....
2.1	Número total de personas a las que se puede dar cabida	.....	.....
2.2	Número de botes salvavidas parcialmente cerrados autoadrizables (regla III/43) ¹	.....	.....
2.3	Número de botes salvavidas totalmente cerrados (regla III/31 y sección 4.6 del Código IDS)	.....	.....
2.4	Número de botes salvavidas provistos de un sistema autónomo de abastecimiento de aire (regla III/31 y sección 4.8 del Código IDS)	.....	.....
2.5	Número de botes salvavidas protegidos contra incendios (regla III/31 y sección 4.9 del Código IDS)	.....	.....
2.6	Otros botes salvavidas	.....	.....
2.6.1	Número	.....	.....
2.6.2	Tipo	.....	.....
2.7	Número de botes salvavidas de caída libre	.....	.....
2.7.1	Totalmente cerrados (regla III/31 y sección 4.7 del Código IDS)	.....	.....
2.7.2	Provistos de un sistema autónomo (regla III/31 y sección 4.8 del Código IDS)	.....	.....
2.7.3	Protegidos contra incendios (regla III/31 y sección 4.9 del Código IDS)	.....	.....
3	Número total de botes salvavidas a motor (comprendidos en el total de botes salvavidas que se acaba de indicar)	.....	.....
3.1	Número de botes salvavidas provistos de proyector	.....	.....
4	Número de botes de rescate	.....	.....
4.1	Número de botes comprendidos en el total de botes salvavidas que se acaba de indicar	.....	.....

¹ Véanse las enmiendas de 1983 al Convenio SOLAS (MSC.6(48)), aplicables a los buques construidos el 1 de julio de 1986, o posteriormente, pero antes del 1 de julio de 1998.

2 Pormenores de los dispositivos de salvamento (continuación)

5	Balsas salvavidas	.....
5.1	Balsas salvavidas para las que se necesitan dispositivos aprobados de puesta a flote	.....
5.1.1	Número de balsas salvavidas	.....
5.1.2	Número de personas a las que se puede dar cabida	.....
5.2	Balsas salvavidas para las que no se necesitan dispositivos aprobados de puesta a flote	.....
5.2.1	Número de balsas salvavidas	.....
5.2.2	Número de personas a las que se puede dar cabida	.....
5.3	Número de balsas salvavidas prescritas en la regla III/31.1.4	.....
6	Número de aros salvavidas	.....
7	Número de chalecos salvavidas	.....
8	Trajes de inmersión	.....
8.1	Número total	.....
8.2	Número de trajes que cumplen con las prescripciones aplicables a los chalecos salvavidas	.....
9	Número de trajes de protección contra la intemperie	.....
10	Instalaciones radioeléctricas utilizadas en los dispositivos de salvamento	.....
10.1	Número de dispositivos de localización de búsqueda y salvamento	.....
10.1.1	Número de respondedores de radar de búsqueda y salvamento (SART)	.....
10.1.2	Número de transmisores de búsqueda y salvamento del SIA (AIS-SART)	.....
10.2	Número de aparatos radiotelefónicos bidireccionales de ondas métricas	.....

3 Pormenores de las instalaciones radioeléctricas

Elemento		Disposiciones y equipos existentes a bordo
1	Sistemas primarios	.....
1.1	Instalación radioeléctrica de ondas métricas	.....
1.1.1	Codificador de LSD	.....
1.1.2	Receptor de escucha de LSD	.....
1.1.3	Radiotelefonía	.....
1.2	Instalación radioeléctrica de ondas hectométricas	.....
1.2.1	Codificador de LSD	.....
1.2.2	Receptor de escucha de LSD	.....
1.2.3	Radiotelefonía	.....
1.3	Instalación radioeléctrica de ondas hectométricas/decamétricas	.....
1.3.1	Codificador de LSD	.....
1.3.2	Receptor de escucha de LSD	.....
1.3.3	Radiotelefonía	.....
1.3.4	Radiotelegrafía de impresión directa	.....

3 Pormenores de las instalaciones radioeléctricas (continuación)

Elemento		Disposiciones y equipos existentes a bordo
1.4	Estación terrena de buque de Inmarsat	.....
2	Medios secundarios para emitir alertas	.....
3	Instalaciones para la recepción de información sobre seguridad marítima	.....
3.1	Receptor NAVTEX	.....
3.2	Receptor de LIG	.....
3.3	Receptor radiotelegráfico de impresión directa de ondas decamétricas	.....
4	RLS satelitaria	.....
4.1	Cospas-Sarsat	.....
5	RLS de ondas métricas	.....
6	Dispositivo de localización de búsqueda y salvamento de buque	.....
6.1	Respondedor de radar de búsqueda y salvamento (SART)	.....
6.2	Transmisor de búsqueda y salvamento del SIA (AIS-SART)	.....

4 Métodos utilizados para garantizar la disponibilidad de las instalaciones radioeléctricas (reglas IV/15.6 y 15.7)

- 4.1 Duplicación del equipo
- 4.2 Mantenimiento en tierra
- 4.3 Capacidad de mantenimiento en el mar

5 Pormenores de los sistemas y aparatos náuticos

Elemento		Disposiciones y equipos existentes a bordo
1.1	Compás magnético magistral ²	.....
1.2	Compás magnético de respeto ²	.....
1.3	Girocompás ²	.....
1.4	Repetidor del rumbo indicado por el girocompás ²	.....
1.5	Repetidor de las marcaciones indicadas por el girocompás ²	.....
1.6	Sistema de control del rumbo o de la derrota ²	.....
1.7	Taxímetro o dispositivo de marcación de compás ²	.....
1.8	Medios para corregir el rumbo y la demora	.....
1.9	Dispositivo transmisor del rumbo (DTR) ²	.....
2.1	Cartas náuticas/Sistema de información y visualización de cartas electrónicas (SIVCE) ³	.....
2.2	Medios auxiliares para los SIVCE	.....

² En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.
³ Táchese según proceda.

5 Pormenores de los sistemas y aparatos náuticos (continuación)

Elemento		Disposiciones y equipos existentes a bordo
2.3	Publicaciones náuticas	.....
2.4	Medios auxiliares para las publicaciones náuticas electrónicas	.....
3.1	Receptor para un sistema mundial de navegación por satélite/sistema de radionavegación terrena ^{2,3}	.....
3.2	Radar de 9 GHz ²	.....
3.3	Segundo radar (3 GHz/9 GHz ³) ²	.....
3.4	Ayuda de punteo radar automática (APRA) ²	.....
3.5	Ayuda de seguimiento automática ²	.....
3.6	Segunda ayuda de seguimiento automática ²	.....
3.7	Ayuda de punteo electrónica ²	.....
4.1	Sistema de identificación automática (SIA)	.....
4.2	Sistema de identificación y seguimiento de largo alcance	.....
5.1	Registrador de datos de la travesía (RDT) ³	.....
5.2	Registrador de datos de la travesía simplificado (RDT-S) ³	.....
6.1	Dispositivo medidor de la velocidad y la distancia (en el agua) ²	.....
6.2	Dispositivo medidor de la velocidad y la distancia (con respecto al fondo en dirección de proa y de través) ²	.....
7	Ecosonda ²	.....
8.1	Indicadores de la posición del timón, del sentido de giro, empuje y paso de la hélice y de la modalidad de funcionamiento ²	.....
8.2	Indicador de la velocidad de giro ²	.....
9	Sistema de recepción de señales acústicas ²	.....
10	Teléfono para comunicar con el puesto de gobierno de emergencia ²	.....
11	Lámpara de señales diurnas ²	.....
12	Reflector de radar ²	.....
13	Código internacional de señales	.....
14	Manual IAMSAR, Volumen III	.....
15	Sistema de alarma para la guardia de navegación en el puente (BNWAS)	.....

SE CERTIFICA que este inventario es correcto en su totalidad.

Expedido en
(lugar de expedición del inventario)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el inventario)

(Sello o estampilla de la autoridad expedidora, según proceda)

² En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.
³ Táchese según proceda.

ANEXO 1

**RESOLUCIÓN MSC.365(93)
(adoptada el 22 de mayo de 2014)**

**ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO TAMBIÉN el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar (Convenio SOLAS), 1974 (en adelante denominado "el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, con excepción de las disposiciones de su capítulo I,

HABIENDO EXAMINADO, en su 93º periodo de sesiones, las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del mismo,

1 ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;

2 DISPONE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de julio de 2015, a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del tonelaje bruto de la flota mercante mundial hayan notificado que recusan las enmiendas;

3 INVITA a los Gobiernos Contratantes del Convenio SOLAS a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de enero de 2016, una vez aceptadas con arreglo a lo dispuesto en el párrafo 2 anterior;

4 PIDE al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;

5 PIDE TAMBIÉN al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO II-1
CONSTRUCCIÓN – ESTRUCTURA, COMPARTIMENTADO Y ESTABILIDAD,
INSTALACIONES DE MÁQUINAS E INSTALACIONES ELÉCTRICAS

PARTE C
Instalaciones de máquinas

Regla 29

Aparato de gobierno

- 1 Se añade el texto nuevo siguiente después del párrafo 3.2:

"Cuando no pueda demostrarse el cumplimiento de esta prescripción durante las pruebas de mar con el buque a su calado máximo en agua salada y navegando en marcha avante a la velocidad correspondiente al número máximo de revoluciones continuas del motor principal y el paso máximo de proyecto, el buque, independientemente de su fecha de construcción, podrá demostrar que cumple esta prescripción aplicando uno de los siguientes métodos:

- .1 durante las pruebas de mar el buque está con la quilla a nivel y el timón totalmente sumergido mientras navega en marcha avante a la velocidad correspondiente al número máximo de revoluciones continuas del motor principal y el paso máximo de proyecto; o
- .2 cuando no pueda lograrse la inmersión total del timón durante las pruebas de mar, se calculará una velocidad en marcha avante apropiada utilizando la zona de la pala del timón sumergida en la condición de carga de la prueba de mar propuesta. La velocidad en marcha avante calculada se traducirá en que se ejerzan una fuerza y un par en el aparato de gobierno principal que sean al menos tan grandes como si se estuvieran haciendo pruebas con el buque a su calado máximo en agua salada y navegando en marcha avante a la velocidad correspondiente al número máximo de revoluciones continuas del motor principal y el paso máximo de proyecto; o
- .3 la fuerza y el par del timón en la condición de carga de la prueba de mar se han previsto de manera fiable y se han extrapolado a la condición de carga plena. La velocidad del buque corresponderá al número máximo de revoluciones continuas del motor principal y el paso máximo de proyecto de la hélice;"

- 2 Se suprime la palabra "y" al final del párrafo 4.2 y se añade el texto nuevo siguiente:

"Cuando no pueda demostrarse el cumplimiento de esta prescripción durante las pruebas de mar con el buque a su calado máximo en agua salada y navegando en marcha avante a la mitad de la velocidad correspondiente al número máximo de revoluciones continuas del motor principal y el paso máximo de proyecto, o a 7 nudos si esta velocidad es mayor, el buque, independientemente de su fecha de construcción, incluidos aquellos construidos antes del 1 de enero de 2009, podrá demostrar que cumple esta prescripción aplicando uno de los siguientes métodos:

- .1 durante las pruebas de mar el buque está con la quilla a nivel y el timón totalmente sumergido mientras navega en marcha avante a la mitad de la velocidad correspondiente al número máximo de revoluciones continuas del motor principal y el paso máximo de proyecto, o a 7 nudos si esta velocidad es mayor; o
- .2 cuando no pueda lograrse la inmersión total del timón durante las pruebas de mar, se calculará una velocidad en marcha avante apropiada utilizando la zona de la pala del timón sumergida en la condición de carga de la prueba de mar propuesta. La velocidad en marcha avante calculada se traducirá en que se ejerzan una fuerza y un par en el aparato de gobierno auxiliar que sean al menos tan grandes como si se estuvieran haciendo pruebas con el buque a su calado máximo en agua salada y navegando en marcha avante a la mitad de la velocidad correspondiente al número máximo de revoluciones continuas del motor principal y el paso máximo de proyecto, o a 7 nudos si esta velocidad es mayor; o
- .3 la fuerza y el par del timón en la condición de carga de la prueba de mar se han previsto de manera fiable y se han extrapolado a la condición de carga plena; y"

CAPÍTULO II-2 CONSTRUCCIÓN – PREVENCIÓN, DETECCIÓN Y EXTINCIÓN DE INCENDIOS

Parte A Generalidades

Regla 1

Ámbito de aplicación

- 3 Se añaden los tres párrafos nuevos siguientes después del párrafo 2.5:

"2.6 Los buques para el transporte de vehículos construidos antes del 1 de enero de 2016, incluidos aquellos construidos antes del 1 de julio de 2012, cumplirán lo dispuesto en el párrafo 2.2 de la regla 20-1, adoptada mediante la resolución MSC.365(93).

2.7 Los buques tanque construidos antes del 1 de enero de 2016, incluidos aquellos construidos antes del 1 de julio de 2012, cumplirán lo dispuesto en la regla 16.3.3, con la excepción del apartado 16.3.3.3.

2.8 Las reglas 4.5.5.1.1 y 4.5.5.1.3 se aplican a los buques construidos el 1 de enero de 2002 o posteriormente, pero antes del 1 de enero de 2016, y la regla 4.5.5.2.1 se aplica a todos los buques construidos antes del 1 de enero de 2016."

Regla 3

Definiciones

4 Se añaden los tres párrafos nuevos siguientes después del párrafo 53:

"54 *Válvula de mariposa contraincendios*: a los efectos de la implantación de la regla 9.7, adoptada mediante la resolución MSC.365(93), según sea enmendada, es un dispositivo instalado en un conducto de ventilación que en condiciones normales permanece abierto para permitir la circulación por el conducto y que se cierra en caso de incendio, impidiendo la circulación a fin de restringir el paso de las llamas. Al utilizar la definición anterior, cabe la asociación de los términos siguientes:

- .1 la *válvula de mariposa contraincendios automática* es la que se cierra por sí sola en presencia de productos del fuego;
- .2 la *válvula de mariposa contraincendios manual* es la proyectada para que la tripulación la abra o la cierre a mano desde la propia válvula; y
- .3 la *válvula de mariposa contraincendios accionada por telemando* es la proyectada para que la tripulación la cierre a través de un mando situado a distancia de la válvula de mariposa controlada.

55 *Válvula de mariposa contra el humo*: a los efectos de la implantación de la regla 9.7, adoptada mediante la resolución MSC.[...](93), según sea enmendada, es un dispositivo instalado en un conducto de ventilación que en condiciones normales permanece abierto para permitir la circulación por el conducto y que se cierra en caso de incendio, impidiendo la circulación a fin de restringir el paso del humo y de los gases calientes. La válvula de mariposa contra el humo no tiene como función contribuir a la integridad de una división contraincendios de cualquier clase que tenga un conducto de ventilación pasante. Al utilizar la definición anterior, cabe la asociación de los términos siguientes:

- .1 la *válvula de mariposa contra el humo automática* es la que se cierra por sí sola en presencia de humo o de gases calientes;
- .2 la *válvula de mariposa contra el humo manual* es la proyectada para que la tripulación la abra o la cierre a mano desde la propia válvula; y
- .3 la *válvula de mariposa contra el humo accionada por telemando* es la proyectada para que la tripulación la cierre a través de un mando situado a distancia de la válvula de mariposa controlada.

56 *Buque para el transporte de vehículos*: buque de carga con espacios de transbordo rodado de varias cubiertas proyectado para el transporte de automóviles y camiones vacíos."

Parte B Prevención de incendios y explosiones

Regla 4

Probabilidad de ignición

5 Se sustituye el párrafo 5.5 por el siguiente:

"5.5 Sistemas de gas inerte

5.5.1 *Ámbito de aplicación*

5.5.1.1 En los buques tanque de peso muerto igual o superior a 20 000 toneladas construidos el 1 de julio de 2002 o posteriormente, pero antes del 1 de enero de 2016, la protección de los tanques de carga se efectuará mediante un sistema fijo de gas inerte, de conformidad con lo dispuesto en el Código de sistemas de seguridad contra incendios, adoptado mediante la resolución MSC.98(73), con la salvedad de que la Administración podrá aceptar otros sistemas o medios equivalentes, tales como los descritos en el párrafo 5.5.4.

5.5.1.2 En los buques de peso muerto igual o superior a 8 000 toneladas construidos el 1 de enero de 2016 o posteriormente que transporten las cargas indicadas en la regla 1.6.1 o 1.6.2, la protección de los tanques de carga se efectuará mediante un sistema fijo de gas inerte, de conformidad con lo dispuesto en el Código de sistemas de seguridad contra incendios, con la salvedad de que la Administración podrá aceptar otros sistemas o medios equivalentes, tales como los descritos en el párrafo 5.5.4.

5.5.1.3 Los buques tanque que utilicen un procedimiento de lavado con crudos para limpiar los tanques de carga estarán provistos de un sistema de gas inerte que cumpla lo prescrito en el Código de sistemas de seguridad contra incendios, así como de máquinas de lavado de tanques fijas. No obstante, los sistemas de gas inerte instalados en buques tanque construidos el 1 de julio de 2002 o posteriormente, pero antes del 1 de enero de 2016, cumplirán lo dispuesto en el Código de sistemas de seguridad contra incendios, adoptado mediante la resolución MSC.98(73).

5.5.1.4 Los buques tanque en que haya que instalar sistemas de gas inerte cumplirán las disposiciones siguientes:

- .1 los espacios del doble casco estarán dotados de conexiones adecuadas para el suministro de gas inerte;
- .2 cuando dichos espacios estén conectados a un sistema de distribución de gas inerte instalado permanentemente, se proveerán medios para evitar que los gases de hidrocarburos procedentes de los tanques de carga pasen a los espacios del doble casco a través de dicho sistema; y
- .3 cuando dichos espacios no estén conectados permanentemente a un sistema de distribución de gas inerte, se proveerán medios adecuados que permitan conectarlos al colector de gas inerte.

5.5.2 *Sistemas de gas inerte de los buques tanque quimiqueros o gaseros*

5.5.2.1 No será necesario aplicar las prescripciones del Código de sistemas de seguridad contra incendios relativas a los sistemas de gas inerte a los buques tanque quimiqueros construidos antes del 1 de enero de 2016, incluidos aquellos construidos antes del 1 de julio de 2012, y a todos los gaseros:

- .1 cuando éstos transporten las cargas indicadas en la regla 1.6.1, a condición de que tales buques cumplan las prescripciones relativas a los sistemas de gas inerte de los buques tanque quimiqueros establecidas por la Administración, basadas en las directrices elaboradas por la Organización;* ni
- .2 cuando éstos transporten cargas inflamables que no sean crudos o productos del petróleo, tales como las cargas enumeradas en los capítulos 17 y 18 del Código internacional de quimiqueros, a condición de que la capacidad de los tanques de carga utilizados para dicho transporte no exceda de 3 000 m³, la capacidad de cada tobera de las máquinas de lavado de tanques no exceda de 17,5 m³/h y el caudal combinado de las máquinas que se estén utilizando en un tanque de carga en cualquier momento no exceda de 110 m³/h.

* Véase la "Regla relativa a los sistemas de gas inerte destinados a los buques tanque quimiqueros", adoptada por la Organización mediante la resolución A.567(14) y Corr.1.

5.5.3 *Prescripciones generales relativas a los sistemas de gas inerte*

5.5.3.1 El sistema de gas inerte será capaz de inertizar, purgar y desgasificar los tanques de carga vacíos y de mantener la atmósfera de dichos tanques con el contenido de oxígeno requerido.

5.5.3.2 Los buques tanque provistos de un sistema fijo de gas inerte llevarán un sistema de indicación del espacio vacío en tanques cerrados.

5.5.4 *Prescripciones relativas a los sistemas equivalentes*

5.5.4.1 Tras haber considerado la disposición del buque y su equipo, la Administración podrá aceptar otras instalaciones fijas, de conformidad con lo dispuesto en la regla I/5 y en el párrafo 5.5.4.3.

5.5.4.2 En los buques tanque de peso muerto igual o superior a 8 000 toneladas, pero inferior a 20 000 toneladas, construidos el 1 de enero de 2016 o posteriormente, en lugar de las instalaciones fijas estipuladas en el párrafo 5.5.4.1, la Administración podrá aceptar otras disposiciones o medios de protección equivalentes, de conformidad con lo dispuesto en la regla I/5 y en el párrafo 5.5.4.3.

5.5.4.3 Los sistemas o medios equivalentes:

- .1 podrán impedir la acumulación peligrosa de mezclas explosivas en los tanques de carga intactos durante el servicio normal a lo largo de todo el viaje en lastre y mientras se efectúen las operaciones necesarias en el interior de los tanques; y
- .2 estarán proyectados de modo que el riesgo de ignición debido a la generación de electricidad estática en el propio sistema quede reducido al mínimo."

Parte C
Control de incendios

Regla 9

Contención del incendio

6 El párrafo 7 se sustituye por el siguiente:

"7 SISTEMAS DE VENTILACIÓN

El presente párrafo se aplica a los buques construidos el 1 de enero de 2016 o posteriormente.

7.1 Generalidades

7.1.1 Los conductos de ventilación, incluidos los conductos de una sola pared o de dos paredes, serán de acero o material equivalente excepto los fuelles flexibles cortos que no excedan de 600 mm utilizados para conectar ventiladores a los conductos en la sala del aire acondicionado. Salvo que se disponga expresamente lo contrario en el párrafo 7.1.6, cualquier otro material que se utilice en la fabricación de los conductos, incluido el aislante, será también incombustible. Sin embargo, los conductos cortos, que no excedan en general de 2 m de longitud y cuya sección transversal libre* no sea superior a 0,02 m², no necesitan ser de acero o material equivalente, siempre y cuando:

- .1 sean de material incombustible, revestidos tanto en su interior como en su exterior de membranas que tengan características de débil propagación de la llama y que, en cada caso, tengan un valor calorífico** que no exceda de 45 MJ/m² del área de la superficie en relación con el espesor utilizado;
- .2 sólo se utilicen en el extremo del sistema de ventilación; y
- .3 no estén situados a menos de 600 mm, medida esta distancia en el sentido longitudinal del conducto, desde una abertura practicada en una división de clase "A" o "B", incluidos los cielos rasos continuos de clase "B".

* La expresión "sección transversal libre" significa que, incluso cuando el conducto haya sido aislado previamente, la sección se calculará a partir del diámetro de las dimensiones interiores del conducto en sí y no del aislamiento.

** Véanse las recomendaciones publicadas por la Organización Internacional de Normalización, en particular la publicación ISO 1716:2002, *Reaction to the fire tests for building products – Determination of the heat of combustion*.

7.1.2 Los siguientes dispositivos se someterán a prueba de conformidad con el Código de procedimientos de ensayo de exposición al fuego:

- .1 las válvulas de mariposa contra incendios, incluidos los mandos de funcionamiento pertinentes; sin embargo, no será necesaria ninguna prueba cuando las válvulas de mariposa estén situadas en el extremo inferior del conducto en los conductos de extracción para los fogones de las cocinas, que deben ser de acero y poder evitar que entre la corriente de aire en el conducto; y
- .2 las perforaciones de conductos que atraviesen divisiones de clase "A". Sin embargo, cuando los manguitos de acero estén soldados o unidos directamente a los conductos de ventilación mediante conexiones ribeteadas o atornilladas no será necesaria la prueba.

7.1.3 Las válvulas de mariposa contra incendios serán fácilmente accesibles. Cuando se encuentren situadas detrás de cielos rasos o revestimientos, en dichos cielos rasos o revestimientos habrá una escotilla para su inspección en la que se marcará el número de identificación de la válvula. Dicho número se marcará también en cualquier mando a distancia provisto.

7.1.4 Los conductos de ventilación estarán provistos de escotillas a fines de inspección y limpieza. Dichas escotillas estarán situadas cerca de las válvulas de mariposa contra incendios.

7.1.5 Los orificios principales de admisión y salida de todos los sistemas de ventilación podrán quedar cerrados desde el exterior del espacio que se esté ventilando. Los medios de cierre serán fácilmente accesibles, estarán marcados de forma clara y permanente e indicarán la posición de funcionamiento del dispositivo de cierre.

7.1.6 En el caso de divisiones de clase "A" o "B" y de conductos cuya construcción debe corresponder a la clase "A", se prohíbe el uso de juntas combustibles en las conexiones embridadas de los conductos de ventilación que se encuentren a menos de 600 mm de una abertura.

7.1.7 No se utilizarán aberturas de ventilación o conductos de equilibrio del aire situados entre dos espacios cerrados, excepto cuando esté permitido según se indica en los párrafos 4.1.2.1 y 4.2.3.

7.2 Disposición de los conductos

7.2.1 Los sistemas de ventilación para los espacios de categoría A para máquinas, espacios para vehículos, espacios de carga rodada, cocinas, espacios de categoría especial y espacios de carga estarán, en general, separados unos de otros, así como de los sistemas de ventilación que presten servicio a otros espacios. No obstante, los sistemas de ventilación para las cocinas de los buques de carga de arqueo bruto inferior a 4 000 y de los buques de pasaje que no transporten más de 36 pasajeros no necesitan estar completamente separados de otros sistemas de ventilación, sino que pueden estar alimentados por conductos separados de una unidad de ventilación que preste servicio a otros espacios. En estos casos se instalará una válvula de mariposa contra incendios automática en el conducto de ventilación de las cocinas, próxima a la unidad de ventilación.

7.2.2 Los conductos de ventilación de los espacios de categoría A para máquinas, cocinas, espacios para vehículos, espacios de carga rodada o espacios de categoría especial no atravesarán espacios de alojamiento o de servicio ni puestos de control, a menos que tales conductos cumplan lo dispuesto en el párrafo 7.2.4.

7.2.3 Los conductos de ventilación de los espacios de alojamiento, espacios de servicio y puestos de control no atravesarán espacios de categoría A para máquinas, cocinas, espacios para vehículos, espacios de carga rodada ni espacios de categoría especial, a menos que tales conductos cumplan lo dispuesto en el párrafo 7.2.4.

7.2.4 Los conductos permitidos con arreglo a los párrafos 7.2.2 y 7.2.3:

- .1.1 serán de acero, con un espesor mínimo de 3 mm si tienen un área de sección transversal libre inferior a 0,075 m², con un espesor mínimo de 4 mm si tienen un área de sección transversal libre de entre 0,075 m² y 0,45 m², y con un espesor mínimo de 5 mm si tienen un área de sección transversal libre superior a 0,45 m²;
 - .1.2 llevarán soportes y refuerzos adecuados;
 - .1.3 estarán provistos de válvulas de mariposa contra incendios automáticas próximas al contorno perforado; y
 - .1.4 tendrán un aislamiento correspondiente a la norma de clase "A-60" desde los contornos de los espacios a los que prestan servicio, hasta un punto situado más allá de cada válvula de mariposa contra incendios que diste de ésta 5 m como mínimo;
- o
- .2.1 serán de acero de conformidad con lo dispuesto en los párrafos 7.2.4.1.1 y 7.2.4.1.2; y
 - 2.2 tendrán un aislamiento correspondiente a la norma de clase "A-60" a través de los espacios por los que pasan, con excepción de los conductos que pasan por espacios de la categoría (9) o (10), tal como se definen en el párrafo 2.2.3.2.2.

7.2.5 A los efectos de los párrafos 7.2.4.1.4 y 7.2.4.2.2, se aislará toda superficie externa de la sección transversal. Se considerará que los conductos que estén situados en el exterior, aunque contiguos al espacio especificado, y que compartan una o más superficies con el espacio correspondiente atraviesan el espacio especificado, y su aislamiento se extenderá a la superficie que compartan con dicho espacio a una distancia de 450 mm más allá del conducto.*

7.2.6 Si es necesario que un conducto de ventilación atraviese una división de zona vertical principal, se instalará junto a la división una válvula de mariposa contra incendios automática. Esa válvula podrá cerrarse también manualmente desde ambos lados de la división. El emplazamiento del mando será fácilmente accesible y estará marcado de manera clara y manifiesta. La parte del conducto situada entre la división y la válvula será de acero de conformidad con los párrafos 7.2.4.1.1 y 7.2.4.1.2 y tendrá un aislamiento, como mínimo, con la misma integridad al fuego que la división perforada. Al menos en un lado de la división, la válvula de mariposa irá provista de un indicador visible que permita saber la posición de funcionamiento de la válvula.

* En las "Interpretaciones unificadas del capítulo II-2 del Convenio SOLAS" (MSC.1/Circ.1276) se incluyen diagramas que muestran esta disposición de los conductos.

7.3 Detalles sobre las válvulas de mariposa contraincendios y las perforaciones para el paso de conductos

7.3.1 Los conductos que pasan por las divisiones de clase "A" cumplirán las prescripciones siguientes:

- .1 cuando un conducto de chapa delgada con un área de sección transversal libre igual o inferior a $0,02 \text{ m}^2$ atraviese divisiones de clase "A", la abertura estará provista de un manguito de chapa de acero de un espesor mínimo de 3 mm y una longitud mínima de 200 mm, preferiblemente repartida a razón de 100 mm a cada lado del mamparo o, si se trata de una cubierta, que se encuentre totalmente en la parte inferior de las cubiertas perforadas;
- .2 cuando los conductos de ventilación con un área de sección transversal libre superior a $0,02 \text{ m}^2$, pero no superior a $0,075 \text{ m}^2$, atraviesen divisiones de clase "A", las aberturas estarán revestidas con manguitos de chapa de acero. Los conductos y manguitos tendrán por lo menos 3 mm de espesor y 900 mm de longitud. Cuando atraviesen un mamparo, esa longitud se repartirá, preferiblemente, a razón de 450 mm a cada lado del mamparo. Los conductos o los manguitos de revestimiento de dichos conductos llevarán un aislamiento contra el fuego. Dicho aislamiento tendrá por lo menos la misma integridad al fuego que la división atravesada; y
- .3 se instalarán válvulas de mariposa contraincendios automáticas en todos los conductos que tengan un área de sección transversal libre superior a $0,075 \text{ m}^2$ que atraviesen divisiones de clase "A". Cada válvula de mariposa se situará próxima a la división perforada y el conducto entre la válvula y la división perforada será de acero, de conformidad con lo dispuesto en los párrafos 7.2.4.2.1 y 7.2.4.2.2. La válvula de mariposa funcionará automáticamente, pero también se podrá cerrar a mano desde cualquier lado de la división. La válvula irá provista de un indicador visible que señale la posición de funcionamiento de la válvula. Las válvulas de mariposa contraincendios no son necesarias, sin embargo, cuando los conductos atraviesen espacios limitados por divisiones de clase "A", sin dar servicio a éstos, a condición de que dichos conductos tengan la misma integridad al fuego que las divisiones que perforen. Los conductos con un área de sección transversal superior a $0,075 \text{ m}^2$ no podrán dividirse en conductos más pequeños en la perforación practicada en una división de clase "A" y unirse de nuevo al conducto original, una vez atravesada la división para no instalar la válvula de mariposa que se prescribe en la presente disposición.

7.3.2 Los conductos de ventilación que tengan un área de sección transversal libre superior a $0,02 \text{ m}^2$ y atraviesen mamparos de clase "B" irán revestidos con manguitos de chapa de acero de 900 mm de longitud, preferiblemente 450 mm a cada lado del mamparo, a menos que el conducto sea de acero a lo largo de esa longitud.

7.3.3 Todas las válvulas de mariposa contraincendios se podrán accionar a mano. Las válvulas de mariposa tendrán un medio mecánico directo de suelta o, en su lugar, se cerrarán mediante accionamiento eléctrico, hidráulico o neumático. Todas las válvulas de mariposa se podrán accionar a mano desde ambos lados de la división. Las válvulas de mariposa contraincendios automáticas, incluidas las que permiten su accionamiento por telemando, tendrán un mecanismo a prueba de fallos que cerrará la válvula en caso de incendio aun cuando se produzca una pérdida de suministro eléctrico o una pérdida de presión hidráulica o neumática. Las válvulas de mariposa contraincendios accionadas por telemando deberán poder reabrirse a mano desde la válvula.

7.4 Sistemas de ventilación para buques de pasaje que transporten más de 36 pasajeros

7.4.1 Además de lo dispuesto en las secciones 7.1, 7.2 y 7.3, el sistema de ventilación de todo buque de pasaje que transporte más de 36 pasajeros cumplirá también las prescripciones siguientes.

7.4.2 En general, los ventiladores estarán dispuestos de manera que los conductos que desembocan en los diversos espacios queden dentro de una zona vertical principal.

7.4.3 Los troncos de escalera estarán ventilados por un solo ventilador independiente y un sistema de conductos (extracción e inyección) que no se utilicen para ningún otro espacio del sistema de ventilación.

7.4.4 Todo conducto, independientemente de su sección transversal, que se utilice para más de un espacio de alojamiento, espacio de servicio o puesto de control de un entrepuente irá provisto, cerca del punto de perforación de cada cubierta de dichos espacios, de una válvula de mariposa contra el humo automática que además se podrá cerrar a mano desde la cubierta protegida situada encima de la válvula. Cuando, dentro de una zona vertical principal, un ventilador se utilice para más de un espacio de entrepuente a través de conductos separados, cada uno de éstos destinado a un espacio de entrepuente único, cada conducto irá provisto de una válvula de mariposa contra el humo de accionamiento manual instalada cerca del ventilador.

7.4.5 Si es necesario, se aislarán los conductos verticales de acuerdo con lo prescrito en las tablas 9.1 y 9.2. Los conductos se aislarán de acuerdo con lo prescrito en relación con las cubiertas que se encuentren entre el espacio al que presten servicio y el espacio de que se trate, según corresponda.

7.5 Conductos de extracción de los fogones de las cocinas

7.5.1 *Prescripciones para los buques de pasaje que transporten más de 36 pasajeros*

7.5.1.1 Además de lo dispuesto en las secciones 7.1, 7.2 y 7.3, los conductos de extracción de los fogones de las cocinas estarán construidos de conformidad con lo dispuesto en los párrafos 7.2.4.2.1 y 7.2.4.2.2 y tendrán un aislamiento correspondiente a la norma de clase "A-60" a través de todos los espacios de alojamiento, espacios de servicio o puestos de control. También estarán provistos de:

- .1 un filtro de grasas que se pueda quitar fácilmente para su limpieza, a menos que se haya instalado otro sistema aprobado para la eliminación de la grasa;
- .2 una válvula de mariposa contra incendios situada en el extremo inferior del conducto, en el cruce entre el conducto y la bóveda del fogón de la cocina que funcione automáticamente y por telemando, y, además, una válvula de mariposa contra incendios de funcionamiento por telemando en el extremo superior del conducto, cerca de su salida;
- .3 medios fijos de extinción de incendios dentro del conducto;*
- .4 medios de telemando que se encuentren situados en un lugar fuera de las cocinas próximo a la entrada de las cocinas y permitan apagar los ventiladores de extracción e inyección, hacer funcionar las válvulas de mariposa contra incendios mencionadas en el párrafo 7.5.1.1.2 y activar el sistema de extinción de incendios. Cuando se instale un sistema de ramales múltiples, se dispondrá de un telemando situado junto a los medios de telemando citados que permita cerrar todos los ramales que descarguen a través del mismo conducto principal antes de que se inyecte el agente extintor en el sistema; y
- .5 escotillas convenientemente situadas a fines de inspección y de limpieza, incluida una situada cerca del ventilador de extracción y otra en el extremo inferior en que se acumula la grasa.

* Véanse las recomendaciones publicadas por la Organización Internacional de Normalización, en particular la publicación ISO 15371:2009, *Ships and marine technology – Fire-extinguishing systems for protection of galley cooking equipment*.

7.5.1.2 Los conductos de evacuación de los fogones para el equipo de cocina instalados en cubiertas expuestas se ajustarán a lo prescrito en el párrafo 7.5.1.1, según proceda, cuando atraviesen espacios de alojamiento o espacios que contengan materiales combustibles.

7.5.2 *Prescripciones para los buques de carga y los buques de pasaje que no transporten más de 36 pasajeros*

Cuando atraviesen espacios de alojamiento o espacios que contengan materiales combustibles, los conductos de extracción de los fogones de las cocinas estarán contruidos de conformidad con lo dispuesto en los párrafos 7.2.4.1.1 y 7.2.4.1.2. Cada conducto de extracción estará provisto de:

- .1 un filtro de grasas fácilmente desmontable a fines de limpieza;
- .2 una válvula de mariposa contra incendios que funcione automáticamente y por telemando, situada en el extremo inferior del conducto, en el cruce entre el conducto y la bóveda del fogón de la cocina, y, además, una válvula de mariposa contra incendios de funcionamiento por telemando en el extremo superior del conducto, cerca de su salida;

- .3 dispositivos accionables desde el interior de la cocina que permitan desconectar los extractores y ventiladores de inyección; y
- .4 medios fijos de extinción de incendios dentro del conducto.*

* Véanse las recomendaciones publicadas por la Organización Internacional de Normalización, en particular la publicación ISO 15371:2009, *Ships and marine technology – Fire-extinguishing systems for protection of galley cooking equipment*.

7.6 Cámaras de ventilación que prestan servicio a espacios para máquinas de categoría A que contienen máquinas de combustión interna

7.6.1 Cuando una cámara de ventilación preste servicio únicamente a un espacio para máquinas contiguo y no exista ninguna división contraincendios entre la cámara de ventilación y el espacio para máquinas, los medios de cierre del conducto o conductos de ventilación que prestan servicio al espacio para máquinas se situarán fuera de la cámara de ventilación y del espacio para máquinas.

7.6.2 Cuando una cámara de ventilación preste servicio a un espacio para máquinas, así como a otros espacios, y esté separada del espacio para máquinas mediante una división de clase "A-0", incluidas las perforaciones, los medios de cierre del conducto o conductos de ventilación del espacio para máquinas podrán estar situados en la cámara de ventilación.

7.7 Sistemas de ventilación para lavanderías en los buques de pasaje que transporten más de 36 pasajeros

Los conductos de extracción de las lavanderías y cuartos de secado de los espacios de la categoría (13) definidos en el párrafo 2.2.3.2.2 estarán provistos de:

- .1 filtros fácilmente desmontables a fines de limpieza;
- .2 una válvula de mariposa contraincendios en el extremo inferior del conducto que funcione automáticamente y por telemando;
- .3 medios de telemando que permitan apagar los ventiladores de extracción e inyección desde dentro del espacio y hacer funcionar la válvula de mariposa contraincendios mencionada en el párrafo 7.7.2; y
- .4 escotillas convenientemente situadas a fines de inspección y de limpieza."

Regla 10 *Lucha contra incendios*

7 Se sustituye el párrafo 1 por el siguiente:

"1 Finalidad

1.1 La finalidad de la presente regla es controlar y extinguir rápidamente un incendio en el espacio en que se haya originado, con la salvedad prevista en el párrafo 1.2. Con ese fin, se cumplirán las siguientes prescripciones funcionales:

- .1 se instalarán sistemas fijos de extinción de incendios teniendo debidamente en cuenta el potencial de propagación del incendio en los espacios protegidos; y
- .2 los dispositivos de extinción de incendios estarán rápidamente disponibles.

1.2 Para las bodegas sin tapas de escotilla* y las zonas de estiba de contenedores en cubierta de los buques proyectados para transportar contenedores en la cubierta de intemperie o por encima de ella, construidos el 1 de enero de 2016 o posteriormente, se proveerán medios de protección contra incendios a fines de contener el incendio en el espacio o zona de origen y enfriar las zonas contiguas para impedir la propagación del incendio y daños estructurales.

* La definición de este término figura en las Directrices provisionales para buques portacontenedores sin tapas de escotilla (MSC/Circ.608/Rev.1)."

8 En el párrafo 2.1.3 se añaden las palabras "distintos de los que se indican en el párrafo 7.3.2" entre "buques de carga" y "en cuyo caso".

9 En el párrafo 2.2.4.1.2 se añaden las palabras "distintos de los que se indican en el párrafo 7.3.2" entre "buques de carga" y "será necesario".

10 Se añade la sección nueva 7.3 siguiente después del párrafo 7.2:

"7.3 Lucha contra incendios para los buques construidos el 1 de enero de 2016 o posteriormente proyectados para transportar contenedores en la cubierta de intemperie o por encima de ella

7.3.1 Además del equipo y los medios prescritos en los párrafos 1 y 2, los buques transportarán a bordo, como mínimo, una lanza de agua nebulizada.

7.3.1.1 La lanza de agua nebulizada consistirá en una tubería con una boquilla de penetración que puede atravesar la pared del contenedor y nebulizar agua dentro de un espacio confinado (contenedor, etc.) al conectarse al colector contra incendios.

7.3.2 Los buques proyectados para transportar cinco o más niveles de contenedores en la cubierta de intemperie o por encima de ella llevarán a bordo, además de lo dispuesto en el párrafo 7.3.1, cañones de agua portátiles* como se estipula a continuación:

- .1 buques de menos de 30 m de manga: dos cañones de agua portátiles como mínimo; o
- .2 buques de manga igual o superior a 30 m: cuatro cañones de agua portátiles como mínimo.

* Véanse las Directrices para el proyecto, funcionamiento, prueba y aprobación de cañones de agua portátiles utilizados para la protección de las zonas de carga en cubierta de los buques proyectados y construidos para transportar cinco o más niveles de contenedores en la cubierta de intemperie o por encima de ella (MSC.1/Circ.1472).

7.3.2.1 Los cañones de agua portátiles y todas las mangueras, accesorios y herramientas de reparaciones necesarios se mantendrán listos para su utilización en un lugar fuera del espacio de carga que no corra el riesgo de quedar aislado en caso de incendio en los espacios de carga.

7.3.2.2 Se dispondrá de un número suficiente de bocas contraincendios de forma que:

- .1 todos los cañones de agua portátiles puedan funcionar simultáneamente para crear barreras de agua eficaces a proa y a popa de cada zona de contenedores;
- .2 los dos chorros de agua prescritos en el párrafo 2.1.5.1 puedan suministrarse a la presión prescrita en el párrafo 2.1.6; y
- .3 el suministro de agua de cada uno de los cañones de agua portátiles puede proceder de bocas separadas a la presión necesaria para alcanzar el nivel más alto de contenedores en cubierta.

7.3.2.3 Se podrá suministrar agua a los cañones de agua portátiles desde el colector contraincendios, siempre que la capacidad de las bombas contraincendios y el diámetro del colector contraincendios sean suficientes para accionar simultáneamente los cañones de agua portátiles y los chorros de agua de las dos mangueras contraincendios a los valores de presión prescritos. Si se transportan mercancías peligrosas, la capacidad de las bombas contraincendios y el diámetro de los colectores contraincendios también cumplirán lo dispuesto en la regla 19.3.1.5, en tanto que sea aplicable a las zonas de carga de cubierta.

7.3.2.4 Durante el reconocimiento inicial a bordo del buque se someterá a prueba el rendimiento operacional de cada uno de los cañones de agua portátiles de modo satisfactorio a juicio de la Administración. Esta prueba verificará lo siguiente:

- .1 que el cañón de agua portátil puede fijarse firmemente a la estructura del buque para garantizar el funcionamiento eficaz y seguro; y
- .2 que el chorro de agua del cañón alcanza el nivel superior de contenedores con todos los cañones y chorros de agua prescritos funcionando simultáneamente."

Parte D Evacuación

Regla 13

Medios de evacuación

- 11 Se añaden los dos párrafos nuevos siguientes después del párrafo 4.1.4:

"4.1.5 Escalas y escaleras inclinadas

En los buques construidos el 1 de enero de 2016 o posteriormente todas las escalas/escaleras inclinadas, instaladas para cumplir lo dispuesto en el párrafo 4.1.1, con escalones abiertos y situadas en los espacios de máquinas, que formen parte de las vías de evacuación o que den acceso a ellas, pero que no estén situadas dentro de un recinto protegido, serán de acero. Tales escalas/escaleras estarán equipadas con protectores de acero fijos a la cara inferior para proteger del calor y las llamas procedentes de abajo al personal durante la evacuación."

4.1.6 Evacuación desde los talleres principales situados en espacios de máquinas

En los buques construidos el 1 de enero de 2016 o posteriormente se proveerán dos medios de evacuación desde el taller principal situado en un espacio de máquinas. Como mínimo, una de estas vías de evacuación ofrecerá protección continua contra el fuego hasta un lugar seguro situado fuera de dicho espacio de máquinas."

- 12 Se añaden los tres párrafos nuevos siguientes después del párrafo 4.2.3:

"4.2.4 Escalas y escaleras inclinadas

En los buques construidos el 1 de enero de 2016 o posteriormente todas las escalas/escaleras inclinadas, instaladas para cumplir lo dispuesto en el párrafo 4.2.1, con escalones abiertos y situadas en los espacios de máquinas, que formen parte de las vías de evacuación o que den acceso a ellas, pero que no estén situadas dentro de un recinto protegido, serán de acero. Tales escalas/escaleras estarán equipadas con protectores de acero fijos a la cara inferior para proteger del calor y las llamas procedentes de abajo al personal durante la evacuación.

4.2.5 Evacuación desde las cámaras de control de máquinas situadas en espacios de máquinas de categoría "A"

En los buques construidos el 1 de enero de 2016 o posteriormente se proveerán dos medios de evacuación desde la cámara de control de máquinas situada en un espacio de máquinas. Como mínimo, una de estas vías de evacuación ofrecerá protección continua contra el fuego hasta un lugar seguro situado fuera de dicho espacio de máquinas.

4.2.6 Evacuación desde los talleres principales situados en espacios de máquinas de categoría "A"

En los buques construidos el 1 de enero de 2016 o posteriormente se proveerán dos medios de evacuación desde el taller principal situado en un espacio de máquinas. Como mínimo, una de estas vías de evacuación ofrecerá protección continua contra el fuego hasta un lugar seguro situado fuera de dicho espacio de máquinas."

Parte E Prescripciones operacionales

Regla 16 *Operaciones*

13 Se añade el párrafo nuevo siguiente después del párrafo 3.2:

"3.3 *Funcionamiento del sistema de gas inerte*

3.3.1 El sistema de gas inerte para buques tanque prescrito de conformidad con la regla 4.5.5.1 se utilizará de tal manera que se cree y mantenga en los tanques de carga una atmósfera que no sea inflamable, salvo cuando sea necesario que tales tanques estén desgasificados.

3.3.2 No obstante lo anterior, en el caso de los buques tanque quimiqueros, la aplicación de gas inerte podrá tener lugar después de que se haya cargado el tanque de carga, pero antes de dar comienzo a la descarga, y seguirá aplicándose gas inerte hasta que el tanque de carga haya sido purgado de todo vapor inflamable antes de la desgasificación. De acuerdo con la presente disposición, solamente es aceptable el nitrógeno como gas inerte.

3.3.3 No obstante lo dispuesto en la regla 1.2.2.2, las disposiciones del presente párrafo sólo se aplicarán a los buques tanque construidos el 1 de enero de 2016 o posteriormente. Si el contenido de oxígeno del gas inerte supera el 5% en volumen, inmediatamente se adoptarán medidas para mejorar la calidad del gas. A menos que la calidad del gas mejore, se suspenderán todas las operaciones en dichos tanques de carga a los que se esté suministrando gas inerte a fin de evitar la entrada de aire en los tanques de carga, se cerrará la válvula reguladora del gas, de haberla, y se expulsará a la atmósfera el gas que no se ajuste a lo especificado.

3.3.4 En el caso de que el sistema de gas inerte no pueda cumplir lo prescrito en el párrafo 16.3.3.1 y se haya determinado que no es práctico llevar a cabo una reparación, el desembarco de la carga y la limpieza de los tanques de carga que sea necesario inertizar no se reanudará hasta que se hayan seguido los procedimientos de emergencia adecuados, teniendo en cuenta las directrices elaboradas por la Organización.*

* Véanse la "Aclaración de las prescripciones sobre sistemas de gas inerte del Convenio" (MSC/Circ.485) y las "Directrices revisadas sobre sistemas de gas inerte" (MSC/Circ.353), enmendadas por la circular MSC/Circ.387."

Parte G Prescripciones especiales

Regla 20

Protección de los espacios para vehículos, espacios de categoría especial y espacios de carga rodada

14 En el párrafo 3.1.4.2 se sustituye "9.7.2.1.1 y 9.7.2.1.2" por "9.7.2.4.1.1 y 9.7.2.4.1.2".

Nueva regla 20-1 – Prescripciones aplicables a los buques para el transporte de vehículos que transportan vehículos de motor con hidrógeno o gas natural comprimido en sus tanques para su propia propulsión como carga

15 Se añade la nueva regla 20-1 siguiente después de la regla 20:

"Regla 20-1

Prescripciones aplicables a los buques para el transporte de vehículos que transportan vehículos de motor con hidrógeno o gas natural comprimido en sus tanques para su propia propulsión como carga

1 FINALIDAD

La finalidad de la presente regla es proporcionar medidas de seguridad adicionales para la consecución de los objetivos de seguridad contra incendios que establece el presente capítulo para los buques para el transporte de vehículos que tienen espacios para vehículos y espacios de carga rodada destinados al transporte de vehículos de motor con hidrógeno comprimido o gas natural comprimido en sus tanques para su propia propulsión como carga.

2 ÁMBITO DE APLICACIÓN

2.1 Además de cumplir lo dispuesto en la regla 20, según proceda, los espacios para vehículos de los buques para el transporte de vehículos construidos el 1 de enero de 2016 o posteriormente, destinados al transporte de vehículos de motor con hidrógeno comprimido o gas natural comprimido en sus tanques para su propia propulsión como carga, cumplirán lo prescrito en los párrafos 3 a 5 de la presente regla.

2.2 Además de cumplir lo dispuesto en la regla 20, según proceda, los buques para el transporte de vehículos construidos antes del 1 de enero de 2016, incluidos los construidos antes del 1 de julio de 2012,* cumplirán lo prescrito en el párrafo 5 de la presente regla.

* Véase la Recomendación sobre las medidas de seguridad aplicables a los buques existentes para el transporte de vehículos que transportan vehículos de motor con hidrógeno comprimido o gas natural comprimido en sus tanques para su propia propulsión como carga.

3 PRESCRIPCIONES APLICABLES A LOS ESPACIOS DESTINADOS AL TRANSPORTE DE VEHÍCULOS DE MOTOR CON GAS NATURAL COMPRIMIDO EN SUS TANQUES PARA SU PROPIA PROPULSIÓN COMO CARGA

3.1 Equipo eléctrico y cableado

Todo el equipo eléctrico y el cableado serán de un tipo certificado como seguro para ser utilizado en atmósferas con mezclas explosivas de aire y metano.*

* Véanse las recomendaciones de la Comisión Electrotécnica Internacional, en particular, la publicación IEC 60079.

3.2 Medio de ventilación

3.2.1 El equipo eléctrico y el cableado instalados en un conducto de ventilación serán de un tipo certificado como seguro para ser utilizado en atmósferas con mezclas explosivas de aire y metano.

3.2.2 Los ventiladores serán tales que se evite la posibilidad de que se produzca la ignición de mezclas de aire y metano. Se instalarán guardas de tela metálica adecuadas en las aberturas de entrada y de salida de aire del sistema de ventilación.

3.3 Otras fuentes de ignición

No se permitirá otro equipo que pueda constituir una fuente de ignición de las mezclas de aire y metano.

4 PRESCRIPCIONES APLICABLES A LOS ESPACIOS DESTINADOS AL TRANSPORTE DE VEHÍCULOS DE MOTOR CON HIDRÓGENO COMPRIMIDO EN SUS TANQUES PARA SU PROPIA PROPULSIÓN COMO CARGA

4.1 Equipo eléctrico y cableado

Todo el equipo eléctrico y el cableado serán de un tipo certificado como seguro para ser utilizado en atmósferas con mezclas explosivas de aire e hidrógeno.*

* Véanse las recomendaciones de la Comisión Electrotécnica Internacional, en particular, la publicación IEC 60079.

4.2 Medio de ventilación

4.2.1 El equipo eléctrico y el cableado instalados en un conducto de ventilación serán de un tipo certificado como seguro para ser utilizado en atmósferas con mezclas explosivas de aire e hidrógeno, y la salida de todos los conductos de escape estará situada en un punto seguro, teniendo en cuenta otras posibles fuentes de ignición.

4.2.2 Los ventiladores se proyectarán de modo que se evite la posibilidad de que se produzca la ignición de mezclas de aire e hidrógeno. Se instalarán guardas de tela metálica adecuadas en las aberturas de entrada y de salida de aire del sistema de ventilación.

4.3 Otras fuentes de ignición

No se permitirá otro equipo que pueda constituir una fuente de ignición de las mezclas de aire e hidrógeno.

5 DETECCIÓN

Cuando un buque para el transporte de vehículos transporte, como carga, uno o más vehículos de motor con hidrógeno comprimido o gas natural comprimido en sus tanques para su propia propulsión se proveerán, como mínimo, dos detectores portátiles de gas. Dichos detectores serán adecuados para la detección de combustible gaseoso y serán de un tipo certificado como seguro para ser utilizado en atmósferas con mezclas explosivas de gases y aire."

ANEXO 1

**RESOLUCIÓN MSC.380(94)
(adoptada el 21 de noviembre de 2014)**

**ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA
HUMANA EN EL MAR (CONVENIO SOLAS), 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO TAMBIÉN el artículo VIII b) vi) 2) del Convenio internacional para la seguridad de la vida humana en el mar (Convenio SOLAS), 1974 ("el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, con excepción de las disposiciones de su capítulo I,

HABIENDO EXAMINADO, en su 94º periodo de sesiones, enmiendas al Convenio, propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del mismo,

1 ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;

2 DISPONE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de enero de 2016, a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del arqueo bruto de la flota mercante mundial hayan notificado al Secretario General de la Organización que recusan las enmiendas;

3 INVITA a los Gobiernos Contratantes del Convenio SOLAS a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de julio de 2016, una vez aceptadas con arreglo a lo dispuesto en el párrafo 2 anterior;

4 PIDE al Secretario General que, a los efectos de lo dispuesto en el artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio; y

5 PIDE TAMBIÉN al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR (CONVENIO SOLAS), 1974,
ENMENDADO

CAPÍTULO II-2
CONSTRUCCIÓN – PREVENCIÓN, DETECCIÓN Y EXTINCIÓN DE INCENDIOS

Parte C
Control de incendios

Regla 10

Lucha contra incendios

1 El título del párrafo 5.2 actual se sustituye por el siguiente:

"5.2 Espacios de máquinas de categoría A con motores de combustión interna"

CAPÍTULO VI
TRANSPORTE DE CARGAS Y COMBUSTIBLE LÍQUIDO

Parte A
Disposiciones generales

Regla 2

Información sobre la carga

2 A continuación del actual párrafo 3, se añaden los nuevos párrafos 4, 5 y 6 siguientes:

"4 En el caso de la carga transportada en un contenedor,* con la salvedad de los contenedores transportados sobre un chasis o en un remolque cuando dichos contenedores sean conducidos a o desde un buque de transbordo rodado que efectúe viajes internacionales cortos, según las definiciones que figuran en la regla III/3, el expedidor verificará la masa bruta de conformidad con lo dispuesto en el párrafo 2.1 de la presente regla, por uno de los dos métodos siguientes:

- .1 pesar el contenedor lleno utilizando un equipo calibrado y certificado;
o
- .2 pesar todos los bultos y elementos de carga, incluyendo la masa de las paletas, la madera de estiba y demás material de sujeción que se cargue en el contenedor y añadiendo la masa de la tara del contenedor a la suma de cada masa, por medio de un método certificado aprobado por la autoridad competente del Estado en el que se haya efectuado la arrumazón del contenedor.

5 El expedidor de un contenedor se asegurará de que la masa bruta verificada** consta en el documento de expedición. El documento de expedición:

- .1 estará firmado por una persona debidamente autorizada por el expedidor; y

- .2 se presentará al capitán o a su representante y al representante de la terminal con suficiente antelación, según lo exija el capitán o su representante, para que pueda utilizarse al elaborar el plano de estiba del buque.**

6 Si en el documento de expedición del contenedor lleno no se indica la masa bruta verificada y el capitán o su representante y el representante de la terminal no han obtenido la masa bruta verificada del contenedor lleno, éste no se embarcará en el buque.

* Debería considerarse que el significado del término "contenedor" es el mismo que el que se define y aplica en el Convenio internacional sobre la seguridad de los contenedores (Convenio CSC), 1972, enmendado, teniendo en cuenta las Directrices para la aprobación de contenedores para instalaciones mar adentro manipulados en mar abierta (MSC/Circ.860) y las Recomendaciones revisadas relativas a la interpretación y aplicación uniformes del Convenio internacional sobre la seguridad de los contenedores, 1972, enmendado (CSC.1/Circ.138/Rev.1).

** Véanse las Directrices relativas a la masa bruta verificada de los contenedores con carga (MSC.1/Circ.1475).

*** Este documento puede presentarse mediante las técnicas de transmisión que utilizan el tratamiento electrónico de datos (EDP) o el intercambio electrónico de datos (EDI). La firma puede ser una firma electrónica o puede sustituirse por el nombre, en letras mayúsculas, de la persona autorizada a firmar el documento."

CAPÍTULO XI-1 MEDIDAS ESPECIALES PARA INCREMENTAR LA SEGURIDAD MARÍTIMA

- 3 A continuación de la regla 6 actual se añade la nueva regla 7 siguiente:

"Regla 7

Instrumento de ensayo de la atmósfera en espacios cerrados

Todo buque al que se aplique el capítulo I llevará uno o varios instrumentos portátiles adecuados que permitan realizar ensayos de la atmósfera.* Como mínimo, dichos instrumentos podrán medir las concentraciones de oxígeno, de gases o vapores inflamables, de sulfuro de hidrógeno y de monóxido de carbono antes de entrar en los espacios cerrados.** Los instrumentos que se lleven con arreglo a otras prescripciones podrán satisfacer esta regla. Se proporcionarán medios apropiados para efectuar la calibración de todos estos instrumentos.

* Véanse las Directrices para facilitar la selección de instrumentos portátiles que permitan realizar ensayos de la atmósfera en espacios cerrados, según se prescribe en la regla XI-1/7 del Convenio SOLAS (MSC.1/Circ.1477).

** Véanse las Recomendaciones revisadas relativas a la entrada en espacios cerrados a bordo de los buques (resolución A.1050(27))."

APÉNDICE
CERTIFICADOS

Inventario del equipo de seguridad para buque de carga (Modelo C)
Inventario del equipo de seguridad para buque de carga (Modelo E)

4 La sección 2 del Inventario del equipo de seguridad para buque de carga (Modelo C) y del Inventario del equipo de seguridad para buque de carga (Modelo E) se sustituye por la siguiente:

"2 **Pormenores de los dispositivos de salvamento**

1	Número total de personas para las que se han provisto dispositivos de salvamento	.....	A babor	A estribor
2	Número total de botes salvavidas de pescante	.....	.....	.....
2.1	Número total de personas a las que se puede dar cabida	.....	.....	.....
2.2	Número de botes salvavidas parcialmente cerrados autoadrizables (regla III/43) ¹	.....	.....	.....
2.3	Número de botes salvavidas totalmente cerrados (regla III/31 y sección 4.6 del Código IDS)	.....	.....	.....
2.4	Número de botes salvavidas provistos de un sistema autónomo de abastecimiento de aire (regla III/31 y sección 4.8 del Código IDS)	.....	.....	.....
2.5	Número de botes salvavidas protegidos contra incendios (regla III/31 y sección 4.9 del Código IDS)	.....	.....	.....
2.6	Otros botes salvavidas	.....	.....	.....
2.6.1	Número	.....	.....	.....
2.6.2	Tipo	.....	.....	.....
3	Número total de botes salvavidas de caída libre	.....	.....	.....
3.1	Número total de personas a las que se puede dar cabida	.....	.....	.....
3.2	Número de botes salvavidas totalmente cerrados (regla III/31 y sección 4.7 del Código IDS)	.....	.....	.....
3.3	Número de botes salvavidas provistos de un sistema autónomo de abastecimiento de aire (regla III/31 y sección 4.8 del Código IDS)	.....	.....	.....
3.4	Número de botes salvavidas protegidos contra incendios (regla III/31 y sección 4.9 del Código IDS)	.....	.....	.....
4	Número total de botes salvavidas a motor (comprendidos en el total de botes salvavidas indicado en 2 y 3 <i>supra</i>)	.....	.....	.....
4.1	Número de botes salvavidas provistos de proyector	.....	.....	.....
5	Número de botes de rescate	.....	.....	.....
5.1	Número de botes comprendidos en el total de botes salvavidas indicado en 2 y 3 <i>supra</i>	.....	.....	.....
6	Balsas salvavidas	.....	.....	.....
6.1	Balsas salvavidas para las que se necesitan dispositivos aprobados de puesta a flote	.....	.....	.....
6.1.1	Número de balsas salvavidas	.....	.....	.....

¹ Véanse las enmiendas de 1983 al Convenio SOLAS (MSC.6(48)), aplicables a los buques construidos el 1 de julio de 1986 o posteriormente, pero antes del 1 de julio de 1998.

2 **Pormenores de los dispositivos de salvamento** (continuación)

6.1.2	Número de personas a las que se puede dar cabida	.....
6.2	Balsas salvavidas para las que no se necesitan dispositivos aprobados de puesta a flote	.....
6.2.1	Número de balsas salvavidas	.....
6.2.2	Número de personas a las que se puede dar cabida	.....
6.3	Número de balsas salvavidas prescritas en la regla III/31.1.4	.....
7	Número de aros salvavidas	.....
8	Número de chalecos salvavidas	.....
9	Trajes de inmersión	.....
9.1	Número total	.....
9.2	Número de trajes que cumplen las prescripciones aplicables a los chalecos salvavidas	.....
10	Número de trajes de protección contra la intemperie	.....
11	Instalaciones radioeléctricas utilizadas en los dispositivos de salvamento	.....
11.1	Número de dispositivos de localización de búsqueda y salvamento	.....
11.1.1	Transpondedores de radar de búsqueda y salvamento (SART)	.....
11.1.2	Respondedores de búsqueda y salvamento del SIA (AIS-SART)	.....
11.2	Número de aparatos radiotelefónicos bidireccionales de ondas métricas	.....

"

ANEXO 2

**RESOLUCIÓN MSC.392(95)
(adoptada el 11 de junio de 2015)**

**ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO TAMBIÉN el artículo VIII b) vi) 2) del Convenio internacional para la seguridad de la vida humana en el mar, 1974 ("el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, con excepción de las disposiciones del capítulo I,

HABIENDO EXAMINADO, en su 95^o periodo de sesiones, las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del Convenio,

1 ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;

2 DISPONE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de julio de 2016, a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del arqueo bruto de la flota mercante mundial haya notificado al Secretario General que recusan las enmiendas;

3 INVITA a los Gobiernos Contratantes del Convenio a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de enero de 2017, una vez aceptadas con arreglo a lo dispuesto en el párrafo 2 anterior;

4 PIDE al Secretario General que, a los efectos del artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;

5 PIDE TAMBIÉN al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

* * *

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO II-1 CONSTRUCCIÓN – ESTRUCTURA, COMPARTIMENTADO Y ESTABILIDAD, INSTALACIONES DE MÁQUINAS E INSTALACIONES ELÉCTRICAS

Parte A Generalidades

Regla 2

Definiciones

1 Se añaden los nuevos párrafos 29 y 30 siguientes, a continuación del párrafo 28 actual:

"29 *Código IGF*: el Código internacional de seguridad para los buques que utilicen gases u otros combustibles de bajo punto de inflamación, adoptado por el Comité de seguridad marítima de la Organización mediante la resolución MSC.391(95), tal como lo enmiende la Organización, a condición de que tales enmiendas se adopten, entren en vigor y pasen a tener efecto de conformidad con las disposiciones del artículo VIII del presente Convenio relativas a los procedimientos de enmienda del anexo, con excepción del capítulo I del mismo.

30 *Combustible de bajo punto de inflamación*: combustible líquido o gaseoso con un punto de inflamación inferior al permitido en los demás casos en la regla II-2/4.2.1.1."

Parte F Proyectos y disposiciones alternativos

Regla 55

Proyectos y disposiciones alternativos

2 Los párrafos 1 a 3 actuales se sustituyen por los siguientes:

"1 **Finalidad**

La finalidad de la presente regla es proporcionar una metodología para proyectos y disposiciones alternativos de instalaciones de máquinas, instalaciones eléctricas, y sistemas de almacenamiento y distribución de combustible de bajo punto de inflamación.

2 **Generalidades**

2.1 Los proyectos y disposiciones de las instalaciones de máquinas, instalaciones eléctricas, y sistemas de almacenamiento y distribución de combustible de bajo punto de inflamación podrán diferir de las prescripciones que figuran en las partes C, D, E o G, siempre y cuando los proyectos y disposiciones alternativos se ajusten al propósito de las prescripciones pertinentes y ofrezcan un nivel de seguridad equivalente al del presente capítulo.

2.2 Cuando los proyectos o disposiciones alternativos difieran de las prescripciones normativas de las partes C, D, E o G, se procederá al análisis técnico, evaluación y aprobación de los mismos de conformidad con lo dispuesto en la presente regla.

3 Análisis técnico

El análisis técnico se elaborará y remitirá a la Administración de acuerdo con las directrices elaboradas por la Organización* e incluirá, como mínimo, los siguientes elementos:

- .1 determinación del tipo de buque, instalaciones de máquinas, instalaciones eléctricas, sistemas de almacenamiento y distribución de combustible de bajo punto de inflamación, y espacios de que se trate;
- .2 indicación de la prescripción o prescripciones normativas que las instalaciones de máquinas, instalaciones eléctricas, y sistemas de almacenamiento y distribución de combustible de bajo punto de inflamación no cumplirán;
- .3 indicación del motivo por el que el proyecto propuesto no cumplirá las prescripciones normativas, respaldada por el cumplimiento de otras normas técnicas o del sector reconocidas;
- .4 determinación de los criterios de funcionamiento del buque, instalaciones de máquinas, instalaciones eléctricas, sistema de almacenamiento y distribución de combustible de bajo punto de inflamación, o espacios que se trate, según lo establecido en las correspondientes prescripciones normativas:
 - .1 los criterios de funcionamiento proporcionarán un nivel de seguridad no inferior al de las prescripciones normativas pertinentes recogidas en las partes C, D, E o G; y
 - .2 los criterios de funcionamiento serán cuantificables y mensurables;
- .5 descripción detallada de los proyectos y disposiciones alternativos, que incluya una lista de los supuestos utilizados en el proyecto y las restricciones o condiciones operacionales propuestas;
- .6 justificación técnica que demuestre que los proyectos y disposiciones alternativos satisfacen los criterios de funcionamiento en lo que respecta a la seguridad; y
- .7 evaluación de los riesgos a partir de la indicación de los errores y peligros potenciales relacionados con la propuesta.

* Véanse las Directrices sobre los proyectos y disposiciones alternativos contemplados en los capítulos II-1 y III del Convenio SOLAS (MSC.1/Circ.1212) y las Directrices para la aprobación de alternativas y equivalencias previstas en varios instrumentos de la OMI (MSC.1/Circ.1455)."

- 3 Se incluye la nueva parte G siguiente, a continuación de la parte F actual:

"Parte G
Buques que utilicen combustibles de bajo punto de inflamación

Regla 56

Ámbito de aplicación

1 Exceptuando lo dispuesto en los párrafos 4 y 5, esta parte se aplicará a los buques que utilicen combustibles de bajo punto de inflamación:

- .1 cuyo contrato de construcción se adjudique el 1 de enero de 2017 o posteriormente;
- .2 en ausencia de un contrato de construcción, cuya quilla se coloque o cuya construcción se halle en una fase equivalente el 1 de julio de 2017 o posteriormente; o
- .3 cuya entrega tenga lugar el 1 de enero de 2021 o posteriormente.

Los buques que utilicen combustibles de bajo punto de inflamación cumplirán las prescripciones de la presente parte, además de todas las demás prescripciones aplicables de las presentes reglas.

2 Exceptuando lo dispuesto en los párrafos 4 y 5, todo buque, independientemente de su fecha de construcción, incluidos los construidos antes del 1 de enero de 2009, que se transforme en buque que utilice combustibles de bajo punto de inflamación el 1 de enero de 2017 o posteriormente, se considerará buque que utiliza combustibles de bajo punto de inflamación en la fecha en que dio comienzo dicha transformación.

3 Exceptuando lo dispuesto en los párrafos 4 y 5, los buques que utilicen combustibles de bajo punto de inflamación, independientemente de su fecha de construcción, incluidos los construidos antes del 1 de enero de 2009, que, el 1 de enero de 2017 o posteriormente, decidan utilizar combustibles de bajo punto de inflamación distintos de los combustibles para cuya utilización habían sido aprobados originalmente antes del 1 de enero de 2017, se considerarán buques que utilizan combustibles de bajo punto de inflamación en la fecha en la que se puso en práctica esa decisión.

4 Esta parte no se aplicará a los buques gaseros definidos en la regla VII/11.2:

- .1 que utilicen su propia carga como combustible y cumplan las prescripciones del Código IGC, definido en la regla VII/11.1; o
- .2 que utilicen otros combustibles gaseosos de bajo punto de inflamación, siempre que los proyectos y disposiciones de los sistemas de almacenamiento y distribución de combustible de bajo punto de inflamación para dichos combustibles gaseosos cumplan las prescripciones del Código CIG relativas al gas como carga.

5 Esta parte no se aplicará a los buques que sean propiedad de un Gobierno Contratante o sean explotados por éste y se utilicen por el momento sólo en servicios gubernamentales de carácter no comercial. Sin embargo, se anima a que los buques

que sean propiedad de un Gobierno Contratante o sean explotados por éste y se utilicen por el momento sólo en servicios gubernamentales de carácter no comercial, actúen en la medida que sea razonable y factible, de manera coherente con lo dispuesto en esta parte.

Regla 57

Prescripciones para los buques que utilicen combustibles de bajo punto de inflamación

Exceptuando lo dispuesto en las reglas 56.4 y 56.5, los buques que utilicen combustibles de bajo punto de inflamación cumplirán las prescripciones del Código IGF."

CAPÍTULO II-2 CONSTRUCCIÓN – PREVENCIÓN, DETECCIÓN Y EXTINCIÓN DE INCENDIOS

Parte B Prevención de incendios y explosiones

Regla 4

Probabilidad de ignición

- 4 En el párrafo 2.1.3.4, se suprime la palabra "y".
- 5 En el párrafo 2.1, el apartado .4 actual se sustituye por el siguiente:
 - .4 en los buques de carga a los que no se aplique lo dispuesto en la parte G del capítulo II-1, se podrá permitir el uso de combustibles líquidos cuyos puntos de inflamación sean inferiores a los especificados en el párrafo 2.1.1, por ejemplo petróleo crudo, a condición de que dicho combustible no esté almacenado en ningún espacio de máquinas y a reserva de que la Administración apruebe la instalación correspondiente en su totalidad; y
 - .5 en los buques a los que se aplique lo dispuesto en la parte G del capítulo II-1, se permite el uso de combustibles líquidos cuyos puntos de inflamación sean inferiores a los especificados en el párrafo 2.1.1."
- 6 Al final del párrafo 5.3.2.2 actual, se añade la frase siguiente:

"En el caso de los buques tanque construidos el 1 de enero de 2017 o posteriormente, todo aislamiento seguirá permitiendo también el paso de grandes volúmenes de mezclas de vapor, aire o gas inerte durante las operaciones de carga y de lastrado o de descarga, de conformidad con lo dispuesto en la regla 11.6.1.2."

Parte C Control de incendios

Regla 11

Integridad estructural

- 7 Se añade la frase siguiente al final del párrafo 6.2 actual:

"En el caso de los buques tanque construidos el 1 de enero de 2017 o posteriormente, las aberturas se dispondrán de conformidad con lo prescrito en la regla 4.5.3.4.1."

- 8 En el párrafo 6.3.2, se añade el texto siguiente entre la primera frase y la segunda:

"Además, en el caso de los buques tanque construidos el 1 de enero de 2017 o posteriormente, los medios secundarios podrán impedir la sobrepresión o la subpresión en caso de avería o cierre involuntario de los medios de aislamiento prescritos en la regla 4.5.3.2.2."

Parte G **Prescripciones especiales**

Regla 20

Protección de los espacios para vehículos, espacios de categoría especial y espacios de carga rodada

- 9 El párrafo 3.1.2 actual se sustituye por el siguiente:

"3.1.2 Funcionamiento de los sistemas de ventilación

3.1.2.1 En los buques de pasaje, el sistema de ventilación mecánica será independiente de los demás sistemas de ventilación. El sistema de ventilación mecánica se hará funcionar para dar al menos el número de renovaciones de aire estipulado en el párrafo 3.1.1 siempre que haya vehículos en estos espacios, salvo que se proporcione un sistema de control de la calidad del aire como se estipula en el párrafo 3.1.2.4. Los conductos que ventilen los espacios de carga mencionados que puedan cerrarse herméticamente serán independientes para cada uno de estos espacios. El sistema podrá accionarse desde el exterior de dichos espacios.

3.1.2.2 En los buques de carga, los ventiladores funcionarán normalmente de manera continua y darán al menos el número de renovaciones de aire estipulado en el párrafo 3.1.1 cuando haya vehículos a bordo, salvo que se proporcione un sistema de control de la calidad del aire como se estipula en el párrafo 3.1.2.4. Cuando esto no sea posible, se harán funcionar a diario un tiempo limitado, según permitan las condiciones meteorológicas, y en todo caso durante un intervalo razonable con anterioridad a la operación de descarga, al término del cual se comprobará que no queda gas en el espacio de carga rodada o espacio para vehículos. A tal fin se llevarán a bordo uno o más instrumentos portátiles de detección de gas combustible. El sistema será completamente independiente de los demás sistemas de ventilación. Los conductos que ventilen los espacios de carga rodada o los espacios para vehículos podrán cerrarse herméticamente en cada espacio de carga. El sistema podrá accionarse desde el exterior de dichos espacios.

3.1.2.3 El sistema de ventilación será tal que evite la estratificación del aire y la formación de bolsas de aire.

3.1.2.4 En todos los buques en los que se proporcione un sistema de control de la calidad del aire basado en las Directrices elaboradas por la Organización,* el sistema de ventilación se podrá hacer funcionar con un número menor de renovaciones de aire y/o con un nivel reducido de ventilación. Esta aplicación menos estricta no se aplica a los espacios que requieren, en virtud del párrafo 3.2.2 de la presente regla, diez renovaciones de aire por hora como mínimo, ni a los espacios regidos por lo dispuesto en las reglas 19.3.4.1 y 20-1.

* Véanse las Directrices revisadas de proyecto y recomendaciones operacionales para los sistemas de ventilación de los espacios de carga rodada (MSC.1/Circ.1515)."

APÉNDICE

CERTIFICADOS

MODELO DE CERTIFICADO DE SEGURIDAD PARA BUQUES DE PASAJE

CERTIFICADO DE SEGURIDAD PARA BUQUE DE PASAJE

- 10 Se añade el nuevo párrafo 2.2 siguiente después del párrafo 2.1 actual:
- "2.2 Que el buque cumple lo dispuesto en la parte G del capítulo II-1 del Convenio en lo que respecta a la utilización de como combustible/N.A.¹"
- 11 Los párrafos 2.2 a 2.11 actuales se vuelven a numerar en consecuencia.

MODELO DE CERTIFICADO DE SEGURIDAD DE CONSTRUCCIÓN PARA BUQUES DE CARGA

CERTIFICADO DE SEGURIDAD DE CONSTRUCCIÓN PARA BUQUE DE CARGA

- 12 El párrafo 2 actual se sustituye por el siguiente:
- "2 Que el reconocimiento ha puesto de manifiesto:
- .1 que el estado de la estructura, las máquinas y el equipo, según lo definido en la citada regla, es satisfactorio, y que el buque cumple las prescripciones pertinentes de los capítulos II-1 y II-2 del Convenio (excluidas las relativas a sistemas y dispositivos de seguridad contra incendios y planos de lucha contra incendios); y
- .2 que el buque cumple lo dispuesto en la parte G del capítulo II-1 del Convenio en lo que respecta a la utilización de como combustible/N.A.⁴"

ANEXO 3

**RESOLUCIÓN MSC.404(96)
(adoptada el 19 de mayo de 2016)**

**ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO TAMBIÉN el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar, 1974 ("el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, con excepción de las disposiciones del capítulo I,

HABIENDO EXAMINADO, en su 96º periodo de sesiones, las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del Convenio,

1 ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;

2 DISPONE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de julio de 2019, a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del arqueo bruto de la flota mercante mundial hayan notificado al Secretario General que recusan las enmiendas;

3 INVITA a los Gobiernos Contratantes del Convenio a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de enero de 2020, una vez aceptadas de conformidad con lo dispuesto en el párrafo 2 *supra*;

4 PIDE al Secretario General que, a los efectos del artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;

5 PIDE TAMBIÉN al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

* * *

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO II-2
CONSTRUCCIÓN – PREVENCIÓN, DETECCIÓN Y EXTINCIÓN DE INCENDIOS

Parte A
Generalidades

Regla 3

Definiciones

1 Se añaden los dos nuevos párrafos siguientes a continuación del párrafo 56 existente:

"57 *Zona de aterrizaje para helicópteros*: zona del buque proyectada para el aterrizaje de helicópteros de manera ocasional o en situaciones de emergencia, pero no proyectada para las operaciones habituales de los helicópteros.

58 *Zona de carga y descarga con chigre*: zona de evacuación prevista para el transbordo en helicóptero de personal o suministros al buque, o desde éste, mientras el helicóptero vuela estacionariamente por encima de la cubierta."

Parte D
Evacuación

Regla 13

Medios de evacuación

1 Se suprime la nota a pie de página del título del párrafo 3.2.

2 Después del párrafo 3.2.6.2 actual se añaden los siguientes párrafos nuevos:

"3.2.7 *Análisis de la evacuación de los buques de pasaje**

3.2.7.1 Las vías de evacuación se evaluarán mediante un análisis de la evacuación en una fase temprana del proceso de proyecto. Este análisis se aplicará a:

- .1 los buques de pasaje de transbordo rodado construidos el 1 de julio de 1999 o posteriormente; y
- .2 otros buques de pasaje construidos el 1 de enero de 2020 o posteriormente que transporten más de 36 pasajeros.

3.2.7.2 El análisis servirá para determinar y eliminar, en la medida de lo posible, la congestión que puede producirse durante el abandono del buque debido a los desplazamientos normales de los pasajeros y la tripulación por las vías de evacuación, incluida la posibilidad de que los tripulantes tengan que desplazarse por esas vías en sentido contrario al de los pasajeros. Además, el análisis se utilizará para demostrar que los medios de evacuación son suficientemente flexibles para tener en cuenta la posibilidad de que determinadas vías de evacuación, puestos de reunión, puestos de embarco o embarcaciones de supervivencia no puedan utilizarse como resultado de un siniestro.

* Véanse las "Directrices revisadas para el análisis de la evacuación de los buques de pasaje nuevos y existentes" (MSC.1/Circ.1533), según pueda ser enmendada."

- 3 Se suprime el párrafo 7.4.

Parte G **Prescripciones especiales**

Regla 18

Instalaciones para helicópteros

- 4 Se añade el siguiente párrafo 2.3 nuevo a continuación del párrafo 2.2 existente:

"2.3 No obstante lo prescrito en el anterior párrafo 2.2, los buques construidos el 1 de enero de 2020 o posteriormente que dispongan de una zona de aterrizaje para helicópteros estarán equipados con dispositivos de lucha contra incendios a base de espuma que cumplan las disposiciones pertinentes del capítulo 17 del Código internacional de sistemas de seguridad contra incendios.

y se modifica como corresponda la numeración de los párrafos restantes.

- 5 Se sustituye el párrafo 2.4 existente por el texto siguiente:

"2.4 No obstante lo prescrito en los párrafos 2.2 o 2.3 *supra*, los buques de pasaje de transbordo rodado que no dispongan de helicubiertas cumplirán la regla III/28."

- 6 Se añade el siguiente nuevo párrafo 5.1.6 a continuación del párrafo 5.1.5 existente:

"6 en lugar de las prescripciones de los párrafos 5.1.3 a 5.1.5, en los buques construidos el 1 de enero de 2020 o posteriormente y equipados con una helicubierta, dispositivos de lucha contra incendios a base de espuma que cumplan las disposiciones del Código internacional de sistemas de seguridad contra incendios;"

y se modifica como corresponda la numeración de los párrafos restantes.

ANEXO 1

**RESOLUCIÓN MSC.409(97)
(adoptada el 25 de noviembre de 2016)**

**ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO TAMBIÉN el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar, 1974 ("el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, con excepción de las disposiciones del capítulo I,

HABIENDO EXAMINADO, en su 97º periodo de sesiones, las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del Convenio,

1 ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;

2 DISPONE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de julio de 2019, a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del arqueo bruto de la flota mercante mundial hayan notificado al Secretario General que recusan las enmiendas;

3 INVITA a los Gobiernos Contratantes del Convenio a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de enero de 2020, una vez aceptadas de conformidad con lo dispuesto en el párrafo 2 *supra*;

4 PIDE al Secretario General que, a los efectos del artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;

5 PIDE TAMBIÉN al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO II-1
CONSTRUCCIÓN – ESTRUCTURA, COMPARTIMENTADO Y ESTABILIDAD,
INSTALACIONES DE MÁQUINAS E INSTALACIONES ELÉCTRICAS

PARTE A
Generalidades

Regla 3-12

Protección contra el ruido

- 1 El párrafo 2.1 actual se enmienda de modo que diga lo siguiente:
 - ".1 cuyo contrato de construcción se firme antes del 1 de julio de 2014 y cuya quilla haya sido colocada o cuya construcción se halle en una fase equivalente el 1 de enero de 2009 o posteriormente; o"

CAPÍTULO II-2
CONSTRUCCIÓN – PREVENCIÓN, DETECCIÓN
Y EXTINCIÓN DE INCENDIOS

Parte A
Generalidades

Regla 1
Ámbito de aplicación

2 Se añade el siguiente párrafo nuevo después del párrafo 2.8 actual:

"2.9 La regla 10.5.1.2.2, enmendada por la resolución MSC.409(97), se aplica a los buques construidos antes del 1 de enero de 2020, incluidos los construidos antes del 1 de julio de 2012."

Parte C
Control de incendios

Regla 10
Lucha contra incendios

3 En el párrafo 5.1.2.2, la última frase se sustituye por la siguiente:

"En el caso de calderas de menos de 175 kW destinadas a servicios domésticos, o de calderas protegidas por los sistemas fijos de extinción de incendios de aplicación local a base de agua exigidos en el párrafo 5.6, no se requiere un extintor de espuma de tipo aprobado de 135 l de capacidad como mínimo."

CAPÍTULO XI-1
MEDIDAS ESPECIALES PARA INCREMENTAR LA SEGURIDAD MARÍTIMA

- 4 Se añade la siguiente regla nueva 2-1 a continuación de la regla 2 actual:

"Regla 2-1

Armonización de los periodos de los reconocimientos de los buques de carga que no estén sujetos al Código ESP

Para los buques de carga que no estén sujetos a los reconocimientos mejorados de la regla XI-1/2, sin perjuicio de lo que establezcan otras disposiciones, podrán llevarse a cabo y completarse los reconocimientos intermedio y de renovación que se indican en la regla I/10 en los periodos correspondientes que se especifican en el Código ESP 2011, según pueda enmendarse, y en las directrices elaboradas por la Organización,* según proceda.

* Véanse las Directrices para efectuar reconocimientos de conformidad con el sistema armonizado de reconocimientos y certificación (SARC), 2015, adoptadas por la Asamblea de la Organización mediante la resolución A.1104(29), según pueda enmendarse."

ANEXO 3

RESOLUCIÓN MSC.421(98) (adoptada el 15 de junio de 2017)

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO TAMBIÉN el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar, 1974 ("el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, con excepción de las disposiciones del capítulo I,

HABIENDO EXAMINADO, en su 98º periodo de sesiones, las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del Convenio,

1 ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;

2 DISPONE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de julio de 2019, a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del arqueo bruto de la flota mercante mundial hayan notificado al Secretario General que recusan las enmiendas;

3 INVITA a los Gobiernos Contratantes del Convenio a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de enero de 2020, una vez aceptadas de conformidad con lo dispuesto en el párrafo 2 *supra*;

4 PIDE al Secretario General que, a los efectos del artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;

5 PIDE TAMBIÉN al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

ANEXO

CAPÍTULO II-1
CONSTRUCCIÓN – ESTRUCTURA, COMPARTIMENTADO Y ESTABILIDAD,
INSTALACIONES DE MÁQUINAS E INSTALACIONES ELÉCTRICAS

PARTE A
GENERALIDADES

Regla 1 – Ámbito de aplicación

1 Se añaden los siguientes nuevos párrafos 1.1.1 y 1.1.2 a continuación del párrafo 1.1 actual:

"1.1.1 Salvo disposición expresa en otro sentido, las partes B, B-1, B-2 y B-4 del presente capítulo sólo se aplicarán a los buques:

- .1 cuyo contrato de construcción se adjudique el 1 de enero de 2020 o posteriormente; o
- .2 en ausencia de un contrato de construcción, cuya quilla se coloque o cuya construcción se halle en una fase equivalente el 1 de julio de 2020 o posteriormente; o
- .3 cuya entrega tenga lugar el 1 de enero de 2024 o posteriormente.

1.1.2 Salvo disposición expresa en otro sentido, la Administración se asegurará de que los buques que no estén regidos por lo dispuesto en el párrafo 1.1.1, pero que se hayan construido el 1 de enero de 2009 o posteriormente:

- .1 cumplen las prescripciones que figuran en las partes B, B-1, B-2 y B-4 que sean aplicables en virtud del capítulo II-1 del Convenio internacional para la seguridad de la vida humana en el mar, 1974, enmendado por las resoluciones MSC.216(82), MSC.269(85) y MSC.325(90); y
- .2 cumplen las prescripciones que figuran en la regla 19-1."

2 Se suprime el párrafo 1.3.4 actual y al final del actual párrafo 1.3.3, se sustituye ";" por ".".

3 El párrafo 2 actual se sustituye por el siguiente:

"2 Salvo disposición expresa en otro sentido, la Administración se asegurará de que los buques construidos antes del 1 de enero de 2009:

- .1 cumplen las prescripciones aplicables en virtud del capítulo II-1 del Convenio internacional para la seguridad de la vida humana en el mar, 1974, enmendado por las resoluciones MSC.1(XLV), MSC.6(48), MSC.11(55), MSC.12(56), MSC.13(57), MSC.19(58), MSC.26(60), MSC.27(61), la resolución 1 de la Conferencia SOLAS de 1995, MSC.47(66), MSC.57(67), MSC.65(68), MSC.69(69), MSC.99(73), MSC.134(76), MSC.151(78) y MSC.170(79); y
- .2 cumplen las prescripciones que figuran en la regla 19-1."

Regla 2 – Definiciones

4 El párrafo 2 actual se sustituye por el siguiente:

"2 *Centro del buque*: el punto medio de la eslora (L)."

5 Los párrafos 9 y 10 actuales se sustituyen por los siguientes:

"9 *Calado (d)*: la distancia vertical medida desde la línea de quilla:

.1 en el centro del buque, para los buques regidos por lo dispuesto en la regla II-1/1.1.1.1; y

.2 en el punto medio de la eslora de compartimentado del buque (L_s), para los buques no regidos por lo dispuesto en la regla II-1/1.1.1.1, pero construidos el 1 de enero de 2009 o posteriormente;

hasta la flotación que se considere.

10 *Calado máximo de compartimentado (d_s)*: el calado correspondiente a la línea de carga de verano que se asigne al buque."

6 El párrafo 13 actual se sustituye por el siguiente:

"13 *Asiento*: la diferencia entre el calado a proa y el calado a popa, medidos en:

.1 las perpendiculares de proa y popa, respectivamente, que se definen en el Convenio internacional sobre líneas de carga en vigor, para los buques regidos por lo dispuesto en la regla II-1/1.1.1.1; y

.2 los extremos proel y popel, respectivamente, para los buques no regidos por lo dispuesto en la regla II-1/1.1.1.1, pero construidos el 1 de enero de 2009 o posteriormente;

sin tener en cuenta la quilla inclinada."

7 El párrafo 19 actual se sustituye por el siguiente:

"19 *Cubierta de cierre*: tratándose de buques de pasaje significa la cubierta más elevada:

.1 a la que llegan los mamparos principales y el forro del buque en forma estanca para los buques regidos por lo dispuesto en la regla II-1/1.1.1.1; y

.2 en cualquier punto de la eslora de compartimentado (L_s) al que llegan los mamparos principales y el forro del buque en forma estanca y la cubierta más baja desde la que pueden evacuarse pasajeros y tripulación sin que el agua lo impida en ninguna de las etapas de inundación en los casos de avería definidos en la regla 8 y en la parte B-2 del presente capítulo, para los buques no regidos por lo dispuesto en la regla II-1/1.1.1.1, pero construidos el 1 de enero de 2009 o posteriormente.

La cubierta de cierre podrá ser de saltillo. En los buques de carga no regidos por lo dispuesto en la regla II-1/1.1.1.1, pero construidos el 1 de enero de 2009 o posteriormente, la cubierta de francobordo puede considerarse la cubierta de cierre."

8 Se suprime el párrafo 26 actual y los párrafos restantes se vuelven a numerar como corresponda.

PARTE B COMPARTIMENTADO Y ESTABILIDAD

Regla 4 – Generalidades

9 El párrafo 1 actual y la nota a pie de página del párrafo 1 actual se suprimen.

10 Los nuevos párrafos 1 y 2 siguientes se introducen antes del párrafo 2 actual:

"1 Salvo disposición expresa en otro sentido, las prescripciones de las partes B-1 a B-4 se aplicarán a los buques de pasaje.

2 En lo que respecta a los buques de carga, se aplicarán las siguientes prescripciones de las partes B-1 a B-4:

2.1 De la parte B-1:

- .1 Salvo disposición expresa en otro sentido, la regla 5 se aplicará a los buques de carga y la regla 5-1 se aplicará a los buques de carga que no sean buques tanque, según se definen éstos en la regla I/2 h);
- .2 las reglas 6 a 7-3 se aplicarán a los buques de carga de eslora (*L*) igual o superior a 80 metros, pero de ellas podrán excluirse los buques regidos por los siguientes instrumentos y cuyo cumplimiento de las prescripciones de compartimentado y estabilidad con avería del instrumento esté demostrado:
 - .1 el Anexo I del Convenio MARPOL, salvo que los buques de carga combinada (definidos en la regla II-2/3.14 del Convenio SOLAS) con francobordo de tipo B cumplirán las disposiciones de las reglas 6 a 7-3*; o
 - .2 el Código internacional para la construcción y el equipo de buques que transporten productos químicos peligrosos a granel (Código CIQ)*; o
 - .3 el Código internacional para la construcción y el equipo de buques que transporten gases licuados a granel (Código CIG)*; o
 - .4 las prescripciones de estabilidad con avería de la regla 27 del Convenio de líneas de carga de 1966 aplicables en cumplimiento de las resoluciones

A.320(IX) y A.514(13), siempre que, en el caso de los buques de carga a los cuales se aplica la regla 27.9), para que los mamparos principales transversales estancos se consideren efectivos, éstos deben estar espaciados según lo estipulado en el párrafo 12) f) de la resolución A.320(IX), salvo que los buques destinados a transportar cubiertas cumplirán lo dispuesto en las reglas 6 a 7-3; o

- .5 las prescripciones de estabilidad con avería de la regla 27 del Protocolo de líneas de carga de 1988, salvo que los buques destinados a transportar cubiertas cumplirán lo dispuesto en las reglas 6 a 7-3; o
- .6 las normas de compartimentado y estabilidad con avería de otros instrumentos** elaborados por la Organización.

2.2 Salvo disposición expresa en otro sentido, las prescripciones de la parte B-2 y la parte B-4 se aplicarán a los buques de carga.

* Véanse las Directrices para la verificación de las prescripciones sobre estabilidad con avería de los buques tanque (MSC.1/Circ.1461).

** .1 En el caso de los buques de suministro mar adentro de eslora no superior a 100 metros, las Directrices para el proyecto y la construcción de buques de suministro mar adentro, 2006 (resolución MSC.235(82), enmendada por la resolución MSC.335(90)); o
.2 en el caso de los buques para fines especiales, el Código de seguridad aplicable a los buques para fines especiales, 2008 (resolución MSC.266(84), en su forma enmendada)."

11 Los párrafos 2 a 4 actuales se vuelven a numerar como corresponda.

PARTE B-1 ESTABILIDAD

Regla 5 – Estabilidad sin avería

12 Se suprime la nota a pie de página y los párrafos 1 y 2 actuales se sustituyen por los siguientes:

"1 Todo buque de pasaje, sean cuales fueren sus dimensiones, y todo buque de carga de eslora (L) igual o superior a 24 m serán sometidos, ya terminada su construcción, a una prueba de estabilidad. Se determinarán el desplazamiento del buque en rosca y las posiciones longitudinal, transversal y vertical de su centro de gravedad. Además de cualquier otra prescripción aplicable de las presentes reglas, los buques de eslora igual o superior a 24 m deberán cumplir, como mínimo, las prescripciones de la parte A del Código IS 2008.

2 La Administración podrá autorizar que, respecto de un determinado buque de carga, se prescinda de la prueba de estabilidad prescrita en la regla 5-1 siempre que se disponga de datos básicos proporcionados por la prueba de estabilidad realizada con un buque gemelo, y que a juicio de la Administración sea posible, partiendo de estos datos básicos, obtener información fiable acerca de la estabilidad del buque no sometido a prueba. Una vez terminada su construcción, se llevará a cabo un reconocimiento para determinar su peso en rosca, y si al comparar los resultados con los datos obtenidos respecto de un buque gemelo se encontrara una variación del desplazamiento en rosca que exceda del 1 % para buques de eslora igual o superior a 160 m y del 2 % para buques de eslora igual o inferior a 50 m, como determina la interpolación lineal de esloras intermedias, o una variación de la posición longitudinal del centro de gravedad que exceda del 0,5 % de L , se someterá al buque a una prueba de estabilidad."

13 El párrafo 5 actual se sustituye por el siguiente:

"5 En todos los buques de pasaje, a intervalos periódicos que no excedan de cinco años, se llevará a cabo un reconocimiento para determinar el peso en rosca y comprobar si se han producido cambios en el desplazamiento en rosca o en la posición longitudinal del centro de gravedad. Si, al comparar los resultados con la información aprobada sobre estabilidad, se encontrara o previera una variación del desplazamiento en rosca que exceda del 2 % o una variación de la posición longitudinal del centro de gravedad que exceda del 1 % de L , se someterá al buque a una nueva prueba de estabilidad."

Regla 5-1 – Información sobre la estabilidad que se facilitará al capitán

14 La nota a pie de página actual del título de la regla se sustituye por la siguiente:

"* Véanse también las Directrices para la preparación de información acerca de la estabilidad sin avería (circular MSC/Circ.456) y la Orientación revisada que sirva de guía al capitán para evitar situaciones peligrosas en condiciones meteorológicas y estados de la mar adversos (circular MSC.1/Circ.1228)."

15 La actual regla 5-1.1 se sustituye por la siguiente:

"1 Se facilitará al capitán información satisfactoria a juicio de la Administración que le permita obtener, por medios rápidos y sencillos, un conocimiento preciso de la estabilidad del buque en las diferentes condiciones de servicio. Se entregará a la Administración una copia de dicha información sobre estabilidad."

16 El párrafo 2.1 actual se sustituye por el siguiente:

".1 unas curvas o tablas de valores de la altura metacéntrica (GM) mínima de servicio y el asiento máximo admisible en función del calado que garanticen el cumplimiento de las prescripciones de estabilidad sin avería y con avería según proceda, o las curvas o tablas de valores de la altura máxima admisible del centro de gravedad (KG) y el asiento máximo admisible en función del calado, o el equivalente de una de esas dos curvas o tablas de valores;"

17 Los párrafos 3 y 4 actuales se sustituyen por el texto siguiente:

"3 La información sobre estabilidad sin avería y con avería prescrita en la regla 5-1.2 se presentará como datos refundidos e incluirá la gama operativa completa de los valores del calado y el asiento. Los valores del asiento aplicados

coincidirán en toda la información sobre estabilidad destinada a ser utilizada a bordo. La información no requerida para la determinación de los límites del asiento y la estabilidad debería excluirse de esta información.

4 Si la estabilidad con avería se calcula de conformidad con las reglas 6 a 7-3 y, si procede, con las reglas 8 y 9.8, se determinará una curva límite de estabilidad mediante interpolación lineal entre el valor mínimo de la *GM* prescrita que se supone para cada uno de los tres calados d_s , d_p y d_i . Cuando se calculen índices de compartimentado adicionales para distintos asientos, se presentará una curva envolvente única basada en los valores mínimos para esos cálculos. Cuando esté previsto elaborar curvas de la altura máxima admisible *KG*, habrá que asegurarse de que las curvas resultantes de la *KG* máxima se correspondan con una variación lineal de la *GM*.

5 Como alternativa a la curva envolvente única, los cálculos de los asientos adicionales podrán llevarse a cabo con una *GM* común para todos los asientos supuestos en cada calado de compartimentado. Seguidamente se utilizarán los valores más bajos de cada índice parcial A_s , A_p y A_i de todos los asientos en la suma del índice de compartimentado obtenido *A* de conformidad con la regla 7.1. De este modo se obtendrá una curva límite de la *GM* basada en la *GM* utilizada en cada calado. Se elaborará un diagrama de límite de asiento que indique la gama de asientos supuesta."

18 El párrafo 5 actual se vuelve a numerar como corresponda y se enmienda de modo que diga lo siguiente:

"6 Cuando las curvas o tablas de valores de la altura metacéntrica (*GM*) mínima de servicio o de la altura *KG* máxima admisible en función del calado no se faciliten, el capitán deberá asegurarse de que las condiciones de servicio no difieren de un estado de carga aprobado, o verificar, mediante los cálculos correspondientes, que las prescripciones de estabilidad se satisfacen respecto de este estado de carga."

Regla 6 – Índice de compartimentado prescrito R

19 En el párrafo 2, el encabezamiento actual se sustituye por el siguiente:

"2 Para los buques a los que se aplican las prescripciones sobre estabilidad con avería de la presente parte, el grado de compartimentado necesario queda determinado por el índice de compartimentado prescrito *R* como se indica a continuación:"

20 En el párrafo 2.2, el encabezamiento actual se sustituye por el siguiente:

".2 En el caso de buques de carga de eslora (*L*) no inferior a 80 m y eslora (L_s) no superior a 100 m:"

21 El texto del párrafo 2.3 actual se sustituye por el siguiente:

"2.3 En el caso de los buques de pasaje:

Personas a bordo	R
$N < 400$	$R = 0,722$
$400 \leq N \leq 1\ 350$	$R = N / 7\ 580 + 0,66923$
$1\ 350 < N \leq 6\ 000$	$R = 0,0369 \times \ln(N + 89,048) + 0,579$
$N > 6\ 000$	$R = 1 - (852,5 + 0,03875 \times N) / (N + 5\ 000)$

donde:

N = número total de personas a bordo."

22 El párrafo 2.4 actual se suprime.

Regla 7 – Índice de compartimentado obtenido A

23 La primera frase del párrafo 1 actual se sustituye por la siguiente:

"1 El índice de compartimentado obtenido A se determina mediante la sumatoria de los índices parciales A_s , A_p y A_l , ponderados tal como se indica y calculados para los calados d_s , d_p y d_l que se definen en la regla 2, de conformidad con la siguiente fórmula:"

24 Los párrafos 2 y 3 actuales se sustituyen por los siguientes:

"2 Como mínimo, A se calculará en el asiento a nivel para el calado máximo de compartimentado d_s y el calado de compartimentado parcial d_p . El asiento de servicio estimado podrá utilizarse para el calado de servicio en rosca d_l . Si en todas las condiciones de servicio previstas en la gama de calados de d_s a d_l la variación del asiento, en comparación con los asientos calculados, es superior al 0,5 % de L , se calculará A , una o más veces, para los mismos calados, pero con asientos suficientes, para asegurarse de que, respecto de todas las condiciones de servicio previstas, la diferencia del asiento, en comparación con el asiento de referencia utilizado para un cálculo, no supere el 0,5 % de L . En cada cálculo adicional de A se cumplirá lo dispuesto en la regla 6.1.

3 Al determinar el brazo adrizante positivo (GZ) de la curva de estabilidad residual en las etapas de equilibrio intermedio y final de la inundación, el desplazamiento será el correspondiente a la condición de estabilidad de carga sin avería. Todos los cálculos deberían realizarse para el asiento que adquiriera el buque libremente."

Regla 7-1 – Cálculo del factor p_i

25 En el párrafo 1 actual, el texto de la notación para la distancia media transversal b se sustituye por el siguiente:

" b = distancia media transversal en metros, medida perpendicularmente al plano diametral en el calado máximo de compartimentado entre el forro exterior y un plano vertical supuesto que se extienda entre los límites longitudinales utilizados en el cálculo del factor p_i y que sea tangente o común a toda o a parte de la cara más exterior del mamparo longitudinal considerado. Este plano vertical estará orientado de modo que la distancia transversal media al forro exterior sea la máxima, pero no superior al doble de la distancia mínima entre el plano y el forro exterior. Si la parte superior de un mamparo longitudinal se encuentra por debajo del calado máximo de compartimentado, se supondrá que el plano vertical utilizado para determinar b se extiende hacia arriba hasta la línea de flotación de compartimentado más profunda. En ningún caso se considerará que b es superior a $B/2$."

Regla 7-2 – Cálculo del factor s_i

26 Los párrafos 2 a 4.1.2 actuales se sustituyen por los siguientes:

"2 Para los buques de pasaje y los buques de carga que tengan dispositivos de inundación compensatoria, el factor $s_{intermedio,i}$ se considera el menor de los factores s calculados en todas las etapas de inundación, incluida la etapa previa al equilibrado, de haberla, y se calculará mediante la siguiente fórmula:

$$s_{intermedio,i} = \left[\frac{GZ_{m\acute{a}x}}{0,05} \times \frac{Gama}{7} \right]^{\frac{1}{4}}$$

donde $GZ_{m\acute{a}x}$ no se considerará superior a 0,05 m y $Gama$ no se considerará superior a 7° . $s_{intermedio,i} = 0$, si el ángulo de escora intermedio supera los 15° en el caso de los buques de pasaje, y 30° en el caso de los buques de carga.

Para los buques de carga que no tengan instalados dispositivos de inundación compensatoria, el factor $s_{intermedio,i}$ se considerará igual a 1, a menos que la Administración estime que la estabilidad en etapas intermedias de la inundación puede ser insuficiente, en cuyo caso se podrá exigir que se investigue más a fondo la situación.

Cuando los buques de pasaje y los buques de carga tengan instalados dispositivos de inundación compensatoria, el tiempo necesario para lograr el equilibrado no excederá de 10 min.

3 El factor $s_{final,i}$ se calculará aplicando la siguiente fórmula:

$$s_{final,i} = K \times \left[\frac{GZ_{m\acute{a}x}}{TGZ_{m\acute{a}x}} \times \frac{Gama}{TGama} \right]^{\frac{1}{4}}$$

donde:

$GZ_{m\acute{a}x}$ no se considerará superior a $TGZ_{m\acute{a}x}$;

$Gama$ no se considerará superior a $TGama$;

$TGZ_{m\acute{a}x} = 0,20$ m, para los buques de pasaje de transbordo rodado en cada caso de avería que afecte a un espacio de carga rodada,

$TGZ_{m\acute{a}x} = 0,12$ m, en los demás casos;

$TGama = 20^\circ$, para los buques de pasaje de transbordo rodado en cada caso de avería que afecte a un espacio de carga rodada;

$TGama = 16^\circ$, en los demás casos;

$K = 1$ si $\theta_e \leq \theta_{m\acute{i}n}$

$K = 0$ si $\theta_e \geq \theta_{m\acute{a}x}$

$$K = \sqrt{\frac{\theta_{m\acute{a}x} - \theta_e}{\theta_{m\acute{a}x} - \theta_{m\acute{i}n}}} \quad \text{en los dem\acute{a}s casos,}$$

donde:

$\theta_{m\acute{i}n}$ igual a 7° en el caso de los buques de pasaje, y a 25° en el caso de los buques de carga; y

$\theta_{m\acute{a}x}$ igual a 15° en el caso de los buques de pasaje, y a 30° en el caso de los buques de carga.

4 El factor $s_{mom,i}$ s\o lo es aplicable a los buques de pasaje (en el caso de los buques de carga, $s_{mom,i}$ se considerar\acute{a} igual a 1) y se calcular\acute{a} en el equilibrio final utilizando la siguiente f\o rmula:

$$S_{mom,i} = \frac{(GZ_{m\acute{a}x} - 0,04) \times \text{Desplazamiento}}{M_{escora}}$$

donde:

Desplazamiento es el desplazamiento sin aver\acute{a} en el calado correspondiente (d_s , d_p o d).

M_{escora} es el momento escorante m\acute{a}ximo supuesto; se calcula como se indica en el subp\arraf o 4.1; y

$$S_{mom,i} \leq 1$$

4.1 El momento de escora, M_{escora} , se calcula utilizando la f\o rmula siguiente:

$$M_{escora} = \text{m\acute{a}ximo} (M_{pasaje} \text{ o } M_{viento} \text{ o } M_{embarc.superv.})$$

4.1.1 M_{pasaje} es el momento de escora m\acute{a}ximo supuesto debido al movimiento de los pasajeros; se calcula del modo siguiente:

$$M_{pasaje} = (0,075 \times N_p) \times (0,45 \times B) \text{ (tm)}$$

donde:

N_p es el n\umero m\acute{a}ximo de pasajeros permitido a bordo en la condici\o n de servicio correspondiente al calado m\acute{a}ximo de compartimentado en cuesti\o n; y

B es la manga del buque, tal como se define en la regla 2.8.

Otra posibilidad es calcular el momento escorante partiendo del supuesto de que la distribuci\o n de los pasajeros es la siguiente: cuatro personas por metro cuadrado en zonas de cubierta despejadas a una banda del buque, en las cubiertas donde est\en situados los puestos de reuni\o n, de manera que produzcan el momento escorante m\acute{a}s desfavorable. A tal fin se supondr\acute{a} un peso de 75 kg por persona.

4.1.2 M_{viento} es el momento máximo supuesto debido al viento que actúa en una situación de avería:

$$M_{\text{viento}} = (P \times A \times Z) / 9\,806 \text{ (tm)}$$

donde:

$$P = 120 \text{ N/m}^2;$$

A = superficie lateral proyectada por encima de la línea de flotación;

Z = distancia desde el centro de la zona lateral proyectada por encima de la línea de flotación hasta $T/2$; y

T = calado correspondiente (d_s , d_p o d)."

27 El párrafo 5 actual se sustituye por el siguiente:

"5 La inundación asimétrica deberá quedar reducida al mínimo compatible con la adopción de medidas eficaces. Cuando sea necesario corregir grandes ángulos de escora, los medios que se adopten serán automáticos en la medida de lo posible y, en todo caso, cuando se instalen mandos para los dispositivos de equilibrado, éstos deberán poder accionarse desde encima de la cubierta de cierre de los buques de pasaje y de la cubierta de francobordo de los buques de carga. Estos dispositivos, y sus mandos, necesitarán la aprobación de la Administración.* Se deberá facilitar al capitán del buque la información necesaria respecto de la utilización de los dispositivos de equilibrado.

* Véase la "Recomendación revisada sobre un método uniforme para evaluar los medios de inundación compensatoria", adoptada por la Organización mediante la resolución MSC.362(92), según pueda ser enmendada."

28 El encabezamiento del párrafo 5.2 actual se sustituye por el siguiente:

"5.2 El valor del factor s_i se considerará igual a cero cuando, con la flotación definitiva, teniendo en cuenta la inmersión, la escora y el asiento, se sumerge:"

29 El párrafo 5.3 actual se sustituye por el siguiente:

"5.3 El valor del factor s_i se considerará igual a cero si, teniendo en cuenta la inmersión, la escora y el asiento, se produce alguna de las siguientes circunstancias en cualquier etapa intermedia o en la etapa final de la inundación:

- .1 la inmersión de cualquier escotilla de evacuación vertical en la cubierta de cierre de los buques de pasaje y en la cubierta de francobordo de los buques de carga para cumplir lo dispuesto en el capítulo II-2;
- .2 alguno de los mandos para el funcionamiento de las puertas estancas, los dispositivos de equilibrado, las válvulas de las tuberías o los conductos de ventilación destinados a mantener la integridad de los mamparos estancos desde encima de la cubierta de cierre de los buques de pasaje y de la cubierta de francobordo de los buques de carga resulte inaccesible o inservible; y

- .3 la inmersión de cualquier parte de las tuberías o los conductos de ventilación situados en la extensión supuesta de la avería y que atraviesan un cerramiento estanco si esto puede llevar a la inundación progresiva de los compartimientos que no se suponen inundados."

30 El párrafo 5.5 actual se sustituye por el siguiente:

"5.5 Salvo por lo que respecta a lo dispuesto en el párrafo 5.3.1, no será necesario considerar las aberturas que se cierren mediante tapas de registro y tapas a ras de cubierta estancas, puertas estancas de corredera accionadas por telemando, portillos fijos ni puertas o tapas de escotilla de acceso estancas que deban permanecer cerradas durante la navegación."

Regla 8 – Prescripciones especiales relativas a la estabilidad de los buques de pasaje

31 Los párrafos 1 y 2 actuales y el encabezamiento del párrafo 3 se sustituyen por los siguientes:

"1 En todo buque de pasaje destinado a transportar 400 personas o más, el compartimentado estanco inmediatamente a popa del mamparo de colisión estará situado de modo que $s_i = 1$ para una avería que afecte a todos los compartimientos situados dentro de una distancia de $0,08L$, medida desde la perpendicular de proa, en las tres condiciones de carga utilizadas para calcular el índice de compartimentado A obtenido. Si el índice de compartimentado A obtenido se calcula para asientos distintos, esta prescripción se satisfará también para esas condiciones de carga.

2 Todo buque de pasaje destinado a transportar 36 personas o más será capaz de resistir una avería en el forro del costado de una extensión especificada en el párrafo 3. El cumplimiento de esta regla se logrará demostrando que s_i , según queda definido en la regla 7-2, no es inferior a 0,9 en las tres condiciones de carga utilizadas para calcular el índice de compartimentado A obtenido. Si el índice de compartimentado A obtenido se calcula para asientos distintos, esta prescripción se satisfará también para esas condiciones de carga.

3 La extensión de la avería supuesta cuando vaya a demostrarse el cumplimiento del párrafo 2 de la presente regla dependerá del número total de personas transportadas y de L , de tal modo que:"

32 El párrafo 3.2 actual se sustituye por el siguiente:

".2 cuando se vayan a transportar al menos 400 personas, se supondrá una longitud de avería de $0,03L$ pero no inferior a 3 m en cualquier posición a lo largo del forro del costado, en conjunción con una penetración hacia el interior de $0,1B$ pero no inferior a 0,75 m medida desde el costado hacia crujía, perpendicularmente al eje longitudinal, al nivel del calado máximo de compartimentado;"

33 El párrafo 3.4 actual se sustituye por el siguiente:

".4 cuando se vayan a transportar 36 personas, se supondrá una longitud de avería de $0,015L$ pero no inferior a 3 m, así como una penetración hacia el interior de $0,05B$ pero no inferior a 0,75 m; y"

Regla 8-1 – Información operacional y capacidad de los sistemas de los buques de pasaje tras un siniestro por inundación

2 Disponibilidad de los sistemas esenciales en caso de daños por inundación

34 El texto del párrafo actual se sustituye por el siguiente:

"Todo buque de pasaje estará proyectado de modo que los sistemas estipulados en la regla II-2/21.4 permanezcan operacionales cuando el buque sufra inundación en un solo compartimiento estanco."

3 Información operacional tras un siniestro por inundación

35 El texto del encabezamiento actual se sustituye por el siguiente:

"A los efectos de facilitar información operacional al capitán para el regreso a puerto en condiciones de seguridad tras un siniestro por inundación, los buques de pasaje contarán con:"

36 La actual nota a pie de página se sustituye por la siguiente:

" Véanse las "Directrices sobre la información operacional facilitada a los capitanes de buques de pasaje para el regreso a puerto del buque en condiciones de seguridad por su propia propulsión o mediante remolque" (MSC.1/Circ.1400) y las "Directrices revisadas sobre la información operacional facilitada a los capitanes de buques de pasaje para el regreso a puerto del buque en condiciones de seguridad" (MSC.1/Circ.1532)". "

PARTE B-2

COMPARTIMENTADO, INTEGRIDAD DE ESTANQUIDAD E INTEGRIDAD A LA INTEMPERIE

Regla 9 – Dobles fondos en los buques de pasaje y en los buques de carga que no sean buques tanque

37 El párrafo 3 actual se sustituye por el siguiente:

3.1 Los pozos pequeños construidos en el doble fondo y destinados a las instalaciones de achique no tendrán más profundidad de la necesaria. La distancia vertical desde el fondo de dicho pozo hasta un plano que coincida con la línea de quilla no será inferior a $h/2$ o a 500 mm, si este último valor es superior, o se deberá demostrar que dicha parte del buque cumple lo dispuesto en el párrafo 8.

3.2 La Administración podrá permitir otros pozos (para el aceite lubricante, por ejemplo, bajo las máquinas principales) si estima que las disposiciones adoptadas dan una protección equivalente a la proporcionada por un doble fondo que cumpla con la presente regla.

3.2.1 Para un buque de carga de eslora igual o superior a 80 m o para un buque de pasaje, se comprobará la protección equivalente demostrando que el buque puede soportar las averías en el fondo que se describen en el párrafo 8. Alternativamente, los pozos para el aceite lubricante bajo las máquinas principales podrán penetrar en el doble fondo por debajo de la línea de cerramiento definida por la distancia h siempre que la distancia vertical entre el fondo del pozo y un plano que coincida con la línea de quilla no sea inferior a $h/2$ o a 500 mm, si este valor es mayor.

3.2.2 Para los buques de carga de eslora inferior a 80 m, las medidas proporcionarán un nivel de seguridad satisfactorio a juicio de la Administración."

38 Los párrafos 6 a 8 actuales se sustituyen por los siguientes:

"6 Cualquier parte de un buque de carga de eslora igual o superior a 80 m o de un buque de pasaje que no lleve un doble fondo conforme a lo dispuesto en los párrafos 1, 4 o 5, como se estipula en el párrafo 2, deberá poder soportar las averías en el fondo que se describen en el párrafo 8. En el caso de los buques de carga de eslora inferior a 80 m, las medidas alternativas proporcionarán un nivel de seguridad satisfactorio a juicio de la Administración.

7 En el caso de que en un buque de carga de eslora igual o superior a 80 m o en un buque de pasaje la disposición del fondo sea poco habitual, se demostrará que el buque puede soportar las averías en el fondo que se especifican en el párrafo 8. En el caso de los buques de carga de eslora inferior a 80 m, las medidas alternativas proporcionarán un nivel de seguridad satisfactorio a juicio de la Administración.

8 El cumplimiento de lo estipulado en los párrafos 3.1, 3.2.1, 6 o 7 se logrará demostrando que s_i , calculado de conformidad con la regla 7-2, no es inferior a 1 en todas las condiciones de servicio tras producirse una avería en el fondo con la extensión que se especifica en el apartado .2 *infra* para cualquier posición en la sección afectada del buque:

.1 La inundación de tales espacios no inutilizará las fuentes de energía eléctrica y el alumbrado de emergencia, las comunicaciones internas, los medios de señalización u otros dispositivos de emergencia en otras partes del buque.

.2 La extensión supuesta de la avería será la siguiente:

	Para $0,3L$ desde la perpendicular de proa del buque	Cualquier otra parte del buque
Extensión longitudinal	$1/3L^{2/3}$ o 14,5 m, si este segundo valor es menor	$1/3L^{2/3}$ o 14,5 m, si este segundo valor es menor
Extensión transversal	$B/6$ o 10 m, si este segundo valor es menor	$B/6$ o 5 m, si este segundo valor es menor
Extensión vertical, medida desde la línea de la quilla	$B/20$, cuyo valor no será inferior a 0,76 ni superior a 2 m	$B/20$, cuyo valor no será inferior a 0,76 ni superior a 2 m

.3 Si cualquier avería de una extensión menor que la avería máxima especificada en el apartado .2 produce una condición más grave, tal avería deberá tenerse en cuenta."

Regla 10 – Construcción de los mamparos estancos

39 El párrafo 1 actual se sustituye por el siguiente:

"1 Todo mamparo estanco de compartimentado, transversal o longitudinal, estará construido de manera que tenga el escantillonado descrito en la regla 2.17. En todos los casos, los mamparos estancos de compartimentado deberán poder resistir, por lo menos, la presión debida a una carga de agua que llegue hasta la cubierta de cierre de los buques de pasaje y la cubierta de francobordo de los buques de carga."

Regla 12 – Mamparos de los piques y de los espacios de máquinas, túneles de ejes, etc.

40 El párrafo 1 actual se sustituye por el siguiente:

"1 Se instalará un mamparo de colisión que será estanco hasta la cubierta de cierre de los buques de pasaje y la cubierta de francobordo de los buques de carga. Este mamparo estará situado a una distancia de la perpendicular de proa no inferior a $0,05L$ o a 10 m, si esta segunda magnitud es menor, y, salvo cuando la Administración permita otra cosa, dicha distancia no será superior a $0,08L$ o $0,05L + 3$ m, si esta segunda magnitud es mayor. "

2 El buque se proyectará de manera que s_i , calculado de conformidad con la regla 7-2, no sea inferior a 1 en la condición de carga con el calado máximo de compartimentado, con asiento a nivel o en cualquier condición de carga con asiento aproante, si cualquier parte de la sección del buque a proa del mamparo de colisión se inunda sin límites verticales."

41 Los párrafos 2 a 10 actuales se sustituyen por los siguientes:

"3 Cuando cualquier parte del buque que quede debajo de la flotación se prolongue por delante de la perpendicular de proa, como por ejemplo ocurre con la proa de bulbo, las distancias estipuladas en el párrafo 1 se medirán desde un punto situado:

- .1 a mitad de dicha prolongación;
- .2 a una distancia igual a $0,015L$ por delante de la perpendicular de proa; o
- .3 a una distancia de 3 m por delante de la perpendicular de proa,

tomándose de estas medidas la menor.

4 El mamparo podrá tener bayonetas o nichos, a condición de que éstos no excedan de los límites establecidos en los párrafos 1 o 3.

5 En el mamparo de colisión situado por debajo de la cubierta de cierre de los buques de pasaje y la cubierta de francobordo de los buques de carga no habrá puertas, registros, aberturas de acceso, conductos de ventilación ni aberturas de ningún otro tipo.

6.1 Salvo en el caso previsto en el párrafo 6.2, el mamparo de colisión sólo podrá estar perforado, por debajo de la cubierta de cierre de los buques de pasaje y la cubierta de francobordo de los buques de carga, por una tubería destinada a dar paso al fluido del pique de proa, y a condición de que dicha tubería esté provista de una válvula de cierre susceptible de ser accionada desde encima de la cubierta de cierre de los buques de pasaje y la cubierta de francobordo de los buques de carga, con la válvula situada en el interior del pique de proa en el mamparo de colisión. La Administración podrá, no obstante, autorizar la instalación de esta válvula en el lado de popa del mamparo de colisión, a condición de que la válvula quede fácilmente accesible en todas las condiciones de servicio y que el espacio en que se halle situada no sea un espacio de carga. En cambio, en los buques de carga, la tubería puede estar provista de una válvula de mariposa sustentada adecuadamente en un

asiento o bridas, que podrá accionarse desde encima de la cubierta de cierre. Todas las válvulas serán de acero, bronce u otro material dúctil aprobado. No se admitirán válvulas de hierro fundido corriente o de un material análogo.

6.2 Si el pique de proa está dividido de modo que pueda contener dos tipos distintos de líquidos, la Administración podrá permitir que el mamparo de colisión sea atravesado por debajo de la cubierta de cierre de los buques de pasaje y la cubierta de francobordo de los buques de carga, por dos tuberías, ambas instaladas de acuerdo con lo prescrito en el párrafo 6.1, a condición de que a juicio de la Administración no exista otra solución práctica que la de instalar una segunda tubería y que, habida cuenta del compartimentado suplementario efectuado en el pique de proa, se mantenga la seguridad del buque.

7 En los casos en que haya instalada una superestructura larga a proa, el mamparo de colisión se prolongará, estanco a la intemperie, hasta la cubierta inmediatamente superior a la de cierre de los buques de pasaje y a la cubierta de francobordo de los buques de carga. No es necesario que esa prolongación vaya directamente encima del mamparo inferior, a condición de que todas las partes de la prolongación, incluida cualquier parte de la rampa que esté unida a ella, queden situadas dentro de los límites especificados en los párrafos 1 o 3, exceptuando el caso permitido en el párrafo 8, y de que la parte de la cubierta que forma la bayoneta se haga efectivamente estanca a la intemperie. La prolongación se instalará de manera que evite la posibilidad de que la puerta de proa o la rampa, si la hay, pueda dañarla en caso de que la puerta de proa o cualquier parte de la rampa sufran algún daño o se desprendan.

8 Cuando se instalen puertas de proa y una rampa de carga forme parte de la prolongación del mamparo de colisión por encima de la cubierta de cierre de los buques de pasaje y la cubierta de francobordo de los buques de carga, la rampa será estanca a la intemperie en toda su longitud. En los buques de carga, la parte de dicha rampa que se halle a más de 2,3 m por encima de la cubierta de francobordo podrá prolongarse por delante del límite especificado en los párrafos 1 o 3. Las rampas que no cumplan las prescripciones *supra* no se considerarán una prolongación del mamparo de colisión.

9 Las aberturas en la prolongación del mamparo de colisión por encima de la cubierta de francobordo quedarán limitadas al menor número compatible con el proyecto del buque y con el servicio normal de éste. Todas ellas deberán ser estancas a la intemperie cuando queden cerradas.

10 Se instalarán mamparos estancos hasta la cubierta de cierre de los buques de pasaje y la cubierta de francobordo de los buques de carga que separen a proa y a popa el espacio de máquinas de los espacios de carga y de alojamiento. Habrá asimismo instalado un mamparo del pique de popa que será estanco hasta la cubierta de cierre o la cubierta de francobordo. El mamparo del pique de popa podrá, sin embargo, formar bayoneta por debajo de la cubierta de cierre o la cubierta de francobordo, a condición de que con ello no disminuya el grado de seguridad del buque en lo que respecta al compartimentado.

11 En todos los casos, las bocinas irán encerradas en espacios estancos de volumen reducido. En los buques de pasaje, el prensaestopas de la bocina estará situado en un túnel de eje, estanco, o en un espacio estanco separado del compartimiento de la bocina y cuyo volumen sea tal que, si se inunda a causa de filtraciones producidas a través del prensaestopas, la cubierta de cierre no quede sumergida. En el caso de los buques de carga, a discreción de la Administración,

podrán tomarse otras medidas para reducir al mínimo el riesgo de que entre agua en el buque en caso de avería que afecte a los medios de cierre de las bocinas."

Regla 13 – Aberturas en los mamparos estancos situados por debajo de la cubierta de cierre de los buques de pasaje

42 El párrafo 11.1 actual se sustituye por el siguiente:

"11.1 Si los troncos o túneles que sirven para comunicar los alojamientos de la tripulación con los espacios de máquinas, dar paso a tuberías o cualquier otro fin, atraviesan mamparos estancos, deberán ser estancos y satisfacer lo previsto en la regla 16-1. Si un túnel o tronco se utiliza en la mar como pasadizo, el acceso a por lo menos uno de sus extremos será un conducto estanco cuya boca esté situada por encima de la cubierta de cierre. El acceso al otro extremo del tronco o túnel podrá ser una puerta estanca del tipo que sea necesario según su emplazamiento en el buque. Dichos troncos o túneles no atravesarán el primer mamparo de compartimentado situado a popa del mamparo de colisión."

Regla 15 – Aberturas en el forro exterior por debajo de la cubierta de cierre de los buques de pasaje y por debajo de la cubierta de francobordo de los buques de carga

43 Los párrafos 4 y 5.1 actuales se sustituyen por los siguientes:

"4 En todos los portillos se instalarán tapas ciegas de bisagra de accionamiento seguro, dispuestas de modo que sea posible cerrarlas y asegurarlas con facilidad y firmeza, haciéndolas estancas, aunque a popa de un octavo de la eslora del buque desde la perpendicular de proa y por encima de una línea trazada en el costado del buque paralelamente a la cubierta de cierre y cuyo punto más bajo esté a una altura de 3,7 m más el 2,5 % de la manga del buque por encima del calado máximo de compartimentado, dichas tapas ciegas podrán ser desmontables en alojamientos para pasajeros, a menos que el Convenio internacional sobre líneas de carga que haya en vigor exija que sean inamovibles. Las citadas tapas desmontables se guardarán junto a los portillos en que deban ser utilizadas.

5.1 No se instalarán portillos en ninguno de los espacios destinados exclusivamente al transporte de carga."

44 El párrafo 8.2.1 actual se sustituye por el siguiente:

"8.2.1 A reserva de lo prescrito en el Convenio internacional sobre líneas de carga en vigor, y exceptuando lo estipulado en el párrafo 8.3, toda descarga separada que atravesase el forro exterior desde espacios situados por debajo de la cubierta de cierre de los buques de pasaje y de la cubierta de francobordo de los buques de carga estará provista de una válvula automática de retención dotada de un medio positivo de cierre situado por encima de la cubierta de cierre en los buques de pasaje y de la cubierta de francobordo en los buques de carga, o bien de dos válvulas automáticas de retención sin medios positivos de cierre, a condición de que la válvula interior esté situada por encima del calado máximo de compartimentado de modo que sea siempre accesible a fines de examen en circunstancias normales de servicio. Cuando se instale una válvula dotada de medios positivos de cierre, su posición de accionamiento, situada por encima de la cubierta de cierre en los buques de pasaje y de la cubierta de francobordo en los buques de carga, será siempre fácilmente accesible, y habrá indicadores que señalen si la válvula está abierta o cerrada."

45 El párrafo 8.4 actual se sustituye por el siguiente:

"8.4 Las piezas móviles que atraviesen la chapa del forro exterior situada debajo del calado máximo de compartimentado estarán dotadas de obturadores estancos que la Administración juzgue satisfactorios. El prensaestopas interior estará situado dentro de un espacio estanco de un volumen tal que, si se inunda, la cubierta de cierre de los buques de pasaje y la cubierta de francobordo de los buques de carga no quedará sumergida. La Administración podrá prescribir que si ese compartimiento está inundado, los dispositivos destinados a servicios esenciales o de emergencia de conducción de fuerza, alumbrado, comunicaciones interiores, señales u otros dispositivos de emergencia sigan funcionando en otras partes del buque."

Regla 16 – Construcción y pruebas iniciales de puertas estancas, portillos estancos, etc.

46 El título de la regla se sustituye por el siguiente:

"Regla 16 – Construcción y pruebas iniciales de cierres estancos"

47 Los párrafos 1 y 2 actuales se sustituyen por los siguientes:

"1.1 El proyecto, los materiales y la construcción de todos los cierres estancos, tales como las puertas, escotillas, portillos, portales y portas de carga, válvulas, tuberías y vertedores de cenizas y de basuras a que se hace referencia en las presentes reglas habrán de ser satisfactorios a juicio de la Administración.

1.2 Tales válvulas, puertas, escotillas y mecanismos irán debidamente marcados, a fin de que puedan utilizarse con la máxima seguridad.

1.3 El marco de las puertas estancas verticales no tendrá en su parte inferior ninguna ranura en la que pueda acumularse suciedad que impida que la puerta se cierre perfectamente.

2 Las puertas estancas y las escotillas se probarán sometiéndolas a la presión correspondiente a la carga de agua máxima que podrían soportar en la etapa final o intermedia de una inundación. En el caso de los buques de carga que no se rigen por las prescripciones sobre estabilidad con avería, las puertas estancas y las escotillas se probarán sometiéndolas a la presión correspondiente a la carga de agua medida desde el borde inferior de la abertura de la puerta hasta un metro por encima de la cubierta de francobordo. Cuando no puedan someterse a la prueba determinadas puertas y escotillas por la posibilidad de que se dañen los aislamientos o sus piezas, la prueba se sustituirá por una prueba de homologación de presión consistente en someter cada tipo y tamaño de puerta y escotilla a una presión de prueba que corresponda por lo menos a la carga hidrostática requerida para la ubicación prevista. La prueba de homologación se efectuará antes de instalar la puerta o escotilla. El método de instalación y el procedimiento para instalar la puerta o escotilla a bordo deberán corresponder a los de la prueba de homologación. Cuando la puerta o la escotilla estén instaladas a bordo, se comprobará el asiento adecuado de cada una de ellas entre el mamparo, el marco y la puerta, o entre la cubierta, la brazola y la escotilla."

Regla 16-1 – Construcción y pruebas iniciales de cubiertas estancas, troncos estancos, etc.

48 Los párrafos 2 y 3 actuales se sustituyen por los siguientes:

"2 En los buques de pasaje, cuando un tronco de ventilación que atraviesa una estructura penetra en una zona estanca de la cubierta de cierre, el tronco será capaz de soportar la presión del agua que pueda haber en su interior, después de tener en cuenta el ángulo máximo de escora durante la inundación, de conformidad con la regla 7-2.

3 En los buques de pasaje de transbordo rodado, cuando la penetración de la cubierta de cierre se produzca total o parcialmente en la cubierta principal de transbordo rodado, el tronco será capaz de soportar la presión del choque debida a los movimientos internos del agua (chapoteo) retenida en la cubierta de transbordo rodado."

Regla 17 – Integridad de estanquidad interna de los buques de pasaje por encima de la cubierta de cierre

49 El párrafo 3 actual se sustituye por el siguiente:

"3 Los tubos de aireación que desemboquen en una superestructura y que carezcan de medios de cierre estancos se considerarán aberturas sin protección al aplicar lo dispuesto en la regla 7-2.6.1.1."

**PARTE B-4
GESTIÓN DE LA ESTABILIDAD**

Regla 19 – Información para la lucha contra averías

50 El párrafo 2 actual se suprime y los párrafos siguientes se numeran como corresponda.

51 Se introduce la nueva regla 19-1 siguiente tras la regla 19 actual:

"Regla 19-1 – Ejercicios de lucha contra averías para los buques de pasaje

1 Esta regla se aplica a los buques de pasaje construidos antes del 1 de enero de 2020, en esta fecha o posteriormente.

2 Se llevará a cabo un ejercicio de lucha contra averías al menos cada tres meses. No es necesario que toda la tripulación participe en cada ejercicio, sino sólo los miembros de ella con responsabilidades en cuanto a lucha contra averías.

3 Las hipótesis de los ejercicios de lucha contra averías variarán en cada ejercicio, de manera que las condiciones de emergencia se simularán para las distintas condiciones de avería, y, en la medida de lo posible, se aplicarán como si se tratara de una emergencia real.

4 Cada ejercicio de lucha contra averías incluirá las medidas siguientes:

- .1 para los miembros de la tripulación con responsabilidades en cuanto a lucha contra averías, personarse en los puestos y prepararse para los cometidos indicados en el cuadro de obligaciones prescrito en la regla III/8;

- .2 utilizar la información para la lucha contra averías y el computador de estabilidad con avería de a bordo, si lo hay, a fin de llevar a cabo evaluaciones de estabilidad para las condiciones de avería simuladas;
- .3 establecer el enlace de comunicaciones entre el buque y el apoyo en tierra, en caso de que se facilite;
- .4 accionar las puertas estancas y otros medios estancos de cierre;
- .5 demostrar aptitud en la utilización del sistema de detección de inundaciones, si lo hay, de conformidad con los cometidos del cuadro de obligaciones;
- .6 demostrar aptitud en la utilización de los sistemas de inundación compensatoria y de equilibrado, si los hay, de conformidad con los cometidos del cuadro de obligaciones;
- .7 accionar las bombas de sentina y comprobar las alarmas de sentina y los sistemas de arranque automático de las bombas de sentina; y
- .8 dar instrucciones sobre el reconocimiento de averías y la utilización de los sistemas de lucha contra averías del buque.

5 Al menos un ejercicio de lucha contra averías cada año incluirá la activación del apoyo en tierra, si se facilita, en cumplimiento de la regla II-1/8-1.3, a fin de llevar a cabo evaluaciones de estabilidad para las condiciones de avería simuladas.

6 Cada miembro de la tripulación con responsabilidades asignadas en cuanto a lucha contra averías estará familiarizado con sus cometidos y con la información para la lucha contra averías antes de que empiece el viaje.

7 Se mantendrá un registro de cada ejercicio de lucha contra averías según el mismo procedimiento prescrito para otros ejercicios en la regla III/19.5."

52 El título y el párrafo 1 actuales de la regla 20 se sustituyen por los siguientes:

"Regla 20 – Operaciones de carga de los buques

1 Una vez terminadas las operaciones de carga del buque y antes de su salida, el capitán determinará el asiento y la estabilidad del buque y se cerciorará además de que éste está adrizado y cumple los criterios de estabilidad prescritos en las reglas pertinentes, haciendo la oportuna anotación. La estabilidad del buque se determinará siempre mediante cálculo o comprobando que el buque se carga de conformidad con alguna de las condiciones de carga calculadas previamente en la información sobre estabilidad aprobada. La Administración podrá aceptar que para ello se utilice un ordenador de carga y estabilidad u otro medio equivalente."

Regla 21 – Accionamiento e inspección periódicos de puertas estancas, etc., en los buques de pasaje

53 El párrafo 1 actual se sustituye por el siguiente:

"1 Semanalmente se realizarán pruebas operacionales de puertas estancas, portillos, válvulas y mecanismos de cierre de imbornales, vertedores de cenizas y de basuras. En los buques cuya duración de viaje exceda de una semana, se llevará a cabo una serie completa de pruebas operacionales antes de que comience el viaje; luego, en el curso del viaje se realizarán otras, a razón de cuando menos una por semana."

54 El párrafo 4 actual se sustituye por el siguiente:

"4 En el diario de navegación quedará constancia de todas las pruebas operacionales e inspecciones prescritas en la presente regla con referencia explícita a cualesquiera defectos que hayan podido descubrirse."

Regla 22 – Prevención y control de la entrada de agua, etc.

55 En el párrafo 1 actual, al final de la primera frase, las palabras "los párrafos 3 y 4" se sustituyen por "el párrafo 3".

56 El párrafo 2 actual se sustituye por el siguiente:

"2 Las puertas estancas que se encuentren por debajo de la cubierta de cierre de los buques de pasaje y la cubierta de francobordo de los buques de carga y que tengan un vano de una anchura máxima superior a 1,2 m se mantendrán cerradas cuando el buque esté en la mar, salvo por periodos limitados y absolutamente necesarios según determine la Administración."

57 Se añade la nota a pie de página siguiente al final del párrafo 3 actual:

"3 Una puerta estanca podrá abrirse durante la navegación para permitir el paso de pasajeros o tripulantes, o si lo exigen los trabajos en las inmediaciones. La puerta se cerrará inmediatamente después de que se haya pasado por ella o cuando se haya terminado la tarea que hizo necesario abrirla. La Administración autorizará que dicha puerta estanca pueda abrirse durante la navegación únicamente después de examinar con detenimiento las repercusiones que pueda tener en las operaciones del buque y en su aptitud para conservar la flotabilidad, teniendo en cuenta las Orientaciones publicadas por la Organización.* Toda puerta estanca que esté permitido abrir durante la navegación se indicará claramente en la información sobre la estabilidad del buque y estará siempre en condiciones de ser cerrada en el acto.

* Véanse las Orientaciones revisadas sobre las puertas estancas de los buques de pasaje que pueden abrirse durante la navegación (MSC.1/Circ.1564)."

58 Los párrafos 4 a 8 actuales se sustituyen por los siguientes:

"4 Las planchas desmontables de los mamparos se colocarán siempre en su lugar antes de que empiece el viaje y no se desmontarán durante la navegación salvo en casos de urgente necesidad, a discreción del capitán. Cuando se vuelvan a colocar, se tomarán las precauciones necesarias para asegurar que las juntas queden estancas. Las puertas estancas de corredera de accionamiento a motor

permitidas en los espacios de máquinas de conformidad con lo dispuesto en la regla 13.10 se cerrarán antes de que empiece el viaje y permanecerán cerradas durante la navegación salvo en caso de urgente necesidad, a discreción del capitán.

5 Las puertas estancas instaladas en los mamparos estancos que dividan los espacios de carga situados en los entrepuentes, de conformidad con lo dispuesto en la regla 13.9.1, se cerrarán antes de que empiece el viaje y se mantendrán cerradas durante la navegación. Las horas de apertura o cierre de dichas puertas se anotarán en el diario de navegación que prescriba la Administración.

6 Los portalones y las portas de carga y de aprovisionamiento de combustible instalados por debajo de la cubierta de cierre de los buques de pasaje y la cubierta de francobordo de los buques de carga se cerrarán de forma eficaz y se asegurarán de forma estanca antes de que empiece el viaje, y permanecerán cerrados durante la navegación.

7 Las puertas indicadas a continuación que estén situadas por encima de la cubierta de cierre de los buques de pasaje y la cubierta de francobordo de los buques de carga quedarán cerradas y enclavadas antes de que el buque empiece el viaje y permanecerán cerradas y enclavadas hasta que el buque llegue al siguiente puerto de atraque durante la navegación:

- .1 las puertas de embarque de carga que haya en el forro exterior o en los cerramientos de las superestructuras;
- .2 los yelmos de las puertas de proa instalados en los lugares indicados en el párrafo 7.1;
- .3 las puertas de embarque de carga que haya en el mamparo de colisión; y
- .4 las rampas que formen un cierre distinto de los definidos en los párrafos 7.1 a 7.3 inclusive."

59 El párrafo 9 actual pasa a ser el 8, y los párrafos 10 a 16 actuales se sustituyen por los siguientes:

"9 No obstante lo prescrito en los párrafos 7.1 y 7.4, la Administración podrá autorizar la apertura de determinadas puertas a discreción del capitán, si ello es necesario para las operaciones del buque o para el embarco y desembarco de pasajeros cuando el buque se halle en un fondeadero seguro y siempre que no vaya en detrimento de la seguridad del buque.

10 El capitán se asegurará de que existe un sistema eficaz de supervisión y notificación de la apertura y el cierre de las puertas mencionadas en el párrafo 7.

11 El capitán se asegurará asimismo de que, antes de que empiece el viaje, se anotan en el diario de navegación que prescriba la Administración, la hora en que se cerraron las puertas a que se hace referencia en el párrafo 12 y la hora en que se abren determinadas puertas en virtud de lo dispuesto en el párrafo 13.

12 Las puertas de bisagra, tapas desmontables, los portillos, portalones, portas de carga y de aprovisionamiento de combustible y demás aberturas que en cumplimiento de lo prescrito en las presentes reglas deban mantenerse cerradas durante la navegación, se cerrarán antes de que empiece el viaje. Las horas a las que dichas puertas se abran y cierren (si esto último está permitido por las presentes reglas) se anotarán en el diario de navegación prescrito por la Administración.

13 Cuando, en un entrepuente, el borde inferior de cualquiera de los portillos a que se hace referencia en la regla 15.3.2 esté por debajo de una línea paralela a la cubierta de cierre trazada en el costado en los buques de pasaje y a la cubierta de francobordo de los buques de carga, y cuyo punto inferior se encuentre a 1,4 m más el 2,5 % de la manga del buque por encima de la superficie del agua cuando empiece el viaje, todos los portillos de ese entrepuente se cerrarán de manera estanca y enclavarán antes de que empiece el viaje, y no se abrirán antes de que el buque haya arribado al próximo puerto. Cuando proceda, al aplicar el presente párrafo se efectuará la corrección correspondiente a la navegación en agua dulce.

- .1 Las horas a las que tales portillos se abran en puerto y se cierren y enclaven antes de que empiece el viaje se anotarán en el diario de navegación que prescriba la Administración.
- .2 En todo buque que tenga uno o más portillos emplazados de tal modo que lo prescrito en el párrafo 13 les sea aplicable cuando el buque esté flotando en su calado máximo de compartimentado, la Administración podrá fijar el calado medio límite con el que dichos portillos tendrán el borde inferior por encima de la línea paralela a la cubierta de cierre trazada en el costado en los buques de pasaje y a la cubierta de francobordo en los buques de carga, y cuyo punto inferior se encuentre a 1,4 m más el 2,5 % de la manga del buque por encima de la flotación correspondiente a dicho calado medio límite, y con el que, por consiguiente, se permitirá que empiece el viaje sin que se cierren y enclaven los citados portillos y que éstos se puedan abrir, bajo la responsabilidad del capitán, durante la navegación. En las zonas tropicales, tal como se definen en el Convenio internacional sobre líneas de carga en vigor, este calado límite se podrá aumentar en 0,3 m.

14 Los portillos y sus tapas ciegas que no hayan de ser accesibles en el curso de la navegación se cerrarán y quedarán asegurados antes de que empiece el viaje.

15 Si se transporta carga en los espacios mencionados en la regla 15.5.2, los portillos y sus tapas ciegas se cerrarán de manera estanca y se enclavarán antes de embarcar la carga, y las horas a las que dichos portillos y tapas se cierren y enclaven se anotarán en el diario de navegación, según estipule la Administración."

60 El párrafo 17 actual pasa a ser el párrafo 16.

Regla 22-1 – Sistemas de detección de inundaciones en buques de pasaje, construidos el 1 de julio de 2010 o posteriormente, que transporten 36 o más personas

61 En el título de la regla 22-1 se suprime la expresión "construidos el 1 de julio de 2010 o posteriormente".

Regla 23 – Prescripciones especiales para los buques de pasaje de transbordo rodado

62 El texto actual de esta regla se sustituye por el siguiente:

"1 Los espacios de categoría especial y los espacios de carga rodada estarán continuamente patrullados o controlados con medios eficaces, como por ejemplo mediante un sistema de vigilancia por televisión, de manera que cualquier desplazamiento de los vehículos en condiciones meteorológicas adversas o el acceso no autorizado de los pasajeros a ellos se pueda detectar durante la navegación.

2 Se conservará a bordo, expuesta en un lugar apropiado, información documentada sobre los procedimientos operativos para cerrar y asegurar todas las puertas del forro exterior, puertas de carga y otros dispositivos de cierre que, a juicio de la Administración, podrían dar lugar a la inundación de un espacio de categoría especial o de un espacio de carga rodada si se dejan abiertos o mal asegurados.

3 Todos los accesos que conduzcan desde la cubierta de transbordo rodado y de las rampas para vehículos a espacios situados por debajo de la cubierta de cierre se cerrarán antes de que empiece el viaje, y permanecerán cerrados hasta que el buque llegue al siguiente puesto de atraque.

4 El capitán se asegurará de que existe un sistema eficaz de supervisión y notificación del cierre y la apertura de los accesos a que se hace referencia en el párrafo 3.

5 El capitán se asegurará de que, antes de que empiece el viaje, se anota en el diario de navegación, según estipula la regla 22.12, la hora en que se cerraron por última vez los accesos a que se hace referencia en el párrafo 3.

6 Independientemente de lo prescrito en el párrafo 3, la Administración podrá permitir que algunos accesos se abran durante la travesía, pero únicamente el tiempo suficiente para pasar a través de ellos y si lo exigen los trabajos esenciales del buque.

7 Todos los mamparos transversales o longitudinales que se consideren eficaces para retener el agua de mar acumulada en la cubierta de transbordo rodado estarán colocados y asegurados antes de que empiece el viaje y permanecerán colocados y asegurados hasta que el buque llegue al siguiente puesto de atraque.

8 Independientemente de lo prescrito en el párrafo 7, la Administración podrá permitir que algunos accesos de dichos mamparos se abran durante la travesía, pero sólo el tiempo necesario para pasar a través de ellos y si lo exigen los trabajos esenciales del buque.

9 En todos los buques de pasaje de transbordo rodado, el capitán o el oficial designado se cerciorarán de que, sin que ellos den su consentimiento expreso, no se permitirá a ningún pasajero el acceso a las cubiertas de transbordo rodado cerradas durante la navegación."

63 En la regla 24, el título y el párrafo 1 actuales se sustituyen por los siguientes:

"Regla 24 – Prescripciones adicionales sobre la prevención y control de la entrada de agua, etc., en los buques de carga

1 Las aberturas practicadas en el forro exterior que se encuentren por debajo de la cubierta que limita la extensión vertical de la avería permanecerán cerradas durante la navegación."

64 El párrafo 3 actual se sustituye por el siguiente:

"3 Las puertas o rampas estancas instaladas para compartimentar internamente espacios de carga de grandes dimensiones se cerrarán antes de que empiece el viaje y se mantendrán cerradas durante la navegación. Las horas de apertura o cierre de dichas puertas se anotarán en el diario de navegación que prescriba la Administración."

PARTE C
INSTALACIONES DE MÁQUINAS

Regla 35-1 – Medios de bombeo de aguas de sentina

65 Se añade la siguiente oración nueva al final del párrafo 2.6 actual:

"Respecto de los riesgos especiales relacionados con la pérdida de estabilidad en los buques regidos por lo dispuesto en la regla II-1/1.1.1.1 que tienen instalados sistemas fijos de extinción de incendios por aspersión de agua a presión véase la regla II-2/20.6.1.4."

66 En el párrafo 3.2, el texto actual del volumen total de los espacios de pasajeros y de la tripulación situados por debajo de la cubierta de cierre P se sustituye por el siguiente:

"P = volumen total de los espacios de pasajeros y de la tripulación situados por debajo de la cubierta de cierre (en metros cúbicos) destinados al alojamiento y uso de los pasajeros y la tripulación, excluidos los pañoles de equipajes, pertrechos y provisiones;"

67 En el párrafo 3.4 el encabezamiento actual se sustituye por el siguiente:

"3.4 En todo buque de eslora L igual o superior a 91,5 m o cuyo coeficiente de bombas de sentina, calculado de conformidad con el párrafo 3.2, sea igual o superior a 30, se tomarán las medidas necesarias para que por lo menos haya una bomba de sentina motorizada que quepa utilizar en todas las condiciones de inundación que el buque deba poder afrontar, y, para los buques regidos por lo dispuesto en la regla II-1/1.1.1.1, en todas las condiciones de inundación derivadas del examen de las averías menores especificadas en la regla 8, disponiéndose a ese fin que:"

68 Se añade la siguiente oración nueva al final del párrafo 3.10 actual:

"Para los buques regidos por lo dispuesto en la regla II-1/1.1.1.1, se considerará que la línea de máxima carga de compartimentado es el calado máximo de compartimentado."

CAPÍTULO II-2 CONSTRUCCIÓN – PREVENCIÓN, DETECCIÓN Y EXTINCIÓN DE INCENDIOS

PARTE A GENERALIDADES

Regla 3 – Definiciones

69 La regla II-2/3.56 se sustituye por la siguiente:

"56 *Buque para el transporte de vehículos*: buque de carga que solamente lleva carga en espacios de transbordo rodado o espacios para vehículos, y proyectado para el transporte como carga de vehículos de motor sin ocupar y sin carga."

PARTE C CONTROL DE INCENDIOS

Regla 9 – Contención del incendio

70 Se añaden los siguientes nuevos párrafos 4.1.3.4 a 4.1.3.6 a continuación del párrafo 4.1.3.3:

"4.1.3.4 No obstante lo prescrito en el párrafo 4.1.3.3, las prescripciones de los párrafos 4.1.3.5 y 4.1.3.6 se aplicarán a los buques construidos el 1 de enero de 2020 o posteriormente.

4.1.3.5 En los buques que transporten más de 36 pasajeros, las ventanas que den a dispositivos de salvamento, puestos de embarco y de reunión, escaleras exteriores y cubiertas expuestas que sirvan de vías de evacuación, así como las ventanas situadas debajo de las zonas de embarco en las balsas salvavidas y rampas de evacuación, tendrán la misma integridad al fuego que la prescrita en el cuadro 9.1. Cuando se hayan provisto cabezales rociadores automáticos exclusivamente para las ventanas, podrán admitirse como equivalentes las ventanas de clase "A-0". Para que el presente párrafo sea aplicable a los cabezales rociadores, éstos habrán de ser:

- .1 cabezales situados específicamente sobre las ventanas e instalados además de los rociadores tradicionales del cielo raso; o
- .2 cabezales rociadores tradicionales del cielo raso dispuestos de modo que la ventana esté protegida por un régimen de aplicación medio de 5 l/min por metro cuadrado como mínimo y la superficie adicional de la ventana esté incluida en el cálculo de la zona de cobertura; o
- .3 boquillas de nebulización de agua que se hayan sometido a ensayo y aprobado de conformidad con las directrices aprobadas por la Organización; y

Las ventanas situadas en el costado del buque por debajo de las zonas de embarco en los botes salvavidas tendrán una integridad al fuego igual por lo menos a la de la clase "A-0".

4.1.3.6 En buques que no transporten más de 36 pasajeros, las ventanas que den a las zonas de embarco en las embarcaciones de supervivencia y rampas de evacuación, y las ventanas situadas por debajo de dichas zonas tendrán una integridad al fuego igual por lo menos a la de la clase "A-0".

* Véanse las Directrices revisadas para la aprobación de sistemas de rociadores equivalentes a los especificados en la regla II-2/12 del Convenio SOLAS (resolución A.800(19), enmendada)."

PARTE G

PRESCRIPCIONES ESPECIALES

Regla 20 – Protección de los espacios para vehículos, espacios de categoría especial y espacios de carga rodada

71 El párrafo 2.1 actual pasa a ser el párrafo 2.1.1 y se añade el párrafo 2.1.2 siguiente a continuación del párrafo 2.1.1:

"2.1.2 En todos los buques, los vehículos que lleven combustible en sus tanques para su propia propulsión podrán transportarse en espacios de carga que no sean espacios para vehículos, espacios de categoría especial o espacios de carga rodada, siempre que se reúnan todas las condiciones siguientes:

- .1 los vehículos no utilicen su propia propulsión dentro de los espacios de carga;
- .2 los espacios de carga cumplan las prescripciones correspondientes de la regla 19; y
- .3 los vehículos se transporten de conformidad con el Código IDMG, según se define en la regla VII/1.1."

Regla 20-1 – Prescripciones aplicables a los buques para el transporte de vehículos que transportan vehículos de motor con hidrógeno o gas natural comprimido en sus tanques para su propia propulsión como carga

72 El párrafo 2.1 actual se sustituye por el siguiente:

"2.1 Además de cumplir lo dispuesto en la regla 20, según proceda, los buques para el transporte de vehículos construidos el 1 de enero de 2016 o posteriormente, destinados al transporte de vehículos de motor con hidrógeno comprimido o gas natural comprimido en sus tanques para su propia propulsión como carga, cumplirán lo prescrito en los párrafos 3 a 5 de la presente regla."

CAPÍTULO III DISPOSITIVOS Y MEDIOS DE SALVAMENTO

PARTE A GENERALIDADES

Regla 1 – Ámbito de aplicación

73 El párrafo 4 actual se sustituye por el siguiente:

"4 En el caso de los buques construidos antes del 1 de julio de 1998, la Administración:

- .1 se asegurará, a reserva de lo dispuesto en el párrafo 4.2, de que se cumplen las prescripciones que, en virtud del capítulo III del Convenio internacional para la seguridad de la vida humana en el mar, 1974, estaban en vigor antes del 1 de julio de 1998 y eran aplicables a los buques nuevos o existentes, tal como se prescribe en ese capítulo;
- .2 se asegurará, cuando se sustituyan los dispositivos o los medios de salvamento de esos buques, o cuando esos buques sean sometidos a reparaciones, reformas o modificaciones de carácter importante que entrañen la sustitución o la adición de dispositivos o medios de salvamento, de que dichos dispositivos o medios cumplen, dentro de lo que sea factible y razonable, las prescripciones del presente capítulo. No obstante, si se sustituye una embarcación de supervivencia que no sea una balsa salvavidas inflable sin sustituir su dispositivo de puesta a flote, o viceversa, la embarcación de supervivencia o el dispositivo de puesta a flote podrán ser del mismo tipo que la embarcación o el dispositivo sustituidos; y
- .3 se asegurará de que se cumplen las prescripciones de las reglas 30.3 y 37.3.9."

PARTE B PRESCRIPCIONES RELATIVAS A LOS BUQUES Y A LOS DISPOSITIVOS DE SALVAMENTO

Regla 30 – Ejercicios periódicos

74 Se añade el nuevo párrafo 3 siguiente después del párrafo 2 actual:

"3 Los ejercicios de lucha contra averías se llevarán a cabo según lo prescrito en la regla II-1/19-1."

Regla 37 – Cuadro de obligaciones e instrucciones para casos de emergencia

75 En el párrafo 3, los subpárrafos .7 y .8 actuales se sustituyen por los siguientes:

- "7 la composición de las cuadrillas de lucha contra incendios;
- .8 los cometidos especiales asignados en relación con la utilización del equipo y de las instalaciones contraincendios; y
- .9 sólo para los buques de pasaje, la lucha contra averías para emergencias de inundaciones."

APÉNDICE
CERTIFICADOS

INVENTARIO DEL EQUIPO DE SEGURIDAD PARA BUQUE DE PASAJE (MODELO P)

76 En la parte 5 se sustituye el texto del punto 3.1 por el siguiente:

"3.1 Receptor para un sistema mundial de navegación por satélite/sistema de radionavegación terrenal/receptor de radionavegación multisistema de a bordo^{3, 4}"

INVENTARIO DEL EQUIPO DE SEGURIDAD PARA BUQUE DE CARGA (MODELO E)

77 En la parte 3 se sustituye el texto del punto 3.1 por el siguiente:

"3.1 Receptor para un sistema mundial de navegación por satélite/sistema de radionavegación terrenal/receptor de radionavegación multisistema de a bordo^{2, 3}"

INVENTARIO DEL EQUIPO DE SEGURIDAD PARA BUQUE DE CARGA (MODELO C)

78 En la parte 5 se sustituye el texto del punto 3.1 por el siguiente:

"3.1 Receptor para un sistema mundial de navegación por satélite/sistema de radionavegación terrenal/receptor de radionavegación multisistema de a bordo^{2, 3}"

RESOLUTION MSC.1(XLV)
adopted on 20 November 1981

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.1(XLV)
adopted on 20 November 1981

**ADOPTION OF AMENDMENTS TO THE
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT
SEA, 1974**

THE MARITIME SAFETY COMMITTEE,

NOTING Article VIII(b) of the International Convention for the Safety of Life at Sea, 1974, hereafter referred to as "the Convention", concerning the procedure for amending the Annex to the Convention, other than the provisions of Chapter I thereof,

NOTING FURTHER the functions which the Convention confers upon the Maritime Safety Committee for the consideration and adoption of amendments to the Convention,

HAVING CONSIDERED at its forty-fifth session amendments to the Convention proposed and circulated in accordance with Article VIII(b)(i) thereof,

1 ADOPTS in accordance with Article VIII(b)(iv) of the Convention amendments to Chapters II-1, II-2, III, IV, V and VI of the Convention, the texts of which are given in the Annex to the present resolution;

2 DETERMINES in accordance with Article VIII(b)(vi)(2)(bb) of the Convention that all of the above-mentioned amendments shall be deemed to have been accepted unless, prior to 1 March 1984, more than one third of Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than fifty per cent of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3 INVITES Contracting Governments to note that in accordance with Article VIII(b)(vii)(2) of the Convention the amendments, upon their acceptance in accordance with paragraph 2 above, shall enter into force on 1 September 1984;

4 REQUESTS the Secretary-General in conformity with Article VIII(b)(v) of the Convention to transmit certified copies of the present resolution and the texts of the amendments contained in the Annex to all Contracting Governments to the International Convention for the Safety of Life at Sea, 1974;

5 FURTHER REQUESTS the Secretary-General to transmit copies of the resolution and its Annex to Members of the Organization which are not Contracting Governments to the Convention.

At its forty-fifth session held in November 1981, the Maritime Safety Committee adopted certain amendments to the International Convention for the Safety of Life at Sea, 1974 (SOLAS) in accordance with the procedure specified in Article VIII(b)(iv). Forty-one Contracting Governments to the 1974 SOLAS Convention were present at the session and the texts of the amendments to that Convention were all adopted unanimously.

ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR
THE SAFETY OF LIFE AT SEA, 1974

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CHAPTER II-1

CONSTRUCTION – SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

The existing text of Chapter II-1 is replaced by the following:

PART A – GENERAL

Regulation 1

Application

1.1 Unless expressly provided otherwise, this Chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 September 1984.

1.2 For the purpose of this Chapter, the term “a similar stage of construction” means the stage at which:

- .1 construction identifiable with a specific ship begins; and
- .2 assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is less.

1.3 For the purpose of this Chapter:

- .1 the expression “ships constructed” means “ships the keels of which are laid or which are at a similar stage of construction”;
- .2 the expression “all ships” means “ships constructed before, on or after 1 September 1984”;
- .3 a cargo ship, whenever built, which is converted to a passenger ship shall be treated as a passenger ship constructed on the date on which such a conversion commences.

2 Unless expressly provided otherwise:

- .1 for ships constructed before 1 September 1984, the Administration shall ensure that subject to the provisions of paragraph 2.2 the requirements which are applicable under Chapter II-1 of the International Convention for the Safety of Life at Sea, 1974*, to new or existing ships as defined in that Chapter are complied with;

* The text as adopted by the International Conference on Safety of Life at Sea, 1974.

- .2 for tankers constructed before 1 September 1984, the Administration shall ensure that the requirements which are applicable under Chapter II-1 of the Annex to the Protocol of 1978 relating to the International Convention for the Safety of Life at Sea, 1974, as amended in 1981 to new or existing ships as defined in that Chapter are complied with.

3 All ships which undergo repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to these ships. Such ships if constructed before 1 September 1984 shall, as a rule, comply with the requirements for ships constructed on or after that date to at least the same extent as they did before undergoing such repairs, alterations, modifications or outfitting. Repairs, alterations and modifications of a major character and outfitting related thereto shall meet the requirements for ships constructed on or after 1 September 1984 in so far as the Administration deems reasonable and practicable.

4 The Administration of a State may, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of this Chapter unreasonable or unnecessary, exempt from those requirements individual ships or classes of ships entitled to fly the flag of that State which, in the course of their voyage, do not proceed more than 20 miles from the nearest land.

5 Any passenger ship which is permitted under Regulation III/27(c) to carry a number of persons in excess of the lifeboat capacity provided, shall comply with the special standards of subdivision set out in Regulation 6.5, and the associated special provisions regarding permeability in Regulation 5.4, unless the Administration is satisfied that, having regard to the nature and conditions of the voyage, compliance with the other provisions of the Regulations of this Chapter and Chapter II-2 is sufficient.

6 In the case of passenger ships which are employed in special trades for the carriage of large numbers of special trade passengers, such as the pilgrim trade, the Administration of the State whose flag such ships are entitled to fly, if satisfied that it is impracticable to enforce compliance with the requirements of this Chapter, may exempt such ships from those requirements, provided that they comply fully with the provisions of:

- .1 the Rules annexed to the Special Trade Passenger Ships Agreement, 1971; and
- .2 the Rules annexed to the Protocol on Space Requirements for Special Trade Passenger Ships, 1973.

Regulation 2

Definitions

For the purpose of this Chapter, unless expressly provided otherwise:

1.1 "Subdivision load line" is a water-line used in determining the subdivision of the ship.

1.2 "Deepest subdivision load line" is the water-line which corresponds to the greatest draught permitted by the subdivision requirements which are applicable.

2 "Length of the ship" is the length measured between perpendiculars taken at the extremities of the deepest subdivision load line.

3 "Breadth of the ship" is the extreme width from outside of frame to outside of frame at or below the deepest subdivision load line.

4 "Draught" is the vertical distance from the moulded base line amidships to the subdivision load line in question.

5 "Bulkhead deck" is the uppermost deck up to which the transverse watertight bulkheads are carried.

6 "Margin line" is a line drawn at least 76 mm below the upper surface of the bulkhead deck at side.

7 "Permeability of a space" is the percentage of that space which can be occupied by water. The volume of a space which extends above the margin line shall be measured only to the height of that line.

8 "Machinery space" is to be taken as extending from the moulded base line to the margin line and between the extreme main transverse watertight bulkheads, bounding the spaces containing the main and auxiliary propulsion machinery, boilers serving the needs of propulsion, and all permanent coal bunkers. In the case of unusual arrangements, the Administration may define the limits of the machinery spaces.

9 "Passenger spaces" are those spaces which are provided for the accommodation and use of passengers, excluding baggage, store, provision and mail rooms. For the purposes of Regulations 5 and 6, spaces provided below the margin line for the accommodation and use of the crew shall be regarded as passenger spaces.

10 In all cases volumes and areas shall be calculated to moulded lines.

11 "Weathertight" means that in any sea conditions water will not penetrate into the ship.

Regulation 3

Definitions relating to Parts C, D and E

For the purpose of Parts C, D and E, unless expressly provided otherwise:

1 "Steering gear control system" is the equipment by which orders are transmitted from the navigating bridge to the steering gear power units. Steering gear control systems comprise transmitters, receivers, hydraulic control pumps and their associated motors, motor controllers, piping and cables.

2 “Main steering gear” is the machinery, rudder actuators, steering gear power units, if any, and ancillary equipment and the means of applying torque to the rudder stock (e.g. tiller or quadrant) necessary for effecting movement of the rudder for the purpose of steering the ship under normal service conditions.

3 “Steering gear power unit” is:

- .1 in the case of electric steering gear, an electric motor and its associated electrical equipment;
- .2 in the case of electrohydraulic steering gear, an electric motor and its associated electrical equipment and connected pump;
- .3 in the case of other hydraulic steering gear, a driving engine and connected pump.

4 “Auxiliary steering gear” is the equipment other than any part of the main steering gear necessary to steer the ship in the event of failure of the main steering gear but not including the tiller, quadrant or components serving the same purpose.

5 “Normal operational and habitable condition” is a condition under which the ship as a whole, the machinery, services, means and aids ensuring propulsion, ability to steer, safe navigation, fire and flooding safety, internal and external communications and signals, means of escape, and emergency boat winches, as well as the designed comfortable conditions of habitability are in working order and functioning normally.

6 “Emergency condition” is a condition under which any services needed for normal operational and habitable conditions are not in working order due to failure of the main source of electrical power.

7 “Main source of electrical power” is a source intended to supply electrical power to the main switchboard for distribution to all services necessary for maintaining the ship in normal operational and habitable conditions.

8 “Dead ship condition” is the condition under which the main propulsion plant, boilers and auxiliaries are not in operation due to the absence of power.

9 “Main generating station” is the space in which the main source of electrical power is situated.

10 “Main switchboard” is a switchboard which is directly supplied by the main source of electrical power and is intended to distribute electrical energy to the ship’s services.

11 “Emergency switchboard” is a switchboard which in the event of failure of the main electrical power supply system is directly supplied by the emergency source of electrical power or the transitional source of emergency power and is intended to distribute electrical energy to the emergency services.

12 "Emergency source of electrical power" is a source of electrical power, intended to supply the emergency switchboard in the event of failure of the supply from the main source of electrical power.

13 "Power actuating system" is the hydraulic equipment provided for supplying power to turn the rudder stock, comprising a steering gear power unit or units, together with the associated pipes and fittings, and a rudder actuator. The power actuating systems may share common mechanical components, i.e., tiller, quadrant and rudder stock, or components serving the same purpose.

14 "Maximum ahead service speed" is the greatest speed which the ship is designed to maintain in service at sea at the deepest sea-going draught.

15 "Maximum astern speed" is the speed which it is estimated the ship can attain at the designed maximum astern power at the deepest sea-going draught.

16 "Machinery spaces" are all machinery spaces of category A and all other spaces containing propelling machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces.

17 "Machinery spaces of category A" are those spaces and trunks to such spaces which contain:

- .1 internal combustion machinery used for main propulsion; or
- .2 internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW; or
- .3 any oil-fired boiler or oil fuel unit.

18 "Control stations" are those spaces in which the ship's radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralized.

19 "Chemical tanker" is a cargo ship constructed or adapted and used for the carriage in bulk of any liquid product listed in the summary of minimum requirements of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk to be adopted by the Maritime Safety Committee under the authority of the Assembly of the Organization conferred by resolution A.490(XII), hereinafter referred to as "Bulk Chemical Code", as may be amended by the Organization, or any liquid substance listed or provisionally assessed as category A, B or C in Appendix II to Annex II of the International Convention for the Prevention of Pollution from Ships in force.

20 "Gas carrier" is a cargo ship constructed or adapted and used for the carriage in bulk of any liquefied gas or other substance listed in Chapter XIX of the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Assembly of the Organization by resolution

A.328(IX), hereinafter referred to as "Gas Carrier Code" as has been or may be amended by the Organization.

21 "Deadweight" is the difference in tonnes between the displacement of a ship in water of a specific gravity of 1.025 at the load water-line corresponding to the assigned summer freeboard and the lightweight of the ship.

22 "Lightweight" is the displacement of a ship in tonnes without cargo, fuel, lubricating oil, ballast water, fresh water and feedwater in tanks, consumable stores, and passengers and crew and their effects.

PART B – SUBDIVISION AND STABILITY*

(Part B applies to passenger ships and to cargo ships, as indicated in the regulations)

Regulation 4

Floodable length in passenger ships

1 The floodable length at any point of the length of a ship shall be determined by a method of calculation which takes into consideration the form, draught and other characteristics of the ship in question.

2 In a ship with a continuous bulkhead deck, the floodable length at a given point is the maximum portion of the length of the ship, having its centre at the point in question, which can be flooded under the definite assumptions set forth in Regulation 5 without the ship being submerged beyond the margin line.

3.1 In the case of a ship not having a continuous bulkhead deck, the floodable length at any point may be determined to an assumed continuous margin line which at no point is less than 76 mm below the top of the deck (at side) to which the bulkheads concerned and the shell are carried watertight.

3.2 Where a portion of an assumed margin line is appreciably below the deck to which bulkheads are carried, the Administration may permit a limited relaxation in the watertightness of those portions of the bulkheads which are above the margin line and immediately under the higher deck.

* Instead of the requirements in this Part, the Regulations on Subdivision and Stability of Passenger Ships as an Equivalent to Part B of Chapter II of the International Convention for the Safety of Life at Sea, 1960, adopted by the Organization by resolution A.265(VIII), may be used, if applied in their entirety.

Regulation 5

Permeability in passenger ships

1.1 The definite assumptions referred to in Regulation 4 relate to the permeabilities of the spaces below the margin line.

1.2 In determining the floodable length, a uniform average permeability shall be used throughout the whole length of each of the following portions of the ship below the margin line:

- .1 the machinery space as defined in Regulation 2;
- .2 the portion forward of the machinery space; and
- .3 the portion abaft the machinery space.

2.1 The uniform average permeability throughout the machinery space shall be determined from the formula:

$$85 + 10 \left(\frac{a - c}{v} \right)$$

where:

a = the volume of the passenger spaces, as defined in Regulation 2, which are situated below the margin line within the limits of the machinery space;

c = the volume of between deck spaces below the margin line within the limits of the machinery space which are appropriated to cargo, coal or stores;

v = the whole volume of the machinery space below the margin line.

2.2 Where it is shown to the satisfaction of the Administration that the average permeability as determined by detailed calculation is less than that given by the formula, the detailed calculated value may be used. For the purpose of such calculation, the permeability of passenger spaces, as defined in Regulation 2, shall be taken as 95, that of all cargo, coal and store spaces as 60, and that of double bottom, oil fuel and other tanks at such value as may be approved in each case.

3 Except as provided in paragraph 4, the uniform average permeability throughout the portion of the ship forward of or abaft the machinery space shall be determined from the formula:

$$63 + 35 \frac{a}{v}$$

where:

a = the volume of the passenger spaces, as defined in Regulation 2, which are situated below the margin line, forward of or abaft the machinery space; and

v = the whole volume of the portion of the ship below the margin line forward of or abaft the machinery space.

4.1 In the case of a ship which is permitted under Regulation III/27(c) to carry a number of persons on board in excess of the lifeboat capacity provided, and is required under Regulation 1.5 to comply with special provisions, the uniform average permeability throughout the portion of the ship forward of or abaft the machinery space shall be determined from the formula:

$$95 - 35 \frac{b}{v}$$

where:

- b = the volume of the spaces below the margin line and above the tops of floors, inner bottom, or peak tanks, as the case may be, which are appropriated to and used as cargo spaces, coal or oil fuel bunkers, store-rooms, baggage and mail rooms, chain lockers and fresh water tanks, forward of or abaft the machinery space; and
- v = the whole volume of the portion of the ship below the margin line forward of or abaft the machinery space.

4.2 In the case of ships engaged on services where the cargo holds are not generally occupied by any substantial quantities of cargo, no part of the cargo spaces is to be included in calculating "b".

5 In the case of unusual arrangements the Administration may allow, or require, a detailed calculation of average permeability for the portions forward of or abaft the machinery space. For the purpose of such calculation, the permeability of passenger spaces as defined in Regulation 2 shall be taken as 95, that of spaces containing machinery as 85, that of all cargo, coal and store spaces as 60, and that of double bottom, oil fuel and other tanks at such value as may be approved in each case.

6 Where a between deck compartment between two watertight transverse bulkheads contains any passenger or crew space, the whole of that compartment, less any space completely enclosed within permanent steel bulkheads and appropriated to other purposes, shall be regarded as passenger space. Where, however, the passenger or crew space in question is completely enclosed within permanent steel bulkheads, only the space so enclosed need be considered as passenger space.

Regulation 6

Permissible length of compartments in passenger ships

1 Ships shall be as efficiently subdivided as is possible having regard to the nature of the service for which they are intended. The degree of subdivision shall vary with the length of the ship and with the service, in such manner that the highest degree of subdivision corresponds with the ships of greatest length, primarily engaged in the carriage of passengers.

2 Factor of subdivision

2.1 The maximum permissible length of a compartment having its centre at any point in the ship's length is obtained from the floodable length by multiplying the latter by an appropriate factor called the factor of subdivision.

2.2 The factor of subdivision shall depend on the length of the ship, and for a given length shall vary according to the nature of the seervice for which the ship is intended. It shall decrease in a regular and continuous manner:

- .1 as the length of the ship increases, and
- .2 from a factor A, applicable to ships primarily engaged in the carriage of cargo, to a factor B, applicable to ships primarily engaged in the carriage of passengers.

2.3 The variations of the factors A and B shall be expressed by the following formulae (1) and (2) where L is the length of the ship as defined in Regulation 2:

$$A = \frac{58.2}{L-60} + .18 \text{ (L = 131 m and upwards)} \dots\dots\dots (1)$$

$$B = \frac{30.3}{L-42} + .18 \text{ (L = 79 m and upwards)} \dots\dots\dots (2)$$

3. Criterion of service

3.1 For a ship of given length the appropriate factor of subdivision shall be determined by the criterion of service numeral (hereinafter called the criterion numeral) as given by the following formulae (3) and (4) where:

- C_s = the criterion numeral;
- L = the length of the ship (metres), as defined in Regulation 2;
- M = the volume of the machinery space (cubic metres), as defined in Regulation 2; with the addition thereto of the volume of any permanent oil fuel bunkers which may be situated above the inner bottom and forward of or abaft the machinery space;
- P = the whole volume of the passenger spaces below the margin line (cubic metres), as defined in Regulation 2;
- V = the whole volume of the ship below the margin line (cubic metres);
- P_1 = KN where:
 - N = the number of passengers for which the ship is to be certified, and
 - K = 0.056L

3.2 Where the value of KN is greater than the sum of P and the whole volume of the actual passenger spaces above the margin line, the figure to be taken as P_1 is that sum or two-thirds KN, whichever is the greater.

When P_1 is greater than P -

$$C_s = 72 \frac{M + 2P_1}{V + P_1 - P} \dots\dots\dots (3)$$

and in other cases -

$$C_s = 72 \frac{M + 2P}{V} \dots\dots\dots (4)$$

3.3 For ships not having a continuous bulkhead deck the volumes are to be taken up to the actual margin lines used in determining the floodable lengths.

4 *Rules for subdivision of ships other than those covered by paragraph 5*

4.1 The subdivision abaft the forepeak of ships of 131 m in length and upwards having a criterion numeral of 23 or less shall be governed by the factor A given by formula (1); of those having a criterion numeral of 123 or more by the factor B given by formula (2); and of those having a criterion numeral between 23 and 123 by the factor F obtained by linear interpolation between the factors A and B, using the formula:

$$F = A - \frac{(A - B)(C_s - 23)}{100} \dots\dots\dots (5)$$

Nevertheless, where the criterion numeral is equal to 45 or more and simultaneously the computed factor of subdivision as given by formula (5) is .65 or less, but more than .50, the subdivision abaft the forepeak shall be governed by the factor .50.

4.2 Where the factor F is less than .40 and it is shown to the satisfaction of the Administration to be impracticable to comply with the factor F in a machinery compartment of the ship, the subdivision of such compartment may be governed by an increased factor, which, however, shall not exceed .40.

4.3 The subdivision abaft the forepeak of ships of less than 131 m but not less than 79 m in length having a criterion numeral equal to S, where:

$$S = \frac{3,574 - 25L}{13}$$

shall be governed by the factor unity; of those having a criterion numeral of 123 or more by the factor B given by the formula (2); of those having a criterion numeral between S and 123 by the factor F obtained by linear interpolation between unity and the factor B using the formula:

$$F = 1 - \frac{(1 - B)(C_s - S)}{123 - S} \dots\dots\dots (6)$$

4.4 The subdivision abaft the forepeak of ships of less than 131 m but not less than 79 m in length and having a criterion numeral less than S, and of ships of less than 79 m in length shall be governed by the factor unity, unless, in either case, it is shown to the satisfaction of the Administration to be

impracticable to comply with this factor in any part of the ship, in which case the Administration may allow such relaxation as may appear to be justified, having regard to all the circumstances.

4.5 The provisions of paragraph 4.4 shall apply also to ships of whatever length, which are to be certified to carry a number of passengers exceeding 12 but not exceeding –

$$\frac{L^2}{650}, \text{ or } 50, \text{ whichever is the less.}$$

5 *Special standards of subdivision for ships which are permitted under Regulation III/27(c) to carry a number of persons on board in excess of the lifeboat capacity provided and are required under Regulation 1.5 to comply with special provisions*

5.1.1 In the case of ships primarily engaged in the carriage of passengers, the subdivision abaft the forepeak shall be governed by a factor of .50 or by the factor determined according to paragraphs 3 and 4, if less than .50.

5.1.2 In the case of such ships of less than 91.5 m in length, if the Administration is satisfied that compliance with such factor would be impracticable in a compartment, it may allow the length of that compartment to be governed by a higher factor provided the factor used is the lowest that is practicable and reasonable in the circumstances.

5.2 Where, in the case of any ship whether of less than 91.5 m or not, the necessity of carrying appreciable quantities of cargo makes it impracticable to require the subdivision abaft the forepeak to be governed by a factor not exceeding .50, the standard of subdivision to be applied shall be determined in accordance with the following sub-paragraphs .1 to .5, subject to the condition that where the Administration is satisfied that insistence on strict compliance in any respect would be unreasonable, it may allow such alternative arrangement of the watertight bulkheads as appears to be justified on merits and will not diminish the general effectiveness of the subdivision.

- .1 The provisions of paragraph 3 relating to the criterion numeral shall apply with the exception that in calculating the value of P_1 for berthed passengers K is to have the value defined in paragraph 3, or 3.5 m^3 , whichever is the greater, and for unberthed passengers K is to have the value 3.5 m^3 .
- .2 The factor B in paragraph 2 shall be replaced by the factor BB determined by the following formula:

$$BB = \frac{17.6}{L - 33} + .20 \text{ (} L = 55 \text{ m and upwards)}$$

- .3 The subdivision abaft the forepeak of ships of 131 m in length and upwards having a criterion numeral of 23 or less shall be governed by the factor A given by formula (1) in paragraph 2.3; of those having a criterion numeral of 123 or more by the factor BB given by the formula in paragraph 5.2.2; and of those having a criterion numeral between 23 and 123 by the factor F obtained by linear

interpolation between the factors A and BB, using the formula:

$$F = A - \frac{(A - BB)(C_s - 23)}{100}$$

except that if the factor F so obtained is less than .50 the factor to be used shall be either .50 or the factor calculated according to the provisions of paragraph 4.1, whichever is the smaller.

- .4 The subdivision abaft the forepeak of ships of less than 131 m but not less than 55 m in length having a criterion numeral equal to S_1 where -

$$S_1 = \frac{3,712 - 25L}{19}$$

shall be governed by the factor unity; of those having a criterion numeral of 123 or more by the factor BB given by the formula in paragraph 5.2.2; of those having a criterion numeral between S_1 and 123 by the factor F obtained by linear interpolation between unity and the factor BB using the formula:

$$F = 1 - \frac{(1 - BB)(C_s - S_1)}{123 - S_1}$$

except that in either of the two latter cases if the factor so obtained is less than .50 the subdivision may be governed by a factor not exceeding .50.

- .5 The subdivision abaft the forepeak of ships of less than 131 m but not less than 55 m in length and having a criterion numeral less than S_1 and of ships of less than 55 m in length shall be governed by the factor unity, unless it is shown to the satisfaction of the Administration to be impracticable to comply with this factor in particular compartments, in which event the Administration may allow such relaxations in respect of those compartments as appear to be justified, having regard to all the circumstances, provided that the aftermost compartment and as many as possible of the forward compartments (between the forepeak and the after end of the machinery space) shall be kept within the floodable length.

Regulation 7

Special requirements concerning passenger ship subdivision

1 Where in a portion or portions of a ship the watertight bulkheads are carried to a higher deck than in the remainder of the ship and it is desired to take advantage of this higher extension of the bulkheads in calculating the floodable length, separate margin lines may be used for each such portion of the ship provided that:

- .1 the sides of the ship are extended throughout the ship's length to the deck corresponding to the upper margin line and all openings in the

shell plating below this deck throughout the length of the ship are treated as being below a margin line, for the purposes of Regulation 17; and

- .2 the two compartments adjacent to the "step" in the bulkhead deck are each within the permissible length corresponding to their respective margin lines, and, in addition, their combined length does not exceed twice the permissible length based on the lower margin line.

2.1 A compartment may exceed the permissible length determined by the rules of Regulation 6 provided the combined length of each pair of adjacent compartments to which the compartment in question is common does not exceed either the floodable length or twice the permissible length, whichever is the less.

2.2 If one of the two adjacent compartments is situated inside the machinery space, and the second is situated outside the machinery space, and the average permeability of the portion of the ship in which the second is situated differs from that of the machinery space, the combined length of the two compartments shall be adjusted to the mean average permeability of the two portions of the ship in which the compartments are situated.

2.3 Where the two adjacent compartments have different factors of subdivision, the combined length of the two compartments shall be determined proportionately.

3 In ships of 100 m in length and upwards, one of the main transverse bulkheads abaft the forepeak shall be fitted at a distance from the forward perpendicular which is not greater than the permissible length.

4 A main transverse bulkhead may be recessed provided that all parts of the recess lie inboard of vertical surfaces on both sides of the ship, situated at a distance from the shell plating equal to one-fifth the breadth of the ship, as defined in Regulation 2, and measured at right angles to the centre line at the level of the deepest subdivision load line. Any part of a recess which lies outside these limits shall be dealt with as a step in accordance with paragraph 5.

5 A main transverse bulkhead may be stepped provided that it meets one of the following conditions:

- .1 the combined length of the two compartments, separated by the bulkhead in question, does not exceed either 90 per cent of the floodable length or twice the permissible length, except that, in ships having a factor of subdivision greater than .9, the combined length of the two compartments in question shall not exceed the permissible length;
- .2 additional subdivision is provided in way of the step to maintain the same measure of safety as that secured by a plane bulkhead;
- .3 the compartment over which the step extends does not exceed the permissible length corresponding to a margin line taken 76 mm below the step.

6 Where a main transverse bulkhead is recessed or stepped, an equivalent plane bulkhead shall be used in determining the subdivision.

7 If the distance between two adjacent main transverse bulkheads, or their equivalent plane bulkheads, or the distance between the transverse planes passing through the nearest stepped portions of the bulkheads, is less than 3.0 m plus 3 per cent of the length of the ship, or 11.0 m whichever is the less, only one of these bulkheads shall be regarded as forming part of the subdivision of the ship in accordance with the provisions of Regulation 6.

8 Where a main transverse watertight compartment contains local subdivision and it can be shown to the satisfaction of the Administration that, after any assumed side damage extending over a length of 3.0 m plus 3 per cent of the length of the ship, or 11.0 m whichever is the less, the whole volume of the main compartment will not be flooded, a proportionate allowance may be made in the permissible length otherwise required for such compartment. In such a case the volume of effective buoyancy assumed on the undamaged side shall not be greater than that assumed on the damaged side.

9 Where the required factor of subdivision is .50 or less, the combined length of any two adjacent compartments shall not exceed the floodable length.

Regulation 8

Stability of passenger ships in damaged condition

1.1 Sufficient intact stability shall be provided in all service conditions so as to enable the ship to withstand the final stage of flooding of any one main compartment which is required to be within the floodable length.

1.2 Where two adjacent main compartments are separated by a bulkhead which is stepped under the conditions of Regulation 7.5.1 the intact stability shall be adequate to withstand the flooding of those two adjacent main compartments.

1.3 Where the required factor of subdivision is .50 or less but more than .33 intact stability shall be adequate to withstand the flooding of any two adjacent main compartments.

1.4 Where the required factor of subdivision is .33 or less the intact stability shall be adequate to withstand the flooding of any three adjacent main compartments.

2.1 The requirements of paragraph 1 shall be determined by calculations which are in accordance with paragraphs 3, 4 and 6 and which take into consideration the proportions and design characteristics of the ship and the arrangement and configuration of the damaged compartments. In making these calculations the ship is to be assumed in the worst anticipated service condition as regards stability.

2.2 Where it is proposed to fit decks, inner skins or longitudinal bulkheads of sufficient tightness to seriously restrict the flow of water, the Administration shall be satisfied that proper consideration is given to such restrictions in the calculations.

2.3 In cases where the Administration considers the range of stability in the damaged condition to be doubtful, it may require investigation thereof.

3 For the purpose of making damage stability calculations the volume and surface permeabilities shall be in general as follows:

Spaces	Permeability
Appropriated to cargo, coal or stores	60
Occupied by accommodation	95
Occupied by machinery	85
Intended for liquids	0 or 95*

* Whichever results in the more severe requirements.

Higher surface permeabilities are to be assumed in respect of spaces which, in the vicinity of the damage waterplane, contain no substantial quantity of accommodation or machinery and spaces which are not generally occupied by any substantial quantity of cargo or stores.

4 Assumed extent of damage shall be as follows:

- .1 longitudinal extent: 3.0 m plus 3 per cent of the length of the ship, or 11.0 m whichever is the less. Where the required factor of subdivision is .33 or less the assumed longitudinal extent of damage shall be increased as necessary so as to include any two consecutive main transverse watertight bulkheads;
- .2 transverse extent (measured inboard from the ship's side, at right angles to the centre line at the level of the deepest subdivision load line): a distance of one-fifth of the breadth of the ship, as defined in Regulation 2; and
- .3 vertical extent: from the base line upwards without limit;
- .4 if any damage of lesser extent than that indicated in paragraphs 4.1, 4.2 and 4.3 would result in a more severe condition regarding heel or loss of metacentric height, such damage shall be assumed in the calculations.

5 Unsymmetrical flooding is to be kept to a minimum consistent with efficient arrangements. Where it is necessary to correct large angles of heel, the means adopted shall, where practicable, be self-acting, but in any case where controls to cross-flooding fittings are provided they shall be operable from above the bulkhead deck. These fittings together with their controls as well as the maximum heel before equalization shall be acceptable to the Administration. Where cross-flooding fittings are required the time for equalization shall not exceed 15 minutes. Suitable information concerning the use of cross-flooding fittings shall be supplied to the master of the ship.*

* Reference is made to the Recommendation on a Standard Method for Establishing Compliance with the Requirements for Cross-Flooding Arrangements in Passenger Ships, adopted by the Organization by resolution A.266(VIII).

6 The final conditions of the ship after damage and, in the case of unsymmetrical flooding, after equalization measures have been taken shall be as follows:

- .1 in the case of symmetrical flooding there shall be a positive residual metacentric height of at least 50 mm as calculated by the constant displacement method;
- .2 in the case of unsymmetrical flooding the total heel shall not exceed 7°, except that, in special cases, the Administration may allow additional heel due to the unsymmetrical moment, but in no case shall the final heel exceed 15°;
- .3 in no case shall the margin line be submerged in the final stage of flooding. If it is considered that the margin line may become submerged during an intermediate stage of flooding, the Administration may require such investigations and arrangements as it considers necessary for the safety of the ship.

7 The master of the ship shall be supplied with the data necessary to maintain sufficient intact stability under service conditions to enable the ship to withstand the critical damage. In the case of ships requiring cross-flooding the master of the ship shall be informed of the conditions of stability on which the calculations of heel are based and be warned that excessive heeling might result should the ship sustain damage when in a less favourable condition.

8.1 No relaxation from the requirements for damage stability may be considered by the Administration unless it is shown that the intact metacentric height in any service condition necessary to meet these requirements is excessive for the service intended.

8.2 Relaxations from the requirements for damage stability shall be permitted only in exceptional cases and subject to the condition that the Administration is to be satisfied that the proportions, arrangements and other characteristics of the ship are the most favourable to stability after damage which can practically and reasonably be adopted in the particular circumstances.

Regulation 9

Ballasting of passenger ships

1 Water ballast should not in general be carried in tanks intended for oil fuel. In ships in which it is not practicable to avoid putting water in oil fuel tanks, oily-water separating equipment to the satisfaction of the Administration shall be fitted, or other alternative means, such as discharge to shore facilities, acceptable to the Administration shall be provided for disposing of the oily-water ballast.

2 The provisions of this Regulation are without prejudice to the provisions of the International Convention for the Prevention of Pollution from Ships in force.

Regulation 10

Peak and machinery space bulkheads, shaft tunnels, etc. in passenger ships

1 A forepeak or collision bulkhead shall be fitted which shall be watertight up to the bulkhead deck. This bulkhead shall be located at a distance from the forward perpendicular of not less than 5 per cent of the length of the ship and not more than 3 m plus 5 per cent of the length of the ship.

2 Where any part of the ship below the water-line extends forward of the forward perpendicular, e.g. a bulbous bow, the distances stipulated in paragraph 1 shall be measured from a point either:

- .1 at the mid-length of such extension; or
- .2 at a distance 1.5 per cent of the length of the ship forward of the forward perpendicular; or
- .3 at a distance 3 m forward of the forward perpendicular;

whichever gives the smallest measurement.

3 Where a long forward superstructure is fitted, the forepeak or collision bulkhead shall be extended weathertight to the deck next above the bulkhead deck. The extension need not be fitted directly above the bulkhead below provided it is located within the limits specified in paragraph 1 or 2 with the exemption permitted by paragraph 4 and the part of the deck which forms the step is made effectively weathertight.

4 Where bow doors are fitted and a sloping loading ramp forms part of the extension of the collision bulkhead above the bulkhead deck the part of the ramp which is more than 2.3 m above the bulkhead deck may extend forward of the limit specified in paragraphs 1 and 2. The ramp shall be weathertight over its complete length.

5 An afterpeak bulkhead, and bulkheads dividing the machinery space, as defined in Regulation 2, from the cargo and passenger spaces forward and aft, shall also be fitted and made watertight up to the bulkhead deck. The afterpeak bulkhead may, however, be stepped below the bulkhead deck, provided the degree of safety of the ship as regards subdivision is not thereby diminished.

6 In all cases stern tubes shall be enclosed in watertight spaces of moderate volume. The stern gland shall be situated in a watertight shaft tunnel or other watertight space separate from the stern tube compartment and of such volume that, if flooded by leakage through the stern gland, the margin line will not be submerged.

Regulation 11

Collision bulkheads in cargo ships

1 For the purpose of this Regulation "freeboard deck", "length of ship" and "forward perpendicular" have the meanings as defined in the International Convention on Load Lines in force.

2 A collision bulkhead shall be fitted which shall be watertight up to the freeboard deck. This bulkhead shall be located at a distance from the forward perpendicular of not less than 5 per cent of the length of the ship or 10 m, whichever is the less, and, except as may be permitted by the Administration, not more than 8 per cent of the length of the ship.

3 Where any part of the ship below the water-line extends forward of the forward perpendicular, e.g. a bulbous bow, the distances stipulated in paragraph 2 shall be measured from a point either:

- .1 at the mid-length of such extension; or
- .2 at a distance 1.5 per cent of the length of the ship forward of the forward perpendicular; or
- .3 at a distance 3 m forward of the forward perpendicular;

whichever gives the smallest measurement.

4 The bulkhead may have steps or recesses provided they are within the limits prescribed in paragraph 2 or 3. Pipes piercing the collision bulkhead shall be fitted with suitable valves operable from above the freeboard deck and the valve chest shall be secured at the bulkhead inside the forepeak. The valves may be fitted on the after side of the collision bulkhead provided that the valves are readily accessible under all service conditions and the space in which they are located is not a cargo space. All valves shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable. No door, manhole, ventilation duct or any other opening shall be fitted in this bulkhead.

5 Where a long forward superstructure is fitted the collision bulkhead shall be extended weathertight to the deck next above the freeboard deck. The extension need not be fitted directly above the bulkhead below provided it is located within the limits prescribed in paragraph 2 or 3 with the exemption permitted by paragraph 6 and the part of the deck which forms the step is made effectively weathertight.

6 Where bow doors are fitted and a sloping loading ramp forms part of the extension of the collision bulkhead above the freeboard deck the part of the ramp which is more than 2.3 m above the freeboard deck may extend forward of the limit specified in paragraph 2 or 3. The ramp shall be weathertight over its complete length.

7 The number of openings in the extension of the collision bulkhead above the freeboard deck shall be restricted to the minimum compatible with the design and normal operation of the ship. All such openings shall be capable of being closed weathertight.

Regulation 12

Double bottoms in passenger ships

1 A double bottom shall be fitted extending from the forepeak bulkhead to the afterpeak bulkhead as far as this is practicable and compatible with the design and proper working of the ship.

- .1 In ships of 50 m and upwards but less than 61 m in length a double bottom shall be fitted at least from the machinery space to the forepeak bulkhead, or as near thereto as practicable.
- .2 In ships of 61 m and upwards but less than 76 m in length a double bottom shall be fitted at least outside the machinery space, and shall extend to the fore and after peak bulkheads, or as near thereto as practicable.
- .3 In ships of 76 m in length and upwards, a double bottom shall be fitted amidships, and shall extend to the fore and after peak bulkheads, or as near thereto as practicable.

2 Where a double bottom is required to be fitted its depth shall be to the satisfaction of the Administration and the inner bottom shall be continued out to the ship's sides in such a manner as to protect the bottom to the turn of the bilge. Such protection will be deemed satisfactory if the line of intersection of the outer edge of the margin plate with the bilge plating is not lower at any part than a horizontal plane passing through the point of intersection with the frame line amidships of a transverse diagonal line inclined at 25° to the base line and cutting it at a point one-half the ship's moulded breadth from the middle line.

3 Small wells constructed in the double bottom in connexion with drainage arrangements of holds, etc., shall not extend downwards more than necessary. The depth of the well shall in no case be more than the depth less 460 mm of the double bottom at the centre line, nor shall the well extend below the horizontal plane referred to in paragraph 2. A well extending to the outer bottom is, however, permitted at the after end of the shaft tunnel. Other wells (e.g., for lubricating oil under main engines) may be permitted by the Administration if satisfied that the arrangements give protection equivalent to that afforded by a double bottom complying with this Regulation.

4 A double bottom need not be fitted in way of watertight compartments of moderate size used exclusively for the carriage of liquids, provided the safety of the ship, in the event of bottom or side damage, is not, in the opinion of the Administration, thereby impaired.

5 In the case of ships to which the provisions of Regulation 1.5 apply and which are engaged on regular service within the limits of a short international voyage as defined in Regulation III/2, the Administration may permit a double bottom to be dispensed with in any part of the ship which is subdivided by a factor not exceeding .50, if satisfied that the fitting of a double bottom in that part would not be compatible with the design and proper working of the ship.

Regulation 13

Assigning, marking and recording of subdivision load lines for passenger ships

1 In order that the required degree of subdivision shall be maintained, a load line corresponding to the approved subdivision draught shall be assigned and marked on the ship's sides. A ship having spaces which are specially adapted for the accommodation of passengers and the carriage of cargo alternatively may, if the owners desire, have one or more additional load lines assigned and marked to correspond with the subdivision draughts which the Administration may approve for the alternative service conditions.

2 The subdivision load lines assigned and marked shall be recorded in the Passenger Ship Safety Certificate, and shall be distinguished by the notation C.1 for the principal passenger condition, and C.2, C.3, etc. for the alternative conditions.

3 The freeboard corresponding to each of these load lines shall be measured at the same position and from the same deck line as the freeboards determined in accordance with the International Convention on Load Lines in force.

4 The freeboard corresponding to each approved subdivision load line and the conditions of service for which it is approved, shall be clearly indicated on the Passenger Ship Safety Certificate.

5 In no case shall any subdivision load line mark be placed above the deepest load line in salt water as determined by the strength of the ship or the International Convention on Load Lines in force.

6 Whatever may be the position of the subdivision load line marks, a ship shall in no case be loaded so as to submerge the load line mark appropriate to the season and locality as determined in accordance with the International Convention on Load Lines in force.

7 A ship shall in no case be so loaded that when it is in salt water the subdivision load line mark appropriate to the particular voyage and condition of service is submerged.

Regulation 14

Construction and initial testing of watertight bulkheads, etc., in passenger ships and cargo ships

1 Each watertight subdivision bulkhead, whether transverse or longitudinal, shall be constructed in such a manner that it shall be capable of supporting, with a proper margin of resistance, the pressure due to the maximum head of water which it might have to sustain in the event of damage to the ship but at least the pressure due to a head of water up to the margin line. The construction of these bulkheads shall be to the satisfaction of the Administration.

2.1 Steps and recesses in bulkheads shall be watertight and as strong as the bulkhead at the place where each occurs.

2.2 Where frames or beams pass through a watertight deck or bulkhead, such deck or bulkhead shall be made structurally watertight without the use of wood or cement.

3 Testing main compartments by filling them with water is not compulsory. When testing by filling with water is not carried out, a hose test is compulsory; this test shall be carried out in the most advanced stage of the fitting out of the ship. In any case, a thorough inspection of the watertight bulkheads shall be carried out.

4 The forepeak, double bottoms (including duct keels) and inner skins shall be tested with water to a head corresponding to the requirements of paragraph 1.

5 Tanks which are intended to hold liquids, and which form part of the subdivision of the ship, shall be tested for tightness with water to a head up to the deepest subdivision load line or to a head corresponding to two-thirds of the depth from the top of keel to the margin line in way of the tanks, whichever is the greater; provided that in no case shall the test head be less than 0.9 m above the top of the tank.

6 The tests referred to in paragraphs 4 and 5 are for the purpose of ensuring that the subdivision structural arrangements are watertight and are not to be regarded as a test of the fitness of any compartment for the storage of oil fuel or for other special purposes for which a test of a superior character may be required depending on the height to which the liquid has access in the tank or its connexions.

Regulation 15

Openings in watertight bulkheads in passenger ships

1 The number of openings in watertight bulkheads shall be reduced to the minimum compatible with the design and proper working of the ship; satisfactory means shall be provided for closing these openings.

2.1 Where pipes, scuppers, electric cables, etc. are carried through watertight subdivision bulkheads, arrangements shall be made to ensure the watertight integrity of the bulkheads.

2.2 Valves not forming part of a piping system shall not be permitted in watertight subdivision bulkheads.

2.3 Lead or other heat sensitive materials shall not be used in systems which penetrate watertight subdivision bulkheads, where deterioration of such systems in the event of fire would impair the watertight integrity of the bulkheads.

3.1 No doors, manholes, or access openings are permitted:

- .1 in the collision bulkhead below the margin line;
- .2 in watertight transverse bulkheads dividing a cargo space from an adjoining cargo space or from a permanent or reserve bunker, except as provided in paragraph 12 and in Regulation 16.

3.2 Except as provided in paragraph 3.3 the collision bulkhead may be pierced below the margin line by not more than one pipe for dealing with fluid in the forepeak tank, provided that the pipe is fitted with a screwdown valve capable of being operated from above the bulkhead deck, the valve chest being secured inside the forepeak to the collision bulkhead.

3.3 If the forepeak is divided to hold two different kinds of liquids the Administration may allow the collision bulkhead to be pierced below the margin line by two pipes, each of which is fitted as required by paragraph 3.2, provided the Administration is satisfied that there is no practical alternative to the fitting of such a second pipe and that, having regard to the additional subdivision provided in the forepeak, the safety of the ship is maintained.

4.1 Watertight doors fitted in bulkheads between permanent and reserve bunkers shall be always accessible, except as provided in paragraph 11.2 for between deck bunker doors.

4.2 Satisfactory arrangements shall be made by means of screens or otherwise to prevent the coal from interfering with the closing of watertight bunker doors.

5 Within spaces containing the main and auxiliary propulsion machinery including boilers serving the needs of propulsion and all permanent bunkers, not more than one door apart from the doors to bunkers and shaft tunnels may be fitted in each main transverse bulkhead. Where two or more shafts are fitted the tunnels shall be connected by an inter-communicating passage. There shall be only one door between the machinery space and the tunnel spaces where two shafts are fitted and only two doors where there are more than two shafts. All these doors shall be of the sliding type and shall be so located as to have their sills as high as practicable. The hand gear for operating these doors from above the bulkhead deck shall be situated outside the spaces containing the machinery if this is consistent with a satisfactory arrangement of the necessary gearing.

6.1 Watertight doors shall be sliding doors or hinged doors or doors of an equivalent type. Plate doors secured only by bolts and doors required to be closed by dropping or by the action of a dropping weight are not permitted.

6.2 Sliding doors may be either:

- Hand-operated only, or
- power-operated as well as hand-operated.

6.3 Authorized watertight doors may therefore be divided into three classes:

Class 1 – hinged doors;

Class 2 – hand-operated sliding doors;

Class 3 – sliding doors which are power-operated as well as hand-operated.

6.4 The means of operation of any watertight door whether power-operated or not shall be capable of closing the door with the ship listed to 15° either way.

6.5 In all classes of watertight doors indicators shall be fitted which show, at all operating stations from which the doors are not visible, whether the doors are open or closed. If any of the watertight doors, of whatever class, is not fitted so as to enable it to be closed from a central control station, it shall be provided with a mechanical, electrical, telephonic, or any other suitable direct means of communication, enabling the officer of the watch promptly to contact the person who is responsible for closing the door in question, under previous orders.

7 Hinged doors (class 1) shall be fitted with quick action closing devices, such as catches, workable from each side of the bulkhead.

8 Hand-operated sliding doors (class 2) may have a horizontal or vertical motion. It shall be possible to operate the mechanism at the door itself from either side, and in addition, from an accessible position above the bulkhead deck, with an all round crank motion, or some other movement providing the same guarantee of safety and of an approved type. Departures from the requirement of operation on both sides may be allowed, if this requirement is impossible owing to the layout of the spaces. When operating a hand gear the time necessary for the complete closure of the door with the vessel upright, shall not exceed 90 seconds.

9.1 Power-operated sliding doors (class 3) may have a vertical or horizontal motion. If a door is required to be power-operated from a central control, the gearing shall be so arranged that the door can be operated by power also at the door itself from both sides. The arrangement shall be such that the door will close automatically if opened by local control after being closed from the central control, and also such that any door can be kept closed by local systems which will prevent the door from being opened from the upper control. Local control handles in connexion with the power gear shall be provided each side of the bulkhead and shall be so arranged as to enable persons passing through the doorway to hold both handles in the open position without being able to set the closing mechanism in operation accidentally. Power-operated sliding doors shall be provided with hand gear workable at the door itself on either side and from an accessible position above the bulkhead deck, with an all round crank motion or some other movement providing the same guarantee of safety and of an approved type. Provision shall be made to give warnings by sound signal that the door has begun to close and will continue to move until it is completely closed. The door shall take a sufficient time to close to ensure safety.

9.2 There shall be at least two independent power sources capable of opening and closing all the doors under control, each of them capable of operating all the doors simultaneously. The two power sources shall be controlled from the central station on the navigating bridge provided with all the necessary indicators for checking that each of the two power sources is capable of giving the required service satisfactorily.

9.3 In the case of hydraulic operation, each power source shall consist of a pump capable of closing all doors in not more than 60 seconds. In addition, there shall be for the whole installation hydraulic accumulators of sufficient capacity to operate all the doors at least three times, i.e., closed-open-closed. The fluid used shall be one which does not freeze at any of the temperatures liable to be encountered by the ship during its service.

10.1 Hinged watertight doors (class 1) in passenger, crew and working spaces are only permitted above a deck the underside of which, at its lowest point at side, is at least 2.0 m above the deepest subdivision load line.

10.2 Watertight doors, the sills of which are above the deepest load line and below the line specified in paragraph 10.1 shall be sliding doors and may be hand-operated (class 2), except in vessels engaged on short international voyages and required to have a factor of subdivision of .50 or less in which all such doors shall be power-operated. When trunkways in connexion with refrigerated cargo and ventilation or forced draught ducts are carried through more than one main watertight subdivision bulkhead, the doors at such openings shall be operated by power.

11.1 Watertight doors which may sometimes be opened at sea, and the sills of which are below the deepest subdivision load line shall be sliding doors. The following rules shall apply:

- .1 when the number of such doors (excluding doors at entrances to shaft tunnels) exceeds five, all of these doors and those at the entrance to shaft tunnels or ventilation or forced draught ducts, shall be power-operated (class 3) and shall be capable of being simultaneously closed from a central station situated on the navigating bridge;
- .2 when the number of such doors (excluding doors at entrances to shaft tunnels) is greater than one, but does not exceed five,
 - .2.1 where the ship has no passenger spaces below the bulkhead deck, all the above-mentioned doors may be hand-operated (class 2);
 - .2.2 where the ship has passenger spaces below the bulkhead deck all the above-mentioned doors shall be power-operated (class 3) and shall be capable of being simultaneously closed from a central station situated on the navigating bridge;
- .3 in any ship where there are only two such watertight doors and they are situated in the machinery space or in the bulkheads bounding such space, the Administration may allow these two doors to be hand-operated only (class 2).

11.2 If sliding watertight doors which have sometimes to be open at sea for the purpose of trimming coal are fitted between bunkers in the between decks below the bulkhead deck, these doors shall be operated by power. The opening and closing of these doors shall be recorded in such log book as may be prescribed by the Administration.

12.1 If the Administration is satisfied that such doors are essential, watertight doors of satisfactory construction may be fitted in watertight bulkheads dividing cargo between deck spaces. Such doors may be hinged, rolling or sliding doors but shall not be remotely controlled. They shall be fitted at the highest level and as far from the shell plating as practicable, but in no case shall the outboard vertical edges be situated at a distance from the shell plating which is less than one-fifth of the breadth of the ship, as defined in Regulation 2, such distance being measured at right angles to the centre line of the ship at the level of the deepest subdivision load line.

12.2 Such doors shall be closed before the voyage commences and shall be kept closed during navigation; the time of opening such doors in port and of closing them before the ship leaves port shall be entered in the log book. Should any of the doors be accessible during the voyage, they shall be fitted with a device which prevents unauthorized opening. When it is proposed to fit such doors, the number and arrangements shall receive the special consideration of the Administration.

13 Portable plates on bulkheads shall not be permitted except in machinery spaces. Such plates shall always be in place before the ship leaves port, and shall not be removed during navigation except in case of urgent necessity. The necessary precautions shall be taken in replacing them to ensure that the joints shall be watertight.

14 All watertight doors shall be kept closed during navigation except when necessarily opened for the working of the ship, in which case they shall always be ready to be immediately closed.

15.1 Where trunkways or tunnels for access from crew accommodation to the stokehold, for piping, or for any other purpose are carried through main transverse watertight bulkheads, they shall be watertight and in accordance with the requirements of Regulation 19. The access to at least one end of each such tunnel or trunkway, if used as a passage at sea, shall be through a trunk extending watertight to a height sufficient to permit access above the margin line. The access to the other end of the trunkway or tunnel may be through a watertight door of the type required by its location in the ship. Such trunkways or tunnels shall not extend through the first subdivision bulkhead abaft the collision bulkhead.

15.2 Where it is proposed to fit tunnels or trunkways for forced draught, piercing main transverse watertight bulkheads, these shall receive the special consideration of the Administration.

Regulation 16

Passenger ships carrying goods vehicles and accompanying personnel

1 This Regulation applies to passenger ships regardless of the date of construction designed or adapted for the carriage of goods vehicles and accompanying personnel where the total number of persons on board, other than those specified in Regulation 1/2(e)(i) and (ii), exceeds 12.

2 If in such a ship the total number of passengers which include personnel accompanying vehicles does not exceed $N = 12 + \sqrt{A/25}$, where A = total deck area (square metres) of spaces available for the stowage of goods vehicles and where the clear height at the stowage position and at the entrance to such spaces is not less than 4 m, the provisions of Regulation 15.12 in respect of watertight doors apply except that the doors may be fitted at any level in watertight bulkheads dividing cargo spaces. Additionally, indicators are required on the navigating bridge to show automatically when each door is closed and all door fastenings are secured.

3 When applying the provisions of this Chapter to such a ship, N shall be taken as the maximum number of passengers for which the ship may be certified in accordance with this Regulation.

4 In applying Regulation 8 for the worst operating conditions, the permeability for cargo spaces intended for the stowage of goods vehicles and containers shall be derived by calculation in which the goods vehicles and containers shall be assumed to be non-watertight and their permeability taken as 65. For ships engaged in dedicated services the actual value of permeability for goods vehicles or containers may be applied. In no case shall the permeability of the cargo spaces in which the goods vehicles and containers are carried be taken as less than 60.

Regulation 17

Openings in the shell plating of passenger ships below the margin line

1 The number of openings in the shell plating shall be reduced to the minimum compatible with the design and proper working of the ship.

2 The arrangement and efficiency of the means for closing any opening in the shell plating shall be consistent with its intended purpose and the position in which it is fitted and generally to the satisfaction of the Administration.

3.1 Subject to the requirements of the International Convention on Load Lines in force, no sidescuttle shall be fitted in such a position that its sill is below a line drawn parallel to the bulkhead deck at side and having its lowest point 2.5 per cent of the breadth of the ship above the deepest subdivision load line, or 500 mm, whichever is the greater.

3.2 All sidescuttles the sills of which are below the margin line, as permitted by paragraph 3.1 shall be of such construction as will effectively prevent any person opening them without the consent of the master of the ship.

3.3.1 Where in a between decks, the sills of any of the sidescuttles referred to in paragraph 3.2 are below a line drawn parallel to the bulkhead deck at side and having its lowest point 1.4 m plus 2.5 per cent of the breadth of the ship above the water when the ship departs from any port, all the sidescuttles in that between decks shall be closed watertight and locked before the ship leaves port, and they shall not be opened before the ship arrives at the next port. In the application of this paragraph the appropriate allowance for fresh water may be made when applicable.

3.3.2 The time of opening such sidescuttles in port and of closing and locking them before the ship leaves port shall be entered in such log book as may be prescribed by the Administration.

3.3.3 For any ship that has one or more sidescuttles so placed that the requirements of paragraph 3.3.1 would apply when it was floating at its deepest subdivision load line, the Administration may indicate the limiting mean draught at which these sidescuttles will have their sills above the line drawn parallel to the bulkhead deck at side, and having its lowest point 1.4 m plus 2.5 per cent of the breadth of the ship above the water-line corresponding to the limiting mean draught, and at which it will therefore be permissible to depart from port without previously closing and locking them and to open them at sea on the responsibility of the master during the voyage to the next port. In tropical zones as defined in the International Convention on Load Lines in force, this limiting draught may be increased by 0.3 m.

4 Efficient hinged inside deadlights so arranged that they can be easily and effectively closed and secured watertight, shall be fitted to all sidescuttles except that abaft one-eighth of the ship's length from the forward perpendicular and above a line drawn parallel to the bulkhead deck at side and having its lowest point at a height of 3.7 m plus 2.5 per cent of the breadth of the ship above the deepest subdivision load line, the deadlights may be portable in passenger accommodation other than that for steerage passengers, unless the deadlights are required by the International Convention on Load Lines in force to be permanently attached in their proper positions. Such portable deadlights shall be stowed adjacent to the sidescuttles they serve.

5 Sidescuttles and their deadlights which will not be accessible during navigation shall be closed and secured before the ship leaves port.

6.1 No sidescuttles shall be fitted in any spaces which are appropriated exclusively to the carriage of cargo or coal.

6.2 Sidescuttles may, however, be fitted in spaces appropriated alternatively to the carriage of cargo or passengers, but they shall be of such construction as will effectively prevent any person opening them or their deadlights without the consent of the master.

6.3 If cargo is carried in such spaces, the sidescuttles and their deadlights shall be closed watertight and locked before the cargo is shipped and such closing and locking shall be recorded in such log book as may be prescribed by the Administration.

7 Automatic ventilating sidescuttles shall not be fitted in the shell plating below the margin line without the special sanction of the Administration.

8 The number of scuppers, sanitary discharges and other similar openings in the shell plating shall be reduced to the minimum either by making each discharge serve for as many as possible of the sanitary and other pipes, or in any other satisfactory manner.

9.1 All inlets and discharges in the shell plating shall be fitted with efficient and accessible arrangements for preventing the accidental admission of water into the ship.

9.2.1 Subject to the requirements of the International Convention on Load Lines in force, and except as provided in paragraph 9.3, each separate discharge led through the shell plating from spaces below the margin line shall be provided with either one automatic non-return valve fitted with a positive means of closing it from above the bulkhead deck or with two automatic non-return valves without positive means of closing, provided that the inboard valve is situated above the deepest subdivision load line and is always accessible for examination under service conditions. Where a valve with positive means of closing is fitted, the operating position above the bulkhead deck shall always be readily accessible and means shall be provided for indicating whether the valve is open or closed.

9.2.2 The requirements of the International Convention on Load Lines in force shall apply to discharges led through the shell plating from spaces above the margin line.

9.3 Machinery space main and auxiliary sea inlets and discharges in connexion with the operation of machinery shall be fitted with readily accessible valves between the pipes and the shell plating or between the pipes and fabricated boxes attached to the shell plating. The valves may be controlled locally and shall be provided with indicators showing whether they are open or closed.

9.4 All shell fittings and valves required by this Regulation shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable. All pipes to which this Regulation refers shall be of steel or other equivalent material to the satisfaction of the Administration.

10.1 Gangway, cargo and coaling ports fitted below the margin line shall be of sufficient strength. They shall be effectively closed and secured watertight before the ship leaves port, and shall be kept closed during navigation.

10.2 Such ports shall in no case be so fitted as to have their lowest point below the deepest subdivision load line.

11.1 The inboard opening of each ash-shoot, rubbish-shoot, etc. shall be fitted with an efficient cover.

11.2 If the inboard opening is situated below the margin line, the cover shall be watertight, and in addition an automatic non-return valve shall be fitted in

the shoot in an easily accessible position above the deepest subdivision load line. When the shoot is not in use both the cover and the valve shall be kept closed and secured.

Regulation 18

Construction and initial tests of watertight doors, sidescuttles, etc., in passenger ships and cargo ships

- 1 In passenger ships:
 - .1 the design, materials and construction of all watertight doors, sidescuttles, gangway, cargo and coaling ports, valves, pipes, ash-shoots and rubbish-shoots referred to in these Regulations shall be to the satisfaction of the Administration;
 - .2 the frames of vertical watertight doors shall have no groove at the bottom in which dirt might lodge and prevent the door closing properly.
- 2 In passenger ships and cargo ships each watertight door shall be tested by water pressure to a head up to the bulkhead deck or freeboard deck respectively. The test shall be made before the ship is put into service, either before or after the door is fitted.

Regulation 19

Construction and initial tests of watertight decks, trunks, etc. in passenger ships and cargo ships

- 1 Watertight decks, trunks, tunnels, duct keels and ventilators shall be of the same strength as watertight bulkheads at corresponding levels. The means used for making them watertight, and the arrangements adopted for closing openings in them, shall be to the satisfaction of the Administration. Watertight ventilators and trunks shall be carried at least up to the bulkhead deck in passenger ships and up to the freeboard deck in cargo ships.
- 2 After completion, a hose or flooding test shall be applied to watertight decks and a hose test to watertight trunks, tunnels and ventilators.

Regulation 20

Watertight integrity of passenger ships above the margin line

- 1 The Administration may require that all reasonable and practicable measures shall be taken to limit the entry and spread of water above the bulkhead deck. Such measures may include partial bulkheads or webs. When partial watertight bulkheads and webs are fitted on the bulkhead deck, above or in the immediate vicinity of main subdivision bulkheads, they shall have

watertight shell and bulkhead deck connexions so as to restrict the flow of water along the deck when the ship is in a heeled damaged condition. Where the partial watertight bulkhead does not line up with the bulkhead below, the bulkhead deck between shall be made effectively watertight.

2 The bulkhead deck or a deck above it shall be weathertight. All openings in the exposed weather deck shall have coamings of ample height and strength and shall be provided with efficient means for expeditiously closing them weathertight. Freeing ports, open rails and scuppers shall be fitted as necessary for rapidly clearing the weather deck of water under all weather conditions.

3 Sidescuttles, gangway, cargo and coaling ports and other means for closing openings in the shell plating above the margin line shall be of efficient design and construction and of sufficient strength having regard to the spaces in which they are fitted and their positions relative to the deepest subdivision load line.

4 Efficient inside deadlights, so arranged that they can be easily and effectively closed and secured watertight, shall be provided for all sidescuttles to spaces below the first deck above the bulkhead deck.

Regulation 21

Bilge pumping arrangements

1 *Passenger ships and cargo ships*

1.1 An efficient bilge pumping system shall be provided, capable of pumping from and draining any watertight compartment other than a space permanently appropriated for the carriage of fresh water, water ballast, oil fuel or liquid cargo and for which other efficient means of pumping are provided, under all practical conditions. Efficient means shall be provided for draining water from insulated holds.

1.2 Sanitary, ballast and general service pumps may be accepted as independent power bilge pumps if fitted with the necessary connexions to the bilge pumping system.

1.3 All bilge pipes used in or under coal bunkers or fuel storage tanks or in boiler or machinery spaces, including spaces in which oil-settling tanks or oil fuel pumping units are situated, shall be of steel or other suitable material.

1.4 The arrangement of the bilge and ballast pumping system shall be such as to prevent the possibility of water passing from the sea and from water ballast spaces into the cargo and machinery spaces, or from one compartment to another. Provision shall be made to prevent any deep tank having bilge and ballast connexions being inadvertently flooded from the sea when containing cargo, or being discharged through a bilge pipe when containing water ballast.

1.5 All distribution boxes and manually operated valves in connexion with the bilge pumping arrangements shall be in positions which are accessible under ordinary circumstances.

2 *Passenger ships*

2.1 The bilge pumping system required by paragraph 1.1 shall be capable of operation under all practicable conditions after a casualty whether the ship is upright or listed. For this purpose wing suction shall generally be fitted except in narrow compartments at the end of the ship where one suction may be sufficient. In compartments of unusual form, additional suction may be required. Arrangements shall be made whereby water in the compartment may find its way to the suction pipes. Where, for particular compartments, the Administration is satisfied that the provision of drainage may be undesirable, it may allow such provision to be dispensed with if calculations made in accordance with the conditions laid down in Regulation 8.2.1 to 8.2.3 show that the survival capability of the ship will not be impaired.

2.2 At least three power pumps shall be fitted connected to the bilge main, one of which may be driven by the propulsion machinery. Where the criterion numeral is 30 or more, one additional independent power pump shall be provided.

2.3 Where practicable, the power bilge pumps shall be placed in separate watertight compartments and so arranged or situated that these compartments will not be flooded by the same damage. If the main propulsion machinery, auxiliary machinery and boilers are in two or more watertight compartments, the pumps available for bilge service shall be distributed as far as is possible throughout these compartments.

2.4 On a ship of 91.5 m in length and upwards or having a criterion numeral of 30 or more, the arrangements shall be such that at least one power bilge pump shall be available for use in all flooding conditions which the ship is required to withstand, as follows:

- .1 one of the required bilge pumps shall be an emergency pump of a reliable submersible type having a source of power situated above the bulkhead deck; or
- .2 the bilge pumps and their sources of power shall be so distributed throughout the length of the ship that at least one pump in an undamaged compartment will be available.

2.5 With the exception of additional pumps which may be provided for peak compartments only, each required bilge pump shall be so arranged as to draw water from any space required to be drained by paragraph 1.1.

2.6 Each power bilge pump shall be capable of pumping water through the required main bilge pipe at a speed of not less than 2 m/sec. Independent power bilge pumps situated in machinery spaces shall have direct suction from these spaces, except that not more than two such suction shall be required in any one space. Where two or more such suction are provided there shall be at least one on each side of the ship. The Administration may require independent power bilge pumps situated in other spaces to have

separate direct suction. Direct suction shall be suitably arranged and those in a machinery space shall be of a diameter not less than that required for the bilge main.

2.7.1 In addition to the direct bilge suction or suction required by paragraph 2.6 a direct suction from the main circulating pump leading to the drainage level of the machinery space and fitted with a non-return valve shall be provided in the machinery space. The diameter of this direct suction pipe shall be at least two-thirds of the diameter of the pump inlet in the case of steamships, and of the same diameter as the pump inlet in the case of motorships.

2.7.2 Where in the opinion of the Administration the main circulating pump is not suitable for this purpose, a direct emergency bilge suction shall be led from the largest available independent power driven pump to the drainage level of the machinery space; the suction shall be of the same diameter as the main inlet of the pump used. The capacity of the pump so connected shall exceed that of a required bilge pump by an amount deemed satisfactory by the Administration.

2.7.3 The spindles of the sea inlet and direct suction valves shall extend well above the engine room platform.

2.8 All bilge suction piping up to the connexion to the pumps shall be independent of other piping.

2.9 The diameter d of the bilge main shall be calculated according to the following formula. However, the actual internal diameter of the bilge main may be rounded off to the nearest standard size acceptable to the Administration:

$$d = 25 + 1.68 \sqrt{L(B + D)}$$

where d is the internal diameter of the bilge main (millimetres);

L and B are the length and the breadth of the ship (metres) as defined in Regulation 2; and

D is the moulded depth of the ship to bulkhead deck (metres).

The diameter of the bilge branch pipes shall meet the requirements of the Administration.

2.10 Provision shall be made to prevent the compartment served by any bilge suction pipe being flooded in the event of the pipe being severed or otherwise damaged by collision or grounding in any other compartment. For this purpose, where the pipe is at any part situated nearer the side of the ship than one-fifth of the breadth of the ship (as defined in Regulation 2 and measured at right angles to the centreline at the level of the deepest subdivision load line), or is in a duct keel, a non-return valve shall be fitted to the pipe in the compartment containing the open end.

2.11 Distribution boxes, cocks and valves in connexion with the bilge pumping system shall be so arranged that, in the event of flooding, one of the bilge pumps may be operative on any compartment; in addition, damage to a pump or its pipe connecting to the bilge main outboard of a line drawn at

one-fifth of the breadth of the ship shall not put the bilge system out of action. If there is only one system of pipes common to all the pumps, the necessary valves for controlling the bilge suction must be capable of being operated from above the bulkhead deck. Where in addition to the main bilge pumping system an emergency bilge pumping system is provided, it shall be independent of the main system and so arranged that a pump is capable of operating on any compartment under flooding condition as specified in paragraph 2.1; in that case only the valves necessary for the operation of the emergency system need be capable of being operated from above the bulkhead deck.

2.12 All cocks and valves referred to in paragraph 2.11 which can be operated from above the bulkhead deck shall have their controls at their place of operation clearly marked and shall be provided with means to indicate whether they are open or closed.

3 *Cargo ships*

At least two power pumps connected to the main bilge system shall be provided, one of which may be driven by the propulsion machinery. If the Administration is satisfied that the safety of the ship is not impaired, bilge pumping arrangements may be dispensed with in particular compartments.

Regulation 22

*Stability information for passenger ships and cargo ships**

1 Every passenger ship regardless of size and every cargo ship having a length, as defined in the International Convention on Load Lines in force, of 24 m and upwards, shall be inclined upon its completion and the elements of its stability determined. The master shall be supplied with such information satisfactory to the Administration as is necessary to enable him by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service. A copy of the stability information shall be furnished to the Administration.

2 Where any alterations are made to a ship so as to materially affect the stability information supplied to the master, amended stability information shall be provided. If necessary the ship shall be re-inclined.

3 The Administration may allow the inclining test of an individual ship to be dispensed with provided basic stability data are available from the inclining test of a sister ship and it is shown to the satisfaction of the Administration that reliable stability information for the exempted ship can be obtained from such basic data.

* Reference is made to the Recommendation on Intact Stability for Passenger and Cargo Ships under 100 metres in length, adopted by the Organization by resolution A.167(ES. IV) and Amendments to this Recommendation, adopted by the Organization by resolution A.206(VII).

4 The Administration may also allow the inclining test of an individual ship or class of ships especially designed for the carriage of liquids or ore in bulk to be dispensed with when reference to existing data for similar ships clearly indicates that due to the ship's proportions and arrangements more than sufficient metacentric height will be available in all probable loading conditions.

Regulation 23

Damage control plans in passenger ships

There shall be permanently exhibited, for the guidance of the officer in charge of the ship, plans showing clearly for each deck and hold the boundaries of the watertight compartments, the openings therein with the means of closure and position of any controls thereof, and the arrangements for the correction of any list due to flooding. In addition, booklets containing the aforementioned information shall be made available to the officers of the ship.

Regulation 24

Marking, periodical operation and inspection of watertight doors, etc. in passenger ships

- 1 This Regulation applies to all ships.
- 2.1 Drills for the operating of watertight doors, sidescuttles, valves and closing mechanisms of scuppers, ash-shoots and rubbish-shoots shall take place weekly. In ships in which the voyage exceeds one week in duration a complete drill shall be held before leaving port, and others thereafter at least once a week during the voyage.
- 2.2 All watertight doors, both hinged and power operated, in main transverse bulkheads, in use at sea, shall be operated daily.
- 3.1 The watertight doors and all mechanisms and indicators connected therewith, all valves, the closing of which is necessary to make a compartment watertight, and all valves the operation of which is necessary for damage control cross connexions shall be periodically inspected at sea at least once a week.
- 3.2 Such valves, doors and mechanisms shall be suitably marked to ensure that they may be properly used to provide maximum safety.

Regulation 25

Entries in log of passenger ships

- 1 This Regulation applies to all ships.

2 Hinged doors, portable plates, sidescuttles, gangway, cargo and coaling ports and other openings, which are required by these Regulations to be kept closed during navigation, shall be closed before the ship leaves port. The time of closing and the time of opening (if permissible under these Regulations) shall be recorded in such log book as may be prescribed by the Administration.

3 A record of all drills and inspections required by Regulation 24 shall be entered in the log book with an explicit record of any defects which may be disclosed.

PART C – MACHINERY INSTALLATIONS

(Except where expressly provided otherwise Part C applies to passenger ships and cargo ships)

Regulation 26

General

1 The machinery, boilers and other pressure vessels, associated piping systems and fittings shall be of a design and construction adequate for the service for which they are intended and shall be so installed and protected as to reduce to a minimum any danger to persons on board, due regard being paid to moving parts, hot surfaces and other hazards. The design shall have regard to materials used in construction, the purpose for which the equipment is intended, the working conditions to which it will be subjected and the environmental conditions on board.

2 The Administration shall give special consideration to the reliability of single essential propulsion components and may require a separate source of propulsion power sufficient to give the ship a navigable speed, especially in the case of unconventional arrangements.

3 Means shall be provided whereby normal operation of propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative. Special consideration shall be given to the malfunctioning of:

- .1 a generating set which serves as a main source of electrical power;
- .2 the sources of steam supply;
- .3 the boiler feed water systems;
- .4 the fuel oil supply systems for boilers or engines;
- .5 the sources of lubricating oil pressure;
- .6 the sources of water pressure;

- .7 a condensate pump and the arrangements to maintain vacuum in condensers;
- .8 the mechanical air supply for boilers;
- .9 an air compressor and receiver for starting or control purposes;
- .10 the hydraulic, pneumatic or electrical means for control in main propulsion machinery including controllable pitch propellers.

However, the Administration, having regard to overall safety considerations, may accept a partial reduction in propulsion capability from normal operation.

4 Means shall be provided to ensure that the machinery can be brought into operation from the dead ship condition without external aid.

5 All boilers, all parts of machinery, all steam, hydraulic, pneumatic and other systems and their associated fittings which are under internal pressure shall be subjected to appropriate tests including a pressure test before being put into service for the first time.

6 Main propulsion machinery and all auxiliary machinery essential to the propulsion and the safety of the ship shall, as fitted in the ship, be designed to operate when the ship is upright and when inclined at any angle of list up to and including 15° either way under static conditions and 22.5° under dynamic conditions (rolling) either way and simultaneously inclined dynamically (pitching) 7.5° by bow or stern. The Administration may permit deviation from these angles, taking into consideration the type, size and service conditions of the ship.

7 Provision shall be made to facilitate cleaning, inspection and maintenance of main propulsion and auxiliary machinery including boilers and pressure vessels.

8 Special consideration shall be given to the design, construction and installation of propulsion machinery systems so that any mode of their vibrations shall not cause undue stresses in this machinery in the normal operating ranges.

Regulation 27

Machinery

1 Where risk from overspeeding of machinery exists, means shall be provided to ensure that the safe speed is not exceeded.

2 Where main or auxiliary machinery including pressure vessels or any parts of such machinery are subject to internal pressure and may be subject to dangerous overpressure, means shall be provided where practicable to protect against such excessive pressure.

3 All gearing and every shaft and coupling used for transmission of power to machinery essential for the propulsion and safety of the ship or for the safety of persons on board shall be so designed and constructed that they will withstand the maximum working stresses to which they may be subjected in all service conditions, and due consideration shall be given to the type of engines by which they are driven or of which they form part.

4 Internal combustion engines of a cylinder diameter of 200 mm or a crankcase volume of 0.6 m³ and above shall be provided with crankcase explosion relief valves of a suitable type with sufficient relief area. The relief valves shall be arranged or provided with means to ensure that discharge from them is so directed as to minimize the possibility of injury to personnel.

5 Main turbine propulsion machinery and, where applicable, main internal combustion propulsion machinery and auxiliary machinery shall be provided with automatic shut-off arrangements in the case of failures such as lubricating oil supply failure which could lead rapidly to complete breakdown, serious damage or explosion. The Administration may permit provisions for overriding automatic shut-off devices.

Regulation 28

Means of going astern

1 Sufficient power for going astern shall be provided to secure proper control of the ship in all normal circumstances.

2 The ability of the machinery to reverse the direction of thrust of the propeller in sufficient time, and so to bring the ship to rest within a reasonable distance from maximum ahead service speed, shall be demonstrated and recorded.*

3 The stopping times, ship headings and distances recorded on trials, together with the results of trials to determine the ability of ships having multiple propellers to navigate and manoeuvre with one or more propellers inoperative, shall be available on board for the use of the master or designated personnel.*

4 Where the ship is provided with supplementary means for manoeuvring or stopping, the effectiveness of such means shall be demonstrated and recorded as referred to in paragraphs 2 and 3.

* Reference is made to the Recommendation on Information to be Included in the Manoeuvring Booklets adopted by the Organization by resolution A.209(VII).

Regulation 29

Steering gear

1 Unless expressly provided otherwise, every ship shall be provided with a main steering gear and an auxiliary steering gear to the satisfaction of the Administration. The main steering gear and the auxiliary steering gear shall be so arranged that the failure of one of them will not render the other one inoperative.

2.1 All the steering gear components and the rudder stock shall be of sound and reliable construction to the satisfaction of the Administration. Special consideration shall be given to the suitability of any essential component which is not duplicated. Any such essential component shall, where appropriate, utilize anti-friction bearings such as ball bearings, roller bearings or sleeve bearings which shall be permanently lubricated or provided with lubrication fittings.

2.2 The design pressure for calculations to determine the scantlings of piping and other steering gear components subjected to internal hydraulic pressure shall be at least 1.25 times the maximum working pressure to be expected under the operational conditions specified in paragraph 3.2, taking into account any pressure which may exist in the low pressure side of the system. At the discretion of the Administration, fatigue criteria shall be applied for the design of piping and components, taking into account pulsating pressures due to dynamic loads.

2.3 Relief valves shall be fitted to any part of the hydraulic system which can be isolated and in which pressure can be generated from the power source or from external forces. The setting of the relief valves shall not exceed the design pressure. The valves shall be of adequate size and so arranged as to avoid an undue rise in pressure above the design pressure.

3 The main steering gear and rudder stock shall be:

- .1 of adequate strength and capable of steering the ship at maximum ahead service speed which shall be demonstrated;
- .2 capable of putting the rudder over from 35° on one side to 35° on the other side with the ship at its deepest seagoing draught and running ahead at maximum ahead service speed and, under the same conditions, from 35° on either side to 30° on the other side in not more than 28 seconds;
- .3 operated by power where necessary to meet the requirements of paragraph 3.2 and in any case when the Administration requires a rudder stock of over 120 mm diameter in way of the tiller, excluding strengthening for navigation in ice; and
- .4 so designed that they will not be damaged at maximum astern speed; however, this design requirement need not be proved by trials at maximum astern speed and maximum rudder angle.

- 4 The auxiliary steering gear shall be:
 - .1 of adequate strength and capable of steering the ship at navigable speed and of being brought speedily into action in an emergency;
 - .2 capable of putting the rudder over from 15° on one side to 15° on the other side in not more than 60 seconds with the ship at its deepest seagoing draught and running ahead at one half of the maximum ahead service speed or 7 knots, whichever is the greater; and
 - .3 operated by power where necessary to meet the requirements of paragraph 4.2 and in any case when the Administration requires a rudder stock of over 230 mm diameter in way of the tiller, excluding strengthening for navigation in ice.
- 5 Main and auxiliary steering gear power units shall be:
 - .1 arranged to re-start automatically when power is restored after a power failure; and
 - .2 capable of being brought into operation from a position on the navigating bridge. In the event of a power failure to any one of the steering gear power units, an audible and visual alarm shall be given on the navigating bridge.
- 6.1 Where the main steering gear comprises two or more identical power units, an auxiliary steering gear need not be fitted, provided that:
 - .1 in a passenger ship, the main steering gear is capable of operating the rudder as required by paragraph 3.2 while any one of the power units is out of operation;
 - .2 in a cargo ship, the main steering gear is capable of operating the rudder as required by paragraph 3.2 while operating with all power units;
 - .3 the main steering gear is so arranged that after a single failure in its piping system or in one of the power units the defect can be isolated so that steering capability can be maintained or speedily regained.
- 6.2 The Administration may, until 1 September 1986, accept the fitting of a steering gear which has a proven record of reliability but does not comply with the requirements of paragraph 6.1.3 for a hydraulic system.
- 6.3 Steering gears, other than of the hydraulic type, shall achieve standards equivalent to the requirements of this paragraph to the satisfaction of the Administration.
- 7 Steering gear control shall be provided:
 - .1 for the main steering gear, both on the navigating bridge and in the steering gear compartment;
 - .2 where the main steering gear is arranged in accordance with paragraph 6, by two independent control systems, both operable from the navigating bridge. This does not require duplication of the

steering wheel or steering lever. Where the control system consists of an hydraulic telemotor, a second independent system need not be fitted, except in a tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards;

- .3 for the auxiliary steering gear, in the steering gear compartment and, if power operated, it shall also be operable from the navigating bridge and shall be independent of the control system for the main steering gear.

8 Any main and auxiliary steering gear control system operable from the navigating bridge shall comply with the following:

- .1 if electric, it shall be served by its own separate circuit supplied from a steering gear power circuit from a point within the steering gear compartment, or directly from switchboard busbars supplying that steering gear power circuit at a point on the switchboard adjacent to the supply to the steering gear power circuit;
- .2 means shall be provided in the steering gear compartment for disconnecting any control system operable from the navigating bridge from the steering gear it serves;
- .3 the system shall be capable of being brought into operation from a position on the navigating bridge;
- .4 in the event of a failure of electrical power supply to the control system, an audible and visual alarm shall be given on the navigating bridge; and
- .5 short circuit protection only shall be provided for steering gear control supply circuits.

9 The electric power circuits and the steering gear control systems with their associated components, cables and pipes required by this Regulation and by Regulation 30 shall be separated as far as is practicable throughout their length.

10 A means of communication shall be provided between the navigating bridge and the steering gear compartment.

11 The angular position of the rudder shall:

- .1 if the main steering gear is power operated, be indicated on the navigating bridge. The rudder angle indication shall be independent of the steering gear control system;
- .2 be recognizable in the steering gear compartment.

12 Hydraulic power-operated steering gear shall be provided with the following:

- .1 arrangements to maintain the cleanliness of the hydraulic fluid taking into consideration the type and design of the hydraulic system;

- .2 a low level alarm for each hydraulic fluid reservoir to give the earliest practicable indication of hydraulic fluid leakage. Audible and visual alarms shall be given on the navigating bridge and in the machinery space where they can be readily observed; and
- .3 a fixed storage tank having sufficient capacity to recharge at least one power actuating system including the reservoir, where the main steering gear is required to be power operated. The storage tank shall be permanently connected by piping in such a manner that the hydraulic systems can be readily recharged from a position within the steering gear compartment and shall be provided with a contents gauge.

13 The steering gear compartment shall be:

- .1 readily accessible and, as far as practicable, separated from machinery spaces; and
- .2 provided with suitable arrangements to ensure working access to steering gear machinery and controls. These arrangements shall include handrails and gratings or other non-slip surfaces to ensure suitable working conditions in the event of hydraulic fluid leakage.

14 Where the rudder stock is required to be over 230 mm diameter in way of the tiller, excluding strengthening for navigation in ice, an alternative power supply, sufficient at least to supply the steering gear power unit which complies with the requirements of paragraph 4.2 and also its associated control system and the rudder angle indicator, shall be provided automatically, within 45 seconds, either from the emergency source of electrical power or from an independent source of power located in the steering gear compartment. This independent source of power shall be used only for this purpose. In every ship of 10,000 tons gross tonnage and upwards, the alternative power supply shall have a capacity for at least 30 minutes of continuous operation and in any other ship for at least 10 minutes.

15 In every tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards and in every other ship of 70,000 tons gross tonnage and upwards, the main steering gear shall comprise two or more identical power units complying with the provisions of paragraph 6.

16 Every tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards shall, subject to paragraph 17, comply with the following:

- .1 the main steering gear shall be so arranged that in the event of loss of steering capability due to a single failure in any part of one of the power actuating systems of the main steering gear, excluding the tiller, quadrant or components serving the same purpose, or seizure of the rudder actuators, steering capability shall be regained in not more than 45 seconds after the loss of one power actuating system;
- .2 the main steering gear shall comprise either:
 - .2.1 two independent and separate power actuating systems, each capable of meeting the requirements of paragraph 3.2; or

- .2.2 at least two identical power actuating systems which, acting simultaneously in normal operation, shall be capable of meeting the requirements of paragraph 3.2. Where necessary to comply with this requirement, inter-connexion of hydraulic power actuating systems shall be provided. Loss of hydraulic fluid from one system shall be capable of being detected and the defective system automatically isolated so that the other actuating system or systems shall remain fully operational;
- .3 steering gears other than of the hydraulic type shall achieve equivalent standards.

17 For tankers, chemical tankers or gas carriers of 10,000 tons gross tonnage and upwards, but of less than 100,000 tonnes deadweight, solutions other than those set out in paragraph 16, which need not apply the single failure criterion to the rudder actuator or actuators, may be permitted provided that an equivalent safety standard is achieved and that:

- .1 following loss of steering capability due to a single failure of any part of the piping system or in one of the power units, steering capability shall be regained within 45 seconds; and
- .2 where the steering gear includes only a single rudder actuator, special consideration is given to stress analysis for the design including fatigue analysis and fracture mechanics analysis, as appropriate, to the material used, to the installation of sealing arrangements and to testing and inspection and to the provision of effective maintenance. In consideration of the foregoing, the Administration shall adopt regulations which include the provisions of the Guidelines for Acceptance of Non-Duplicated Rudder Actuators for Tankers, Chemical Tankers and Gas Carriers of 10,000 Tons Gross Tonnage and Above but Less than 100,000 Tonnes Deadweight, adopted by the Organization.*

18 For a tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards, but less than 70,000 tonnes deadweight, the Administration may, until 1 September 1986, accept a steering gear system with a proven record of reliability which does not comply with the single failure criterion required for a hydraulic system in paragraph 16.

19 Every tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards, constructed before 1 September 1984, shall comply, not later than 1 September 1986, with the following:

- .1 the requirements of paragraphs 7.1, 8.2, 8.4, 10, 11, 12.2, 12.3 and 13.2;
- .2 two independent steering gear control systems shall be provided each of which can be operated from the navigating bridge. This does not require duplication of the steering wheel or steering lever;

* Reference is made to the Guidelines for Acceptance of Non-Duplicated Rudder Actuators for Tankers, Chemical Tankers and Gas Carriers of 10,000 Tons Gross Tonnage and Above but Less than 100,000 Tonnes Deadweight, adopted by the Organization by resolution A.467(XII).

- .3 if the steering gear control system in operation fails, the second system shall be capable of being brought into immediate operation from the navigating bridge; and
- .4 each steering gear control system, if electric, shall be served by its own separate circuit supplied from the steering gear power circuit or directly from switchboard busbars supplying that steering gear power circuit at a point on the switchboard adjacent to the supply to the steering gear power circuit.

20 In addition to the requirements of paragraph 19, in every tanker, chemical tanker or gas carrier of 40,000 tons gross tonnage and upwards, constructed before 1 September 1984, the steering gear shall, not later than 1 September 1988, be so arranged that, in the event of a single failure of the piping or of one of the power units, steering capability can be maintained or the rudder movement can be limited so that steering capability can be speedily regained. This shall be achieved by:

- .1 an independent means of restraining the rudder; or
- .2 fast acting valves which may be manually operated to isolate the actuator or actuators from the external hydraulic piping together with a means of directly refilling the actuators by a fixed independent power-operated pump and piping system; or
- .3 an arrangement such that, where hydraulic power systems are interconnected, loss of hydraulic fluid from one system shall be detected and the defective system isolated either automatically or from the navigating bridge so that the other system remains fully operational.

Regulation 30

Additional requirements for electric and electrohydraulic steering gear

1 Means for indicating that the motors of electric and electrohydraulic steering gear are running shall be installed on the navigating bridge and at a suitable main machinery control position.

2 Each electric or electrohydraulic steering gear comprising one or more power units shall be served by at least two exclusive circuits fed directly from the main switchboard; however, one of the circuits may be supplied through the emergency switchboard. An auxiliary electric or electrohydraulic steering gear associated with a main electric or electrohydraulic steering gear may be connected to one of the circuits supplying this main steering gear. The circuits supplying an electric or electrohydraulic steering gear shall have adequate rating for supplying all motors which can be simultaneously connected to them and may be required to operate simultaneously.

3 Short circuit protection and an overload alarm shall be provided for such circuits and motors. Protection against excess current, including starting current, if provided, shall be for not less than twice the full load current of the motor or circuit so protected, and shall be arranged to permit the passage of

the appropriate starting currents. Where a three-phase supply is used an alarm shall be provided that will indicate failure of any one of the supply phases. The alarms required in this paragraph shall be both audible and visual and shall be situated in a conspicuous position in the main machinery space or control room from which the main machinery is normally controlled and as may be required by Regulation 51.

4 When in a ship of less than 1,600 tons gross tonnage an auxiliary steering gear which is required by Regulation 29.4.3 to be operated by power is not electrically powered or is powered by an electric motor primarily intended for other services, the main steering gear may be fed by one circuit from the main switchboard. Where such an electric motor primarily intended for other services is arranged to power such an auxiliary steering gear, the requirement of paragraph 3 may be waived by the Administration if satisfied with the protection arrangement together with the requirements of Regulation 29.5.1 and .2 and 29.7.3 applicable to auxiliary steering gear.

Regulation 31

Machinery controls

1 Main and auxiliary machinery essential for the propulsion and safety of the ship shall be provided with effective means for its operation and control.

2 Where remote control of propulsion machinery from the navigating bridge is provided and the machinery spaces are intended to be manned, the following shall apply:

- .1 the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the navigating bridge under all sailing conditions, including manoeuvring;
- .2 the remote control shall be performed, for each independent propeller, by a control device so designed and constructed that its operation does not require particular attention to the operational details of the machinery. Where multiple propellers are designed to operate simultaneously, they may be controlled by one control device;
- .3 the main propulsion machinery shall be provided with an emergency stopping device on the navigating bridge which shall be independent of the navigating bridge control system;
- .4 propulsion machinery orders from the navigating bridge shall be indicated in the main machinery control room or at the manoeuvring platform as appropriate;
- .5 remote control of the propulsion machinery shall be possible only from one location at a time; at such locations interconnected control positions are permitted. At each location there shall be an indicator showing which location is in control of the propulsion machinery. The transfer of control between the navigating bridge and machinery spaces shall be possible only in the main machinery space or the

main machinery control room. This system shall include means to prevent the propelling thrust from altering significantly when transferring control from one location to another;

- .6 it shall be possible to control the propulsion machinery locally, even in the case of failure in any part of the remote control system;
- .7 the design of the remote control system shall be such that in case of its failure an alarm will be given. Unless the Administration considers it impracticable the preset speed and direction of thrust of the propeller shall be maintained until local control is in operation;
- .8 indicators shall be fitted on the navigating bridge for:
 - .8.1 propeller speed and direction of rotation in the case of fixed pitch propellers;
 - .8.2 propeller speed and pitch position in the case of controllable pitch propellers;
- .9 an alarm shall be provided on the navigating bridge and in the machinery space to indicate low starting air pressure which shall be set at a level to permit further main engine starting operations. If the remote control system of the propulsion machinery is designed for automatic starting, the number of automatic consecutive attempts which fail to produce a start shall be limited in order to safeguard sufficient starting air pressure for starting locally.

3 Where the main propulsion and associated machinery, including sources of main electrical supply, are provided with various degrees of automatic or remote control and are under continuous manual supervision from a control room the arrangements and controls shall be so designed, equipped and installed that the machinery operation will be as safe and effective as if it were under direct supervision; for this purpose Regulations 46 to 50 shall apply as appropriate. Particular consideration shall be given to protect such spaces against fire and flooding.

4 In general, automatic starting, operational and control systems shall include provisions for manually overriding the automatic controls. Failure of any part of such systems shall not prevent the use of the manual override.

Regulation 32

Steam boilers and boiler feed systems

1 Every steam boiler and every unfired steam generator shall be provided with not less than two safety valves of adequate capacity. However, having regard to the output or any other features of any boiler or unfired steam generator, the Administration may permit only one safety valve to be fitted if it is satisfied that adequate protection against overpressure is thereby provided.

2 Each oil-fired boiler which is intended to operate without manual supervision shall have safety arrangements which shut off the fuel supply and give an alarm in the case of low water level, air supply failure or flame failure.

3 Water tube boilers serving turbine propulsion machinery shall be fitted with a high-water-level alarm.

4 Every steam generating system which provides services essential for the safety of the ship, or which could be rendered dangerous by the failure of its feed water supply, shall be provided with not less than two separate feed water systems from and including the feed pumps, noting that a single penetration of the steam drum is acceptable. Unless overpressure is prevented by the pump characteristics means shall be provided which will prevent overpressure in any part of the systems.

5 Boilers shall be provided with means to supervise and control the quality of the feed water. Suitable arrangements shall be provided to preclude, as far as practicable, the entry of oil or other contaminants which may adversely affect the boiler.

6 Every boiler essential for the safety of the ship and designed to contain water at a specified level shall be provided with at least two means for indicating its water level, at least one of which shall be a direct reading gauge glass.

Regulation 33

Steam pipe systems

1 Every steam pipe and every fitting connected thereto through which steam may pass shall be so designed, constructed and installed as to withstand the maximum working stresses to which it may be subjected.

2 Means shall be provided for draining every steam pipe in which dangerous water hammer action might otherwise occur.

3 If a steam pipe or fitting may receive steam from any source at a higher pressure than that for which it is designed a suitable reducing valve, relief valve and pressure gauge shall be fitted.

Regulation 34

Air pressure systems

1 In every ship means shall be provided to prevent overpressure in any part of compressed air systems and wherever water jackets or casings of air compressors and coolers might be subjected to dangerous overpressure due to leakage into them from air pressure parts. Suitable pressure relief arrangements shall be provided for all systems.

2 The main starting air arrangements for main propulsion internal combustion engines shall be adequately protected against the effects of backfiring and internal explosion in the starting air pipes.

3 All discharge pipes from starting air compressors shall lead directly to the starting air receivers, and all starting pipes from the air receivers to main or auxiliary engines shall be entirely separate from the compressor discharge pipe system.

4 Provision shall be made to reduce to a minimum the entry of oil into the air pressure systems and to drain these systems.

Regulation 35

Ventilating systems in machinery spaces

Machinery spaces of category A shall be adequately ventilated so as to ensure that when machinery or boilers therein are operating at full power in all weather conditions including heavy weather, an adequate supply of air is maintained to the spaces for the safety and comfort of personnel and the operation of the machinery. Any other machinery space shall be adequately ventilated appropriate for the purpose of that machinery space.

Regulation 36

*Protection against noise**

Measures shall be taken to reduce machinery noise in machinery spaces to acceptable levels as determined by the Administration. If this noise cannot be sufficiently reduced the source of excessive noise shall be suitably insulated or isolated or a refuge from noise shall be provided if the space is required to be manned. Ear protectors shall be provided for personnel required to enter such spaces, if necessary.

Regulation 37

Communication between navigating bridge and machinery space

At least two independent means shall be provided for communicating orders from the navigating bridge to the position in the machinery space or in the control room from which the engines are normally controlled: one of these shall be an engine room telegraph which provides visual indication of the orders and responses both in the machinery space and on the navigating bridge. Appropriate means of communication shall be provided to any other positions from which the engines may be controlled.

* Reference is made to the Code on Noise Levels on Board Ships, adopted by the Organization by resolution A.468(XII).

Regulation 38

Engineers' alarm

An engineers' alarm shall be provided to be operated from the engine control room or at the manoeuvring platform as appropriate, and shall be clearly audible in the engineers' accommodation.

Regulation 39

Location of emergency installations in passenger ships

Emergency sources of electrical power, fire pumps, bilge pumps except those specifically serving the spaces forward of the collision bulkhead, any fixed fire-extinguishing system required by Chapter II-2 and other emergency installations which are essential for the safety of the ship, except anchor windlasses, shall not be installed forward of the collision bulkhead.

PART D – ELECTRICAL INSTALLATIONS

(Except where expressly provided otherwise Part D applies to passenger ships and cargo ships)

Regulation 40

General

- 1 Electrical installations shall be such that:
 - .1 all electrical auxiliary services necessary for maintaining the ship in normal operational and habitable conditions will be ensured without recourse to the emergency source of electrical power;
 - .2 electrical services essential for safety will be ensured under various emergency conditions; and
 - .3 the safety of passengers, crew and ship from electrical hazards will be ensured.
- 2 The Administration shall take appropriate steps to ensure uniformity in the implementation and application of the provisions of this Part in respect of electrical installations*.

* Reference is made to the Recommendations published by the International Electrotechnical Commission and, in particular, Publication 92 – Electrical Installations in Ships.

Regulation 41

Main source of electrical power and lighting systems

1.1 A main source of electrical power of sufficient capacity to supply all those services mentioned in Regulation 40.1.1 shall be provided. This main source of electrical power shall consist of at least two generating sets.

1.2 The capacity of these generating sets shall be such that in the event of any one generating set being stopped it will still be possible to supply those services necessary to provide normal operational conditions of propulsion and safety. Minimum comfortable conditions of habitability shall also be ensured which include at least adequate services for cooking, heating, domestic refrigeration, mechanical ventilation, sanitary and fresh water.

1.3 The arrangements of the ship's main source of electrical power shall be such that the services referred to in Regulation 40.1.1 can be maintained regardless of the speed and direction of the propulsion machinery or shafting.

1.4 In addition, the generating sets shall be such as to ensure that with any one generator or its primary source of power out of operation, the remaining generating sets shall be capable of providing the electrical services necessary to start the main propulsion plant from a dead ship condition. The emergency source of electrical power may be used for the purpose of starting from a dead ship condition if its capability either alone or combined with that of any other source of electrical power is sufficient to provide at the same time those services required to be supplied by Regulations 42.2.1 to 42.2.3 or 43.2.1 to 43.2.4.

1.5 Where transformers constitute an essential part of the electrical supply system required by this paragraph, the system shall be so arranged as to ensure the same continuity of the supply as is stated in this paragraph.

2.1 A main electric lighting system which shall provide illumination throughout those parts of the ship normally accessible to and used by passengers or crew shall be supplied from the main source of electrical power.

2.2 The arrangement of the main electric lighting system shall be such that a fire or other casualty in spaces containing the main source of electrical power, associated transforming equipment, if any, the main switchboard and the main lighting switchboard, will not render the emergency electric lighting system required by Regulations 42.2.1 and 42.2.2 or 43.2.1, 43.2.2 and 43.2.3 inoperative.

2.3 The arrangement of the emergency electric lighting system shall be such that a fire or other casualty in spaces containing the emergency source of electrical power, associated transforming equipment, if any, the emergency switchboard and the emergency lighting switchboard will not render the main electric lighting system required by this Regulation inoperative.

3 The main switchboard shall be so placed relative to one main generating station that, as far as is practicable, the integrity of the normal electrical supply may be affected only by a fire or other casualty in one space. An

environmental enclosure for the main switchboard, such as may be provided by a machinery control room situated within the main boundaries of the space, is not to be considered as separating the switchboards from the generators.

4 Where the total installed electrical power of the main generating sets is in excess of 3 MW, the main busbars shall be subdivided into at least two parts which shall normally be connected by removable links or other approved means; so far as is practicable, the connexion of generating sets and any other duplicated equipment shall be equally divided between the parts. Equivalent arrangements may be permitted to the satisfaction of the Administration.

Regulation 42

Emergency source of electrical power in passenger ships

1.1 A self-contained emergency source of electrical power shall be provided.

1.2 The emergency source of electrical power, associated transforming equipment, if any, transitional source of emergency power, emergency switchboard and emergency lighting switchboard shall be located above the uppermost continuous deck and shall be readily accessible from the open deck. They shall not be located forward of the collision bulkhead.

1.3 The location of the emergency source of electrical power and associated transforming equipment, if any, the transitional source of emergency power, the emergency switchboard and the emergency electric lighting switchboards in relation to the main source of electrical power, associated transforming equipment, if any, and the main switchboard shall be such as to ensure to the satisfaction of the Administration that a fire or other casualty in spaces containing the main source of electrical power, associated transforming equipment, if any, and the main switchboard or in any machinery space of category A will not interfere with the supply, control and distribution of emergency electrical power. As far as practicable, the space containing the emergency source of electrical power, associated transforming equipment, if any, the transitional source of emergency electrical power and the emergency switchboard shall not be contiguous to the boundaries of machinery spaces of category A or those spaces containing the main source of electrical power, associated transforming equipment, if any, or the main switchboard.

1.4 Provided that suitable measures are taken for safeguarding independent emergency operation under all circumstances, the emergency generator may be used exceptionally, and for short periods, to supply non-emergency circuits.

2 The electrical power available shall be sufficient to supply all those services that are essential for safety in an emergency, due regard being paid to such services as may have to be operated simultaneously. The emergency source of electrical power shall be capable, having regard to starting currents and the transitory nature of certain loads, of supplying simultaneously at least the following services for the periods specified hereinafter, if they depend upon an electrical source for their operation:

- 2.1 For a period of 36 hours, emergency lighting:
- .1 at every embarkation station on deck and over sides as required by Regulations III/19 and III/30;
 - .2 in all service and accommodation alleyways, stairways and exits, personnel lift cars;
 - .3 in the machinery spaces and main generating stations including their control positions;
 - .4 in all control stations, machinery control rooms, and at each main and emergency switchboard;
 - .5 at all stowage positions for firemen's outfits;
 - .6 at the steering gear; and
 - .7 at the fire pump, the sprinkler pump and the emergency bilge pump referred to in paragraph 2.4 and at the starting position of their motors.

2.2 For a period of 36 hours, the navigation lights and other lights required by the International Regulations for Preventing Collisions at Sea in force.

- 2.3 For a period of 36 hours:
- .1 all internal communication equipment required in an emergency;
 - .2 the navigational aids as required by Regulation V/12; where such provision is unreasonable or impracticable the Administration may waive this requirement for ships of less than 5,000 tons gross tonnage;
 - .3 the fire detection and fire alarm system, and the fire door holding and release system; and
 - .4 for intermittent operation of the daylight signalling lamp, the ship's whistle, the manual fire alarms and all internal signals that are required in an emergency;

unless such services have an independent supply for the period of 36 hours from an accumulator battery suitably located for use in an emergency.

- 2.4 For a period of 36 hours:
- .1 one of the fire pumps required by Regulation II-2/4.3.1 and 4.3.3;
 - .2 the automatic sprinkler pump, if any; and
 - .3 the emergency bilge pump and all the equipment essential for the operation of electrically powered remote controlled bilge valves.

2.5 For the period of time required by Regulation 29.14 the steering gear if required to be so supplied by that Regulation.

2.6 For a period of half an hour:

- .1 any watertight doors required by Regulation 15 to be power operated together with their indicators and warning signals. Provided the requirements of Regulation 15.9.2 are complied with, sequential operation of the doors may be permitted providing all doors can be closed in 60 seconds;
- .2 the emergency arrangements to bring the lift cars to deck level for the escape of persons. The passenger lift cars may be brought to deck level sequentially in an emergency.

2.7 In a ship engaged regularly on voyages of short duration, the Administration if satisfied that an adequate standard of safety would be attained may accept a lesser period than the 36 hour period specified in paragraphs 2.1 to 2.5 but not less than 12 hours.

3 The emergency source of electrical power may be either a generator or an accumulator battery, which shall comply with the following:

3.1 Where the emergency source of electrical power is a generator, it shall be:

- .1 driven by a suitable prime-mover with an independent supply of fuel having a flashpoint (closed cup test) of not less than 43°C;
- .2 started automatically upon failure of the electrical supply from the main source of electrical power and shall be automatically connected to the emergency switchboard; those services referred to in paragraph 4 shall then be transferred automatically to the emergency generating set. The automatic starting system and the characteristic of the prime-mover shall be such as to permit the emergency generator to carry its full rated load as quickly as is safe and practicable, subject to a maximum of 45 seconds; unless a second independent means of starting the emergency generating set is provided, the single source of stored energy shall be protected to preclude its complete depletion by the automatic starting system; and
- .3 provided with a transitional source of emergency electrical power according to paragraph 4.

3.2 Where the emergency source of electrical power is an accumulator battery, it shall be capable of:

- .1 carrying the emergency electrical load without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage;
- .2 automatically connecting to the emergency switchboard in the event of failure of the main source of electrical power; and
- .3 immediately supplying at least those services specified in paragraph 4.

4 The transitional source of emergency electrical power required by paragraph 3.1.3 shall consist of an accumulator battery suitably located for use in an emergency which shall operate without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage and be of sufficient capacity and so arranged as to supply automatically in the event of failure of either the main or emergency source of electrical power at least the following services, if they depend upon an electrical source for their operation:

4.1 For half an hour:

- .1 the lighting required by paragraphs 2.1 and 2.2;
- .2 all services required by paragraphs 2.3.1, 2.3.3 and 2.3.4 unless such services have an independent supply for the period specified from an accumulator battery suitably located for use in an emergency.

4.2 Power to close the watertight doors but not necessarily all of them simultaneously, together with their indicators and warning signals as required by paragraph 2.6.1.

5.1 The emergency switchboard shall be installed as near as is practicable to the emergency source of electrical power.

5.2 Where the emergency source of electrical power is a generator, the emergency switchboard shall be located in the same space unless the operation of the emergency switchboard would thereby be impaired.

5.3 No accumulator battery fitted in accordance with this Regulation shall be installed in the same space as the emergency switchboard. An indicator shall be mounted in a suitable place on the main switchboard or in the machinery control room to indicate when the batteries constituting either the emergency source of electrical power or the transitional source of emergency electrical power referred to in paragraph 3.1.3 or 4 are being discharged.

5.4 The emergency switchboard shall be supplied during normal operation from the main switchboard by an interconnector feeder which is to be adequately protected at the main switchboard against overload and short circuit and which is to be disconnected automatically at the emergency switchboard upon failure of the main source of electrical power. Where the system is arranged for feedback operation, the interconnector feeder is also to be protected at the emergency switchboard at least against short circuit.

5.5 In order to ensure ready availability of the emergency source of electrical power, arrangements shall be made where necessary to disconnect automatically non-emergency circuits from the emergency switchboard to ensure that power shall be available to the emergency circuits.

6 The emergency generator and its prime-mover and any emergency accumulator battery shall be so designed and arranged as to ensure that they will function at full rated power when the ship is upright and when inclined at any angle of list up to 22.5° or when inclined up to 10° either in the fore or aft direction, or is in any combination of angles within those limits.

7 Provision shall be made for the periodic testing of the complete emergency system and shall include the testing of automatic starting arrangements.

Regulation 43

Emergency source of electrical power in cargo ships

1.1 A self-contained emergency source of electrical power shall be provided.

1.2 The emergency source of electrical power, associated transforming equipment, if any, transitional source of emergency power, emergency switchboard and emergency lighting switchboard shall be located above the uppermost continuous deck and shall be readily accessible from the open deck. They shall not be located forward of the collision bulkhead, except where permitted by the Administration in exceptional circumstances.

1.3 The location of the emergency source of electrical power, associated transforming equipment, if any, the transitional source of emergency power, the emergency switchboard and the emergency lighting switchboard in relation to the main source of electrical power, associated transforming equipment, if any, and the main switchboard shall be such as to ensure to the satisfaction of the Administration that a fire or other casualty in the space containing the main source of electrical power, associated transforming equipment, if any, and the main switchboard, or in any machinery space of category A will not interfere with the supply, control and distribution of emergency electrical power. As far as practicable the space containing the emergency source of electrical power, associated transforming equipment, if any, the transitional source of emergency electrical power and the emergency switchboard shall not be contiguous to the boundaries of machinery spaces of category A or those spaces containing the main source of electrical power, associated transforming equipment, if any, and the main switchboard.

1.4 Provided that suitable measures are taken for safeguarding independent emergency operation under all circumstances, the emergency generator may be used, exceptionally, and for short periods, to supply non-emergency circuits.

2 The electrical power available shall be sufficient to supply all those services that are essential for safety in an emergency, due regard being paid to such services as may have to be operated simultaneously. The emergency source of electrical power shall be capable, having regard to starting currents and the transitory nature of certain loads, of supplying simultaneously at least the following services for the periods specified hereinafter, if they depend upon an electrical source for their operation:

2.1 For a period of 3 hours, emergency lighting at every embarkation station on deck and over sides as required by Regulations III/19 and III/38.

- 2.2 For a period of 18 hours, emergency lighting:
- .1 in all service and accommodation alleyways, stairways and exits, personnel lift cars and personnel lift trunks;
 - .2 in the machinery spaces and main generating stations including their control positions;
 - .3 in all control stations, machinery control rooms, and at each main and emergency switchboard;
 - .4 at all stowage positions for firemen's outfits;
 - .5 at the steering gear; and
 - .6 at the fire pump referred to in paragraph 2.5, at the sprinkler pump, if any, and at the emergency bilge pump, if any, and at the starting positions of their motors.

2.3 For a period of 18 hours, the navigation lights and other lights required by the International Regulations for Preventing Collisions at Sea in force.

2.4 For a period of 18 hours:

- .1 all internal communication equipment as required in an emergency;
- .2 the navigational aids as required by Regulation V/12; where such provision is unreasonable or impracticable the Administration may waive this requirement for ships of less than 5,000 tons gross tonnage;
- .3 the fire detection and fire alarm system; and
- .4 intermittent operation of the daylight signalling lamp, the ship's whistle, the manual fire alarms, and all internal signals that are required in an emergency;

unless such services have an independent supply for the period of 18 hours from an accumulator battery suitably located for use in an emergency.

2.5 For a period of 18 hours one of the fire pumps required by Regulation II-2/4.3.1 and 4.3.3 if dependent upon the emergency generator for its source of power.

2.6.1 For the period of time required by Regulation 29.14 the steering gear where it is required to be so supplied by that Regulation.

2.6.2 In a ship engaged regularly in voyages of short duration, the Administration if satisfied that an adequate standard of safety would be attained may accept a lesser period than the 18 hour period specified in paragraphs 2.2 to 2.5 but not less than 12 hours.

3 The emergency source of electrical power may be either a generator or an accumulator battery, which shall comply with the following:

3.1 Where the emergency source of electrical power is a generator, it shall be:

- .1 driven by a suitable prime-mover with an independent supply of fuel, having a flashpoint (closed cup test) of not less than 43°C;
- .2 started automatically upon failure of the main source of electrical power supply unless a transitional source of emergency electrical power in accordance with paragraph 3.1.3 is provided; where the emergency generator is automatically started, it shall be automatically connected to the emergency switchboard; those services referred to in paragraph 4 shall then be connected automatically to the emergency generator; and unless a second independent means of starting the emergency generator is provided the single source of stored energy shall be protected to preclude its complete depletion by the automatic starting system; and
- .3 provided with a transitional source of emergency electrical power as specified in paragraph 4 unless an emergency generator is provided capable both of supplying the services mentioned in that paragraph and of being automatically started and supplying the required load as quickly as is safe and practicable subject to a maximum of 45 seconds.

3.2 Where the emergency source of electrical power is an accumulator battery it shall be capable of:

- .1 carrying the emergency electrical load without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage;
- .2 automatically connecting to the emergency switchboard in the event of failure of the main source of electrical power; and
- .3 immediately supplying at least those services specified in paragraph 4.

4 The transitional source of emergency electrical power where required by paragraph 3.1.3 shall consist of an accumulator battery suitably located for use in an emergency which shall operate without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage and be of sufficient capacity and shall be so arranged as to supply automatically in the event of failure of either the main or the emergency source of electrical power for half an hour at least the following services if they depend upon an electrical source for their operation:

- .1 the lighting required by paragraphs 2.1, 2.2 and 2.3. For this transitional phase, the required emergency electric lighting, in respect of the machinery space and accommodation and service spaces may be provided by permanently fixed, individual, automatically charged, relay operated accumulator lamps; and
- .2 all services required by paragraphs 2.4.1, 2.4.3 and 2.4.4 unless such services have an independent supply for the period specified from an accumulator battery suitably located for use in an emergency.

5.1 The emergency switchboard shall be installed as near as is practicable to the emergency source of electrical power.

5.2 Where the emergency source of electrical power is a generator, the emergency switchboard shall be located in the same space unless the operation of the emergency switchboard would thereby be impaired.

5.3 No accumulator battery fitted in accordance with this Regulation shall be installed in the same space as the emergency switchboard. An indicator shall be mounted in a suitable place on the main switchboard or in the machinery control room to indicate when the batteries constituting either the emergency source of electrical power or the transitional source of electrical power referred to in paragraph 3.2 or 4 are being discharged.

5.4 The emergency switchboard shall be supplied during normal operation from the main switchboard by an interconnector feeder which is to be adequately protected at the main switchboard against overload and short circuit and which is to be disconnected automatically at the emergency switchboard upon failure of the main source of electrical power. Where the system is arranged for feedback operation, the interconnector feeder is also to be protected at the emergency switchboard at least against short circuit.

5.5 In order to ensure ready availability of the emergency source of electrical power, arrangements shall be made where necessary to disconnect automatically non-emergency circuits from the emergency switchboard to ensure that electrical power shall be available automatically to the emergency circuits.

6 The emergency generator and its prime-mover and any emergency accumulator battery shall be so designed and arranged as to ensure that they will function at full rated power when the ship is upright and when inclined at any angle of list up to 22.5° or when inclined up to 10° either in the fore or aft direction, or is in any combination of angles within those limits.

7 Provision shall be made for the periodic testing of the complete emergency system and shall include the testing of automatic starting arrangements.

Regulation 44

Starting arrangements for emergency generating sets

1 Emergency generating sets shall be capable of being readily started in their cold condition at a temperature of 0°C. If this is impracticable, or if lower temperatures are likely to be encountered, provision acceptable to the Administration shall be made for the maintenance of heating arrangements, to ensure ready starting of the generating sets.

2 Each emergency generating set arranged to be automatically started shall be equipped with starting devices approved by the Administration with a stored energy capability of at least three consecutive starts. A second source of energy shall be provided for an additional three starts within 30 minutes unless manual starting can be demonstrated to be effective.

- 3 The stored energy shall be maintained at all times, as follows:
- .1 electrical and hydraulic starting systems shall be maintained from the emergency switchboard;
 - .2 compressed air starting systems may be maintained by the main or auxiliary compressed air receivers through a suitable non-return valve or by an emergency air compressor which, if electrically driven, is supplied from the emergency switchboard;
 - .3 all of these starting, charging and energy storing devices shall be located in the emergency generator space; these devices are not to be used for any purpose other than the operation of the emergency generating set. This does not preclude the supply to the air receiver of the emergency generating set from the main or auxiliary compressed air system through the non-return valve fitted in the emergency generator space.
- 4.1 Where automatic starting is not required, manual starting is permissible, such as manual cranking, inertia starters, manually charged hydraulic accumulators, or powder charge cartridges, where they can be demonstrated as being effective.
- 4.2 When manual starting is not practicable, the requirements of paragraphs 2 and 3 shall be complied with except that starting may be manually initiated.

Regulation 45

Precautions against shock, fire and other hazards of electrical origin

- 1.1 Exposed metal parts of electrical machines or equipment which are not intended to be live but which are liable under fault conditions to become live shall be earthed unless the machines or equipment are:
- .1 supplied at a voltage not exceeding 55 V direct current or 55 V, root mean square between conductors; auto-transformers shall not be used for the purpose of achieving this voltage; or
 - .2 supplied at a voltage not exceeding 250 V by safety isolating transformers supplying only one consuming device; or
 - .3 constructed in accordance with the principle of double insulation.
- 1.2 The Administration may require additional precautions for portable electrical equipment for use in confined or exceptionally damp spaces where particular risks due to conductivity may exist.
- 1.3 All electrical apparatus shall be so constructed and so installed as not to cause injury when handled or touched in the normal manner.
- 2 Main and emergency switchboards shall be so arranged as to give easy access as may be needed to apparatus and equipment, without danger to personnel. The sides and the rear and, where necessary, the front of

switchboards shall be suitably guarded. Exposed live parts having voltages to earth exceeding a voltage to be specified by the Administration shall not be installed on the front of such switchboards. Where necessary, non-conducting mats or gratings shall be provided at the front and rear of the switchboard.

3.1 The hull return system of distribution shall not be used for any purpose in a tanker, or for power, heating, or lighting in any other ship of 1,600 tons gross tonnage and upwards.

3.2 The requirement of paragraph 3.1 does not preclude under conditions approved by the Administration the use of:

- .1 impressed current cathodic protective systems;
- .2 limited and locally earthed systems; or
- .3 insulation level monitoring devices provided the circulation current does not exceed 30 mA under the most unfavourable conditions.

3.3 Where the hull return system is used, all final subcircuits, i.e. all circuits fitted after the last protective device, shall be two-wire and special precautions shall be taken to the satisfaction of the Administration.

4.1 Earthed distribution systems shall not be used in a tanker. The Administration may exceptionally permit in a tanker the earthing of the neutral for alternating current power networks of 3,000 V (line to line) and over, provided that any possible resulting current does not flow directly through any of the dangerous spaces.

4.2 When a distribution system, whether primary or secondary, for power, heating or lighting, with no connexion to earth is used, a device capable of continuously monitoring the insulation level to earth and of giving an audible or visual indication of abnormally low insulation values shall be provided.

5.1 Except as permitted by the Administration in exceptional circumstances, all metal sheaths and armour of cables shall be electrically continuous and shall be earthed.

5.2 All electric cables and wiring external to equipment shall be at least of a flame retardant type and shall be so installed as not to impair their original flame retarding properties. Where necessary for particular applications the Administration may permit the use of special types of cables such as radio frequency cables, which do not comply with the foregoing.

5.3 Cables and wiring serving essential or emergency power, lighting, internal communications or signals shall so far as practicable be routed clear of galleys, laundries, machinery spaces of category A and their casings and other high fire risk areas. Cables connecting fire pumps to the emergency switchboard shall be of a fire resistant type where they pass through high fire risk areas. Where practicable all such cables should be run in such a manner as to preclude their being rendered unserviceable by heating of the bulkheads that may be caused by a fire in an adjacent space.

5.4 Where cables which are installed in hazardous areas introduce the risk of fire or explosion in the event of an electrical fault in such areas, special

precautions against such risks shall be taken to the satisfaction of the Administration.

5.5 Cables and wiring shall be installed and supported in such a manner as to avoid chafing or other damage.

5.6 Terminations and joints in all conductors shall be so made as to retain the original electrical, mechanical, flame retarding and, where necessary, fire resisting properties of the cable.

6.1 Each separate circuit shall be protected against short circuit and against overload, except as permitted in Regulations 29 and 30 or where the Administration may exceptionally otherwise permit.

6.2 The rating or appropriate setting of the overload protective device for each circuit shall be permanently indicated at the location of the protective device.

7 Lighting fittings shall be so arranged as to prevent temperature rises which could damage the cables and wiring, and to prevent surrounding material from becoming excessively hot.

8 All lighting and power circuits terminating in a bunker or cargo space shall be provided with a multiple pole switch outside the space for disconnecting such circuits.

9.1 Accumulator batteries shall be suitably housed, and compartments used primarily for their accommodation shall be properly constructed and efficiently ventilated.

9.2 Electrical or other equipment which may constitute a source of ignition of flammable vapours shall not be permitted in these compartments except as permitted in paragraph 10.

9.3 Accumulator batteries shall not be located in sleeping quarters except where hermetically sealed to the satisfaction of the Administration.

10 No electrical equipment shall be installed in any space where flammable mixtures are liable to collect including those on board tankers or in compartments assigned principally to accumulator batteries, in paint lockers, acetylene stores or similar spaces, unless the Administration is satisfied that such equipment is:

- .1 essential for operational purposes;
- .2 of a type which will not ignite the mixture concerned;
- .3 appropriate to the space concerned; and
- .4 appropriately certified for safe usage in the dusts, vapours or gases likely to be encountered.

11 In a passenger ship, distribution systems shall be so arranged that fire in any main vertical zone as is defined in Regulation II-2/3.9 will not interfere with services essential for safety in any other such zone. This requirement will

be met if main and emergency feeders passing through any such zone are separated both vertically and horizontally as widely as is practicable.

PART E - ADDITIONAL REQUIREMENTS FOR PERIODICALLY UNATTENDED MACHINERY SPACES

(Part E applies to cargo ships except that Regulation 54
refers to passenger ships)

Regulation 46

General

- 1 The arrangements provided shall be such as to ensure that the safety of the ship in all sailing conditions, including manoeuvring, is equivalent to that of a ship having the machinery spaces manned.
- 2 Measures shall be taken to the satisfaction of the Administration to ensure that the equipment is functioning in a reliable manner and that satisfactory arrangements are made for regular inspections and routine tests to ensure continuous reliable operation.
- 3 Every ship shall be provided with documentary evidence, to the satisfaction of the Administration, of its fitness to operate with periodically unattended machinery spaces.

Regulation 47

Fire precautions

- 1 Means shall be provided to detect and give alarms at an early stage in case of fires:
 - .1 in boiler air supply casings and exhausts (uptakes); and
 - .2 in scavenging air belts of propulsion machinery,unless the Administration considers this to be unnecessary in a particular case.
- 2 Internal combustion engines of 2250 kW and above or having cylinders of more than 300 mm bore shall be provided with crankcase oil mist detectors or engine bearing temperature monitors or equivalent devices.

Regulation 48

Protection against flooding

1 Bilge wells in periodically unattended machinery spaces shall be located and monitored in such a way that the accumulation of liquids is detected at normal angles of trim and heel, and shall be large enough to accommodate easily the normal drainage during the unattended period.

2 Where the bilge pumps are capable of being started automatically, means shall be provided to indicate when the influx of liquid is greater than the pump capacity or when the pump is operating more frequently than would normally be expected. In these cases, smaller bilge wells to cover a reasonable period of time may be permitted. Where automatically controlled bilge pumps are provided, special attention shall be given to oil pollution prevention requirements.

3 The location of the controls of any valve serving a sea inlet, a discharge below the water-line or a bilge injection system shall be so sited as to allow adequate time for operation in case of influx of water to the space, having regard to the time likely to be required in order to reach and operate such controls. If the level to which the space could become flooded with the ship in the fully loaded condition so requires, arrangements shall be made to operate the controls from a position above such level.

Regulation 49

Control of propulsion machinery from the navigating bridge

1 Under all sailing conditions, including manoeuvring, the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the navigating bridge.

1.1 Such remote control shall be performed by a single control device for each independent propeller, with automatic performance of all associated services, including, where necessary, means of preventing overload of the propulsion machinery.

1.2 The main propulsion machinery shall be provided with an emergency stopping device on the navigating bridge which shall be independent of the navigating bridge control system.

2 Propulsion machinery orders from the navigating bridge shall be indicated in the main machinery control room or at the propulsion machinery control position as appropriate.

3 Remote control of the propulsion machinery shall be possible only from one location at a time; at such locations interconnected control positions are permitted. At each location there shall be an indicator showing which location is in control of the propulsion machinery. The transfer of control between the navigating bridge and machinery spaces shall be possible only in

the machinery space or in the machinery control room. The system shall include means to prevent the propelling thrust from altering significantly when transferring control from one location to another.

4 It shall be possible for all machinery essential for the safe operation of the ship to be controlled from a local position, even in the case of failure in any part of the automatic or remote control systems.

5 The design of the remote automatic control system shall be such that in case of its failure an alarm will be given. Unless the Administration considers it impracticable, the preset speed and direction of thrust shall be maintained until local control is in operation.

6 Indicators shall be fitted on the navigating bridge for:

- .1 propeller speed and direction of rotation in case of fixed pitch propellers; or
- .2 propeller speed and pitch position in case of controllable pitch propellers.

7 The number of consecutive automatic attempts which fail to produce a start shall be limited to safeguard sufficient starting air pressure. An alarm shall be provided to indicate low starting air pressure set at a level which still permits starting operations of the propulsion machinery.

Regulation 50

Communication

A reliable means of vocal communication shall be provided between the main machinery control room or the propulsion machinery control position as appropriate, the navigating bridge and the engineer officers' accommodation.

Regulation 51

Alarm system

1 An alarm system shall be provided indicating any fault requiring attention and shall:

- .1 be capable of sounding an audible alarm in the main machinery control room or at the propulsion machinery control position, and indicate visually each separate alarm function at a suitable position;
- .2 have a connexion to the engineers' public rooms and to each of the engineers' cabins through a selector switch, to ensure connexion to at least one of those cabins. Administrations may permit equivalent arrangements;
- .3 activate an audible and visual alarm on the navigating bridge for any situation which requires action by or attention of the officer on watch;

- .4 as far as is practicable be designed on the fail-to-safety principle; and
- .5 activate the engineers' alarm required by Regulation 38 if an alarm function has not received attention locally within a limited time.

2.1 The alarm system shall be continuously powered and shall have an automatic change-over to a stand-by power supply in case of loss of normal power supply.

2.2 Failure of the normal power supply of the alarm system shall be indicated by an alarm.

3.1 The alarm system shall be able to indicate at the same time more than one fault and the acceptance of any alarm shall not inhibit another alarm.

3.2 Acceptance at the position referred to in paragraph 1 of any alarm condition shall be indicated at the positions where it was shown. Alarms shall be maintained until they are accepted and the visual indications of individual alarms shall remain until the fault has been corrected, when the alarm system shall automatically reset to the normal operating condition.

Regulation 52

Safety systems

A safety system shall be provided to ensure that serious malfunction in machinery or boiler operations, which presents an immediate danger, shall initiate the automatic shut-down of that part of the plant and that an alarm shall be given. Shut-down of the propulsion system shall not be automatically activated except in cases which could lead to serious damage, complete breakdown, or explosion. Where arrangements for overriding the shut-down of the main propelling machinery are fitted, these shall be such as to preclude inadvertent operation. Visual means shall be provided to indicate when the override has been activated.

Regulation 53

Special requirements for machinery, boiler and electrical installations

1 The special requirements for the machinery, boiler and electrical installations shall be to the satisfaction of the Administration and shall include at least the requirements of this Regulation.

2 The main source of electrical power shall comply with the following:

2.1 Where the electrical power can normally be supplied by one generator, suitable load shedding arrangements shall be provided to ensure the integrity of supplies to services required for propulsion and steering as well as the safety of the ship. In the case of loss of the generator in operation, adequate provision shall be made for automatic starting and connecting to the main

switchboard of a stand-by generator of sufficient capacity to permit propulsion and steering and to ensure the safety of the ship with automatic re-starting of the essential auxiliaries including, where necessary, sequential operations. The Administration may dispense with this requirement for a ship of less than 1,600 tons gross tonnage, if it is considered impracticable.

2.2 If the electrical power is normally supplied by more than one generator simultaneously in parallel operation, provision shall be made, for instance by load shedding, to ensure that, in case of loss of one of these generating sets, the remaining ones are kept in operation without overload to permit propulsion and steering, and to ensure the safety of the ship.

3 Where stand-by machines are required for other auxiliary machinery essential to propulsion, automatic change-over devices shall be provided.

4 *Automatic control and alarm system*

4.1 The control system shall be such that the services needed for the operation of the main propulsion machinery and its auxiliaries are ensured through the necessary automatic arrangements.

4.2 An alarm shall be given on the automatic change-over.

4.3 An alarm system complying with Regulation 51 shall be provided for all important pressures, temperatures and fluid levels and other essential parameters.

4.4 A centralized control position shall be arranged with the necessary alarm panels and instrumentation indicating any alarm.

5 Means shall be provided to keep the starting air pressure at the required level where internal combustion engines are used for main propulsion.

Regulation 54

Special consideration in respect of passenger ships

Passenger ships shall be specially considered by the Administration as to whether or not their machinery spaces may be periodically unattended and if so whether additional requirements to those stipulated in these Regulations are necessary to achieve equivalent safety to that of normally attended machinery spaces.

CHAPTER II-2

CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

The existing text of Chapter II-2 is replaced by the following:

PART A – GENERAL

Regulation 1

Application

1.1 Unless expressly provided otherwise, this Chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 September 1984.

1.2 For the purpose of this Chapter the term “a similar stage of construction” means the stage at which:

- .1 construction identifiable with a specific ship begins; and
- .2 assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is less.

1.3 For the purpose of this Chapter:

- .1 the expression “ships constructed” means “ships the keels of which are laid or which are at a similar stage of construction”;
- .2 the expression “all ships” means “ships constructed before, on or after 1 September 1984”;
- .3 a cargo ship, whenever built, which is converted to a passenger ship shall be treated as a passenger ship constructed on the date on which such a conversion commences.

2 Unless expressly provided otherwise:

- .1 for ships constructed before 1 September 1984, the Administration shall ensure that, subject to the provisions of paragraph 2.2, the requirements which are applicable under Chapter II-2 of the International Convention for the Safety of Life at Sea, 1974* to new or existing ships as defined in that Chapter are complied with;
- .2 for tankers constructed before 1 September 1984, the Administration shall ensure that the requirements which are applicable under

* The text as adopted by the International Conference on Safety of Life at Sea, 1974.

Chapter II-2 of the Annex to the Protocol of 1978 relating to the International Convention for the Safety of Life at Sea, 1974, to new or existing ships as defined in that Chapter are complied with.

3 All ships which undergo repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to these ships. Such ships, if constructed before 1 September 1984 shall, as a rule, comply with the requirements for ships constructed on or after that date to at least the same extent as they did before undergoing such repairs, alterations, modifications or outfitting. Repairs, alterations and modifications of a major character and outfitting related thereto shall meet the requirements for ships constructed on or after 1 September 1984 in so far as the Administration deems reasonable and practicable.

4.1 The Administration of a State may, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of this Chapter unreasonable or unnecessary, exempt from those requirements individual ships or classes of ships entitled to fly the flag of that State which, in the course of their voyage, do not proceed more than 20 miles from the nearest land.

4.2 In the case of passenger ships which are employed in special trades for the carriage of large numbers of special trade passengers, such as the pilgrim trade, the Administration of the State whose flag such ships are entitled to fly, if satisfied that it is impracticable to enforce compliance with the requirements of this Chapter, may exempt such ships from those requirements, provided that they comply fully with provisions of:

- .1 the Rules annexed to the Special Trade Passenger Ships Agreement, 1971; and
- .2 the Rules annexed to the Protocol on Space Requirements for Special Trade Passenger Ships, 1973.

Regulation 2

Basic principles

1 The purpose of this Chapter is to require the fullest practicable degree of fire protection, fire detection and fire extinction in ships.

2 The following basic principles underlie the Regulations in this Chapter and are embodied in the Regulations as appropriate, having regard to the type of ships and the potential fire hazard involved:

- .1 division of ship into main vertical zones by thermal and structural boundaries;
- .2 separation of accommodation spaces from the remainder of the ship by thermal and structural boundaries;

- .3 restricted use of combustible materials;
- .4 detection of any fire in the zone of origin;
- .5 containment and extinction of any fire in the space of origin;
- .6 protection of means of escape or access for fire fighting;
- .7 ready availability of fire-extinguishing appliances;
- .8 minimization of possibility of ignition of flammable cargo vapour.

Regulation 3

Definitions

For the purpose of this Chapter, unless expressly provided otherwise:

1 "Non-combustible material" is a material which neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750°C, this being determined to the satisfaction of the Administration by an established test procedure.* Any other material is a combustible material.

2 "A standard fire test" is one in which specimens of the relevant bulkheads or decks are exposed in a test furnace to temperatures corresponding approximately to the standard time-temperature curve. The specimen shall have an exposed surface of not less than 4.65 m² and height (or length of deck) of 2.44 m, resembling as closely as possible the intended construction and including where appropriate at least one joint. The standard time-temperature curve is defined by a smooth curve drawn through the following temperature points measured above the initial furnace temperature:

at the end of the first	5 minutes	556°C
" " " " " "	10 minutes	659°C
" " " " " "	15 minutes	718°C
" " " " " "	30 minutes	821°C
" " " " " "	60 minutes	925°C

3 "'A' class divisions" are those divisions formed by bulkheads and decks which comply with the following:

- .1 they shall be constructed of steel or other equivalent material;
- .2 they shall be suitably stiffened;
- .3 they shall be so constructed as to be capable of preventing the passage of smoke and flame to the end of the one-hour standard fire test;

* Reference is made to Improved Recommendation on Test Method for Qualifying Marine Construction Materials as Non-Combustible, adopted by the Organization by resolution A.472(XII)

- .4 they shall be insulated with approved non-combustible materials such that the average temperature of the unexposed side will not rise more than 139°C above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180°C above the original temperature, within the time listed below:

class "A-60"	60 minutes
class "A-30"	30 minutes
class "A-15"	15 minutes
class "A-0"	0 minutes

- .5 the Administration may require a test of a prototype bulkhead or deck to ensure that it meets the above requirements for integrity and temperature rise.*

4 "B" class divisions" are those divisions formed by bulkheads, decks, ceilings or linings which comply with the following:

- .1 they shall be so constructed as to be capable of preventing the passage of flame to the end of the first half hour of the standard fire test;
- .2 they shall have an insulation value such that the average temperature of the unexposed side will not rise more than 139°C above the original temperature, nor will the temperature at any one point, including any joint, rise more than 225°C above the original temperature, within the time listed below:

class "B-15"	15 minutes
class "B-0"	0 minutes

- .3 they shall be constructed of approved non-combustible materials and all materials entering into the construction and erection of "B" class divisions shall be non-combustible, with the exception that combustible veneers may be permitted provided they meet other requirements of this Chapter;
- .4 the Administration may require a test of a prototype division to ensure that it meets the above requirements for integrity and temperature rise.*

5 "C" class divisions" are divisions constructed of approved non-combustible materials. They need meet neither requirements relative to the passage of smoke and flame nor limitations relative to the temperature rise. Combustible veneers are permitted provided they meet other requirements of this Chapter.

6 "Continuous 'B' class ceilings or linings" are those "B" class ceilings or linings which terminate only at an "A" or "B" class division.

7 "Steel or other equivalent material". Where the words "steel or other equivalent material" occur, "equivalent material" means any non-

* Reference is made to Recommendation for Fire Test Procedures for "A" and "B" Class Divisions, adopted by the Organization by resolutions A.163(ES.IV) and A.215(VII).

combustible material which, by itself or due to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable exposure to the standard fire test (e.g. aluminium alloy with appropriate insulation).

8 "Low flame spread" means that the surface thus described will adequately restrict the spread of flame, this being determined to the satisfaction of the Administration by an established test procedure.

9 "Main vertical zones" are those sections into which the hull, superstructure, and deckhouses are divided by "A" class divisions, the mean length of which on any deck does not in general exceed 40 m.

10 "Accommodation spaces" are those spaces used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, games and hobbies rooms, barber shops, pantries containing no cooking appliances and similar spaces.

11 "Public spaces" are those portions of the accommodation which are used for halls, dining rooms, lounges and similar permanently enclosed spaces.

12 "Service spaces" are those spaces used for galleys, pantries containing cooking appliances, lockers, main and specie rooms, store-rooms, workshops other than those forming part of the machinery spaces, and similar spaces and trunks to such spaces.

13 "Cargo spaces" are all spaces used for cargo (including cargo oil tanks) and trunks to such spaces.

14 "Ro/ro cargo spaces" are spaces not normally subdivided in any way and extending to either a substantial length or the entire length of the ship in which goods (packaged or in bulk, in or on rail or road cars, vehicles (including road or rail tankers), trailers, containers, pallets, demountable tanks or in or on similar stowage units or other receptacles) can be loaded and unloaded normally in a horizontal direction.

15 "Open ro/ro cargo spaces" are ro/ro cargo spaces either open at both ends, or open at one end and provided with adequate natural ventilation effective over their entire length through permanent openings in the side plating or deckhead to the satisfaction of the Administration.

16 "Closed ro/ro cargo spaces" are ro/ro cargo spaces which are neither open ro/ro cargo spaces nor weather decks.

17 "Weather deck" is a deck which is completely exposed to the weather from above and from at least two sides.

18 "Special category spaces" are those enclosed spaces above or below the bulkhead deck intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion, into and from which such vehicles can be driven and to which passengers have access.

19 "Machinery spaces of category A" are those spaces and trunks to such

spaces which contain.

- .1 internal combustion machinery used for main propulsion; or
- .2 internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW; or
- .3 any oil-fired boiler or oil fuel unit.

20 "Machinery spaces" are all machinery spaces of category A and all other spaces containing propulsion machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces.

21 "Oil fuel unit" is the equipment used for the preparation of oil fuel for delivery to an oil-fired boiler, or equipment used for the preparation for delivery of heated oil to an internal combustion engine, and includes any oil pressure pumps, filters and heaters dealing with oil at a pressure of more than 0.18 N/mm².

22 "Control stations" are those spaces in which the ship's radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralized.

23 "Rooms containing furniture and furnishings of restricted fire risk" are, for the purpose of Regulation 26, those rooms containing furniture and furnishings of restricted fire risk (whether cabins, public spaces, offices or other types of accommodation) in which:

- .1 all case furniture such as desks, wardrobes, dressing tables, bureaux, dressers, is constructed entirely of approved non-combustible materials, except that a combustible veneer not exceeding 2 mm may be used on the working surface of such articles;
- .2 all free-standing furniture such as chairs, sofas, tables, is constructed with frames of non-combustible materials;
- .3 all draperies, curtains and other suspended textile materials have, to the satisfaction of the Administration, qualities of resistance to the propagation of flame not inferior to those of wool of mass 0.8 kg/m²;
- .4 all floor coverings have, to the satisfaction of the Administration, qualities of resistance to the propagation of flame not inferior to those of an equivalent woollen material used for the same purpose;
- .5 all exposed surfaces of bulkheads, linings and ceilings have low flame-spread characteristics; and

* Reference is made to Recommendation on Test Method for Determining the Resistance to Flame of Vertically Supported Textiles and Films, adopted by the Organization by resolution A.471(XII).

.6 all upholstered furniture has qualities of resistance to the ignition and propagation of flame to the satisfaction of the Administration.

24 "Bulkhead deck" is the uppermost deck up to which the transverse watertight bulkheads are carried.

25 "Deadweight" is the difference in tonnes between the displacement of a ship in water of a specific gravity of 1.025 at the load water-line corresponding to the assigned summer freeboard and the lightweight of the ship.

26 "Lightweight" is the displacement of a ship in tonnes without cargo, fuel, lubricating oil, ballast water, fresh water and feedwater in tanks, consumable stores, and passengers and crew and their effects.

27 "Combination carrier" is a tanker designed to carry oil or alternatively solid cargoes in bulk.

28 "Crude oil" is any oil occurring naturally in the earth whether or not treated to render it suitable for transportation and includes:

.1 crude oil from which certain distillate fractions may have been removed; and

.2 crude oil to which certain distillate fractions may have been added.

29 "Dangerous goods" are those goods referred to in Regulation VII/2.

30 "Chemical tanker" is a tanker constructed or adapted and used for the carriage in bulk of any liquid product of a flammable nature listed in the summary of minimum requirements of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk to be adopted by the Maritime Safety Committee under the authority of the Assembly of the Organization conferred by resolution A.490(XII), hereinafter referred to as "Bulk Chemical Code", as may be amended by the Organization.

31 "Gas carrier" is a tanker constructed or adapted and used for the carriage in bulk of any liquefied gas or certain other substances of a flammable nature listed in Chapter XIX of the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Organization by resolution A.328(IX), hereinafter referred to as "Gas Carrier Code", as has been or may be amended by the Organization.

Regulation 4

Fire pumps, fire mains, hydrants and hoses

1 Every ship shall be provided with fire pumps, fire mains, hydrants and hoses complying as applicable with the requirements of this Regulation.

2 *Capacity of fire pumps*

2.1 The required fire pumps shall be capable of delivering for fire-fighting

purposes a quantity of water, at the pressure specified in paragraph 4, as follows:

- .1 pumps in passenger ships, not less than two-thirds of the quantity required to be dealt with by the bilge pumps when employed for bilge pumping; and
- .2 pumps in cargo ships, other than any emergency pump, not less than four-thirds of the quantity required under Regulation II-1/21 to be dealt with by each of the independent bilge pumps in a passenger ship of the same dimension when employed in bilge pumping, provided that in no cargo ship need the total required capacity of the fire pumps exceed 180 m³/hour.

2.2 Each of the required fire pumps (other than any emergency pump required in paragraph 3.3.2 for cargo ships) shall have a capacity not less than 80 per cent of the total required capacity divided by the minimum number of required fire pumps but in any case not less than 25 m³/hour and each such pump shall in any event be capable of delivering at least the two required jets of water. These fire pumps shall be capable of supplying the fire main system under the required conditions. Where more pumps than the minimum of required pumps are installed the capacity of such additional pumps shall be to the satisfaction of the Administration.

3 *Arrangements of fire pumps and of fire mains*

3.1 Ships shall be provided with independently driven fire pumps as follows:

- .1 Passenger ships of 4,000 tons gross tonnage and upwards at least three
- .2 Passenger ships of less than 4,000 tons gross tonnage and cargo ships of 1,000 tons gross tonnage and upwards at least two
- .3 Cargo ships of less than 1,000 tons gross tonnage to the satisfaction of the Administration

3.2 Sanitary, ballast, bilge or general service pumps may be accepted as fire pumps, provided that they are not normally used for pumping oil and that if they are subject to occasional duty for the transfer or pumping of oil fuel, suitable change-over arrangements are fitted.

3.3 The arrangement of sea connexions, fire pumps and their sources of power shall be such as to ensure that:

- .1 In passenger ships of 1,000 tons gross tonnage and upwards, in the event of a fire in any one compartment all the fire pumps will not be put out of action.
- .2 In cargo ships of 2,000 tons gross tonnage and upwards if a fire in any one compartment could put all the pumps out of action there shall be an alternative means consisting of a fixed independently driven emergency pump which shall be capable of supplying two jets

of water to the satisfaction of the Administration. The pump and its location shall comply with the following requirements:

- .2.1 The capacity of the pump shall not be less than 40 per cent of the total capacity of the fire pumps required by this Regulation and in any case not less than 25 m³/hour.
- .2.2 When the pump is delivering the quantity of water required by paragraph 3.3.2.1 the pressure at any hydrant shall be not less than the minimum pressures given in paragraph 4.2.
- .2.3 Any diesel driven power source for the pump shall be capable of being readily started in its cold condition down to a temperature of 0°C by hand (manual) cranking. If this is impracticable, or if lower temperatures are likely to be encountered, consideration is to be given to the provision and maintenance of heating arrangements, acceptable to the Administration, so that ready starting will be assured. If hand (manual) starting is impracticable the Administration may permit other means of starting. These means shall be such as to enable the diesel driven power source to be started at least 6 times within a period of 30 minutes, and at least twice within the first 10 minutes.
- .2.4 Any service fuel tank shall contain sufficient fuel to enable the pump to run on full load for at least three hours and sufficient reserves of fuel shall be available outside the main machinery space to enable the pump to be run on full load for an additional 15 hours.
- .2.5 The total suction head of the pump shall not exceed 4.5 m under all conditions of list and trim likely to be encountered in service and the suction piping shall be designed to minimize suction losses.
- .2.6 The boundaries of the space containing the fire pump shall be insulated to a standard of structural fire protection equivalent to that required for a control room in Regulation 44.
- .2.7 No direct access shall be permitted between the machinery space and the space containing the emergency fire pump and its source of power. When this is impracticable an Administration may accept an arrangement where the access is by means of an airlock, each of the two doors being self-closing, or through a watertight door capable of being operated from a space remote from the machinery space and the space containing the emergency fire pump and unlikely to be cut off in the event of fire in those spaces. In such cases a second means of access to the space containing the emergency fire pump and its source of power shall be provided.
- .2.8 Ventilation arrangements to the space containing the independent source of power for the emergency fire pump shall be such as to preclude, as far as practicable, the possibility of smoke from a machinery space fire entering or being drawn into that space.
- .3 In passenger ships of less than 1,000 tons gross tonnage and cargo

ships of less than 2,000 tons gross tonnage, if a fire in any one compartment could put all the pumps out of action the alternative means of providing water for fire-fighting purposes are to the satisfaction of the Administration.

- .4 In addition, in cargo ships where other pumps, such as general service, bilge and ballast, etc., are fitted in a machinery space, arrangements shall be made to ensure that at least one of these pumps, having the capacity and pressure required by paragraphs 2.2 and 4.2, is capable of providing water to the fire main.

3.4 The arrangements for the ready availability of water supply shall be:

- .1 in passenger ships of 1,000 tons gross tonnage and upwards such that at least one effective jet of water is immediately available from any hydrant in an interior location and so as to ensure the continuation of the output of water by the automatic starting of a required fire pump;
- .2 in passenger ships of less than 1,000 tons gross tonnage and in cargo ships to the satisfaction of the Administration;
- .3 in cargo ships with a periodically unattended machinery space or when only one person is required on watch there shall be immediate water delivery from the fire main system at a suitable pressure, either by remote starting of one of the main fire pumps with remote starting from the navigating bridge and fire control station, if any, or permanent pressurization of the fire main system by one of the main fire pumps, except that the Administration may waive this requirement for cargo ships of less than 1,600 tons gross tonnage if the arrangement of the machinery space access makes it unnecessary;
- .4 in passenger ships, if fitted with periodically unattended machinery spaces in accordance with Regulation II-1/54, the Administration shall determine provisions for fixed water fire-extinguishing arrangement for such spaces equivalent to those required for normally attended machinery spaces.

3.5 Relief valves shall be provided in conjunction with all fire pumps if the pumps are capable of developing a pressure exceeding the design pressure of the water service pipes, hydrants and hoses. These valves shall be so placed and adjusted as to prevent excessive pressure in any part of the fire main system.

3.6 In tankers isolation valves shall be fitted in the fire main at poop front in a protected position and on the tank deck at intervals of not more than 40 m to preserve the integrity of the fire main system in case of fire or explosion.

4 *Diameter of and pressure in the fire mains*

4.1 The diameter of the fire main and water service pipes shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously, except that in the case of cargo ships the diameter need only be sufficient for the discharge of 140 m³/hour.

4.2 With the two pumps simultaneously delivering through nozzles specified in paragraph 8 the quantity of water specified in paragraph 4.1, through any adjacent hydrants, the following minimum pressures shall be maintained at all hydrants:

Passenger ships:

4,000 tons gross tonnage and upwards	0.31 N/mm ²
1,000 tons gross tonnage and upwards but under 4,000 tons gross tonnage	0.27 N/mm ²
Under 1,000 tons gross tonnage	To the satisfaction of the Administration

Cargo ships:

6,000 tons gross tonnage and upwards	0.27 N/mm ²
1,000 tons gross tonnage and upwards but under 6,000 tons gross tonnage	0.25 N/mm ²
Under 1,000 tons gross tonnage	To the satisfaction of the Administration

4.3 The maximum pressure at any hydrant shall not exceed that at which the effective control of a fire hose can be demonstrated.

5 *Number and position of hydrants*

5.1 The number and position of hydrants shall be such that at least two jets of water not emanating from the same hydrant, one of which shall be from a single length of hose, may reach any part of the ship normally accessible to the passengers or crew while the ship is being navigated and any part of any cargo space when empty, any ro/ro cargo space or any special category space in which latter case the two jets shall reach any part of such space, each from a single length of hose. Furthermore, such hydrants shall be positioned near the accesses to the protected spaces.

5.2 In the accommodation, service and machinery spaces of passenger ships the number and position of hydrants shall be such that the requirements of paragraph 5.1 may be complied with when all watertight doors and all doors in main vertical zone bulkheads are closed.

5.3 Where, in a passenger ship, access is provided to a machinery space of category A at a low level from an adjacent shaft tunnel, two hydrants shall be provided external to, but near the entrance to that machinery space. Where such access is provided from other spaces, in one of those spaces two hydrants shall be provided near the entrance to the machinery space of category A. Such provision need not be made where the tunnel or adjacent spaces are not part of the escape route.

6 *Pipes and hydrants*

6.1 Materials readily rendered ineffective by heat shall not be used for fire

mains and hydrants unless adequately protected. The pipes and hydrants shall be so placed that the fire hoses may be easily coupled to them. The arrangement of pipes and hydrants shall be such as to avoid the possibility of freezing. In ships where deck cargo may be carried, the positions of the hydrants shall be such that they are always readily accessible and the pipes shall be arranged as far as practicable to avoid risk of damage by such cargo. Unless one hose and nozzle is provided for each hydrant in the ship, there shall be complete interchangeability of hose couplings and nozzles.

6.2 A valve shall be fitted to serve each fire hose so that any fire hose may be removed while the fire pumps are at work.

6.3 Isolating valves to separate the section of the fire main within the machinery space containing the main fire pump or pumps from the rest of the fire main shall be fitted in an easily accessible and tenable position outside the machinery spaces. The fire main shall be so arranged that when the isolating valves are shut all the hydrants on the ship, except those in the machinery space referred to above, can be supplied with water by a fire pump not located in this machinery space through pipes which do not enter this space. Exceptionally, the Administration may permit short lengths of the emergency fire pump suction and discharge piping to penetrate the machinery space if it is impracticable to route it externally provided that the integrity of the fire main is maintained by the enclosure of the piping in a substantial steel casing.

7 *Fire hoses*

7.1 Fire hoses shall be of material approved by the Administration and shall be sufficient in length to project a jet of water to any of the spaces in which they may be required to be used. Their maximum length shall be to the satisfaction of the Administration. Each hose shall be provided with a nozzle and the necessary couplings. Hoses specified in this Chapter as "fire hoses" shall together with any necessary fittings and tools be kept ready for use in conspicuous positions near the water service hydrants or connexions. Additionally in interior locations in passenger ships carrying more than 36 passengers fire hoses shall be connected to the hydrants at all times.

7.2 Ships shall be provided with fire hoses the number and diameter of which shall be to the satisfaction of the Administration.

7.3 In passenger ships there shall be at least one fire hose for each of the hydrants required by paragraph 5 and these hoses shall be used only for the purposes of extinguishing fires or testing the fire-extinguishing apparatus at fire drills and surveys.

7.4.1 In cargo ships of 1,000 tons gross tonnage and upwards the number of fire hoses to be provided shall be one for each 30 m length of the ship and one spare but in no case less than five in all. This number does not include any hoses required in any engine or boiler room. The Administration may increase the number of hoses required so as to ensure that hoses in sufficient number are available and accessible at all times, having regard to the type of ship and the nature of trade in which the ship is employed.

7.4.2 In cargo ships of less than 1,000 tons gross tonnage the number of fire hoses to be provided shall be to the satisfaction of the Administration.

8 *Nozzles*

8.1 For the purposes of this Chapter, standard nozzle sizes shall be 12 mm, 16 mm and 19 mm or as near thereto as possible. Larger diameter nozzles may be permitted at the discretion of the Administration.

8.2 For accommodation and service spaces, a nozzle size greater than 12 mm need not be used.

8.3 For machinery spaces and exterior locations, the nozzle size shall be such as to obtain the maximum discharge possible from two jets at the pressure mentioned in paragraph 4 from the smallest pump, provided that a nozzle size greater than 19 mm need not be used.

8.4 All nozzles shall be of an approved dual purpose type (i.e. spray/jet type) incorporating a shut-off.

9 *Location and arrangement of water pumps, etc., for other fire-extinguishing systems*

Pumps required for the provision of water for other fire-extinguishing systems required by this Chapter, their sources of power and their controls shall be installed outside the space or spaces protected by such systems and shall be so arranged that a fire in the space or spaces protected will not put any such system out of action.

Regulation 5

Fixed gas fire-extinguishing systems

1 *General*

1.1 The use of a fire-extinguishing medium which, in the opinion of the Administration, either by itself or under expected conditions of use gives off toxic gases in such quantities as to endanger persons shall not be permitted.

1.2 The necessary pipes for conveying fire-extinguishing medium into protected spaces shall be provided with control valves so marked as to indicate clearly the spaces to which the pipes are led. Suitable provision shall be made to prevent inadvertent admission of the medium to any space. Where a cargo space fitted with a gas fire-extinguishing system is used as a passenger space the gas connexion shall be blanked during such use.

1.3 The piping for the distribution of fire-extinguishing medium shall be arranged and discharge nozzles so positioned that a uniform distribution of medium is obtained.

1.4 Means shall be provided to close all openings which may admit air to or allow gas to escape from a protected space.

1.5 Where the volume of free air contained in air receivers in any space is such that, if released in such space in the event of fire, such release of air

within that space would seriously affect the efficiency of the fixed fire-extinguishing system, the Administration shall require the provision of an additional quantity of fire-extinguishing medium.

1.6 Means shall be provided for automatically giving audible warning of the release of fire-extinguishing medium into any space in which personnel normally work or to which they have access. The alarm shall operate for a suitable period before the medium is released.

1.7 The means of control of any fixed gas fire-extinguishing system shall be readily accessible and simple to operate and shall be grouped together in as few locations as possible at positions not likely to be cut off by a fire in a protected space. At each location there shall be clear instructions relating to the operation of the system having regard to the safety of personnel.

1.8 Automatic release of fire-extinguishing medium shall not be permitted, except as permitted by paragraph 3.3.5 and in respect of local automatically operated units referred to in paragraphs 3.4 and 3.5.

1.9 Where the quantity of extinguishing medium is required to protect more than one space, the quantity of medium available need not be more than the largest quantity required for any one space so protected.

1.10 Except as otherwise permitted by paragraphs 3.3, 3.4 or 3.5 pressure containers required for the storage of fire-extinguishing medium, other than steam, shall be located outside protected spaces in accordance with paragraph 1.13.

1.11 Means shall be provided for the crew to safely check the quantity of medium in the containers.

1.12 Containers for the storage of fire-extinguishing medium and associated pressure components shall be designed to pressure codes of practice to the satisfaction of the Administration having regard to their locations and maximum ambient temperatures expected in service.

1.13 When the fire-extinguishing medium is stored outside a protected space, it shall be stored in a room which shall be situated in a safe and readily accessible position and shall be effectively ventilated to the satisfaction of the Administration. Any entrance to such a storage room shall preferably be from the open deck and in any case shall be independent of the protected space. Access doors shall open outwards, and bulkheads and decks including doors and other means of closing any opening therein, which form the boundaries between such rooms and adjoining enclosed spaces shall be gastight. For the purpose of the application of the integrity tables in Regulations 26, 27, 44 and 58, such storage rooms shall be treated as control stations.

1.14 Spare parts for the system shall be stored on board and be to the satisfaction of the Administration.

2 *Carbon dioxide systems*

2.1 For cargo spaces the quantity of carbon dioxide available shall, unless

otherwise provided, be sufficient to give a minimum volume of free gas equal to 30 per cent of the gross volume of the largest cargo space so protected in the ship.

2.2 For machinery spaces the quantity of carbon dioxide carried shall be sufficient to give a minimum quantity of free gas equal to the larger of the following quantities, either:

- .1 40 per cent of the gross volume of the largest machinery space so protected, the volume to exclude that part of the casing above the level at which the horizontal area of the casing is 40 per cent or less of the horizontal area of the space concerned taken midway between the tank top and the lowest part of the casing; or
- .2 35 per cent of the gross volume of the largest machinery space protected, including the casing;

provided that the above-mentioned percentages may be reduced to 35 per cent and 30 per cent respectively for cargo ships of less than 2,000 tons gross tonnage; provided also that if two or more machinery spaces are not entirely separate they shall be considered as forming one space.

2.3 For the purpose of this paragraph the volume of free carbon dioxide shall be calculated at 0.56 m³/kg.

2.4 For machinery spaces the fixed piping system shall be such that 85 per cent of the gas can be discharged into the space within 2 minutes.

3 *Halogenated hydrocarbon systems*

3.1 The use of halogenated hydrocarbons as fire-extinguishing media is only permitted in machinery spaces, pumprooms and in cargo spaces intended solely for the carriage of vehicles which are not carrying any cargo.

3.2 When halogenated hydrocarbons are used as the fire-extinguishing media in total flooding systems:

- .1 The system shall be arranged for manual initiation of power release only.
- .2 If the charge of halogenated hydrocarbon is required to supply more than one space, the arrangements for its storage and release shall be such that compliance with paragraphs 3.2.9 or 3.2.10 respectively, is obtained.
- .3 Means shall be provided for automatically stopping all ventilation fans serving the protected space before the medium is released.
- .4 Means shall be provided to manually close all dampers in the ventilation system serving a protected space.
- .5 The discharge arrangements shall be so designed that the minimum quantity of medium required for cargo spaces or machinery spaces in paragraphs 3.2.9 or 3.2.10 respectively can be substantially discharged in a nominal 20 seconds or less based on the discharge of

the liquid phase.

- .6 The system shall be designed to operate within a temperature range to the satisfaction of the Administration.
- .7 The discharge shall not endanger personnel engaged on maintenance of equipment or using the normal access ladders and escapes serving the space.
- .8 Means shall be provided for the crew to safely check the pressure within containers.
- .9 The quantity of extinguishing medium for cargo spaces intended solely for the carriage of vehicles which are not carrying any cargo shall be calculated in accordance with table 5.1. This quantity shall be based on the gross volume of the protected space. In respect of Halon 1301 and 1211, the quantity shall be calculated on a volumetric ratio basis, and in respect of Halon 2402 on a mass per unit volume basis.

TABLE 5.1

Halon	Minimum	Maximum
1301	5 per cent	7 per cent
1211	5 per cent	5.5 per cent
2402	0.23 kg/m ³	0.30 kg/m ³

- .10 The quantity of extinguishing media for machinery spaces shall be calculated in accordance with table 5.2. This quantity shall be based on the gross volume of the space in respect of the minimum concentration and the net volume of the space in respect of the maximum concentration, including the casing. In respect of Halon 1301 and 1211, the quantity shall be calculated on a volumetric ratio basis, and in respect of Halon 2402 on a mass per unit volume basis.

TABLE 5.2

Halon	Minimum	Maximum
1301	4.25 per cent	7 per cent
1211	4.25 per cent	5.5 per cent
2402	0.20 kg/m ³	0.30 kg/m ³

- .11 For the purpose of paragraphs 3.2.9 and 3.2.10, the volume of Halon 1301 shall be calculated at 0.16 m³/kg and the volume of Halon 1211 shall be calculated at 0.14 m³/kg.

3.3 Only Halon 1301 may be stored within a protected machinery space. Containers shall be individually distributed throughout that space and the following requirements shall be complied with:

- .1 A manually initiated power release, located outside the protected space, shall be provided. Duplicate sources of power shall be provided for this release and shall be located outside the protected space and be immediately available except that for machinery spaces, one of the sources of power may be located inside the protected space.
- .2 Electric power circuits connecting the containers shall be monitored for fault conditions and loss of power. Visual and audible alarms shall be provided to indicate this.
- .3 Pneumatic or hydraulic power circuits connecting the containers shall be duplicated. The sources of pneumatic or hydraulic pressure shall be monitored for loss of pressure. Visual and audible alarms shall be provided to indicate this.
- .4 Within the protected space, electrical circuits essential for the release of the system shall be heat resistant e.g. mineral insulated cable or equivalent. Piping systems essential for the release of systems designed to be operated hydraulically or pneumatically shall be of steel or other equivalent heat-resisting material to the satisfaction of the Administration.
- .5 Each pressure container shall be fitted with an automatic over-pressure release device which, in the event of the container being exposed to the effects of fire and the system not being operated, will safely vent the contents of the container into the protected space.
- .6 The arrangement of containers and the electrical circuits and piping essential for the release of any system shall be such that in the event of damage to any one power release line through fire or explosion in a protected space, i.e. a single fault concept, at least two-thirds of the fire-extinguishing charge required by paragraphs 3.2.9 or 3.2.10 for that space can still be discharged having regard to the requirement for uniform distribution of medium throughout the space. The arrangements in respect of systems for spaces requiring only one or two containers shall be to the satisfaction of the Administration.
- .7 Not more than two discharge nozzles shall be fitted to any pressure container and the maximum quantity of agent in each container shall be to the satisfaction of the Administration having regard to the requirement for uniform distribution of medium throughout the space.
- .8 The containers shall be monitored for decrease in pressure due to leakage and discharge. Visual and audible alarms in the protected area and on the navigating bridge or in the space where the fire control equipment is centralized shall be provided to indicate this condition, except that for cargo spaces, alarms are only required on the navigating bridge or the space where the fire control equipment is centralized.

3.4 Local automatically operated fixed fire-extinguishing units containing Halon 1301 or 1211, fitted in enclosed areas of high fire risk within machinery

spaces, in addition to, and independent of, any required fixed fire-extinguishing system may be accepted subject to compliance with the following:

- .1 The space in which such additional local protection is provided shall preferably be on one working level and on the same level as the access. At the discretion of the Administration more than one working level may be permitted subject to an access being provided on each level.
- .2 The size of the space and arrangements of accesses thereto and machinery therein, shall be such that escape from anywhere in the space can be effected in not more than 10 seconds.
- .3 The operation of any unit shall be signalled both visually and audibly outside each access to the machinery space and at the navigating bridge or in the space where the fire control equipment is centralized.
- .4 A notice indicating that the space contains one or more automatically operated fire-extinguishing units and stating which medium is used, shall be displayed outside each access thereto.
- .5 Discharge nozzles shall be so positioned that the discharge does not endanger personnel using the normal access ladders and escapes serving the compartment. Provision shall also be made to protect personnel engaged in maintenance of machinery from inadvertent discharge of the medium.
- .6 The fire-extinguishing units shall be designed to operate within a temperature range to the satisfaction of the Administration.
- .7 Means shall be provided for the crew to safely check the pressure within the containers.
- .8 The total quantity of extinguishing medium provided in the local automatically operated units shall be such that a concentration of 7 per cent in respect of Halon 1301 and 5.5 per cent in respect of Halon 1211 at 20°C based on the net volume of the enclosed space is not exceeded. This requirement applies when either a local automatically operated unit or a fixed system fitted in compliance with paragraph 3.2 has operated, but not when both have operated. The volume of Halon 1301 shall be calculated at 0.16 m³/kg and the volume of Halon 1211 shall be calculated at 0.14 m³/kg.
- .9 The time of discharge of a unit, based on the discharge of the liquid phase, shall be 10 seconds or less.
- .10 The arrangement of local automatically operated fire-extinguishing units shall be such that their release does not result in loss of electrical power or reduction of the manoeuvrability of the ship.

3.5 Automatically operated fire-extinguishing units, as described in paragraph 3.4, fitted in machinery spaces over equipment having a high fire risk, in addition to and independent of any required fixed fire-extinguishing system, may be accepted subject to compliance with paragraphs 3.4.3 to

3.4.6, 3.4.9 and 3.4.10 and with the following:

- 1 The quantity of medium provided in local automatically operated units shall be such that a vapour in air concentration not greater than 1.25 per cent at 20°C based on the gross volume of the machinery space is obtained in the event of their simultaneous operation.
- 2 The volume of Halon 1301 shall be calculated at 0.16 m³/kg and the volume of Halon 1211 shall be calculated at 0.14 m³/kg.

4 *Steam systems*

In general, the Administration shall not permit the use of steam as a fire-extinguishing medium in fixed fire-extinguishing systems. Where the use of steam is permitted by the Administration it shall be used only in restricted areas as an addition to the required fire-extinguishing medium and with the proviso that the boiler or boilers available for supplying steam shall have an evaporation of at least 1.0 kg of steam per hour for each 0.75 m³ of the gross volume of the largest space so protected. In addition to complying with the foregoing requirements the systems in all respects shall be as determined by, and to the satisfaction of, the Administration.

5 *Other gas systems*

5.1 Where gas other than carbon dioxide or halogenated hydrocarbons, or steam as permitted by paragraph 4 is produced on the ship and is used as a fire-extinguishing medium, it shall be a gaseous product of fuel combustion in which the oxygen content, the carbon monoxide content, the corrosive elements and any solid combustible elements have been reduced to a permissible minimum.

5.2 Where such gas is used as the fire-extinguishing medium in a fixed fire-extinguishing system for the protection of machinery spaces it shall afford protection equivalent to that provided by a fixed system using carbon dioxide as the medium.

5.3 Where such gas is used as a fire-extinguishing medium in a fixed fire-extinguishing system for the protection of cargo spaces, a sufficient quantity of such gas shall be available to supply hourly a volume of free gas at least equal to 25 per cent of the gross volume of the largest space protected in this way for a period of 72 hours.

Regulation 6

Fire extinguishers

1 All fire extinguishers shall be of approved types and designs.

1.1 The capacity of required portable fluid extinguishers shall be not more than 13.5 ℓ and not less than 9 ℓ. Other extinguishers shall be at least as portable as the 13.5 ℓ fluid extinguisher and shall have a fire-extinguishing capability at least equivalent to that of a 9 ℓ fluid extinguisher.

1.2 The Administration shall determine the equivalents of fire extinguishers.

2 Spare charges shall be provided in accordance with requirements to be specified by the Administration.

3 Fire extinguishers containing an extinguishing medium which, in the opinion of the Administration, either by itself or under expected conditions of use gives off toxic gases in such quantities as to endanger persons shall not be permitted.

4 A portable foam applicator unit shall consist of an air-foam nozzle of an inductor type capable of being connected to the fire main by a fire hose, together with a portable tank containing at least 20 ℓ of foam-making liquid and one spare tank. The nozzle shall be capable of producing effective foam suitable for extinguishing an oil fire, at the rate of at least 1.5 m³/minute.

5 Fire extinguishers shall be periodically examined and subjected to such tests as the Administration may require.

6 One of the portable fire extinguishers intended for use in any space shall be stowed near the entrance to that space.

7 Accommodation spaces, service spaces and control stations shall be provided with portable fire extinguishers of appropriate types and in sufficient number to the satisfaction of the Administration. Ships of 1,000 tons gross tonnage and upwards shall carry at least five portable fire extinguishers.

Regulation 7

Fire-extinguishing arrangements in machinery spaces

1 Spaces containing oil-fired boilers or oil fuel units

1.1 Machinery spaces of category A containing oil-fired boilers or oil fuel units shall be provided with any one of the following fixed fire-extinguishing systems:

- .1 a gas system complying with the provisions of Regulation 5;
- .2 a high expansion foam system complying with the provisions of Regulation 9;
- .3 a pressure water-spraying system complying with the provisions of Regulation 10.

In each case if the engine and boiler rooms are not entirely separate, or if fuel oil can drain from the boiler room into the engine room, the combined engine and boiler rooms shall be considered as one compartment.

1.2 There shall be in each boiler room at least one set of portable air-foam equipment complying with the provisions of Regulation 6.4.

1.3 There shall be at least two portable foam extinguishers or equivalent in each firing space in each boiler room and in each space in which a part of the oil fuel installation is situated. There shall be not less than one approved foam-type extinguisher of at least 135 ℓ capacity or equivalent in each boiler room. These extinguishers shall be provided with hoses on reels suitable for reaching any part of the boiler room. In the case of domestic boilers of less than 175 kW in cargo ships the Administration may consider relaxing the requirements of this paragraph.

1.4 In each firing space there shall be a receptacle containing sand, sawdust impregnated with soda, or other approved dry material in such quantity as may be required by the Administration. An approved portable extinguisher may be substituted as an alternative.

2 *Spaces containing internal combustion machinery*

Machinery spaces of category A containing internal combustion machinery shall be provided with:

- .1 One of the fire-extinguishing systems required by paragraph 1.1.
- .2 At least one set of portable air-foam equipment complying with the provisions of Regulation 6.4.
- .3 In each such space approved foam type fire extinguishers, each of at least 45 ℓ capacity or equivalent, sufficient in number to enable foam or its equivalent to be directed on to any part of the fuel and lubricating oil pressure systems, gearing and other fire hazards. In addition, there shall be provided a sufficient number of portable foam extinguishers or equivalent which shall be so located that no point in the space is more than 10 m walking distance from an extinguisher and that there are at least two such extinguishers in each such space. For smaller spaces of cargo ships the Administration may consider relaxing this requirement.

3 *Spaces containing steam turbines or enclosed steam engines*

In spaces containing steam turbines or enclosed steam engines used either for main propulsion or for other purposes when such machinery has in the aggregate a total power output of not less than 375 kW there shall be provided:

- .1 Approved foam fire extinguishers each of at least 45 ℓ capacity or equivalent sufficient in number to enable foam or its equivalent to be directed on to any part of the pressure lubrication system, on to any part of the casings enclosing pressure lubricated parts of the turbines, engines or associated gearing, and any other fire hazards. However, such extinguishers shall not be required if protection at least equivalent to that required by this sub-paragraph is provided in such spaces by a fixed fire-extinguishing system fitted in compliance with paragraph 1.1.
- .2 A sufficient number of portable foam extinguishers or equivalent which shall be so located that no point in the space is more than 10 m walking distance from an extinguisher and that there are at

least two such extinguishers in each such space, except that such extinguishers shall not be required in addition to any provided in compliance with paragraph 1.3.

- .3 One of the fire-extinguishing systems required by paragraph 1.1, where such spaces are periodically unattended.

4 *Fire-extinguishing appliances in other machinery spaces*

Where, in the opinion of the Administration, a fire hazard exists in any machinery space for which no specific provisions for fire-extinguishing appliances are prescribed in paragraphs 1, 2 and 3, there shall be provided in, or adjacent to, that space such a number of approved portable fire extinguishers or other means of fire extinction as the Administration may deem sufficient.

5 *Fixed fire-extinguishing systems not required by this Chapter*

Where a fixed fire-extinguishing system not required by this Chapter is installed, such a system shall be to the satisfaction of the Administration.

6 *Machinery spaces of category A in passenger ships*

In passenger ships carrying more than 36 passengers each machinery space of category A shall be provided with at least two suitable water fog applicators.*

Regulation 8

Fixed low-expansion foam fire-extinguishing systems in machinery spaces

1 Where in any machinery space a fixed low-expansion foam fire-extinguishing system is fitted in addition to the requirements of Regulation 7, such system shall be capable of discharging through fixed discharge outlets in not more than five minutes a quantity of foam sufficient to cover to a depth of 150 mm the largest single area over which oil fuel is liable to spread. The system shall be capable of generating foam suitable for extinguishing oil fires. Means shall be provided for effective distribution of the foam through a permanent system of piping and control valves or cocks to suitable discharge outlets, and for the foam to be effectively directed by fixed sprayers on other main fire hazards in the protected space. The expansion ratio of the foam shall not exceed 12 to 1.

2 The means of control of any such systems shall be readily accessible and simple to operate and shall be grouped together in as few locations as possible at positions not likely to be cut off by a fire in the protected space.

* A water fog applicator might consist of a metal "L"-shaped pipe, the long limb being about 2 m in length capable of being fitted to a fire hose and the short limb being about 250 mm in length fitted with a fixed water fog nozzle or capable of being fitted with a water spray nozzle.

Regulation 9

Fixed high-expansion foam fire-extinguishing systems in machinery spaces

1.1 Any required fixed high-expansion foam system in machinery spaces shall be capable of rapidly discharging through fixed discharge outlets a quantity of foam sufficient to fill the greatest space to be protected at a rate of at least 1 m in depth per minute. The quantity of foam-forming liquid available shall be sufficient to produce a volume of foam equal to five times the volume of the largest space to be protected. The expansion ratio of the foam shall not exceed 1,000 to 1.

1.2 The Administration may permit alternative arrangements and discharge rates provided that it is satisfied that equivalent protection is achieved.

2 Supply ducts for delivering foam, air intakes to the foam generator and the number of foam-producing units shall in the opinion of the Administration be such as will provide effective foam production and distribution.

3 The arrangement of the foam generator delivery ducting shall be such that a fire in the protected space will not affect the foam generating equipment.

4 The foam generator, its sources of power supply, foam-forming liquid and means of controlling the system shall be readily accessible and simple to operate and shall be grouped in as few locations as possible at positions not likely to be cut off by a fire in the protected space.

Regulation 10

Fixed pressure water-spraying fire-extinguishing systems in machinery spaces

1 Any required fixed pressure water-spraying fire-extinguishing system in machinery spaces shall be provided with spraying nozzles of an approved type.

2 The number and arrangement of the nozzles shall be to the satisfaction of the Administration and shall be such as to ensure an effective average distribution of water of at least 5 ℓ/m² per minute in the spaces to be protected. Where increased application rates are considered necessary, these shall be to the satisfaction of the Administration. Nozzles shall be fitted above bilges, tank tops and other areas over which oil fuel is liable to spread and also above other specific fire hazards in the machinery spaces.

3 The system may be divided into sections, the distribution valves of which shall be operated from easily accessible positions outside the spaces to be protected and will not be readily cut off by a fire in the protected space.

4 The system shall be kept charged at the necessary pressure and the pump supplying the water for the system shall be put automatically into action

by a pressure drop in the system.

5 The pump shall be capable of simultaneously supplying at the necessary pressure all sections of the system in any one compartment to be protected. The pump and its controls shall be installed outside the space or spaces to be protected. It shall not be possible for a fire in the space or spaces protected by the water-spraying system to put the system out of action.

6 The pump may be driven by independent internal combustion machinery but, if it is dependent upon power being supplied from the emergency generator fitted in compliance with the provisions of Regulation II-1/44 or Regulation II-1/45, as appropriate, that generator shall be so arranged as to start automatically in case of main power failure so that power for the pump required by paragraph 5 is immediately available. When the pump is driven by independent internal combustion machinery it shall be so situated that a fire in the protected space will not affect the air supply to the machinery.

7 Precautions shall be taken to prevent the nozzles from becoming clogged by impurities in the water or corrosion of piping, nozzles, valves and pump.

Regulation 11

Special arrangements in machinery spaces

1 The provisions of this Regulation shall apply to machinery spaces of category A and, where the Administration considers it desirable, to other machinery spaces.

2.1 The number of skylights, doors, ventilators, openings in funnels to permit exhaust ventilation and other openings to machinery spaces shall be reduced to a minimum consistent with the needs of ventilation and the proper and safe working of the ship.

2.2 Skylights shall be of steel and shall not contain glass panels. Suitable arrangements shall be made to permit the release of smoke in the event of fire, from the space to be protected.

2.3 In passenger ships, doors other than power-operated watertight doors, shall be so arranged that positive closure is assured in case of fire in the space, by power-operated closing arrangements or by the provision of self-closing doors capable of closing against an inclination of 3.5° opposing closure and having a fail-safe hook-back facility, provided with a remotely operated release device.

3 Windows shall not be fitted in machinery space boundaries. This does not preclude the use of glass in control rooms within the machinery spaces.

4 Means of control shall be provided for:

- .1 opening and closure of skylights, closure of openings in funnels which normally allow exhaust ventilation, and closure of ventilator dampers;

- .2 permitting the release of smoke;
- .3 closing power-operated doors or actuating release mechanism on doors other than power-operated watertight doors;
- .4 stopping ventilating fans; and
- .5 stopping forced and induced draught fans, oil fuel transfer pumps, oil fuel unit pumps and other similar fuel pumps.

5 The controls required in paragraph 4 and in Regulation 15.2.5 shall be located outside the space concerned, where they will not be cut off in the event of fire in the space they serve. In passenger ships such controls and the controls for any required fire-extinguishing system shall be situated at one control position or grouped in as few positions as possible to the satisfaction of the Administration. Such positions shall have a safe access from the open deck.

6 When access to any machinery space of category A is provided at a low level from an adjacent shaft tunnel, there shall be provided in the shaft tunnel, near the watertight door, a light steel fire-screen door operable from each side.

7 For periodically unattended machinery spaces in cargo ships, the Administration shall give special consideration to maintaining fire integrity of the machinery spaces, the location and centralization of the fire-extinguishing system controls, the required shut-down arrangements (e.g. ventilation, fuel pumps, etc.) and may require additional fire-extinguishing appliances and other fire-fighting equipment and breathing apparatus. In passenger ships these requirements shall be at least equivalent to those of machinery spaces normally attended.

8 An approved automatic fire detection and alarm system complying with the provisions of Regulation 14 shall be fitted in any machinery space:

- .1 where the installation of automatic and remote control systems and equipment has been approved in lieu of continuous manning of the space; and
- .2 where the main propulsion and associated machinery including sources of main electrical supply are provided with various degrees of automatic or remote control and are under continuous manned supervision from a control room.

Regulation 12

Automatic sprinkler, fire detection and fire alarm systems

1.1 Any required automatic sprinkler, fire detection and fire alarm system shall be capable of immediate operation at all times and no action by the crew shall be necessary to set it in operation. It shall be of the wet pipe type but small exposed sections may be of the dry pipe type where in the opinion of the Administration this is a necessary precaution. Any parts of the system which

may be subjected to freezing temperatures in service shall be suitably protected against freezing. It shall be kept charged at the necessary pressure and shall have provision for a continuous supply of water as required in this Regulation.

1.2 Each section of sprinklers shall include means for giving a visual and audible alarm signal automatically at one or more indicating units whenever any sprinkler comes into operation. Such alarm systems shall be such as to indicate if any fault occurs in the system.

1.2.1 In passenger ships such units shall give an indication of any fire and its location in any space served by the system and shall be centralized on the navigating bridge or in the main fire control station, which shall be so manned or equipped as to ensure that any alarm from the system is immediately received by a responsible member of the crew.

1.2.2 In cargo ships such units shall indicate in which section served by the system fire has occurred and shall be centralized on the navigating bridge and in addition, visible and audible alarms from the unit shall be placed in a position other than on the navigating bridge, so as to ensure that the indication of fire is immediately received by the crew.

2.1 Sprinklers shall be grouped into separate sections, each of which shall contain not more than 200 sprinklers. In passenger ships any section of sprinklers shall not serve more than two decks and shall not be situated in more than one main vertical zone. However, the Administration may permit such a section of sprinklers to serve more than two decks or be situated in more than one main vertical zone, if it is satisfied that the protection of the ship against fire will not thereby be reduced.

2.2 Each section of sprinklers shall be capable of being isolated by one stop valve only. The stop valve in each section shall be readily accessible and its location shall be clearly and permanently indicated. Means shall be provided to prevent the operation of the stop valves by any unauthorized person.

2.3 A gauge indicating the pressure in the system shall be provided at each section stop valve and at a central station.

2.4 The sprinklers shall be resistant to corrosion by marine atmosphere. In accommodation and service spaces the sprinklers shall come into operation within the temperature range from 68° to 79°C, except that in locations such as drying rooms, where high ambient temperatures might be expected, the operating temperature may be increased by not more than 30°C above the maximum deckhead temperature.

2.5 A list or plan shall be displayed at each indicating unit showing the spaces covered and the location of the zone in respect of each section. Suitable instructions for testing and maintenance shall be available.

3 Sprinklers shall be placed in an overhead position and spaced in a suitable pattern to maintain an average application rate of not less than 5 ℓ/m² per minute over the nominal area covered by the sprinklers. However, the Administration may permit the use of sprinklers providing such an alternative amount of water suitably distributed as has been shown to the satisfaction of

the Administration to be not less effective.

4.1 A pressure tank having a volume equal to at least twice that of the charge of water specified in this sub-paragraph shall be provided. The tank shall contain a standing charge of fresh water, equivalent to the amount of water which would be discharged in one minute by the pump referred to in paragraph 5.2, and the arrangements shall provide for maintaining an air pressure in the tank such as to ensure that where the standing charge of fresh water in the tank has been used the pressure will be not less than the working pressure of the sprinkler, plus the pressure exerted by a head of water measured from the bottom of the tank to the highest sprinkler in the system. Suitable means of replenishing the air under pressure and of replenishing the fresh water charge in the tank shall be provided. A glass gauge shall be provided to indicate the correct level of the water in the tank.

4.2 Means shall be provided to prevent the passage of sea-water into the tank.

5.1 An independent power pump shall be provided solely for the purpose of continuing automatically the discharge of water from the sprinklers. The pump shall be brought into action automatically by the pressure drop in the system before the standing fresh water charge in the pressure tank is completely exhausted.

5.2 The pump and the piping system shall be capable of maintaining the necessary pressure at the level of the highest sprinkler to ensure a continuous output of water sufficient for the simultaneous coverage of a minimum area of 280 m² at the application rate specified in paragraph 3.

5.3 The pump shall have fitted on the delivery side a test valve with a short open-ended discharge pipe. The effective area through the valve and pipe shall be adequate to permit the release of the required pump output while maintaining the pressure in the system specified in paragraph 4.1.

5.4 The sea inlet to the pump shall wherever possible be in the space containing the pump and shall be so arranged that when the ship is afloat it will not be necessary to shut off the supply of sea-water to the pump for any purpose other than the inspection or repair of the pump.

6 The sprinkler pump and tank shall be situated in a position reasonably remote from any machinery space of category A and shall not be situated in any space required to be protected by the sprinkler system.

7.1 In passenger ships there shall be not less than two sources of power supply for the sea-water pump and automatic alarm and detection system. Where the sources of power for the pump are electrical, these shall be a main generator and an emergency source of power. One supply for the pump shall be taken from the main switchboard, and one from the emergency switchboard by separate feeders reserved solely for that purpose. The feeders shall be so arranged as to avoid galleys, machinery spaces and other enclosed spaces of high fire risk except in so far as it is necessary to reach the appropriate switchboards, and shall be run to an automatic change-over switch situated near the sprinkler pump. This switch shall permit the supply of power from the main switchboard so long as a supply is available therefrom,

and be so designed that upon failure of that supply it will automatically change over to the supply from the emergency switchboard. The switches on the main switchboard and the emergency switchboard shall be clearly labelled and normally kept closed. No other switch shall be permitted in the feeders concerned. One of the sources of power supply for the alarm and detection system shall be an emergency source. Where one of the sources of power for the pump is an internal combustion engine it shall, in addition to complying with the provisions of paragraph 6, be so situated that a fire in any protected space will not affect the air supply to the machinery.

7.2 In cargo ships there shall not be less than two sources of power supply for the sea-water pump and automatic alarm and detection system. If the pump is electrically driven it shall be connected to the main source of electrical power, which shall be capable of being supplied by at least two generators. The feeders shall be so arranged as to avoid galleys, machinery spaces and other enclosed spaces of high fire risk except in so far as it is necessary to reach the appropriate switchboards. One of the sources of power supply for the alarm and detection system shall be an emergency source. Where one of the sources of power for the pump is an internal combustion engine it shall, in addition to complying with the provisions of paragraph 6, be so situated that a fire in any protected space will not affect the air supply to the machinery.

8 The sprinkler system shall have a connexion from the ship's fire main by way of a lockable screw-down non-return valve at the connexion which will prevent a backflow from the sprinkler system to the fire main.

9.1 A test valve shall be provided for testing the automatic alarm for each section of sprinklers by a discharge of water equivalent to the operation of one sprinkler. The test valve for each section shall be situated near the stop valve for that section.

9.2 Means shall be provided for testing the automatic operation of the pump on reduction of pressure in the system.

9.3 Switches shall be provided at one of the indicating positions referred to in paragraph 1.2 which will enable the alarm and the indicators for each section of sprinklers to be tested.

10 Spare sprinkler heads shall be provided for each section of sprinklers to the satisfaction of the Administration.

Regulation 13

Fixed fire detection and fire alarm systems

1 General requirements

1.1 Any required fixed fire detection and fire alarm system with manually operated call points shall be capable of immediate operation at all times.

1.2 Power supplies and electric circuits necessary for the operation of the system shall be monitored for loss of power or fault conditions as appropriate.

Occurrence of a fault condition shall initiate a visual and audible fault signal at the control panel which shall be distinct from a fire signal.

1.3 There shall be not less than two sources of power supply for the electrical equipment used in the operation of the fire detection and fire alarm system, one of which shall be an emergency source. The supply shall be provided by separate feeders reserved solely for that purpose. Such feeders shall run to an automatic change-over switch situated in or adjacent to the control panel for the fire detection system.

1.4 Detectors and manually operated call points shall be grouped into sections. The activation of any detector or manually operated call point shall initiate a visual and audible fire signal at the control panel and indicating units. If the signals have not received attention within two minutes an audible alarm shall be automatically sounded throughout the crew accommodation and service spaces, control stations and machinery spaces of category A. This alarm sounder system need not be an integral part of the detection system.

1.5 The control panel shall be located on the navigating bridge or in the main fire control station.

1.6 Indicating units shall denote the section in which a detector or manually operated call point has operated. At least one unit shall be so located that it is easily accessible to responsible members of the crew at all times, when at sea or in port except when the ship is out of service. One indicating unit shall be located on the navigating bridge if the control panel is located in the main fire control station.

1.7 Clear information shall be displayed on or adjacent to each indicating unit about the spaces covered and the location of the sections.

1.8 No section covering more than one deck within accommodation, service and control stations shall normally be permitted except a section which covers an enclosed stairway. In order to avoid delay in identifying the source of fire, the number of enclosed spaces included in each section shall be limited as determined by the Administration. In no case shall more than fifty enclosed spaces be permitted in any section.

1.9 In passenger ships a section of detectors shall not serve spaces on both sides of the ship nor on more than one deck and neither shall it be situated in more than one main vertical zone except that the Administration, if it is satisfied that the protection of the ship against fire will not thereby be reduced, may permit such a section of detectors to serve both sides of the ship and more than one deck.

1.10 A section of fire detectors which covers a control station, a service space or an accommodation space shall not include a machinery space of category A.

1.11 Detectors shall be operated by heat, smoke or other products of combustion, flame, or any combination of these factors. Detectors operated by other factors indicative of incipient fires may be considered by the Administration provided that they are no less sensitive than such detectors. Flame detectors shall only be used in addition to smoke or heat detectors.

1.12 Suitable instructions and components spares for testing and maintenance shall be provided.

1.13 The function of the detection system shall be periodically tested to the satisfaction of the Administration by means of equipment producing hot air at the appropriate temperature, or smoke or aerosol particles having the appropriate range of density or particle size, or other phenomena associated with incipient fires to which the detector is designed to respond. All detectors shall be of a type such that they can be tested for correct operation and restored to normal surveillance without the renewal of any component.

1.14 The fire detection system shall not be used for any other purpose, except that closing of fire doors and similar functions may be permitted at the control panel.

2 *Installation requirements*

2.1 Manual call points shall be installed throughout the accommodation spaces, service spaces and control stations. One manual call point shall be located at each exit. Manual call points shall be readily accessible in the corridors of each deck such that no part of the corridor is more than 20 m from a manual call point.

2.2 Smoke detectors shall be installed in all stairways, corridors and escape routes within accommodation spaces. Consideration shall be given to the installation of special purpose smoke detectors within ventilation ducting.

2.3 Where a fixed fire detection and fire alarm system is required for the protection of spaces other than those specified in paragraph 2.2, at least one detector complying with paragraph 1.11 shall be installed in each such space.

2.4 Detectors shall be located for optimum performance. Positions near beams and ventilation ducts or other positions where patterns of air flow could adversely affect performance and positions where impact or physical damage is likely shall be avoided. In general, detectors which are located on the overhead shall be a minimum distance of 0.5 m away from bulkheads.

2.5 The maximum spacing of detectors shall be in accordance with the table below:

Type of detector	Maximum floor area per detector	Maximum distance apart between centres	Maximum distance away from bulkheads
Heat	37 m ²	9 m	4.5 m
Smoke	74 m ²	11 m	5.5 m

The Administration may require or permit other spacings based upon test data which demonstrate the characteristics of the detectors.

2.6 Electrical wiring which forms part of the system shall be so arranged as to avoid galleys, machinery spaces of category A, and other enclosed spaces of high fire risk except where it is necessary to provide for fire detection or

fire alarm in such spaces or to connect to the appropriate power supply.

3 *Design requirements*

3.1 The system and equipment shall be suitably designed to withstand supply voltage variation and transients, ambient temperature changes, vibration, humidity, shock, impact and corrosion normally encountered in ships.

3.2 Smoke detectors required by paragraph 2.2 shall be certified to operate before the smoke density exceeds 12.5 per cent obscuration per metre, but not until the smoke density exceeds 2 per cent obscuration per metre. Smoke detectors to be installed in other spaces shall operate within sensitivity limits to the satisfaction of the Administration having regard to the avoidance of detector insensitivity or oversensitivity.

3.3 Heat detectors shall be certified to operate before the temperature exceeds 78°C but not until the temperature exceeds 54°C, when the temperature is raised to those limits at a rate less than 1°C per minute. At higher rates of temperature rise, the heat detector shall operate within temperature limits to the satisfaction of the Administration having regard to the avoidance of detector insensitivity or oversensitivity.

3.4 At the discretion of the Administration, the permissible temperature of operation of heat detectors may be increased to 30°C above the maximum deckhead temperature in drying rooms and similar spaces of a normal high ambient temperature.

Regulation 14

Fixed fire detection and fire alarm systems for periodically unattended machinery spaces

1 A fixed fire detection and fire alarm system in accordance with the relevant provisions of Regulation 13 shall be installed in periodically unattended machinery spaces.

2 This fire detection system shall be so designed and the detectors so positioned as to detect rapidly the onset of fire in any part of those spaces and under any normal conditions of operation of the machinery and variations of ventilation as required by the possible range of ambient temperatures. Except in spaces of restricted height and where their use is specially appropriate, detection systems using only thermal detectors shall not be permitted. The detection system shall initiate audible and visual alarms distinct in both respects from the alarms of any other system not indicating fire, in sufficient places to ensure that the alarms are heard and observed on the navigating bridge and by a responsible engineer officer. When the navigating bridge is unmanned the alarm shall sound in a place where a responsible member of the crew is on duty.

3 After installation the system shall be tested under varying conditions of engine operation and ventilation.

Regulation 15

Arrangements for oil fuel, lubricating oil and other flammable oils

1 *Limitations in the use of oil as fuel*

The following limitations shall apply to the use of oil as fuel:

- .1 Except as otherwise permitted by this paragraph, no oil fuel with a flashpoint of less than 60°C shall be used.
- .2 In emergency generators oil fuel with a flashpoint of not less than 43°C may be used.
- .3 Subject to such additional precautions as it may consider necessary and on condition that the ambient temperature of the space in which such oil fuel is stored or used shall not be allowed to rise to within 10°C below the flashpoint of the oil fuel, the Administration may permit the general use of oil fuel having a flashpoint of less than 60°C but not less than 43°C.
- .4 In cargo ships the use of fuel having a lower flashpoint than otherwise specified in this paragraph, for example crude oil, may be permitted provided that such fuel is not stored in any machinery space and subject to the approval by the Administration of the complete installation.

The flashpoint of oils shall be determined by an approved closed cup method.

2 *Oil fuel arrangements*

In a ship in which oil fuel is used, the arrangements for the storage, distribution and utilization of the oil fuel shall be such as to ensure the safety of the ship and persons on board and shall at least comply with the following provisions:

- .1 As far as practicable, parts of the oil fuel system containing heated oil under pressure exceeding 0.18 N/mm² shall not be placed in a concealed position such that defects and leakage cannot readily be observed. The machinery spaces in way of such parts of the oil fuel system shall be adequately illuminated.
- .2 The ventilation of machinery spaces shall be sufficient under all normal conditions to prevent accumulation of oil vapour.
- .3 As far as practicable, oil fuel tanks shall be part of the ship's structure and shall be located outside machinery spaces of category A. Where oil fuel tanks, other than double bottom tanks, are necessarily located adjacent to or within machinery spaces of category A, at least one of their vertical sides shall be contiguous to the machinery space boundaries, and shall preferably have a common boundary with the double bottom tanks, and the area of the tank boundary common with the machinery spaces shall be kept to a minimum. Where such tanks are situated within the boundaries of machinery spaces of category A they shall not contain oil fuel

having a flashpoint of less than 60°C. In general the use of free standing oil fuel tanks shall be avoided. When such tanks are employed their use shall be prohibited in category A machinery spaces on passenger ships. Where permitted, they shall be placed in an oil-tight spill tray of ample size having a suitable drain pipe leading to a suitably sized spill oil tank.

- .4 No oil fuel tank shall be situated where spillage or leakage therefrom can constitute a hazard by falling on heated surfaces. Precautions shall be taken to prevent any oil that may escape under pressure from any pump, filter or heater from coming into contact with heated surfaces.
- .5 Every oil fuel pipe, which, if damaged, would allow oil to escape from a storage, settling or daily service tank situated above the double bottom shall be fitted with a cock or valve directly on the tank capable of being closed from a safe position outside the space concerned in the event of a fire occurring in the space in which such tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel or similar space, valves on the tank shall be fitted but control in the event of fire may be effected by means of an additional valve on the pipe or pipes outside the tunnel or similar space. If such additional valve is fitted in the machinery space it shall be operated from a position outside this space.
- .6 Safe and efficient means of ascertaining the amount of oil fuel contained in any oil fuel tank shall be provided. Sounding pipes shall not terminate in any space where the risk of ignition of spillage from the sounding pipe might arise. In particular, they shall not terminate in passenger or crew spaces. Other means of ascertaining the amount of oil fuel contained in any oil fuel tank may be permitted:
 - 6.1 in passenger ships, if such means do not require penetration below the top of the tank, and providing their failure or over-filling of the tanks will not permit release of fuel;
 - 6.2 in cargo ships, providing the failure of such means or over-filling of the tanks will not permit release of fuel. The use of cylindrical gauge glasses is prohibited. The Administration may permit the use of oil level gauges with flat glasses and self-closing valves between the gauges and oil tanks.

Such other means shall be acceptable to the Administration and shall be maintained in the proper condition to ensure their continued accurate functioning in service.

- .7 Provision shall be made to prevent overpressure in any oil tank or in any part of the oil fuel system, including the filling pipes. Any relief valves and air or overflow pipes shall discharge to a position which, in the opinion of the Administration, is safe.
- .8 Oil fuel pipes and their valves and fittings shall be of steel or other approved material, except that restricted use of flexible pipes shall be permissible in positions where the Administration is satisfied that

they are necessary. Such flexible pipes and end attachments shall be of approved fire-resisting materials of adequate strength and shall be constructed to the satisfaction of the Administration.

3 *Lubricating oil arrangements*

The arrangements for the storage, distribution and utilization of oil used in pressure lubrication systems shall be such as to ensure the safety of the ship and persons on board, and such arrangements in machinery spaces of category A and whenever practicable in other machinery spaces shall at least comply with the provisions of paragraphs 2.1, 2.4, 2.5, 2.6, 2.7 and 2.8, except that this does not preclude the use of sight flow glasses in lubricating systems provided that they are shown by test to have a suitable degree of fire resistance.

4 *Arrangements for other flammable oils*

The arrangements for the storage, distribution and utilization of other flammable oils employed under pressure in power transmission systems, control and activating systems and heating systems shall be such as to ensure the safety of the ship and persons on board. In locations where means of ignition are present, such arrangements shall at least comply with the provisions of paragraphs 2.4 and 2.6, and with the provisions of paragraphs 2.7 and 2.8 in respect of strength and construction.

5 *Periodically unattended machinery spaces*

In addition to the requirements of paragraphs 1 to 4, the oil fuel and lubricating oil systems shall comply with the following:

- .1 Where necessary, oil fuel and lubricating oil pipelines shall be screened or otherwise suitably protected to avoid as far as practicable oil spray or oil leakages on to hot surfaces or into machinery air intakes. The number of joints in such piping systems shall be kept to a minimum and, where practicable, leakages from high pressure oil fuel pipes shall be collected and arrangements provided for an alarm to be given.
- .2 Where daily service oil fuel tanks are filled automatically, or by remote control, means shall be provided to prevent overflow spillages. Other equipment which treats flammable liquids automatically, e.g. oil fuel purifiers, which, whenever practicable, shall be installed in a special space reserved for purifiers and their heaters, shall have arrangements to prevent overflow spillages.
- .3 Where daily service oil fuel tanks or settling tanks are fitted with heating arrangements, a high temperature alarm shall be provided if the flashpoint of the oil fuel can be exceeded.

Regulation 16

Ventilation systems in ships other than passenger ships carrying more than 36 passengers

1 Ventilation ducts shall be of non-combustible material. Short ducts, however, not generally exceeding 2 m in length and with a cross-section not exceeding 0.02 m² need not be non-combustible, subject to the following conditions:

- .1 these ducts shall be of a material which, in the opinion of the Administration, has a low fire risk;
- .2 they may only be used at the end of the ventilation device;
- .3 they shall not be situated less than 600 mm, measured along the duct, from an opening in an "A" or "B" class division including continuous "B" class ceilings.

2 Where the ventilation ducts with a free-sectional area exceeding 0.02 m² pass through class "A" bulkheads or decks, the opening shall be lined with a steel sheet sleeve unless the ducts passing through the bulkheads or decks are of steel in the vicinity of passage through the deck or bulkhead and the ducts and sleeves shall comply in this part with the following:

- .1 The sleeves shall have a thickness of at least 3 mm and a length of at least 900 mm. When passing through bulkheads, this length shall be divided preferably into 450 mm on each side of the bulkhead. These ducts, or sleeves lining such ducts, shall be provided with fire insulation. The insulation shall have at least the same fire integrity as the bulkhead or deck through which the duct passes. Equivalent penetration protection may be provided to the satisfaction of the Administration.
- .2 Ducts with a free cross-sectional area exceeding 0.075 m² shall be fitted with fire dampers in addition to the requirements of paragraph 2.1. The fire damper shall operate automatically but shall also be capable of being closed manually from both sides of the bulkhead or deck. The damper shall be provided with an indicator which shows whether the damper is open or closed. Fire dampers are not required, however, where ducts pass through spaces surrounded by "A" class divisions, without serving those spaces, provided those ducts have the same fire integrity as the divisions which they pierce.

3 Ducts provided for the ventilation of machinery spaces of category A, galleys, car deck spaces, ro/ro cargo spaces or special category spaces shall not pass through accommodation spaces, service spaces or control stations unless the ducts are either:

- .1.1 constructed of steel having a thickness of at least 3 mm and 5 mm for ducts the widths or diameters of which are up to and including 300 mm and 760 mm and over respectively and, in the case of such ducts, the widths or diameters of which are between 300 mm and 760 mm having a thickness to be obtained by interpolation;

- .1.2 suitably supported and stiffened;
- .1.3 fitted with automatic fire dampers close to the boundaries penetrated; and
- .1.4 insulated to "A-60" standard from the machinery spaces, galleys, car deck spaces, ro/ro cargo spaces or special category spaces to a point at least 5 m beyond each fire damper;

or

- .2.1 constructed of steel in accordance with paragraphs 3.1.1 and 3.1.2; and
- .2.2 insulated to "A-60" standard throughout the accommodation spaces, service spaces or control stations;

except that penetrations of main zone divisions shall also comply with the requirements of paragraph 8.

4 Ducts provided for ventilation to accommodation spaces, service spaces or control stations shall not pass through machinery spaces of category A, galleys, car deck spaces, ro/ro cargo spaces or special category spaces unless either:

- .1.1 the ducts where they pass through a machinery space of category A, galley, car deck space, ro/ro cargo space or special category space are constructed of steel in accordance with paragraphs 3.1.1 and 3.1.2;
- .1.2 automatic fire dampers are fitted close to the boundaries penetrated; and
- .1.3 the integrity of the machinery space, galley, car deck space, ro/ro cargo space or special category space boundaries is maintained at the penetrations;

or

- .2.1 the ducts where they pass through a machinery space of category A, galley, car deck space, ro/ro cargo space or special category space are constructed of steel in accordance with paragraphs 3.1.1 and 3.1.2; and
- .2.2 are insulated to "A-60" standard within the machinery space, galley, car deck space, ro/ro cargo space or special category space;

except that penetrations of main zone divisions shall also comply with the requirements of paragraph 8.

5 Ventilation ducts with a free cross-sectional area exceeding 0.02 m² passing through "B" class bulkheads shall be lined with steel sheet sleeves of 900 mm in length divided preferably into 450 mm on each side of the bulkheads unless the duct is of steel for this length.

6 Such measures as are practicable shall be taken in respect of control

stations outside machinery spaces in order to ensure that ventilation, visibility and freedom from smoke are maintained, so that in the event of fire the machinery and equipment contained therein may be supervised and continue to function effectively. Alternative and separate means of air supply shall be provided; air inlets of the two sources of supply shall be so disposed that the risk of both inlets drawing in smoke simultaneously is minimized. At the discretion of the Administration, such requirements need not apply to control stations situated on, and opening on to, an open deck, or where local closing arrangements would be equally effective.

7 Where they pass through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be constructed of "A" class divisions. Each exhaust duct shall be fitted with:

- .1 a grease trap readily removable for cleaning;
- .2 a fire damper located in the lower end of the duct;
- .3 arrangements, operable from within the galley, for shutting off the exhaust fans; and
- .4 fixed means for extinguishing a fire within the duct.

8 Where in a passenger ship it is necessary that a ventilation duct passes through a main vertical zone division, a fail-safe automatic closing fire damper shall be fitted adjacent to the division. The damper shall also be capable of being manually closed from each side of the division. The operating position shall be readily accessible and be marked in red light-reflecting colour. The duct between the division and the damper shall be of steel or other equivalent material and, if necessary, insulated to comply with the requirements of Regulation 18.1.1. The damper shall be fitted on at least one side of the division with a visible indicator showing whether the damper is in the open position.

9 The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated.

10 Power ventilation of accommodation spaces, service spaces, cargo spaces, control stations and machinery spaces shall be capable of being stopped from an easily accessible position outside the space being served. This position should not be readily cut off in the event of a fire in the spaces served. The means provided for stopping the power ventilation of the machinery spaces shall be entirely separate from the means provided for stopping ventilation of other spaces.

Regulation 17

Fireman's outfit

- 1 A fireman's outfit shall consist of:
 - 1.1 Personal equipment comprising:
 - .1 Protective clothing of material to protect the skin from the heat

radiating from the fire and from burns and scalding by steam. The outer surface shall be water-resistant.

- .2 Boots and gloves of rubber or other electrically non-conducting material.
 - .3 A rigid helmet providing effective protection against impact.
 - .4 An electric safety lamp (hand lantern) of an approved type with a minimum burning period of three hours.
 - .5 An axe to the satisfaction of the Administration.
- 1.2 A breathing apparatus of an approved type which may be either:
- .1 a smoke helmet or smoke mask which shall be provided with a suitable air pump and a length of air hose sufficient to reach from the open deck, well clear of hatch or doorway, to any part of the holds or machinery spaces. If, in order to comply with this sub-paragraph, an air hose exceeding 36 m in length would be necessary, a self-contained breathing apparatus shall be substituted or provided in addition as determined by the Administration; or
 - .2 a self-contained compressed air-operated breathing apparatus, the volume of air contained in the cylinders of which shall be at least 1,200 ℓ, or other self-contained breathing apparatus which shall be capable of functioning for at least 30 minutes. A number of spare charges, suitable for use with the apparatus provided, shall be available on board to the satisfaction of the Administration.
- 2 For each breathing apparatus a fireproof lifeline of sufficient length and strength shall be provided capable of being attached by means of a snaphook to the harness of the apparatus or to a separate belt in order to prevent the breathing apparatus becoming detached when the lifeline is operated.
- 3 All ships shall carry at least two fireman's outfits complying with the requirements of paragraph 1.
- 3.1 In addition, there shall be provided:
- .1 in passenger ships for every 80 m, or part thereof, of the aggregate of the lengths of all passenger spaces and service spaces on the deck which carries such spaces or, if there is more than one such deck, on the deck which has the largest aggregate of such lengths, two fireman's outfits and two sets of personal equipment, each set comprising the items stipulated in paragraphs 1.1.1, 1.1.2 and 1.1.3;
 - .2 in tankers, two fireman's outfits.
- 3.2 In passenger ships carrying more than 36 passengers for each pair of breathing apparatus there shall be provided one water fog applicator which shall be stored adjacent to such apparatus.
- 3.3 The Administration may require additional sets of personal equipment and breathing apparatus, having due regard to the size and type of the ship.

4 The fireman's outfits or sets of personal equipment shall be so stored as to be easily accessible and ready for use and, where more than one fireman's outfit or more than one set of personal equipment is carried, they shall be stored in widely separated positions. In passenger ships at least two fireman's outfits and one set of personal equipment shall be available at any one position.

Regulation 18

Miscellaneous items

1.1 Where "A" class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts, etc., or for girders, beams or other structural members, arrangements shall be made to ensure that the fire resistance is not impaired, subject to the provisions of Regulation 30.5.

1.2 Where "B" class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts, etc., or for the fitting of ventilation terminals, lighting fixtures and similar devices, arrangements shall be made to ensure that the fire resistance is not impaired.

2.1 Pipes penetrating "A" or "B" class divisions shall be of materials approved by the Administration having regard to the temperature such divisions are required to withstand.

2.2 Where the Administration may permit the conveying of oil and combustible liquids through accommodation and service spaces, the pipes conveying oil or combustible liquids shall be of a material approved by the Administration having regard to the fire risk.

2.3 Materials readily rendered ineffective by heat shall not be used for overboard scuppers, sanitary discharges, and other outlets which are close to the water-line and where the failure of the material in the event of fire would give rise to danger of flooding.

3 Electric radiators, if used, shall be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiators shall be fitted with an element so exposed that clothing, curtains, or other similar materials can be scorched or set on fire by heat from the element.

4 Cellulose-nitrate based films shall not be used for cinematograph installations.

5 All waste-receptacles shall be constructed of non-combustible materials with no openings in the sides or bottom.

6 In spaces where penetration of oil products is possible, the surface of insulation shall be impervious to oil or oil vapours.

Regulation 19

*International shore connexion**

1 Ships of 500 tons gross tonnage and upwards shall be provided with at least one international shore connexion, complying with provisions of paragraph 3.

2 Facilities shall be available enabling such a connexion to be used on either side of the ship.

3 Standard dimensions of flanges for the international shore connexion shall be in accordance with the following table:

Description	Dimension
Outside diameter	178 mm
Inside diameter	64 mm
Bolt circle diameter	132 mm
Slots in flange	4 holes 19 mm in diameter spaced equidistantly on a bolt circle of the above diameter, slotted to the flange periphery
Flange thickness	14.5 mm minimum
Bolts and nuts	4, each of 16 mm diameter, 50 mm in length

4 The connexion shall be of steel or other suitable material and shall be designed for 1.0 N/mm² services. The flange shall have a flat face on one side and on the other shall be permanently attached to a coupling that will fit the ship's hydrant and hose. The connexion shall be kept aboard the ship together with a gasket of any material suitable for 1.0 N/mm² services, together with four 16 mm bolts, 50 mm in length and eight washers.

Regulation 20

Fire control plans

1 In all ships general arrangement plans shall be permanently exhibited for the guidance of the ship's officers, showing clearly for each deck the control stations, the various fire sections enclosed by "A" class divisions, the sections enclosed by "B" class divisions together with particulars of the fire detection and fire alarm systems, the sprinkler installation, the fire-extinguishing appliances, means of access to different compartments, decks, etc. and the ventilating system including particulars of the fan control positions, the position of dampers and identification numbers of the

* Reference is made to the recommendation contained in resolution A.470(XII) adopted by the Organization entitled "International Shore Connexion (shore side)".

ventilating fans serving each section. Alternatively, at the discretion of the Administration, the aforementioned details may be set out in a booklet, a copy of which shall be supplied to each officer, and one copy shall at all times be available on board in an accessible position. Plans and booklets shall be kept up to date, any alterations being recorded thereon as soon as practicable. Description in such plans and booklets shall be in the national language. If the language is neither English nor French, a translation into one of those languages shall be included. In addition, instructions concerning the maintenance and operation of all the equipment and installations on board for the fighting and containment of fire shall be kept under one cover, readily available in an accessible position.

2 In all ships a duplicate set of fire control plans or a booklet containing such plans shall be permanently stored in a prominently marked weathertight enclosure outside the deckhouse for the assistance of shoreside fire-fighting personnel.

Regulation 21

Ready availability of fire-extinguishing appliances

In all ships, fire-extinguishing appliances shall be kept in good order and available for immediate use at all times during the voyage.

Regulation 22

Acceptance of substitutes

1 This Regulation applies to all ships.

2 Where in this Chapter any special type of appliance, apparatus, extinguishing medium or arrangement is specified in any ship, any other type of appliance etc., may be allowed, provided the Administration is satisfied that it is not less effective.

PART B – FIRE SAFETY MEASURES FOR PASSENGER SHIPS

Regulation 23

Structure

1 The hull, superstructure, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material. For the purpose of applying the definition of steel or other equivalent material as given in Regulation 3.7 the “applicable fire exposure” shall be according to the integrity and insulation standards given in the tables of Regulations 26 and 27. For example where divisions such as decks or sides and ends of deckhouses

are permitted to have "B-0" fire integrity, the "applicable fire exposure" shall be half an hour.

2 However, in cases where any part of the structure is of aluminium alloy, the following shall apply:

- .1 The insulation of aluminium alloy components of "A" or "B" class divisions, except structure which, in the opinion of the Administration, is non-load-bearing, shall be such that the temperature of the structural core does not rise more than 200°C above the ambient temperature at any time during the applicable fire exposure to the standard fire test.
- .2 Special attention shall be given to the insulation of aluminium alloy components of columns, stanchions and other structural members required to support lifeboat and liferaft stowage, launching and embarkation areas, and "A" and "B" class divisions to ensure:
 - .2.1 that for such members supporting lifeboat and liferaft areas and "A" class divisions, the temperature rise limitation specified in paragraph 2.1 shall apply at the end of one hour; and
 - .2.2 that for such members required to support "B" class divisions, the temperature rise limitation specified in paragraph 2.1 shall apply at the end of half an hour.

3 Crowns and casings of machinery spaces of category A shall be of steel construction adequately insulated and openings therein, if any, shall be suitably arranged and protected to prevent the spread of fire.

Regulation 24

Main vertical zones and horizontal zones

1.1 For ships carrying more than 36 passengers, the hull, superstructure and deckhouses shall be subdivided into main vertical zones by "A" class divisions. Steps and recesses shall be kept to a minimum, but where they are necessary they shall also be "A" class divisions. These divisions shall have insulation values in accordance with tables in Regulation 26.

1.2 For ships carrying not more than 36 passengers, the hull, superstructure and deckhouses in way of accommodation and service spaces shall be subdivided into main vertical zones by "A" class divisions. These divisions shall have insulation values in accordance with tables in Regulation 27.

2 As far as practicable, the bulkheads forming the boundaries of the main vertical zones above the bulkhead deck shall be in line with watertight subdivision bulkheads situated immediately below the bulkhead deck.

3 Such bulkheads shall extend from deck to deck and to the shell or other boundaries.

4 Where a main vertical zone is subdivided by horizontal "A" class

divisions into horizontal zones for the purpose of providing an appropriate barrier between sprinklered and non-sprinklered zones of the ship, the divisions shall extend between adjacent main vertical zone bulkheads and to the shell or exterior boundaries of the ship and shall be insulated in accordance with the fire insulation and integrity values given in table 26.3 or in table 27.2.

5.1 On ships designed for special purposes, such as automobile or railroad car ferries, where the provision of main vertical zone bulkheads would defeat the purpose for which the ship is intended, equivalent means for controlling and limiting a fire shall be substituted and specifically approved by the Administration.

5.2 However, in a ship with special category spaces, any such space shall comply with the applicable provisions of Regulation 37 and in so far as such compliance would be inconsistent with compliance with other requirements of this Part, the requirements of Regulation 37 shall prevail.

Regulation 25

Bulkheads within a main vertical zone

1.1 For ships carrying more than 36 passengers all bulkheads which are not required to be "A" class divisions shall be at least "B" class or "C" class divisions as prescribed in the tables in Regulation 26.

1.2 For ships carrying not more than 36 passengers all bulkheads within accommodation and service spaces which are not required to be "A" class divisions shall be at least "B" class or "C" class divisions as prescribed in the tables in Regulation 27.

1.3 All such divisions may be faced with combustible materials in accordance with the provisions of Regulation 34.

2 All corridor bulkheads where not required to be "A" class shall be "B" class divisions which shall extend from deck to deck except:

- .1 when continuous "B" class ceilings or linings are fitted on both sides of the bulkhead, the portion of the bulkhead behind the continuous ceiling or lining shall be of material which, in thickness and composition, is acceptable in the construction of "B" class divisions but which shall be required to meet "B" class integrity standards only in so far as is reasonable and practicable in the opinion of the Administration;
- .2 in the case of a ship protected by an automatic sprinkler system complying with the provisions of Regulation 12 the corridor bulkheads of "B" class materials may terminate at a ceiling in the corridor provided such a ceiling is of material which, in thickness and composition, is acceptable in the construction of "B" class divisions. Notwithstanding the requirements of Regulations 26 and 27 such bulkheads and ceilings shall be required to meet "B" class integrity standards only in so far as is reasonable and practicable in

the opinion of the Administration. All doors and frames in such bulkheads shall be of non-combustible materials and shall be so constructed and erected as to provide substantial fire resistance to the satisfaction of the Administration.

3 All bulkheads required to be "B" class divisions, except corridor bulkheads, shall extend from deck to deck and to the shell or other boundaries unless continuous "B" class ceilings or linings are fitted on both sides of the bulkhead, in which case the bulkhead may terminate at the continuous ceiling or lining.

Regulation 26

Fire integrity of bulkheads and decks in ships carrying more than 36 passengers

1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this Part, the minimum fire integrity of all bulkheads and decks shall be as prescribed in tables 26.1 to 26.4. Where, due to any particular structural arrangements in the ship, difficulty is experienced in determining from the tables the minimum fire integrity value of any divisions, such values shall be determined to the satisfaction of the Administration.

2 The following requirements shall govern application of the tables:

.1 Table 26.1 shall apply to bulkheads bounding main vertical zones or horizontal zones.

Table 26.2 shall apply to bulkheads not bounding either main vertical zones or horizontal zones.

Table 26.3 shall apply to decks forming steps in main vertical zones or bounding horizontal zones.

Table 26.4 shall apply to decks not forming steps in main vertical zones nor bounding horizontal zones.

.2 for the purpose of determining the appropriate fire integrity standards to be applied to boundaries between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (14) below. Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this Regulation, it shall be treated as a space within the relevant category having the most stringent boundary requirements. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row number in the tables.

(1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.

Spaces containing the ship's radio equipment.

Fire-extinguishing rooms, fire control and recording stations.
Control room for propulsion machinery when located outside the propulsion machinery space.
Spaces containing centralized fire alarm equipment.
Spaces containing centralized emergency public address system stations and equipment.

(2) *Stairways*

Interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) for passengers and crew and enclosures thereto.

In this connexion a stairway which is enclosed at only one level shall be regarded as part of the space from which it is not separated by a fire door.

(3) *Corridors*

Passenger and crew corridors and lobbies.

(4) *Lifeboat and liferaft handling and embarkation stations*

Open deck spaces and enclosed promenades forming lifeboat and liferaft embarkation and lowering stations.

(5) *Open deck spaces*

Open deck spaces and enclosed promenades clear of lifeboat and liferaft embarkation and lowering stations.

Air space (the space outside superstructures and deckhouses).

(6) *Accommodation spaces of minor fire risk*

Cabins containing furniture and furnishings of restricted fire risk.

Offices and dispensaries containing furniture and furnishings of restricted fire risk.

Public spaces containing furniture and furnishings of restricted fire risk and having a deck area of less than 50 m².

(7) *Accommodation spaces of moderate fire risk*

Spaces as in category (6) above but containing furniture and furnishings of other than restricted fire risk.

Public spaces containing furniture and furnishings of restricted fire risk and having a deck area of 50 m² or more.

Isolated lockers and small store-rooms in accommodation spaces.

Sale shops.

Motion picture projection and film stowage rooms.

Diet kitchens (containing no open flame).

Cleaning gear lockers (in which flammable liquids are not stowed).

- Laboratories (in which flammable liquids are not stowed).
Pharmacies.
Small drying rooms (having a deck area of 4 m² or less).
Specie rooms.
- (8) *Accommodation spaces of greater fire risk*
Public spaces containing furniture and furnishings of other than restricted fire risk and having a deck area of 50 m² or more.
Barber shops and beauty parlours.
- (9) *Sanitary and similar spaces*
Communal sanitary facilities, showers, baths, water closets, etc.
Small laundry rooms.
Indoor swimming, pool area.
Operating rooms.
Isolated pantries containing no cooking appliances in accommodation spaces.
Private sanitary facilities shall be considered a portion of the space in which they are located.
- (10) *Tanks, voids and auxiliary machinery spaces having little or no fire risk*
Water tanks forming part of the ship's structure.
Voids and cofferdams.
Auxiliary machinery spaces which do not contain machinery having a pressure lubrication system and where storage of combustibles is prohibited, such as:
ventilation and air-conditioning rooms; windlass room; steering gear room; stabilizer equipment room; electrical propulsion motor room; rooms containing section switchboards and purely electrical equipment other than oil-filled electrical transformers (above 10 kVA); shaft alleys and pipe tunnels; spaces for pumps and refrigeration machinery (not handling or using flammable liquids).
Closed trunks serving the spaces listed above.
Other closed trunks such as pipe and cable trunks.
- (11) *Auxiliary machinery spaces, cargo spaces, special category spaces, cargo and other oil tanks and other similar spaces of moderate fire risk*
Cargo oil tanks.
Cargo holds, trunkways and hatchways.
Refrigerated chambers.
Oil fuel tanks (where installed in a separate space with no machinery).

Shaft alleys and pipe tunnels allowing storage of combustibles.

Auxiliary machinery spaces as in category (10) which contain machinery having a pressure lubrication system or where storage of combustibles is permitted.

Oil fuel filling stations.

Spaces containing oil-filled electrical transformers (above 10 kVA).

Spaces containing turbine and reciprocating steam engine driven auxiliary generators and small internal combustion engines of power output up to 110 kW driving emergency generators, sprinkler, drencher or fire pumps, bilge pumps, etc.

Special category spaces (tables 26.1 and 26.3 only apply).

Closed trunks serving the spaces listed above.

(12) *Machinery spaces and main galleys*

Main propulsion machinery rooms (other than electric propulsion motor rooms) and boiler rooms.

Auxiliary machinery spaces other than those in categories (10) and (11) which contain internal combustion machinery or other oil-burning, heating or pumping units.

Main galleys and annexes.

Trunks and casings to the spaces listed above.

(13) *Store-rooms, workshops, pantries, etc.*

Main pantries not annexed to galleys.

Main laundry.

Large drying rooms (having a deck area of more than 4 m²).

Miscellaneous stores.

Mail and baggage rooms.

Garbage rooms.

Workshops (not part of machinery spaces, galleys, etc.)

(14) *Other spaces in which flammable liquids are stowed*

Lamp rooms.

Paint rooms.

Store-rooms containing flammable liquids (including dyes, medicines, etc.).

Laboratories (in which flammable liquids are stowed).

.3 Where a single value is shown for the fire integrity of a boundary between two spaces, that value shall apply in all cases.

.4 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is not protected by an automatic sprinkler system complying

TABLE 26.1 – BULKHEADS BOUNDING MAIN VERTICAL ZONES OR HORIZONTAL ZONES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations (1)	A-60	A-30	A-30	A-0	A-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60
Stairways (2)		A-0	A-0	A-0	A-0	A-15 A-0	A-30 A-0	A-60 A-15	A-0	A-0	A-30	A-60	A-15 A-0	A-60
Corridors (3)			A-0	A-0	A-0	A-0	A-30 A-0	A-30 A-0	A-0	A-0	A-30	A-60	A-15 A-0	A-60
Lifeboat and liferaft handling and embarkation stations (4)				-	-	A-0	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-60
Open deck spaces (5)					-	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of minor fire risk (6)						A-15 A-0	A-30 A-0	A-30 A-0	A-0	A-0	A-15 A-0	A-30	A-15 A-0	A-30
Accommodation spaces of moderate fire risk (7)							A-30 A-0	A-60 A-15	A-0	A-0	A-30 A-0	A-60	A-30 A-0	A-60
Accommodation spaces of greater fire risk (8)								A-60 A-15	A-0	A-0	A-60 A-15	A-60	A-30 A-0	A-60
Sanitary and similar spaces (9)									A-0	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk (10)										A-0	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, special category spaces, cargo and other oil tanks and other similar spaces of moderate fire risk (11)											A-0	A-60	A-0	A-60
Machinery spaces and main galleys (12)												A-60	A-30 ^{b/} A-15	A-60
Store-rooms, workshops, pantries etc. (13)													A-0	A-30
Other spaces in which flammable liquids are stowed (14)														A-60

See notes under table 26.4

TABLE 26.2 – BULKHEADS NOT BOUNDING EITHER MAIN VERTICAL ZONES OR HORIZONTAL ZONES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations (1)	B-0 ^{a/}	A-0	A-0	A-0	A-0 B-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60
Stairways (2)		A-0 ^{a/}	A-0	A-0	A-0	A-0	A-15 A-0	A-30 A-0	A-0	A-0	A-15	A-30	A-15 A-0	A-30
Corridors (3)			C	A-0	A-0 B-0	B-0	B-15 B-0	B-15 B-0	B-0	A-0	A-15	A-30	A-0	A-30 A-0
Lifeboat and liferaft handling and embarkation stations (4)				–	–	A-0	A-0	A-0	A-0	A-0	A-0	A-15	A-0	A-15 A-0
Open deck space (5)					–	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-0	A-0 B-0	A-0 B-0
Accommodation spaces of minor fire risk (6)						B-0 C	B-15 C	B-15 C	B-0 C	A-0	A-15 A-0	A-30	A-0	A-30 A-0
Accommodation spaces of moderate fire risk (7)							B-15 C	B-15 C	B-0 C	A-0	A-15 A-0	A-60	A-15 A-0	A-60 A-15
Accommodation spaces of greater fire risk (8)								B-15 C	B-0 C	A-0	A-30 A-0	A-60	A-15 A-0	A-60 A-15
Sanitary and similar spaces (9)									C	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk (10)										A-0 ^{a/}	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk (11)											A-0 ^{a/}	A-0	A-0	A-30 ^{b/} A-15
Machinery spaces and main galleys (12)												A-0 ^{a/}	A-0	A-60
Store-rooms, workshops, pantries, etc (13)													A-0 ^{a/}	A-0
Other spaces in which flammable liquids are stowed (14)														A-30 ^{b/} A-15

See notes under table 26.4

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TABLE 26.3 – DECKS FORMING STEPS IN MAIN VERTICAL ZONES OR BOUNDING HORIZONTAL ZONES

Space below ↓	Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations	(1)	A-60	A-60	A-30	A-0	A-0	A-15	A-30	A-60	A-0	A-0	A-30	A-60	A-15	A-60
Stairways	(2)	A-15	A-0	A-0	A-0	A-0	A-0	A-15 A-0	A-15 A-0	A-0	A-0	A-0	A-60	A-0	A-60
Corridors	(3)	A-30	A-0	A-0	A-0	A-0	A-0	A-15 A-0	A-15 A-0	A-0	A-0	A-0	A-60	A-0	A-60
Lifeboat and liferaft handling and embarkation stations	(4)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Open deck spaces	(5)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of minor fire risk	(6)	A-60	A-30 A-0	A-15 A-0	A-0	A-0	A-0	A-15 A-0	A-30 A-0	A-0	A-0	A-15 A-0	A-15	A-0	A-15
Accommodation spaces of moderate fire risk	(7)	A-60	A-60 A-15	A-30 A-0	A-15 A-0	A-0	A-15 A-0	A-30 A-0	A-60 A-15	A-0	A-0	A-30 A-0	A-30	A-0	A-30
Accommodation spaces of greater fire risk	(8)	A-60	A-60 A-15	A-60 A-15	A-60 A-15	A-0	A-30 A-0	A-60 A-15	A-60 A-15	A-0	A-0	A-30 A-0	A-60	A-15 A-0	A-60
Sanitary and similar spaces	(9)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk	(10)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, special category spaces, cargo and other oil tanks and other similar spaces of moderate fire risk	(11)	A-60	A-60	A-60	A-60	A-0	A-30 A-0	A-60 A-15	A-60 A-15	A-0	A-0	A-0	A-30	A-30 ^{b/} A-0	A-30
Machinery spaces and main galleys	(12)	A-60	A-60	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60
Store-rooms, workshops, pantries, etc.	(13)	A-60	A-60 A-15	A-30 A-0	A-15	A-0	A-15 A-0	A-30 A-0	A-60 A-15	A-0	A-0	A-0	A-30	A-0	A-30
Other spaces in which flammable liquids are stowed	(14)	A-60	A-60	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60

See notes under table 26.4

TABLE 26.4 – DECKS NOT FORMING STEPS IN MAIN VERTICAL ZONES NOR BOUNDING HORIZONTAL ZONES

Space below ↙	Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations	(1)	A-30 A-0	A-30 A-0	A-15 A-0	A-0	A-0 B-0	A-0	A-15 A-0	A-30 A-0	A-0	A-0	A-0	A-60	A-0	A-60 A-15
Stairways	(2)	A-0	A-0	A-0	A-0	A-0 B-0	A-0	A-0	A-0	A-0	A-0	A-0	A-30	A-0	A-30 A-0
Corridors	(3)	A-15 A-0	A-0	A-0 ^{a/} B-0 ^{b/}	A-0	A-0 B-0	A-0 B-0	A-15 B-0	A-15 B-0	A-0 B-0	A-0	A-0	A-30	A-0	A-30 A-0
Lifeboat and liferaft handling and embarkation stations	(4)	A-0	A-0	A-0	A-0	–	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-0	A-0	A-0
Open deck spaces	(5)	A-0	A-0	A-0 B-0	A-0	–	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-0	A-0 B-0	A-0
Accommodation spaces of minor fire risk	(6)	A-60	A-15 A-0	A-0	A-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-15 A-0	A-0	A-15 A-0
Accommodation spaces of moderate fire risk	(7)	A-60	A-30 A-0	A-15 A-0	A-15 A-0	A-0 B-0	A-0 B-0	A-15 B-0	A-30 B-0	A-0 B-0	A-0	A-15 A-0	A-30 A-0	A-0	A-30 A-0
Accommodation spaces of greater fire risk	(8)	A-60	A-60 A-15	A-60 A-0	A-30 A-0	A-0 B-0	A-15 B-0	A-30 B-0	A-60 B-0	A-0 B-0	A-0	A-30 A-0	A-30 A-0	A-0	A-30 A-0
Sanitary spaces and similar spaces	(9)	A-0	A-0	A-0 B-0	A-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk	(10)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0 ^{a/}	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk	(11)	A-60	A-60 A-15	A-60 A-15	A-30 A-0	A-0	A-0	A-15 A-0	A-30 A-0	A-0	A-0	A-0 ^{a/}	A-0	A-0	A-30 ^{b/} A-15
Machinery spaces and main galleys	(12)	A-60	A-60	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0	A-30	A-30 ^{a/}	A-0	A-60
Store-rooms, workshops, pantries, etc.	(13)	A-60	A-30 A-0	A-15 A-0	A-15 A-0	A-0 B-0	A-15 A-0	A-30 A-0	A-30 A-0	A-0 B-0	A-0	A-0	A-0	A-0	A-15 ^{b/} A-0
Other spaces in which flammable liquids are stowed	(14)	A-60	A-60 A-30	A-60 A-30	A-60	A-0	A-30 A-0	A-60 A-15	A-60 A-15	A-0	A-0	A-30 ^{b/} A-0	A-30 ^{b/} A-0	A-0	A-30 ^{b/} A-0

Notes. To be applied to tables 26.1 to 26.4, as appropriate.

a/ Where adjacent spaces are in the same numerical category and superscript ^{a/} appears, a bulkhead or deck between such spaces need not be fitted if deemed unnecessary by the Administration. For example, in category (12) a bulkhead need not be required between a galley and its annexed pantries provided the pantry bulkheads and decks maintain the integrity of the galley boundaries. A bulkhead is, however, required between a galley and a machinery space even though both spaces are in category (12).

b/ Where superscript ^{b/} appears the lesser insulation value may be permitted only if at least one of the adjoining spaces is protected by an automatic sprinkler system complying with the provisions of Regulation 12.

with the provisions of Regulation 12 or between such zones neither of which is so protected, the higher of the two values given in the tables shall apply.

- .5 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is protected by an automatic sprinkler system complying with the provisions of Regulation 12 or between such zones both of which are so protected, the lesser of the two values given in the tables shall apply. Where a sprinklered zone and a non-sprinklered zone meet within accommodation and service spaces, the higher of the two values given in the tables shall apply to the division between the zones.
- .6 Notwithstanding the provisions of Regulation 35 there are no special requirements for material or integrity of boundaries where only a dash appears in the tables.
- .7 The Administration shall determine in respect of category (5) spaces whether the insulation values in table 26.1 or 26.2 shall apply to ends of deckhouses and superstructures, and whether the insulation values in table 26.3 or 26.4 shall apply to weather decks. In no case shall the requirements of category (5) of tables 26.1 to 26.4 necessitate enclosure of spaces which in the opinion of the Administration need not be enclosed.

3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing wholly or in part, to the required insulation and integrity of a division.

4 In approving structural fire protection details, the Administration shall have regard to the risk of heat transmission at intersections and terminal points of required thermal barriers.

Regulation 27

Fire integrity of bulkheads and decks in ships carrying not more than 36 passengers

- 1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this Part, the minimum fire integrity of bulkheads and decks shall be as prescribed in table 27.1 and table 27.2.
- 2 The following requirements shall govern application of the tables:
 - .1 Tables 27.1 and 27.2 shall apply respectively to the bulkheads and decks separating adjacent spaces.
 - .2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) below. The title of each category is intended to be typical

rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

(1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.

Spaces containing the ship's radio equipment.

Fire-extinguishing rooms, fire control stations and fire-recording stations.

Control room for propulsion machinery when located outside the machinery space.

Spaces containing centralized fire alarm equipment.

(2) *Corridors*

Passenger and crew corridors and lobbies.

(3) *Accommodation spaces*

Spaces as defined in Regulation 3.10 excluding corridors.

(4) *Stairways*

Interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connexion, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(5) *Service spaces (low risk)*

Lockers and store-rooms having areas of less than 2 m², drying rooms and laundries.

(6) *Machinery spaces of category A*

Spaces as defined in Regulation 3.19.

(7) *Other machinery spaces*

Spaces as defined in Regulation 3.20 excluding machinery spaces of category A.

(8) *Cargo spaces*

All spaces used for cargo (including cargo oil tanks) and trunkways and hatchways to such spaces, other than special category spaces.

(9) *Service spaces (high risk)*

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 2 m² or more and workshops other than those forming part of the machinery spaces.

TABLE 27.1 – FIRE INTEGRITY OF BULKHEADS SEPARATING ADJACENT SPACES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0 ^{c/}	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*	A-60
Corridors (2)		C ^{e/}	B-0 ^{e/}	B-0 ^{e/} A-0 ^{a/}	B-0 ^{e/}	A-60	A-0	A-0	A-15 A-0 ^{d/}	*	A-15
Accommodation spaces (3)			C ^{e/}	B-0 ^{e/} A-0 ^{a/}	B-0 ^{e/}	A-60	A-0	A-0	A-15 A-0 ^{d/}	*	A-30 A-0 ^{d/}
Stairways (4)				B-0 ^{e/} A-0 ^{a/}	B-0 ^{e/} A-0 ^{a/}	A-60	A-0	A-0	A-15 A-0 ^{d/}	*	A-15
Service spaces (low risk) (5)					C ^{e/}	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces (6) of category A						*	A-0	A-0	A-60	*	A-60
Other machinery spaces (7)							A-0 ^{b/}	A-0	A-0	*	A-0
Cargo spaces (8)								*	A-0	*	A-0
Service spaces (high risk) (9)									A-0 ^{b/}	*	A-30
Open decks (10)										--	A-0
Special category (11) spaces											A-0

Notes: To be applied to both tables 27.1 and 27.2, as appropriate.

- a/ For clarification as to which applies see Regulations 25 and 29.
- b/ Where spaces are of the same numerical category and superscript b appears, a bulkhead or deck of the ratings shown in the tables is only required when the adjacent spaces are for a different purpose, e.g. in category (9). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.
- c/ Bulkheads separating the wheelhouse and chartroom from each other may be "B-0" rating.
- d/ See 2.3 and 2.4 of this Regulation.
- e/ For the application of Regulation 24.1.2, "B-0" and "C", where appearing in table 27.1, shall be read as "A-0".
- f/ Fire insulation need not be fitted if the machinery space of category (7), in the opinion of the Administration, has little or no fire risk.
- * Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material but is not required to be of "A" class standard.
For the application of Regulation 24.1.2 an asterisk, where appearing in table 27.2, except for categories (8) and (10), shall be read as "A-0".

TABLE 27.2 – FIRE INTEGRITY OF DECKS SEPARATING ADJACENT SPACES

Space below ↓	Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations	(1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*	A-30
Corridors	(2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Accommodation spaces	(3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30 A-0d/
Stairways	(4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*	A-0
Service spaces (low risk)	(5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A	(6)	A-60	A-60	A-60	A-60	A-60	*	A-60 f/	A-30	A-60	*	A-60
Other machinery spaces	(7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*	A-0
Cargo spaces	(8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*	A-0
Service spaces (high risk)	(9)	A-60	A-30 A-0d/	A-30 A-0d/	A-30 A-0d/	A-0	A-60	A-0	A-0	A-0	*	A-30
Open decks	(10)	*	*	*	*	*	*	*	*	*	--	A-0
Special category spaces	(11)	A-60	A-15	A-30 A-0d/	A-15	A-0	A-30	A-0	A-0	A-30	A-0	A-0

(10) *Open decks*

Open deck spaces and enclosed promenades having no fire risk. Air spaces (the space outside superstructures and deck-houses).

(11) *Special category spaces*

Spaces as defined in Regulation 3.18.

- 3 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is not protected by an automatic sprinkler system complying with the provisions of Regulation 12 or between such zones neither of which is so protected, the higher of the two values given in the tables shall apply.
- 4 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone

which is protected by an automatic sprinkler system complying with the provisions of Regulation 12 or between such zones both of which are so protected, the lesser of the two values given in the tables shall apply. Where a sprinklered zone and a non-sprinklered zone meet within accommodation and service spaces, the higher of the two values given in the tables shall apply to the division between the zones.

3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

4 External boundaries which are required in Regulation 23.1 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries to have "A" class integrity elsewhere in this Chapter. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be of materials to the satisfaction of the Administration.

Regulation 28

Means of escape

1 Stairways and ladders shall be arranged to provide ready means of escape to the lifeboat and liferaft embarkation deck from all passenger and crew spaces and from spaces in which the crew is normally employed, other than machinery spaces. In particular, the following provisions shall be complied with:

- .1 Below the bulkhead deck two means of escape, at least one of which shall be independent of watertight doors, shall be provided from each watertight compartment or similarly restricted space or group of spaces. Exceptionally, the Administration may dispense with one of the means of escape, due regard being paid to the nature and location of spaces and to the number of persons who might normally be accommodated or employed there.
- .2 Above the bulkhead deck there shall be at least two means of escape from each main vertical zone or similarly restricted space or group of spaces at least one of which shall give access to a stairway forming a vertical escape.
- .3 If a radiotelegraph station has no direct access to the open deck, two means of escape from or access to such station shall be provided, one of which may be a porthole or window of sufficient size or another means to the satisfaction of the Administration.
- .4 A corridor or part of a corridor from which there is only one route of escape shall not exceed:
 - 13 m in length for ships carrying more than 36 passengers, and
 - 7 m in length for ships carrying not more than 36 passengers.
- .5 At least one of the means of escape required by paragraphs 1.1 and

1.2 shall consist of a readily accessible enclosed stairway, which shall provide continuous fire shelter from the level of its origin to the appropriate lifeboat and liferaft embarkation decks or the highest level served by the stairway, whichever level is the highest. However, where the Administration has granted dispensation under the provisions of paragraph 1.1 the sole means of escape shall provide safe escape to the satisfaction of the Administration. The width, number and continuity of the stairways shall be to the satisfaction of the Administration.

- .6 Protection of access from the stairway enclosures to the lifeboat and liferaft embarkation areas shall be to the satisfaction of the Administration.
- .7 Stairways serving only a space and a balcony in that space shall not be considered as forming one of the required means of escape.

2.1 In special category spaces the number and disposition of the means of escape both below and above the bulkhead deck shall be to the satisfaction of the Administration and in general the safety of access to the embarkation deck shall be at least equivalent to that provided for under paragraphs 1.1, 1.2, 1.5 and 1.6.

2.2 One of the escape routes from the machinery spaces where the crew is normally employed shall avoid direct access to any special category space.

3.1 Two means of escape shall be provided from each machinery space. In particular, the following provisions shall be complied with:

- .1 Where the space is below the bulkhead deck the two means of escape shall consist of either:
 - .1.1 two sets of steel ladders as widely separated as possible, leading to doors in the upper part of the space similarly separated and from which access is provided to the appropriate lifeboat and liferaft embarkation decks. One of these ladders shall provide continuous fire shelter from the lower part of the space to a safe position outside the space; or
 - .1.2 one steel ladder leading to a door in the upper part of the space from which access is provided to the embarkation deck and additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the embarkation deck.
- .2 Where the space is above the bulkhead deck, the two means of escape shall be as widely separated as possible and the doors leading from such means of escape shall be in a position from which access is provided to the appropriate lifeboat and liferaft embarkation decks. Where such means of escape require the use of ladders, these shall be of steel.

3.2 In a ship of less than 1,000 tons gross tonnage, the Administration may

dispense with one of the means of escape, due regard being paid to the width and disposition of the upper part of the space; and in a ship of 1,000 tons gross tonnage and above, the Administration may dispense with one means of escape from any such space so long as either a door or a steel ladder provides a safe escape route to the embarkation deck, due regard being paid to the nature and location of the space and whether persons are normally employed in that space.

4 In no case shall lifts be considered as forming one of the required means of escape.

Regulation 29

Protection of stairways and lifts in accommodation and service spaces

1 All stairways shall be of steel frame construction except where the Administration sanctions the use of other equivalent material, and shall be within enclosures formed of "A" class divisions, with positive means of closure at all openings, except that:

- .1 a stairway connecting only two decks need not be enclosed, provided the integrity of the deck is maintained by proper bulkheads or doors in one 'tweendeck space. When a stairway is closed in one 'tweendeck space, the stairway enclosure shall be protected in accordance with the tables for decks in Regulations 26 or 27;
- .2 stairways may be fitted in the open in a public space, provided they lie wholly within such public space.

2 Stairway enclosures shall have direct communication with the corridors and be of sufficient area to prevent congestion, having in view the number of persons likely to use them in an emergency. In so far as is practicable, stairway enclosures shall not give direct access to cabins, service lockers, or other enclosed spaces containing combustibles in which a fire is likely to originate.

3 Lift trunks shall be so fitted as to prevent the passage of smoke and flame from one 'tweendeck to another and shall be provided with means of closing so as to permit the control of draught and smoke.

Regulation 30

Openings in "A" class divisions

1 Except for hatches between cargo, special category, store, and baggage spaces, and between such spaces and the weather decks, all openings shall be provided with permanently attached means of closing which shall be at least as effective for resisting fires as the divisions in which they are fitted.

2 The construction of all doors and door frames in "A" class divisions,

with the means of securing them when closed, shall provide resistance to fire as well as to the passage of smoke and flame, as far as practicable, equivalent to that of the bulkheads in which the doors are situated. Such doors and door frames shall be constructed of steel or other equivalent material. Watertight doors need not be insulated.

3 It shall be possible for each door to be opened and closed from each side of the bulkhead by one person only.

4 Fire doors in main vertical zone bulkheads and stairway enclosures, other than power-operated watertight doors and those which are normally locked, shall be of the self-closing type capable of closing against an inclination of 3.5° opposing closure. The speed of door closure shall, if necessary, be controlled so as to prevent undue danger to persons. All such doors, except those that are normally closed, shall be capable of release from a control station, either simultaneously or in groups, and also individually from a position at the door. The release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system; however, approved power-operated watertight doors will be considered acceptable for this purpose. Hold-back hooks not subject to control station release will not be permitted. When double swing doors are permitted, they shall have a latch arrangement which is automatically engaged by the operation of the door release system.

5 Where a space is protected by an automatic sprinkler system complying with the provisions of Regulation 12 or fitted with a continuous "B" class ceiling, openings in decks not forming steps in main vertical zones nor bounding horizontal zones shall be closed reasonably tight and such decks shall meet the "A" class integrity requirements in so far as is reasonable and practicable in the opinion of the Administration.

6 The requirements for "A" class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles. Similarly, the requirements for "A" class integrity shall not apply to exterior doors in superstructures and deckhouses.

Regulation 31

Openings in "B" class divisions

1 Doors and door frames in "B" class divisions and means of securing them shall provide a method of closure which shall have resistance to fire as far as practicable equivalent to that of the divisions except that ventilation openings may be permitted in the lower portion of such doors. Where such opening is in or under a door the total net area of any such opening or openings shall not exceed 0.05 m². When such opening is cut in a door it shall be fitted with a grill made of non-combustible material. Doors shall be non-combustible.

2 The requirements for "B" class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles. Similarly, the requirements for "B" class integrity shall not apply to exterior doors in

superstructures and deckhouses. For ships carrying not more than 36 passengers, the Administration may permit the use of combustible materials in doors separating cabins from the individual interior sanitary spaces such as showers.

3 Where an automatic sprinkler system complying with the provisions of Regulation 12 is fitted:

- .1 openings in decks not forming steps in main vertical zones nor bounding horizontal zones shall be closed reasonably tight and such decks shall meet the "B" class integrity requirements in so far as is reasonable and practicable in the opinion of the Administration; and
- .2 openings in corridor bulkheads of "B" class materials shall be protected in accordance with the provisions of Regulation 25.

Regulation 32

Ventilation systems

1 *Passenger ships carrying more than 36 passengers*

1.1 The ventilation system of a passenger ship carrying more than 36 passengers shall, in addition to this part of this Regulation, also be in compliance with the requirements of Regulation 16.2 to 16.9.

1.2 In general, the ventilation fans shall be so disposed that the ducts reaching the various spaces remain within the main vertical zone.

1.3 Where ventilation systems penetrate decks, precautions shall be taken, in addition to those relating to the fire integrity of the deck required by Regulations 18.1.1 and 30.5, to reduce the likelihood of smoke and hot gases passing from one 'tweendeck space to another through the system. In addition to insulation requirements contained in this Regulation, vertical ducts shall, if necessary, be insulated as required by the appropriate tables in Regulation 26.

1.4 Except in cargo spaces, ventilation ducts shall be constructed of the following materials:

- .1 ducts not less than 0.075 m² in sectional area and all vertical ducts serving more than a single 'tweendeck space shall be constructed of steel or other equivalent material;
- .2 ducts less than 0.075 m² in sectional area other than the vertical ducts referred to in paragraph 1.4.1, shall be constructed of non-combustible materials. Where such ducts penetrate "A" or "B" class divisions due regard shall be given to ensuring the fire integrity of the division;
- .3 short lengths of duct, not in general exceeding 0.02 m² in sectional area nor 2 m in length, need not be non-combustible provided that

all of the following conditions are met:

- .3.1 the duct is constructed of a material of restricted fire risk to the satisfaction of the Administration;
- .3.2 the duct is used only at the terminal end of the ventilation system; and
- .3.3 the duct is not located closer than 600 mm measured along its length to a penetration of an "A" or "B" class division, including continuous "B" class ceilings.

1.5 Where a stairway enclosure is ventilated, the duct or ducts shall be taken from the fan room independently of other ducts in the ventilation system and shall not serve any other space.

1.6 All power ventilation, except machinery space and cargo space ventilation and any alternative system which may be required under Regulation 16.6, shall be fitted with controls so grouped that all fans may be stopped from either of two separate positions which shall be situated as far apart as practicable. Controls provided for the power ventilation serving machinery spaces shall also be grouped so as to be operable from two positions, one of which shall be outside such spaces. Fans serving power ventilation systems to cargo spaces shall be capable of being stopped from a safe position outside such spaces.

2 *Passenger ships carrying not more than 36 passengers*

2.1 The ventilation system of passenger ships carrying not more than 36 passengers shall be in compliance with Regulation 16.

Regulation 33

Windows and sidescuttles

1 All windows and sidescuttles in bulkheads within accommodation and service spaces and control stations other than those to which the provisions of Regulation 30.6 and of Regulation 31.2 apply, shall be so constructed as to preserve the integrity requirements of the type of bulkheads in which they are fitted.

2 Notwithstanding the requirements of the tables in Regulations 26 and 27:

- .1 all windows and sidescuttles in bulkheads separating accommodation and service spaces and control stations from weather shall be constructed with frames of steel or other suitable material. The glass shall be retained by a metal glazing bead or angle;
- .2 special attention shall be given to the fire integrity of windows facing open or enclosed lifeboat and liferaft embarkation areas and to the fire integrity of windows situated below such areas in such a position that their failure during a fire would impede the launching of, or embarkation into, lifeboats or liferafts.

Regulation 34

Restricted use of combustible materials

1 Except in cargo spaces, mail rooms, baggage rooms, or refrigerated compartments of service spaces, all linings, grounds, ceilings and insulations shall be of non-combustible materials. Partial bulkheads or decks used to subdivide a space for utility or artistic treatment shall also be of non-combustible material.

2 Vapour barriers and adhesives used in conjunction with insulation, as well as insulation of pipe fittings, for cold service systems need not be non-combustible, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have qualities of resistance to the propagation of flame to the satisfaction of the Administration.

3 The following surfaces shall have low flame-spread characteristics:*

- .1 exposed surfaces in corridors and stairway enclosures, and of bulkheads, wall and ceiling linings in all accommodation and service spaces and control stations;
- .2 concealed or inaccessible spaces in accommodation, service spaces and control stations.

4 The total volume of combustible facings, mouldings, decorations and veneers in any accommodation and service space shall not exceed a volume equivalent to 2.5 mm veneer on the combined area of the walls and ceilings. In the case of ships fitted with an automatic sprinkler system complying with the provisions of Regulation 12, the above volume may include some combustible material used for erection of "C" class divisions.

5 Veneers used on surfaces and linings covered by the requirements of paragraph 3 shall have a calorific value not exceeding 45 MJ/m² of the area for the thickness used.

6 Furniture in the corridors and stairway enclosures shall be kept to a minimum.

7 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke and toxic products.

8 Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of approved material which will not readily ignite, or give rise to toxic or explosive hazards at elevated temperatures.**

* Reference is made to Guidelines on the Evaluation of Fire Hazard Properties of Materials, adopted by the Organization by resolution A.166(ES.IV).

** Reference is made to Improved Provisional Guidelines on Test Procedures for Primary Deck Coverings, adopted by the Organization by resolution A.214(VII).

Regulation 35

Details of construction

- 1 In accommodation and service spaces, control stations, corridors and stairways:
 - .1 air spaces enclosed behind ceilings, panelling or linings shall be suitably divided by close-fitting draught stops not more than 14 m apart;
 - .2 in the vertical direction, such enclosed air spaces, including those behind linings of stairways, trunks, etc. shall be closed at each deck.
- 2 The construction of ceiling and bulkheading shall be such that it will be possible, without impairing the efficiency of the fire protection, for the fire patrols to detect any smoke originating in concealed and inaccessible places, except where in the opinion of the Administration there is no risk of fire originating in such places.

Regulation 36

Automatic sprinkler, fire detection and fire alarm systems or automatic fire detection and fire alarm systems

- 1 In any ship to which this Part applies there shall be installed throughout each separate zone, whether vertical or horizontal, in all accommodation and service spaces and, where it is considered necessary by the Administration, in control stations, except spaces which afford no substantial fire risk (such as void spaces, sanitary spaces, etc.) either:
 - .1 an automatic sprinkler, fire detection and fire alarm system of an approved type, complying with the provisions of Regulation 12 and so installed and arranged as to protect such spaces; or
 - .2 a fixed fire detection and fire alarm system of an approved type, complying with the provisions of Regulation 13 and so installed and arranged as to detect the presence of fire in such spaces, except that the smoke detectors required by Regulation 13.2.2 need not be provided.

Regulation 37

Protection of special category spaces

- 1 *Provisions applicable to special category spaces whether above or below the bulkhead deck*
 - 1.1 General
 - 1.1.1 The basic principle underlying the provisions of this Regulation is that as normal main vertical zoning may not be practicable in special category

spaces, equivalent protection must be obtained in such spaces on the basis of a horizontal zone concept and by the provision of an efficient fixed fire-extinguishing system. Under this concept a horizontal zone for the purpose of this Regulation may include special category spaces on more than one deck provided that the total overall clear height for vehicles does not exceed 10 m.

1.1.2 The requirements of Regulations 16, 18, 30 and 32 for maintaining the integrity of vertical zones shall be applied equally to decks and bulkheads forming the boundaries separating horizontal zones from each other and from the remainder of the ship.

1.2 Structural protection

1.2.1 Boundary bulkheads of special category spaces shall be insulated as required for category (11) spaces in table 26.1 or in table 27.1 and the horizontal boundaries as required for category (11) spaces in table 26.3 or in table 27.2.

1.2.2 Indicators shall be provided on the navigating bridge which shall indicate when any fire door leading to or from the special category spaces is closed.

1.3 Fixed fire-extinguishing system*

Each special category space shall be fitted with an approved fixed pressure water-spraying system for manual operation which shall protect all parts of any deck and vehicle platform in such space, provided that the Administration may permit the use of any other fixed fire-extinguishing system that has been shown by full-scale test in conditions simulating a flowing petrol fire in a special category space to be not less effective in controlling fires likely to occur in such a space.

1.4 Patrols and detection

1.4.1 An efficient patrol system shall be maintained in special category spaces. In any such space in which the patrol is not maintained by a continuous fire watch at all times during the voyage there shall be provided an automatic fire detection system of an approved type.

1.4.2 Manually operated call points shall be provided as necessary throughout the special category spaces and one shall be placed close to each exit from such spaces.

1.5 Fire-extinguishing equipment

There shall be provided in each special category space:

- .1 at least three water fog applicators;
- .2 one portable foam applicator unit complying with the provisions of Regulation 6.4, provided that at least two such units are available in

* Reference is made to Recommendation on Fixed Fire-Extinguishing Systems for Special Category Spaces, adopted by the Organization by resolution A.123(V).

the ship for use in such spaces; and

- .3 such number of portable fire extinguishers as the Administration may deem sufficient, provided that at least one portable extinguisher is located at each access to such spaces.

1.6 Ventilation system

1.6.1 There shall be provided an effective power ventilation system for the special category spaces sufficient to give at least 10 air changes per hour. The system for such spaces shall be entirely separated from other ventilation systems and shall be operating at all times when vehicles are in such spaces. The Administration may require an increased number of air changes when vehicles are being loaded and unloaded. Ventilation ducts serving special category spaces capable of being effectively sealed shall be separated for each such space. The system shall be capable of being controlled from a position outside such spaces.

1.6.2 The ventilation shall be such as to prevent air stratification and the formation of air pockets.

1.6.3 Means shall be provided to indicate on the navigating bridge any loss or reduction of the required ventilating capacity.

1.6.4 Arrangements shall be provided to permit a rapid shut-down and effective closure of the ventilation system in case of fire, taking into account the weather and sea conditions.

1.6.5 Ventilation ducts, including dampers, shall be made of steel and their arrangement shall be to the satisfaction of the Administration.

2 *Additional provisions applicable only to special category spaces above the bulkhead deck*

2.1 Scuppers

In view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or decks consequent on the operation of the fixed pressure water-spraying system, scuppers shall be fitted so as to ensure that such water is rapidly discharged directly overboard.

2.2 Precautions against ignition of flammable vapours

2.2.1 On any deck on which vehicles are carried and on which explosive vapours might be expected to accumulate, equipment which may constitute a source of ignition of flammable vapours and, in particular, electrical equipment and wiring, shall be installed at least 450 mm above the deck. Electrical equipment installed at more than 450 mm above the deck shall be of a type so enclosed and protected as to prevent the escape of sparks. However, if the Administration is satisfied that the installation of electrical equipment and wiring at less than 450 mm above the deck is necessary for the safe operation of the ship, such electrical equipment and wiring may be installed provided that it is of a type approved for use in an explosive petrol and air mixture.

2.2.2 Electrical equipment and wiring, if installed in an exhaust ventilation duct, shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

3 *Additional provisions applicable only to special category spaces below the bulkhead deck*

3.1 Bilge pumping and drainage

In view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or tank top consequent on the operation of the fixed pressure water-spraying system, the Administration may require pumping and drainage facilities to be provided additional to the requirements of Regulation II-1/21.

3.2 Precautions against ignition of flammable vapours

3.2.1 Electrical equipment and wiring, if fitted, shall be of a type suitable for use in explosive petrol and air mixtures. Other equipment which may constitute a source of ignition of flammable vapours shall not be permitted.

3.2.2 Electrical equipment and wiring, if installed in an exhaust ventilation duct, shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

Regulation 38

*Protection of cargo spaces, other than special category spaces,
intended for the carriage of motor vehicles with
fuel in their tanks for their own propulsion*

In any cargo space (other than special category spaces) containing motor vehicles with fuel in their tanks for their own propulsion, the following provisions shall be complied with.

1 *Fire detection*

There shall be provided an approved automatic fire detection and fire alarm system. The design and arrangements of this system shall be considered in conjunction with the ventilation requirements referred to in paragraph 3.

2 *Fire-extinguishing arrangements*

2.1 There shall be fitted a fixed fire-extinguishing system which shall comply with the provisions of Regulation 5, except that, if a carbon dioxide system is fitted, the quantity of gas available shall be at least sufficient to give a minimum volume of free gas equal to 45 per cent of the gross volume of the largest such cargo space which is capable of being sealed, and the arrangements shall be such as to ensure that at least two thirds of the gas required for the relevant space shall be introduced during 10 minutes. Any

other fixed gas fire-extinguishing system or fixed high expansion foam fire-extinguishing system may be fitted provided it gives equivalent protection. Furthermore, any cargo space designated only for vehicles which are not carrying any cargo may be fitted with fixed halogenated hydrocarbon fire-extinguishing systems which shall comply with the provisions of Regulation 5.

2.2 As an alternative, a system meeting the requirements of Regulation 37.1.3 may be fitted, provided that Regulation 37.2.1 or 37.3.1, as appropriate, is also complied with.

2.3 There shall be provided for use in any such space such number of portable fire extinguishers as the Administration may deem sufficient. At least one portable extinguisher shall be located at each access to such spaces.

3 *Ventilation system*

3.1 There shall be provided an effective power ventilation system sufficient to give at least 10 air changes per hour for ships carrying more than 36 passengers, and 6 air changes per hour for ships carrying not more than 36 passengers. The system for such cargo spaces shall be entirely separate from other ventilation systems and shall be operating at all times when vehicles are in such spaces. Ventilation ducts serving such cargo spaces capable of being effectively sealed shall be separated for each such space. The system shall be capable of being controlled from a position outside such spaces.

3.2 The ventilation shall be such as to prevent air stratification and the formation of air pockets.

3.3 Means shall be provided to indicate on the navigating bridge any loss or reduction of the required ventilating capacity.

3.4 Arrangements shall be provided to permit a rapid shut-down and effective closure of the ventilation system in case of fire, taking into account the weather and sea conditions.

3.5 Ventilation ducts, including dampers, shall be made of steel and their arrangement shall be to the satisfaction of the Administration.

4 *Precautions against ignition of flammable vapours*

4.1 Electrical equipment and wiring, if fitted, shall be of a type suitable for use in explosive petrol and air mixtures. Other equipment which may constitute a source of ignition of flammable vapours shall not be permitted.

4.2 Electrical equipment and wiring, if installed in an exhaust ventilation duct, shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

4.3 Scuppers shall not be led to machinery or other spaces where sources of ignition may be present.

Regulation 39

Fixed fire-extinguishing arrangements in cargo spaces

1 Except as provided for in paragraph 3, the cargo spaces of ships of 1,000 tons gross tonnage and upwards shall be protected by a fixed gas fire-extinguishing system complying with the provisions of Regulation 5, or by a fixed high expansion foam fire-extinguishing system which gives equivalent protection.

2 Where it is shown to the satisfaction of the Administration that a ship is engaged on voyages of such short duration that it would be unreasonable to apply the requirements of paragraph 1 and also in ships of less than 1,000 tons gross tonnage, the arrangements in cargo spaces shall be to the satisfaction of the Administration.

3 A ship engaged in the carriage of dangerous goods shall be provided in any cargo spaces with a fixed gas fire-extinguishing system complying with the provisions of Regulation 5 or with a fire-extinguishing system which in the opinion of the Administration gives equivalent protection for the cargoes carried.

Regulation 40

Fire patrols, detection, alarms and public address systems

1 Manual alarms shall be fitted throughout the accommodation and service spaces to transmit an alarm immediately to the navigating bridge or main fire control station.

2 An approved fire detection or fire alarm system shall be provided which will automatically indicate at one or more suitable points or stations the presence or indication of fire and its location in any cargo space which, in the opinion of the Administration, is not accessible except where it is shown to the satisfaction of the Administration that the ship is engaged on voyages of such short duration that it would be unreasonable to apply this requirement.

3 All ships shall at all times when at sea, or in port (except when out of service), be so manned or equipped as to ensure that any initial fire alarm is immediately received by a responsible member of the crew.

4 A special alarm, operated from the navigating bridge or fire control station, shall be fitted to summon the crew. This alarm may be part of the ship's general alarm system but it shall be capable of being sounded independently of the alarm to the passenger spaces.

5 A public address system or other effective means of communication shall be available throughout the accommodation and service spaces and control stations.

6 For ships carrying more than 36 passengers an efficient patrol system shall be maintained so that an outbreak of fire may be promptly detected. Each member of the fire patrol shall be trained to be familiar with the

arrangements of the ship as well as the location and operation of any equipment he may be called upon to use.

Regulation 41

Special requirements for ships carrying dangerous goods

The requirements of Regulation 54 shall apply, as appropriate, to passenger ships carrying dangerous goods.

PART C – FIRE SAFETY MEASURES FOR CARGO SHIPS

(Regulation 54 of this Part also applies to passenger ships as appropriate).

Regulation 42

Structure

1 Subject to the provisions of paragraph 4, the hull, superstructure, structural bulkheads, deck and deckhouses shall be constructed of steel or other equivalent material.

2 The insulation of aluminium alloy components of “A” or “B” class divisions, except structure which in the opinion of the Administration is non-load-bearing, shall be such that the temperature of the structural core does not rise more than 200°C above the ambient temperature at any time during the applicable exposure to the standard fire test.

3 Special attention shall be given to the insulation of aluminium alloy components of columns, stanchions and other structural members required to support lifeboat and liferaft stowage, launching and embarkation areas, and “A” and “B” class divisions, to ensure:

- .1 that for such members supporting lifeboat and liferaft areas and “A” class divisions, the temperature rise limitation specified in paragraph 2 shall apply at the end of one hour;
and
- .2 that for such members required to support “B” class divisions, the temperature rise limitation specified in paragraph 2 shall apply at the end of half an hour.

4 Crowns and casings of machinery spaces of category A shall be of steel construction adequately insulated and openings therein, if any, shall be suitably arranged and protected to prevent the spread of fire.

5 One of the following methods of protection shall be adopted in accommodation and service areas:

- .1 *Method IC* – The construction of all internal divisional bulkheading of non-combustible “B” or “C” class divisions generally without the installation of an automatic sprinkler, fire detection and fire alarm system in the accommodation and service spaces, except as required by Regulation 52.1; or
- .2 *Method IIC* – The fitting of an automatic sprinkler, fire detection and fire alarm system as required by Regulation 52.2 for the detection and extinction of fire in all spaces in which fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheading; or
- .3 *Method IIIC* – The fitting of a fixed fire detection and fire alarm system, as required by Regulation 52.3, in all spaces in which a fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheading, except that in no case must the area of any accommodation space or spaces bounded by an “A” or “B” class division exceed 50 m². Consideration may be given by the Administration to increasing this area for public spaces.

6 The requirements for the use of non-combustible materials in construction and insulation of the boundary bulkheads of machinery spaces, control stations, service spaces, etc., and the protection of stairway enclosures and corridors will be common to all three methods outlined in paragraph 5.

Regulation 43

Bulkheads within the accommodation and service spaces

1 All bulkheads required to be “B” class divisions shall extend from deck to deck and to the shell or other boundaries, unless continuous “B” class ceilings or linings are fitted on both sides of the bulkhead in which case the bulkhead may terminate at the continuous ceiling or lining.

2 *Method IC* – All bulkheads not required by this or other Regulations of this Part to be “A” or “B” class divisions, shall be of at least “C” class construction.

3 *Method IIC* – There shall be no restriction on the construction of bulkheads not required by this or other regulations of this Part to be “A” or “B” class divisions except in individual cases where “C” class bulkheads are required in accordance with table 44.1.

4 *Method IIIC* – There shall be no restriction on the construction of bulkheads not required by this Part to be “A” or “B” class divisions except that the area of any accommodation space or spaces bounded by a continuous “A” or “B” class division must in no case exceed 50 m² except in individual cases where “C” class bulkheads are required in accordance with table 44.1. Consideration may be given by the Administration to increasing this area for public space.

Regulation 44

Fire integrity of bulkheads and decks

1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this Part, the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 44.1 and 44.2.

2 The following requirements shall govern application of the tables:

.1 Tables 44.1 and 44.2 shall apply respectively to the bulkheads and decks separating adjacent spaces.

.2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) below. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

(1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.

Spaces containing the ship's radio equipment.

Fire-extinguishing rooms, fire control rooms and fire-recording stations.

Control room for propulsion machinery when located outside the machinery space.

Spaces containing centralized fire alarm equipment.

(2) *Corridors*

Corridors and lobbies.

(3) *Accommodation spaces*

Spaces as defined in Regulation 3.10, excluding corridors.

(4) *Stairways*

Interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connexion, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(5) *Service spaces (low risk)*

Lockers and store-rooms having an area of less than 2 m², drying rooms and laundries.

(6) *Machinery spaces of category A*

Spaces as defined in Regulation 3.19.

TABLE 44.1 – FIRE INTEGRITY OF BULKHEADS SEPARATING ADJACENT SPACES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0 ^{e/}	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*	A-60
Corridors (2)		C	B-0	B-0 A-0 ^{c/}	B-0	A-60	A-0	A-0	A-0	*	A-30
Accommodation spaces (3)			Ca,b/	B-0 A-0 ^{c/}	B-0	A-60	A-0	A-0	A-0	*	A-30
Stairways (4)				B-0 A-0 ^{c/}	B-0 A-0 ^{c/}	A-60	A-0	A-0	A-0	*	A-30
Service spaces (low risk) (5)					C	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces (6) of category A						*	A-0	A-0 ^{d/}	A-60	*	A-60 ^{f/}
Other machinery spaces (7)							A-0 ^{d/}	A-0	A-0	*	A-0
Cargo spaces (8)								*	A-0	*	A-0
Service spaces (high risk) (9)									A-0 ^{d/}	*	A-30
Open decks (10)										-	A-0
Ro/ro cargo spaces (11)											*h/

Notes: To be applied to tables 44.1 and 44.2, as appropriate.

- a/ No special requirements are imposed upon bulkheads in methods IIC and IIIC fire protection.
- b/ In case of method IIIC "B" class bulkheads of "B-0" rating shall be provided between spaces or groups of spaces of 50 m² and over in area.
- c/ For clarification as to which applies, see Regulations 43 and 46.
- d/ Where spaces are of the same numerical category and superscript d appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose, e.g. in category (3). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.
- e/ Bulkheads separating the wheelhouse, chartroom and radio room from each other may be "B-0" rating.
- f/ A-0 rating may be used if no dangerous goods are intended to be carried or if such goods are stowed not less than 3 m horizontally from such bulkhead.
- g/ For cargo spaces in which dangerous goods are intended to be carried, Regulation 54.2.8 applies.
- h/ Bulkheads and decks separating ro/ro cargo spaces shall be capable of being closed reasonably gastight and such divisions shall have "A" class integrity in so far as is reasonable and practicable in the opinion of the Administration.
- i/ Fire insulation need not be fitted if the machinery space in category (7), in the opinion of the Administration, has little or no fire risk.
- * Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material but is not required to be of "A" class standard.

TABLE 44.2 – FIRE INTEGRITY OF DECKS SEPARATING ADJACENT SPACES

Space below ↓ Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*	A-60
Corridors (2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30
Accommodation spaces (3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30
Stairways (4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*	A-30
Service spaces (low risk) (5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A (6)	A-60	A-60	A-60	A-60	A-60	*	A-60 i/	A-30	A-60	*	A-60
Other machinery spaces (7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*	A-0
Cargo spaces (8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*	A-0
Service spaces (high risk) (9)	A-60	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0 ^{d/}	*	A-30
Open decks (10)	*	*	*	*	*	*	*	*	*	—	*
Ro/ro cargo spaces (11)	A-60	A-30	A-30	A-30	A-0	A-60	A-0	A-0	A-30	*	* ^{h/}

(7) *Other machinery spaces*

Spaces as defined in Regulation 3.20 excluding machinery spaces of category A.

(8) *Cargo spaces*

All spaces used for cargo (including cargo oil tanks) and trunkways and hatchways to such spaces.

(9) *Service spaces (high risk)*

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having an area of 2 m² or more, workshops other than those forming part of the machinery spaces.

(10) *Open decks*

Open deck spaces and enclosed promenades having no fire risk. Air spaces (the space outside superstructures and deck-houses).

(11) *Rolro cargo spaces*

Spaces as defined in Regulation 3.14. Cargo spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion.

3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

4 External boundaries which are required in Regulation 42.1 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries to have "A" class integrity elsewhere in this Part. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be of materials to the satisfaction of the Administration.

Regulation 45

Means of escape

1 Stairways and ladders shall be so arranged as to provide, from all accommodation spaces and from spaces in which the crew is normally employed, other than machinery spaces, ready means of escape to the open deck and thence to the lifeboats and liferafts. In particular the following general provisions shall be complied with:

- .1 At all levels of accommodation there shall be provided at least two widely separated means of escape from each restricted space or group of spaces.
- .2.1 Below the lowest open deck the main means of escape shall be a stairway and the second escape may be a trunk or a stairway.

- .2.2 Above the lowest open deck the means of escape shall be stairways or doors to an open deck or a combination thereof.
 - .3 Exceptionally the Administration may dispense with one of the means of escape, due regard being paid to the nature and location of spaces and to the numbers of persons who normally might be quartered or employed there.
 - .4 No dead-end corridors having a length of more than 7 m shall be accepted. A dead-end corridor is a corridor or part of a corridor from which there is only one escape route.
 - .5 The width and continuity of the means of escape shall be to the satisfaction of the Administration.
 - .6 If a radiotelegraph station has no direct access to the open deck, two means of access to or egress from such station shall be provided, one of which may be a porthole or window of sufficient size or other means to the satisfaction of the Administration, to provide an emergency escape.
- 2 In all ro/ro cargo spaces where the crew is normally employed the number and locations of escape routes to the open deck shall be to the satisfaction of the Administration, but shall in no case be less than two and shall be widely separated.
- 3 Except as provided in paragraph 4, two means of escape shall be provided from each machinery space of category A. In particular, one of the following provisions shall be complied with:
- .1 two sets of steel ladders as widely separated as possible leading to doors in the upper part of the space similarly separated and from which access is provided to the open deck. In general, one of these ladders shall provide continuous fire shelter from the lower part of the space to a safe position outside the space. However, the Administration may not require the shelter if, due to the special arrangement or dimensions of the machinery space, a safe escape route from the lower part of this space is provided. This shelter shall be of steel, insulated, where necessary, to the satisfaction of the Administration and be provided with a self-closing steel door at the lower end; or
 - .2 one steel ladder leading to a door in the upper part of the space from which access is provided to the open deck and additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the open deck.
- 4 In a ship of less than 1,000 tons gross tonnage, the Administration may dispense with one of the means of escape required under paragraph 3, due regard being paid to the dimension and disposition of the upper part of the space.
- 5 From machinery spaces other than those of category A, escape routes

shall be provided to the satisfaction of the Administration having regard to the nature and location of the space and whether persons are normally employed in that space.

6 Lifts shall not be considered as forming one of the required means of escape as required by this Regulation.

Regulation 46

Protection of stairways and lift trunks in accommodation spaces, service spaces and control stations

1 Stairways which penetrate only a single deck shall be protected at least at one level by at least "B-0" class divisions and self-closing doors. Lifts which penetrate only a single deck shall be surrounded by "A-0" class divisions with steel doors at both levels. Stairways and lift trunks which penetrate more than a single deck shall be surrounded by at least "A-0" class divisions and be protected by self-closing doors at all levels.

2 On ships having accommodation for 12 persons or less, where stairways penetrate more than a single deck and where there are at least two escape routes direct to the open deck at every accommodation level, consideration may be given by the Administration to reducing the "A-0" requirements of paragraph 1 to "B-0".

3 All stairways shall be of steel frame construction except where the Administration sanctions the use of other equivalent material.

Regulation 47

Doors in fire resisting divisions

1 The fire resistance of doors shall, as far as practicable, be equivalent to that of the division in which they are fitted. Doors and door frames in "A" class divisions shall be constructed of steel. Doors in "B" class divisions shall be non-combustible. Doors fitted in boundary bulkheads of machinery spaces of category A shall be reasonably gastight and self-closing. In ships constructed according to method IC, an Administration may permit the use of combustible materials in doors separating cabins from individual interior sanitary accommodation such as showers.

2 Doors required to be self-closing shall not be fitted with hold-back hooks. However, hold-back arrangements fitted with remote release devices of the fail-safe type may be utilized.

3 In corridor bulkheads ventilation openings may be permitted only in and under the doors of cabins and public spaces. The openings shall be provided only in the lower half of a door. Where such opening is in or under a door the total net area of any such opening or openings shall not exceed 0.05 m². When such opening is cut in a door it shall be fitted with a grille made of non-combustible material.

- 4 Watertight doors need not be insulated.

Regulation 48

Ventilation systems

The ventilation systems of cargo ships shall be in compliance with the provisions of Regulation 16, except paragraph 8.

Regulation 49

Restricted use of combustible materials

- 1 All exposed surfaces in corridors and stairway enclosures and surfaces including grounds in concealed or inaccessible spaces in accommodation and service spaces and control stations shall have low flame-spread characteristics.* Exposed surfaces of ceilings in accommodation and service spaces and control stations shall have low flame-spread characteristics.
- 2 Paints, varnishes and other finishes used on exposed interior surfaces shall not offer an undue fire hazard in the judgement of the Administration and shall not be capable of producing excessive quantities of smoke.
- 3 Primary deck coverings, if applied, in accommodation and service spaces and control stations shall be of an approved material which will not readily ignite.**

Regulation 50

Details of construction

- 1 *Method IC* – In accommodation and service spaces and control stations all linings, draught stops, ceilings and their associated grounds shall be of non-combustible materials.
- 2 *Methods IIC and IIC* – In corridors and stairway enclosures serving accommodation and service spaces and control stations, ceilings, linings, draught stops and their associated grounds shall be of non-combustible materials.
- 3 *Methods IC, IIC and IIC*
 - 3.1 Except in cargo spaces or refrigerated compartments of service spaces, insulating materials shall be non-combustible. Vapour barriers and adhesives used in conjunction with insulation, as well as the insulation of pipe fittings,

* Reference is made to Guidelines on the Evaluation of Fire Hazard Properties of Materials, adopted by the Organization by resolution A.166(ES.IV).

** Reference is made to Improved Provisional Guidelines on Test Procedures for Primary Deck Coverings, adopted by the Organization by resolution A.214(VII).

for cold service systems, need not be of non-combustible materials, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have qualities of resistance to the propagation of flame to the satisfaction of the Administration.

3.2 Where non-combustible bulkheads, linings and ceilings are fitted in accommodation and service spaces they may have a combustible veneer not exceeding 2.0 mm in thickness within any such space except corridors, stairway enclosures and control stations, where the veneer shall not exceed 1.5 mm in thickness.

3.3 Air spaces enclosed behind ceilings, panellings, or linings, shall be divided by close-fitting draught stops spaced not more than 14 m apart. In the vertical direction, such air spaces, including those behind linings of stairways, trunks, etc., shall be closed at each deck.

Regulation 51

Arrangements for gaseous fuel for domestic purposes

Where gaseous fuel is used for domestic purposes the arrangements, storage, distribution and utilization of the fuel shall be such that, having regard to the hazards of fire and explosion which the use of such fuel may entail, the safety of the ship and the persons on board is preserved.

Regulation 52

Fixed fire detection and fire alarm systems Automatic sprinkler, fire detection and fire alarm systems

1 In ships in which method IC is adopted, a smoke detection system in accordance with the relevant provisions of Regulation 13 shall be so installed and arranged as to protect all corridors, stairways and escape routes within accommodation spaces.

2 In ships in which method IIC is adopted, an automatic sprinkler, fire detection and fire alarm system of an approved type and complying with the relevant provisions of Regulation 12 shall be so installed and arranged as to protect accommodation spaces, galleys and other service spaces, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc. In addition, a smoke detection system in accordance with the relevant provisions of Regulation 13 shall be so arranged and installed as to protect corridors, stairways and escape routes within accommodation spaces.

3 In ships in which method IIIC is adopted, a fixed fire detection and fire alarm system of an approved type and complying with the relevant provisions of Regulation 13 shall be so installed and arranged as to detect the presence of fire in all accommodation spaces and service spaces, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc.

4 Notwithstanding the provisions of the above, the Administration need

not require the installation of detectors required in accordance with the provisions of Regulation 13.2.2 until 1 September 1985.

Regulation 53

Fire protection arrangements in cargo spaces

1 General

1.1 Except for cargo spaces covered in paragraphs 2 and 3, cargo spaces of ships of 2,000 tons gross tonnage and upwards shall be protected by a fixed gas fire-extinguishing system complying with the provisions of Regulation 5 or by a fire-extinguishing system which gives equivalent protection.

1.2 The Administration may exempt from the requirements of paragraph 1.1 cargo spaces of any ship if constructed and solely intended for carrying ore, coal, grain, unseasoned timber and non-combustible cargoes or cargoes which, in the opinion of the Administration, constitute a low fire risk. Such exemptions may be granted only if the ship is fitted with steel hatch covers and effective means of closing all ventilators and other openings leading to the cargo spaces.

1.3 Notwithstanding the provisions of paragraph 1.1, any ship engaged in the carriage of dangerous goods shall be provided in any cargo spaces with a fixed gas fire-extinguishing system complying with the provisions of Regulation 5 or by a fire-extinguishing system which in the opinion of the Administration give equivalent protection for the cargoes carried.

2 Ro/ro cargo spaces

2.1 Fire detection

There shall be provided an approved automatic fire detection and fire alarm system. The design and arrangements of this system shall be considered in conjunction with the ventilation requirements referred to in 2.3.

2.2 Fire-extinguishing arrangements

2.2.1 Ro/ro cargo spaces capable of being sealed shall be fitted with a fixed gas fire-extinguishing system which shall comply with the provisions of Regulation 5, except that:

- .1 if a carbon dioxide system is fitted, the quantity of gas available shall be at least sufficient to give a minimum volume of free gas equal to 45 per cent of the gross volume of the largest such cargo space which is capable of being sealed, and the arrangements shall be such as to ensure that at least two thirds of the gas required for the relevant space shall be introduced during 10 minutes;
- .2 a halogenated hydrocarbon system may be used only for spaces designated only for vehicles which are not carrying any cargo;
- .3 any other fixed gas fire-extinguishing system or fixed high expansion

foam fire-extinguishing system may be fitted provided the Administration is satisfied that an equivalent protection is achieved;

- .4 as an alternative, a system meeting the requirements of Regulation 37.1.3 may be fitted. However, the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. If this is not possible the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information.* Such information shall be included in the stability information supplied to the master as required by Regulation II-1/22.

2.2.2 Ro/ro cargo spaces not capable of being sealed shall be fitted with a system meeting the requirements of Regulation 37.1.3. However, the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. If this is not possible the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information*. Such information shall be included in the stability information supplied to the master as required by Regulation II-1/22.

2.2.3 There shall be provided for use in any ro/ro cargo space such number of portable fire extinguishers as the Administration may deem sufficient. At least one portable extinguisher shall be located at each access to such a cargo space.

2.2.4 Each ro/ro cargo space intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion shall be provided with:

- .1 at least three water fog applicators;
- .2 one portable foam applicator unit complying with the provisions of Regulation 6.4 provided that at least two such units are available in the ship for use in such ro/ro cargo spaces.

2.3 Ventilation system

2.3.1 Closed ro/ro cargo spaces shall be provided with an effective power ventilation system sufficient to provide at least six air changes per hour based on an empty hold. Ventilation fans shall normally be run continuously whenever vehicles are on board. Where this is impracticable, they shall be operated for a limited period daily as weather permits and in any case for a reasonable period prior to discharge, after which period the ro/ro cargo space shall be proved gas free. One or more portable combustible gas detecting instruments shall be carried for this purpose. The system shall be entirely separate from other ventilating systems. Ventilation ducts serving ro/ro cargo spaces capable of being effectively sealed shall be separated for each cargo space. The Administration may require an increased number of air changes when vehicles are being loaded or unloaded. The system shall be capable of being controlled from a position outside such spaces.

* Reference is made to Recommendation on Fixed Fire-Extinguishing Systems for Special Category Spaces, adopted by the Organization by resolution A.123(V).

2.3.2 The ventilation shall be so arranged as to prevent air stratification and the formation of air pockets.

2.3.3 Means shall be provided to indicate any loss of the required ventilating capacity on the navigating bridge.

2.3.4 Arrangements shall be provided to permit a rapid shut-down and effective closure of the ventilation system in case of fire, taking into account the weather and sea conditions.

2.3.5 Ventilation ducts, including dampers, shall be made of steel and their arrangement shall be to the satisfaction of the Administration.

2.4 Precautions against ignition of flammable vapours

Closed ro/ro cargo spaces carrying motor vehicles with fuel in their tanks for their own propulsion shall comply with the following additional provisions:

- .1 Except as provided in paragraph 2.4.2, electrical equipment and wiring shall be of a type suitable for use in explosive petrol and air mixtures.
 - .2 Above a height of 450 mm from the deck, electrical equipment of a type so enclosed and protected as to prevent the escape of sparks shall be permitted as an alternative on condition that the ventilating system is so designed and operated as to provide continuous ventilation of the cargo spaces at the rate of at least ten air changes per hour whenever vehicles are on board.
 - .3 Other equipment which may constitute a source of ignition of flammable vapours shall not be permitted.
 - .4 Electrical equipment and wiring in an exhaust ventilation duct shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.
 - .5 Scuppers shall not be led to machinery or other spaces where sources of ignition may be present.
- 3 *Cargo spaces, other than ro/ro cargo spaces, intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion*

Spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion shall comply with requirements of paragraph 2, except that paragraph 2.2.4 need not be complied with.

Regulation 54

Special requirements for ships carrying dangerous goods

1 *General*

1.1 In addition to complying with the requirements of Regulation 53 for cargo ships and with the requirements of Regulations 38 and 39 for passenger ships as appropriate, ship types and cargo spaces, referred to in paragraph 1.2, intended for the carriage of dangerous goods shall comply with the requirements of this Regulation, as appropriate, except when carrying dangerous goods in limited quantities* unless such requirements have already been met by compliance with the requirements elsewhere in this Chapter. The types of ships and modes of carriage of dangerous goods are referred to in paragraph 1.2 and in table 54.1, where the numbers appearing in paragraph 1.2 are referred to in the top line.

1.2 The following ship types and cargo spaces shall govern the application of tables 54.1 and 54.2:

- .1 Ships and cargo spaces not specifically designed for the carriage of freight containers but intended for the carriage of dangerous goods in packaged form including goods in freight containers and portable tanks.
- .2 Purpose built container ships and cargo spaces intended for the carriage of dangerous goods in freight containers and portable tanks.
- .3 Ro/ro ships and ro/ro cargo spaces intended for the carriage of dangerous goods.
- .4 Ships and cargo spaces intended for the carriage of solid dangerous goods in bulk.
- .5 Ships and cargo spaces intended for carriage of dangerous goods other than liquids and gases in bulk in shipborne barges.

2 *Special requirements*

Unless otherwise specified the following requirements shall govern the application of tables 54.1, 54.2 and 54.3 to both "on deck" and "under deck" stowage of dangerous goods where the numbers of the following paragraphs are indicated in the first column.

2.1 Water supplies

2.1.1 Arrangements shall be made to ensure immediate availability of a supply of water from the fire main at the required pressure either by permanent pressurization or by suitably placed remote starting arrangements for the fire pumps.

* Reference is made to Section 18 of the General Introduction to the International Maritime Dangerous Goods Code (the IMDG Code) for a definition of the term "limited quantities"

TABLE 54.1 – APPLICATION OF THE REQUIREMENTS TO DIFFERENT MODES OF CARRIAGE OF DANGEROUS GOODS IN SHIPS AND CARGO SPACES

Wherever "x" appears in table 54.1 it means that this requirement is applicable to all classes of dangerous goods as given in the appropriate line of table 54.3, except as indicated by the notes.

Regulation 54.1.2 Regulation 54.2	.1 Not specifically designed	.2 Container cargo spaces	.3			.4 Solid dangerous goods in bulk	.5 Shipborne barges
			Closed ro/ro cargo spaces	Open ro/ro cargo spaces	Weather decks		
.1.1	x	x	x	x	x	For application of requirements of Regulation 54 to different classes of dangerous goods – see Table 54.2	x
.1.2	x	x	x	x	x		—
.1.3	x	x	x	x	—		x
.1.4	x	x	x	x	—		x
.2	x	x	x	x	—		x ^{d/}
.3	x	x	x	—	—		x ^{d/}
.4.1	x	x ^{a/}	x	—	—		x ^{d/}
.4.2	x	x ^{a/}	x	—	—		x ^{d/}
.5	x	x	x	—	—		—
.6.1	x	x	x	x	x		—
.6.2	x	x	x	x	x		—
.7	x	—	—	x	x		—
.8	x	x ^{b/}	x	x	x		—
.9	—	—	x ^{c/}	x	—	—	

Notes

- a/ For classes 4 and 5.1 not applicable to closed freight containers. For classes 2, 3, 6.1 and 8 when carried in closed freight containers the ventilation rate may be reduced to not less than two air changes. For the purpose of this requirement a portable tank is a closed freight container.
- b/ Applicable to decks only.
- c/ Applies only to closed ro/ro cargo spaces, not capable of being sealed.
- d/ In the special case where the barges are capable of containing flammable vapours or alternatively if they are capable of discharging flammable vapours to a safe space outside the barge carrier compartment by means of ventilation ducts connected to the barges, these requirements may be reduced or waived to the satisfaction of the Administration.

TABLE 54.2 – APPLICATION OF THE REQUIREMENTS TO DIFFERENT CLASSES OF DANGEROUS GOODS FOR SHIPS AND CARGO SPACES CARRYING SOLID DANGEROUS GOODS IN BULK

Class – Chapter VII Regulation 54.2	4.1	4.2	4.3 ^{f/}	5.1	6.1	8	9
.1.1	x	x	–	x	x ^{g/}	x ^{g/}	x
.1.2 ^{e/}	x	x	–	x	–	–	x
.2	x	x ^{g/}	x	x ^{g/}	–	–	x ^{g/}
.4.1 ^{h/}	x ^{g/}	x ^{g/}	x	x ^{g/}	–	–	x ^{g/}
.4.2 ^{h/}	x	x ^{g/}	x	x ^{g/}	–	–	x ^{g/}
.6	x	x	x	x	x	x	x
.8	x	x	x	x ^{g/}	x ^{g/}	x ^{g/}	x

Notes

- ^{e/} This requirement is applicable when the characteristics of the substance call for large quantities of water for fire fighting.
- ^{f/} The hazards of substances in this class which may be carried in bulk are such that special consideration must be given by the Administration to the construction and equipment of the ships involved in addition to those enumerated in this table.
- ^{g/} Reference is made to the International Maritime Dangerous Goods Code (resolution A.81(IV) as amended) or the Code of Safe Practice for Solid Bulk Cargoes (resolution A.434(XI) as amended), as appropriate.
- ^{h/} At least natural ventilation is required in enclosed cargo spaces intended for carriage of solid dangerous goods in bulk. In cases where power ventilation is required in the Code of Safe Practice for Solid Bulk Cargoes (resolution A.434(XI) as amended), the use of portable ventilation units (equipment) to the satisfaction of the Administration may suffice.

TABLE 54.3 – APPLICATION OF THE REQUIREMENTS TO DIFFERENT CLASSES OF DANGEROUS GOODS EXCEPT SOLID DANGEROUS GOODS IN BULK

Class -- Chapter VII Regulation 54.2	1	2	3	4	5.1	5.2	6.1	8
.1.1	x	x	x	x ^{p/}	x	x ^{p/}	x	x
.1.2 ^{i/}	x	x	x	x ^{p/}	x	x ^{p/}	—	—
.1.3	x ^{k/}	—	—	—	—	—	—	—
.1.4	x ^{k/}	—	—	—	—	—	—	—
.2	x ^{k/}	x ^{l/}	x ^{m/}	—	—	—	x ^{m/} x ^{p/}	x ^{m/} x ^{p/}
.3	x	x	x	x	x	—	x	x
.4.1	—	x ^{j/}	x ^{m/}	x ^{p/}	x ^{p/}	—	x ^{m/} x ^{p/}	x ^{m/} x ^{p/}
.4.2	—	x ^{l/}	x ^{m/}	—	—	—	x ^{m/} x ^{p/}	x ^{m/} x ^{p/}
.5	—	—	x ^{m/}	—	—	—	x ^{n/}	x ^{m/}
.6	—	x	x	x	x	x ^{p/}	x	x
.7	—	—	x	x	x	x ^{p/}	x ^{p/}	x ^{p/}
.8	x ^{k/} o/	x	x	x	x ^{p/}	—	x ^{p/}	x ^{p/}
.9	x	x	x ^{m/}	x ^{p/}	x	—	x ^{m/}	x ^{m/}

Notes

- i/ This requirement is applicable when the characteristics of the substance call for large quantities of water for fire fighting.
- j/ Applicable to flammable or poisonous gases.
- k/ Except goods of class 1 in division 1.4, compatibility group S.
- l/ All flammable gases.
- m/ All liquids having a flashpoint below 23°C (closed cup test).
- n/ Liquids only.
- o/ Goods of class 1 shall be stowed 3 m horizontally away from the machinery space boundaries in all cases.
- p/ Reference is made to the International Maritime Dangerous Goods Code (resolution A.81(IV) as amended), or the Code of Safe Practice for Solid Bulk Cargoes (resolution A.434(XI) as amended), as appropriate.

2.1.2 The quantity of water delivered shall be capable of supplying four nozzles of a size and at pressures as specified in Regulation 4, capable of being trained on any part of the cargo space when empty. This amount of water may be applied by equivalent means to the satisfaction of the Administration.

2.1.3 Means of effectively cooling the designated under deck cargo space by copious quantities of water, either by a fixed arrangement of spraying nozzles, or flooding the cargo space with water, shall be provided. Hoses may be used for this purpose in small cargo spaces and in small areas of larger cargo spaces at the discretion of the Administration. In any event the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. If this is not possible the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information.*

2.1.4 Provision to flood a designated under deck cargo space with suitable specified media may be substituted for the requirements in paragraph 2.1.3.

2.2 Sources of ignition

Electrical equipment and wiring shall not be fitted in enclosed cargo spaces, closed vehicle deck spaces, or open vehicle deck spaces unless it is essential for operational purposes in the opinion of the Administration. However, if electrical equipment is fitted in such spaces, it shall be of a certified safe type** for use in the dangerous environments to which it may be exposed unless it is possible to completely isolate the electrical system (by removal of links in the system, other than fuses). Cable penetrations of the decks and bulkheads shall be sealed against the passage of gas or vapour. Through runs of cables and cables within the cargo spaces shall be protected against damage from impact. Any other equipment which may constitute a source of ignition of flammable vapour shall not be permitted.

2.3 Detection system

An approved fire detection and fire alarm system shall be fitted to all enclosed cargo spaces including closed vehicle deck spaces. Where the detection system utilizes samples of atmosphere drawn from such cargo spaces provision shall be made to prevent, in the event of cargo leakage, the discharge of contaminated atmosphere through the sampling system into the space in which the detection apparatus is situated. A notice stating that the samples shall be discharged to the open air when cargoes giving off toxic fumes are being carried shall be permanently exhibited at the equipment.

2.4 Ventilation

2.4.1 Adequate power ventilation shall be provided in enclosed cargo spaces. The arrangement shall be such as to provide for at least six air changes per

* Reference is made to Recommendation on Fixed Fire-Extinguishing Systems for Special Category Spaces, adopted by the Organization by resolution A.123(V).

** Reference is made to Recommendations published by the International Electrotechnical Commission and, in particular, Publication 92 - Electrical Installations in Ships.

hour in the cargo space based on an empty cargo space and for removal of vapours from the upper or lower parts of the cargo space, as appropriate.

2.4.2 The fans shall be such as to avoid the possibility of ignition of flammable gas air mixtures. Suitable wire mesh guards shall be fitted over inlet and outlet ventilation openings.

2.5 Bilge pumping

Where it is intended to carry flammable or toxic liquids in enclosed cargo spaces the bilge pumping system shall be designed to ensure against inadvertent pumping of such liquids through machinery space piping or pumps. Where large quantities of such liquids are carried, consideration shall be given to the provision of additional means of draining those cargo spaces. These means shall be to the satisfaction of the Administration.

2.6 Personnel protection

2.6.1 Four sets of full protective clothing resistant to chemical attack shall be provided in addition to the fireman's outfits required by Regulation 17. The protective clothing shall cover all skin, so that no part of the body is unprotected.

2.6.2 At least two self-contained breathing apparatuses additional to those required by Regulation 17 shall be provided.

2.7 Portable fire extinguishers

Portable fire extinguishers with a total capacity of at least 12 kg of dry powder or equivalent shall be provided for the cargo spaces. These extinguishers shall be in addition to any portable fire extinguishers required elsewhere in this Chapter.

2.8 Insulation of machinery space boundaries

Bulkheads forming boundaries between cargo spaces and machinery spaces of category A shall be insulated to "A-60" standard, unless the dangerous goods are stowed at least 3 m horizontally away from such bulkheads. Other boundaries between such spaces shall be insulated to "A-60" standard.

2.9 Water spray system

Each open ro/ro cargo space having a deck above it and each space deemed to be a closed ro/ro cargo space not capable of being sealed shall be fitted with an approved fixed pressure water-spraying system for manual operation which shall protect all parts of any deck and vehicle platform in such space, except that the Administration may permit the use of any other fixed fire-extinguishing system that has been shown by full-scale test to be no less effective. In any event the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. If this is not possible the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information.*

* Reference is made to Recommendation on Fixed Fire-Extinguishing Systems for Special Category Spaces, adopted by the Organisation by resolution A.123(V).

3 *Document of compliance*

The Administration shall provide the ship with an appropriate document as evidence of compliance of construction and equipment with the requirements of this Regulation.

PART D – FIRE SAFETY MEASURES FOR TANKERS

(The requirements of this Part are additional to those of Part C except for Regulations 53 and 54 which do not apply to tankers and except as provided otherwise in Regulations 57 and 58)

Regulation 55

Application

1 Unless expressly provided otherwise, this Part shall apply to tankers carrying crude oil and petroleum products having a flashpoint not exceeding 60°C (closed cup test), as determined by an approved flashpoint apparatus, and a Reid vapour pressure which is below atmospheric pressure and other liquid products having a similar fire hazard.

2 Where liquid cargoes other than those referred to in paragraph 1 or liquefied gases which introduce additional fire hazards are intended to be carried, additional safety measures shall be required to the satisfaction of the Administration, having due regard to the provisions of the Bulk Chemical Code and the Gas Carrier Code.

3 This paragraph applies to all ships which are combination carriers. Such ships shall not carry solid cargoes unless all cargo tanks are empty of oil and gas freed or unless the arrangements provided in each case are to the satisfaction of the Administration and in accordance with the relevant operational requirements contained in the Guidelines for Inert Gas Systems*.

4 Tankers carrying petroleum products having a flashpoint exceeding 60°C (closed cup test) as determined by an approved flashpoint apparatus shall comply with the provisions of Part C, except that in lieu of the fixed fire-extinguishing system required in Regulation 53 they shall be fitted with a fixed deck foam system which shall comply with the provisions of Regulation 61.

5 The requirements for inert gas systems of Regulation 60 need not be applied to all chemical tankers or gas carriers when carrying cargoes described in paragraph 1, provided that alternative arrangements, to be developed by the Organization, are fitted.**

* Reference is made to Guidelines for Inert Gas Systems, adopted by the Maritime Safety Committee at its forty-second session in May 1980 (MSC/Circ.282).

** Reference is made to Interim Regulation for Inert Gas Systems on Chemical Tankers Carrying Petroleum Products, adopted by the Organization by resolution A.473(XII).

6 Chemical tankers and gas carriers shall comply with the requirements of this Part, except where alternative and supplementary arrangements are provided to the satisfaction of the Administration, having due regard to the provisions of the Bulk Chemical Code and the Gas Carrier Code.

Regulation 56

Location and separation of spaces

1 Machinery spaces of category A other than such spaces for bow thrusters and their associated equipment shall be positioned aft of cargo tanks and slop tanks; they shall also be situated aft of cargo pump rooms and cofferdams, but not necessarily aft of the oil fuel bunker tanks. Any machinery space of category A shall be isolated from cargo tanks and slop tanks by a cofferdam, a cargo pump room, or an oil fuel bunker tank. However, the lower portion of the pump room may be recessed into machinery spaces of category A to accommodate pumps provided that the deckhead of the recess is in general not more than one third of the moulded depth above the keel except that in the case of ships of not more than 25,000 tonnes deadweight, where it can be demonstrated that for reasons of access and satisfactory piping arrangements this is impracticable, the Administration may permit a recess in excess of such height, but not exceeding one half of the moulded depth above the keel.

2 Accommodation spaces, main cargo control stations, control stations and service spaces (excluding isolated cargo handling gear lockers) shall be positioned aft of all cargo tanks, slop tanks, cargo pump rooms and cofferdams which isolate cargo or slop tanks from machinery spaces of category A. Any common bulkheads separating a cargo pump room, including the cargo pump room entrance, from accommodation and service spaces and control stations shall be constructed to "A-60" standard. Where deemed necessary, accommodation spaces, control stations, machinery spaces other than those of category A, and service spaces may be permitted forward of all cargo tanks, slop tanks, cargo pump rooms and cofferdams subject to an equivalent standard of safety and appropriate availability of fire-extinguishing arrangements being provided to the satisfaction of the Administration.

3 Where the fitting of a navigation position above the cargo tank area is shown to be necessary it shall be for navigation purposes only and it shall be separated from the cargo tank deck by means of an open space with a height of at least 2 m. The fire protection of such navigation position shall in addition be as required for control spaces as set forth in Regulation 58.1 and 58.2 and other provisions, as applicable, of this Part.

4 Means shall be provided to keep deck spills away from the accommodation and service areas. This may be accomplished by provision of a permanent continuous coaming of a suitable height extending from side to side. Special consideration shall be given to the arrangements associated with stern loading.

5 Exterior boundaries of superstructures and deckhouses enclosing accommodation and service spaces and including any overhanging decks which support such accommodation, shall be insulated to "A-60" standard for the whole of the portions which face cargo oil tanks and for 3 m aft of the front boundary. In the case of the sides of these superstructures and deckhouses, such insulation shall be carried as high as is deemed necessary by the Administration.

6.1 Entrances, air inlets and openings to accommodation spaces, service spaces and control stations shall not face the cargo area. They shall be located on the end bulkhead not facing the cargo area and/or on the outboard side of the superstructure or deckhouse at a distance of at least 25 per cent of the length of the ship but not less than 3 m from the end of the superstructure or deckhouse facing the cargo area. This distance, however, need not exceed 5 m.

6.2 No doors shall be permitted within the limits mentioned in paragraph 6.1, except that doors to those spaces not having access to accommodation spaces, service spaces and control stations, such as cargo control stations, provision rooms and store-rooms may be permitted by the Administration. Where such doors are fitted, the boundaries of the space shall be insulated to "A-60" standard. Bolted plates for removal of machinery may be fitted within the limits specified in paragraph 6.1. Navigating bridge doors and wheelhouse windows may be located within the limits specified in paragraph 6.1 so long as they are so designed that a rapid and efficient gas and vapour tightening of the navigating bridge can be ensured.

6.3 Port lights facing the cargo area and on the sides of the superstructures and deckhouses within the limits specified in paragraph 6.1 shall be of the fixed (non-opening) type. Such port lights in the first tier on the main deck shall be fitted with inside covers of steel or other equivalent material.

Regulation 57

Structure, bulkheads within accommodation and service spaces and details of construction

1 For the application of the requirements of Regulations 42, 43 and 50 to tankers, only method IC as defined in Regulation 42.5.1 shall be used.

2 Skylights to cargo pump rooms shall be of steel, shall not contain any glass and shall be capable of being closed from outside the pump room.

Regulation 58

Fire integrity of bulkheads and decks

1 In lieu of Regulation 44 and in addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this Part the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 58.1 and 58.2.

TABLE 58.1 – FIRE INTEGRITY OF BULKHEADS SEPARATING ADJACENT SPACES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Control stations (1)	A-0 ^{c/}	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*
Corridors (2)		C	B-0	B-0 A-0 ^{a/}	B-0	A-60	A-0	A-60	A-0	*
Accommodation spaces (3)			C	B-0 A-0 ^{a/}	B-0	A-60	A-0	A-60	A-0	*
Stairways (4)				B-0 A-0 ^{a/}	B-0 A-0 ^{a/}	A-60	A-0	A-60	A-0	*
Service spaces (low risk) (5)					C	A-60	A-0	A-60	A-0	*
Machinery spaces of category A (6)						*	A-0	A-0 ^{d/}	A-60	*
Other machinery spaces (7)							A-0 ^{b/}	A-0	A-0	*
Cargo pump rooms (8)								*	A-60	*
Service spaces (high risk) (9)									A-0 ^{b/}	*
Open decks (10)										—

Notes: To be applied to tables 58.1 and 58.2, as appropriate.

a/ For clarification as to which applies, see Regulations 43 and 46 of this Chapter.

b/ Where spaces are of the same numerical category and superscript b appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose, e.g. in category (9). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.

c/ Bulkheads separating the wheelhouse, chartroom and radio room from each other may be "B-0" rating.

d/ Bulkheads and decks between cargo pump rooms and machinery spaces of category A may be penetrated by cargo pump shaft glands and similar glanded penetrations, provided that gastight seals with efficient lubrication or other means of ensuring the permanence of the gas seal are fitted in way of the bulkhead or deck.

e/ Fire insulation need not be fitted if the machinery space in category (7), in the opinion of the Administration, has little or no fire risk.

* Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material but is not required to be of "A" class standard.

TABLE 58.2 – FIRE INTEGRITY OF DECKS SEPARATING ADJACENT SPACES

Space below ↓	Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Control stations	(1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	–	A-0	*
Corridors	(2)	A-0	*	*	A-0	*	A-60	A-0	–	A-0	*
Accommodation spaces	(3)	A-60	A-0	*	A-0	*	A-60	A-0	–	A-0	*
Stairways	(4)	A-0	A-0	A-0	*	A-0	A-60	A-0	–	A-0	*
Service spaces (low risk)	(5)	A-15	A-0	A-0	A-0	*	A-60	A-0	–	A-0	*
Machinery spaces of category A	(6)	A-60	A-60	A-60	A-60	A-60	*	A-50 ^{e/}	A-0	A-60	*
Other machinery spaces	(7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*
Cargo pump rooms	(8)	–	–	–	–	–	A-0 ^{d/}	A-0	*	–	*
Service spaces (high risk)	(9)	A-60	A-0	A-0	A-0	A-0	A-60	A-0	–	A-0 ^{b/}	*
Open decks	(10)	*	*	*	*	*	*	*	*	*	–

- 2 The following requirements shall govern application of the tables:
- .1 Tables 58.1 and 58.2 shall apply respectively to the bulkhead and decks separating adjacent spaces.
 - .2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (10) below. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.
 - (1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.
Spaces containing the ship's radio equipment.
Fire-extinguishing rooms, fire control rooms and fire-recording stations.
Control room for propulsion machinery when located outside the machinery space.
Spaces containing centralized fire alarm equipment.
 - (2) *Corridors*

Corridors and lobbies.
 - (3) *Accommodation spaces*

Spaces as defined in Regulation 3.10, excluding corridors.
 - (4) *Stairways*

Interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connexion, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.
 - (5) *Service spaces (low risk)*

Lockers and store-rooms having areas of less than 2 m², drying rooms and laundries.
 - (6) *Machinery spaces of category A*

Spaces as defined in Regulation 3.19.
 - (7) *Other machinery spaces*

Spaces as defined in Regulation 3.20 excluding machinery spaces of category A.
 - (8) *Cargo pump rooms*

Spaces containing cargo pumps and entrances and trunks to such spaces.

(9) *Service spaces (high risk)*

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having an area of 2 m² or more, workshops other than those forming part of the machinery spaces.

(10) *Open decks*

Open deck spaces and enclosed promenades having no fire risk. Air spaces (the space outside superstructures and deck-houses).

3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

4 External boundaries which are required in Regulation 57.1 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries to have "A" class integrity elsewhere in these Requirements. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be of materials to the satisfaction of the Administration.

5 Permanent approved gastight lighting enclosures for illuminating cargo pump rooms may be permitted in bulkheads and decks separating cargo pump rooms and other spaces provided they are of adequate strength and the integrity and gastightness of the bulkhead or deck is maintained.

Regulation 59

Venting, purging, gas freeing and ventilation

1 *Cargo tank venting*

1.1 The venting systems of cargo tanks are to be entirely distinct from the air pipes of the other compartments of the ship. The arrangements and position of openings in the cargo tank deck from which emission of flammable vapours can occur shall be such as to minimize the possibility of flammable vapours being admitted to enclosed spaces containing a source of ignition, or collecting in the vicinity of deck machinery and equipment which may constitute an ignition hazard. In accordance with this general principle the criteria in paragraphs 1.2 to 1.10 will apply.

1.2 The venting arrangements shall be so designed and operated as to ensure that neither pressure nor vacuum in cargo tanks shall exceed design parameters and be such as to provide for:

- .1 the flow of the small volumes of vapour, air or inert gas mixtures caused by thermal variations in a cargo tank in all cases through pressure/vacuum valves; and
- .2 the passage of large volumes of vapour, air or inert gas mixtures during cargo loading and ballasting, or during discharging.

1.3.1 The venting arrangements in each cargo tank may be independent or combined with other cargo tanks and may be incorporated into the inert gas piping.

1.3.2 Where the arrangements are combined with other cargo tanks either stop valves or other acceptable means shall be provided to isolate each cargo tank. Where stop valves are fitted, they shall be provided with locking arrangements which shall be under the control of the responsible ship's officer. Any isolation must continue to permit the flow caused by thermal variations in a cargo tank in accordance with paragraph 1.2.1.

1.4 The venting arrangements shall be connected to the top of each cargo tank and shall be self-draining to the cargo tanks under all normal conditions of trim and list of the ship. Where it may not be possible to provide self-draining lines permanent arrangements shall be provided to drain the vent lines to a cargo tank.

1.5 The venting system shall be provided with devices to prevent the passage of flame into the cargo tanks. The design, testing and locating of these devices shall comply with the requirements established by the Administration which shall contain at least the standards adopted by the Organization.

1.6 Provision shall be made to guard against liquid rising in the venting system to a height which would exceed the design head of cargo tanks. This shall be accomplished by high level alarms or overflow control systems or other equivalent means, together with gauging devices and cargo tank filling procedures.

1.7 Openings for pressure release required by paragraph 1.2.1 shall:

- .1 have as great a height as is practicable above the cargo tank deck to obtain maximum dispersal of flammable vapours but in no case less than 2 m above the cargo tank deck;
- .2 be arranged at the furthest distance practicable but not less than 5 m from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery and equipment which may constitute an ignition hazard.

1.8 Pressure/vacuum valves required by paragraph 1.2.1 may be provided with a by-pass arrangement when they are located in a vent main or masthead riser. Where such an arrangement is provided there shall be suitable indicators to show whether the by-pass is open or closed.

1.9 Vent outlets for cargo loading, discharging and ballasting required by paragraph 1.2.2 shall:

- .1.1 permit the free flow of vapour mixtures; or
- .1.2 permit the throttling of the discharge of the vapour mixtures to achieve a velocity of not less than 30 m/sec;
- .2 be so arranged that the vapour mixture is discharged vertically upwards;

- .3 where the method is by free flow of vapour mixtures, be such that the outlet shall be not less than 6 m above the cargo tank deck or fore and aft gangway if situated within 4 m of the gangway and located not less than 10 m measured horizontally from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery and equipment which may constitute an ignition hazard;
- .4 where the method is by high velocity discharge, be located at a height not less than 2 m above the cargo tank deck and not less than 10 m measured horizontally from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery and equipment which may constitute an ignition hazard. These outlets shall be provided with high velocity devices of an approved type;
- .5 be designed on the basis of the maximum designed loading rate multiplied by a factor of at least 1.25 to take account of gas evolution, in order to prevent the pressure in any cargo tank from exceeding the design pressure. The master shall be provided with information regarding the maximum permissible loading rate for each cargo tank and in the case of combined venting systems, for each group of cargo tanks.

1.10 In combination carriers, the arrangement to isolate slop tanks containing oil or oil residues from other cargo tanks shall consist of blank flanges which will remain in position at all times when cargoes other than liquid cargoes referred to in Regulation 55.1 are carried.

2 *Cargo tank purging and/or gas freeing*

Arrangements for purging and/or gas freeing shall be such as to minimize the hazards due to the dispersal of flammable vapours in the atmosphere and to flammable mixtures in a cargo tank. Accordingly:

- .1 When the ship is provided with an inert gas system the cargo tanks shall first be purged in accordance with the provisions of Regulation 62.13 until the concentration of hydrocarbon vapours in the cargo tanks has been reduced to less than 2 per cent by volume. Thereafter, venting may be at the cargo tank deck level.
- .2 When the ship is not provided with an inert gas system, the operation shall be such that the flammable vapour is initially discharged:
 - .2.1 through the vent outlets as specified in paragraph 1.9; or
 - .2.2 with a vertical exit velocity of at least 20 m/sec through outlets at least 2 m above the cargo tank deck level and which are protected by suitable devices to prevent the passage of flame.

When the flammable gas concentration in the outlet has been reduced to 30 per cent of the lower flammable limit the discharge of the gas mixture may be at the cargo tank deck level.

3 *Ventilation*

3.1 Cargo pump rooms shall be mechanically ventilated and discharges from the exhaust fans shall be led to a safe place on the open deck. The ventilation of these rooms shall have sufficient capacity to minimize the possibility of accumulation of flammable vapours. The number of changes of air shall be at least 20 per hour, based upon the gross volume of the space. The air ducts shall be arranged so that all of the space is effectively ventilated. The ventilation shall be of the suction type using fans of the non-sparking type.

3.2 The arrangement of ventilation inlets and outlets and other deckhouse and superstructure boundary space openings shall be such as to complement the provisions of paragraph 1. Such vents especially for machinery spaces shall be situated as far aft as practicable. Due consideration in this regard should be given when the ship is equipped to load or discharge at the stern. Sources of ignition such as electrical equipment shall be so arranged as to avoid an explosion hazard.

3.3 In combination carriers all cargo spaces and any enclosed spaces adjacent to cargo spaces shall be capable of being mechanically ventilated. The mechanical ventilation may be provided by portable fans. An approved fixed gas warning system capable of monitoring flammable vapours shall be provided in cargo pump rooms and pipe ducts and cofferdams referred to in Regulation 56.1 adjacent to slop tanks. Suitable arrangements shall be made to facilitate measurement of flammable vapours in all other spaces within the cargo tank area. Such measurements shall be made possible from open deck or easily accessible positions.

Regulation 60

Cargo tank protection

1 For tankers of 20,000 tonnes deadweight and upwards the protection of the cargo tanks deck area and cargo tanks shall be achieved by a fixed deck foam system and a fixed inert gas system in accordance with the requirements of Regulations 61 and 62, except that, in lieu of the above installations, the Administration, after having given consideration to the ship's arrangement and equipment, may accept other combinations of fixed installations if they afford protection equivalent to the above, in accordance with Regulation I/5.

2 To be considered equivalent, the system proposed in lieu of the deck foam system shall:

- .1 be capable of extinguishing spill fires and also preclude ignition of spilled oil not yet ignited; and
- .2 be capable of combating fires in ruptured tanks.

3 To be considered equivalent, the system proposed in lieu of the fixed inert gas system shall:

- .1 be capable of preventing dangerous accumulations of explosive mixtures in intact cargo tanks during normal service throughout the

ballast voyage and necessary in-tank operations; and

- .2 be so designed as to minimize the risk of ignition from the generation of static electricity by the system itself.

4 Tankers of 20,000 tonnes deadweight and upwards constructed before 1 September 1984 which are engaged in the trade of carrying crude oil shall be fitted with an inert gas system, complying with the requirements of paragraph 1, not later than:

- .1 for a tanker of 70,000 tonnes deadweight and upwards 1 September 1984 or the date of delivery of the ship, whichever occurs later; and
- .2 for a tanker of less than 70,000 tonnes deadweight 1 May 1985 or the date of delivery of the ship, whichever occurs later except that for tankers of less than 40,000 tonnes deadweight not fitted with tank washing machines having an individual throughput of greater than 60 m³/hour the Administration may exempt such tankers from the requirements of this paragraph, if it would be unreasonable and impracticable to apply these requirements, taking into account the ship's design characteristics.

5 Tankers of 40,000 tonnes deadweight and upwards constructed before 1 September 1984 which are engaged in the trade of carrying oil other than crude oil and any such tanker of 20,000 tonnes deadweight and upwards engaged in the trade of carrying oil other than crude oil fitted with tank washing machines having an individual throughput of greater than 60 m³/hour shall be fitted with an inert gas system, complying with the requirements of paragraph 1, not later than:

- .1 for a tanker of 70,000 tonnes deadweight and upwards 1 September 1984 or the date of delivery of the ship, whichever occurs later; and
- .2 for a tanker of less than 70,000 tonnes deadweight 1 May 1985 or the date of delivery of the ship, whichever occurs later.

6 All tankers operating with a cargo tank cleaning procedure using crude oil washing shall be fitted with an inert gas system complying with the requirements of Regulation 62 and with fixed tank washing machines.

7 All tankers fitted with a fixed inert gas system shall be provided with a closed ullage system.

8 Tankers of less than 20,000 tonnes deadweight shall be provided with a deck foam system complying with the requirements of Regulation 61.

Regulation 61

Fixed deck foam systems

1 The arrangements for providing foam shall be capable of delivering foam to the entire cargo tank area as well as into any cargo tank the deck of which has been ruptured.

2 The deck foam system shall be capable of simple and rapid operation. The main control station for the system shall be suitably located outside the cargo tank area, adjacent to the accommodation spaces and readily accessible and operable in the event of fire in the areas protected.

3 The rate of supply of foam solution shall be not less than the greatest of the following:

- .1 0.6 ℓ/minute per square metre of cargo deck area, where cargo deck area means the maximum breadth of the ship multiplied by the total longitudinal extent of the cargo tank spaces;
- .2 6 ℓ/minute per square metre of the horizontal sectional area of the single tank having the largest such area; or
- .3 3 ℓ/minute per square metre of the area protected by the largest monitor, such area being entirely forward of the monitor, but not less than 1,250 ℓ/minute.

4 Sufficient foam concentrate shall be supplied to ensure at least 20 minutes of foam generation in tankers fitted with an inert gas installation or 30 minutes of foam generation in tankers not fitted with an inert gas installation when using solution rates stipulated in paragraphs 3.1, 3.2 or 3.3, whichever is the greatest. The foam expansion ratio (i.e. the ratio of the volume of foam produced to the volume of the mixture of water and foam-making concentrate supplied) shall not generally exceed 12 to 1. Where systems essentially produce low expansion foam but at an expansion ratio slightly in excess of 12 to 1 the quantity of foam solution available shall be calculated as for 12 to 1 expansion ratio systems. When medium expansion ratio foam (between 50 to 1 and 150 to 1 expansion ratio) is employed the application rate of the foam and the capacity of a monitor installation shall be to the satisfaction of the Administration.

5 Foam from the fixed foam system shall be supplied by means of monitors and foam applicators. At least 50 per cent of the foam solution supply rate required in paragraphs 3.1 and 3.2 shall be delivered from each monitor. On tankers of less than 4,000 tonnes deadweight the Administration may not require installation of monitors but only applicators. However, in such a case the capacity of each applicator shall be at least 25 per cent of the foam solution supply rate required in paragraphs 3.1 or 3.2.

6.1 The number and position of monitors shall be such as to comply with paragraph 1. The capacity of any monitor shall be at least 3 ℓ/minute of foam solution per square metre of deck area protected by that monitor, such area being entirely forward of the monitor. Such capacity shall be not less than 1,250 ℓ/minute.

6.2 The distance from the monitor to the farthest extremity of the protected area forward of that monitor shall not be more than 75 per cent of the monitor throw in still air conditions.

7 A monitor and hose connexion for a foam applicator shall be situated both port and starboard at the front of the poop or accommodation spaces facing the cargo deck. On tankers of less than 4,000 tonnes deadweight a hose

connexion for a foam applicator shall be situated both port and starboard at the front of the poop or accommodation spaces facing the cargo deck.

8 Applicators shall be provided to ensure flexibility of action during fire-fighting operations and to cover areas screened from the monitors. The capacity of any applicator shall be not less than 400 ℓ and the applicator throw in still air conditions shall be not less than 15 m. The number of foam applicators provided shall be not less than four. The number and disposition of foam main outlets shall be such that foam from at least two applicators can be directed on to any cargo tank deck area.

9 Valves shall be provided in the foam main, and in the fire main when this is an integral part of the deck foam system, immediately forward of any monitor position to isolate damaged sections of those mains.

10 Operation of a deck foam system at its required output shall permit the simultaneous use of the minimum required number of jets of water at the required pressure from the fire main.

Regulation 62

Inert gas systems

1 The inert gas system referred to in Regulation 60 shall be designed, constructed and tested to the satisfaction of the Administration. It shall be so designed and operated as to render and maintain the atmosphere of the cargo tanks* non-flammable at all times, except when such tanks are required to be gas free. In the event that the inert gas system is unable to meet the operational requirement set out above and it has been assessed that it is impractical to effect a repair, then cargo discharge, deballasting and necessary tank cleaning shall only be resumed when the "emergency conditions" laid down in the Guidelines on Inert Gas Systems** are complied with.

2 The system shall be capable of:

- .1 inerting empty cargo tanks by reducing the oxygen content of the atmosphere in each tank to a level at which combustion cannot be supported;
- .2 maintaining the atmosphere in any part of any cargo tank with an oxygen content not exceeding 8 per cent by volume and at a positive pressure at all times in port and at sea except when it is necessary for such a tank to be gas free;
- .3 eliminating the need for air to enter a tank during normal operations except when it is necessary for such a tank to be gas free;
- .4 purging empty cargo tanks of hydrocarbon gas, so that subsequent

* Throughout this Regulation the term "cargo tank" includes also "slop tanks".

** Reference is made to Guidelines for Inert Gas Systems, adopted by the Maritime Safety Committee at its forty-second session in May 1980 (MSC/Circ.282).

gas freeing operations will at no time create a flammable atmosphere within the tank.

3.1 The system shall be capable of delivering inert gas to the cargo tanks at a rate of at least 125 per cent of the maximum rate of discharge capacity of the ship expressed as a volume.

3.2 The system shall be capable of delivering inert gas with an oxygen content of not more than 5 per cent by volume in the inert gas supply main to the cargo tanks at any required rate of flow.

4 The inert gas supply may be treated flue gas from main or auxiliary boilers. The Administration may accept systems using flue gases from one or more separate gas generators or other sources or any combination thereof, provided that an equivalent standard of safety is achieved. Such systems should, as far as practicable, comply with the requirements of this Regulation. Systems using stored carbon dioxide shall not be permitted unless the Administration is satisfied that the risk of ignition from generation of static electricity by the system itself is minimized.

5 Flue gas isolating valves shall be fitted in the inert gas supply mains between the boiler uptakes and the flue gas scrubber. These valves shall be provided with indicators to show whether they are open or shut, and precautions shall be taken to maintain them gastight and keep the seatings clear of soot. Arrangements shall be made to ensure that boiler soot blowers cannot be operated when the corresponding flue gas valve is open.

6.1 A flue gas scrubber shall be fitted which will effectively cool the volume of gas specified in paragraph 3 and remove solids and sulphur combustion products. The cooling water arrangements shall be such that an adequate supply of water will always be available without interfering with any essential services on the ship. Provision shall also be made for an alternative supply of cooling water.

6.2 Filters or equivalent devices shall be fitted to minimize the amount of water carried over to the inert gas blowers.

6.3 The scrubber shall be located aft of all cargo tanks, cargo pump rooms and cofferdams separating these spaces from machinery spaces of category A.

7.1 At least two blowers shall be fitted which together shall be capable of delivering to the cargo tanks at least the volume of gas required by paragraph 3. In the system with gas generator the Administration may permit only one blower if that system is capable of delivering the total volume of gas required by paragraph 3 to the protected cargo tanks, provided that sufficient spares for the blower and its prime mover are carried on board to enable any failure of the blower and its prime mover to be rectified by the ship's crew.

7.2 Two fuel oil pumps shall be fitted to the inert gas generator. The Administration may permit only one fuel oil pump on condition that sufficient spares for the fuel oil pump and its prime mover are carried on board to enable any failure of the fuel oil pump and its prime mover to be rectified by the ship's crew.

7.3 The inert gas system shall be so designed that the maximum pressure which it can exert on any cargo tank will not exceed the test pressure of any cargo tank. Suitable shut-off arrangements shall be provided on the suction and discharge connexions of each blower. Arrangements shall be provided to enable the functioning of the inert gas plant to be stabilized before commencing cargo discharge. If the blowers are to be used for gas freeing, their air inlets shall be provided with blanking arrangements.

7.4 The blowers shall be located aft of all cargo tanks, cargo pump rooms and cofferdams separating these spaces from machinery spaces of category A.

8.1 Special consideration shall be given to the design and location of scrubber and blowers with relevant piping and fittings in order to prevent flue gas leakages into enclosed spaces.

8.2 To permit safe maintenance, an additional water seal or other effective means of preventing flue gas leakage shall be fitted between the flue gas isolating valves and scrubber or incorporated in the gas entry to the scrubber.

9.1 A gas regulating valve shall be fitted in the inert gas supply main. This valve shall be automatically controlled to close as required in paragraphs 19.2 and 19.3. It shall also be capable of automatically regulating the flow of inert gas to the cargo tanks unless means are provided to automatically control the speed of the inert gas blowers required in paragraph 7.

9.2 The valve referred to in paragraph 9.1 shall be located at the forward bulkhead of the forwardmost gas safe space* through which the inert gas supply main passes.

10.1 At least two non-return devices, one of which shall be a water seal, shall be fitted in the inert gas supply main, in order to prevent the return of hydrocarbon vapour to the machinery space uptakes or to any gas safe spaces under all normal conditions of trim, list and motion of the ship. They shall be located between the automatic valve required by paragraph 9.1 and the aftermost connexion to any cargo tank or cargo pipeline.

10.2 The devices referred to in paragraph 10.1 shall be located in the cargo tank area on deck.

10.3 The water seal referred to in paragraph 10.1 shall be capable of being supplied by two separate pumps, each of which shall be capable of maintaining an adequate supply at all times.

10.4 The arrangement of the seal and its associated fittings shall be such that it will prevent backflow of hydrocarbon vapours and will ensure the proper functioning of the seal under operating conditions.

10.5 Provision shall be made to ensure that the water seal is protected against freezing, in such a way that the integrity of seal is not impaired by overheating.

* Gas safe space is a space in which the entry of hydrocarbon gases would produce hazards with regard to flammability or toxicity.

10.6 A water loop or other approved arrangement shall also be fitted to each associated water supply and drain pipe and each venting or pressure-sensing pipe leading to gas safe spaces. Means shall be provided to prevent such loops from being emptied by vacuum.

10.7 The deck water seal and all loop arrangements shall be capable of preventing return of hydrocarbon vapours at a pressure equal to the test pressure of the cargo tanks.

10.8 The second device shall be a non-return valve or equivalent capable of preventing the return of vapours or liquids and fitted forward of the deck water seal required in paragraph 10.1. It shall be provided with positive means of closure. As an alternative to positive means of closure, an additional valve having such means of closure may be provided forward of the non-return valve to isolate the deck water seal from the inert gas main to the cargo tanks.

10.9 As an additional safeguard against the possible leakage of hydrocarbon liquids or vapours back from the deck main, means shall be provided to permit this section of the line between the valve having positive means of closure referred to in paragraph 10.8 and the valve referred to in paragraph 9 to be vented in a safe manner when the first of these valves is closed.

11.1 The inert gas main may be divided into two or more branches forward of the non-return devices required by paragraph 10.

11.2.1 The inert gas supply mains shall be fitted with branch piping leading to each cargo tank. Branch piping for inert gas shall be fitted with either stop valves or equivalent means of control for isolating each tank. Where stop valves are fitted, they shall be provided with locking arrangements, which shall be under the control of a responsible ship's officer.

11.2.2 In combination carriers, the arrangement to isolate the slop tanks containing oil or oil residues from other tanks shall consist of blank flanges which will remain in position at all times when cargoes other than oil are being carried except as provided for in the relevant section of the Guidelines on Inert Gas Systems.

11.3 Means shall be provided to protect cargo tanks against the effect of overpressure or vacuum caused by thermal variations when the cargo tanks are isolated from the inert gas mains.

11.4 Piping systems shall be so designed as to prevent the accumulation of cargo or water in the pipelines under all normal conditions.

11.5 Suitable arrangements shall be provided to enable the inert gas main to be connected to an external supply of inert gas.

12 The arrangements for the venting of all vapours displaced from the cargo tanks during loading and ballasting shall comply with Regulation 59.1 and shall consist of either one or more mast risers, or a number of high velocity vents. The inert gas supply mains may be used for such venting.

13 The arrangements for inerting, purging or gas freeing of empty tanks as

required in paragraph 2 shall be to the satisfaction of the Administration and shall be such that the accumulation of hydrocarbon vapours in pockets formed by the internal structural members in a tank is minimized and that:

- .1 on individual cargo tanks the gas outlet pipe, if fitted, shall be positioned as far as practicable from the inert gas/air inlet and in accordance with Regulation 59.1. The inlet of such outlet pipes may be located either at deck level or at not more than 1 m above the bottom of the tank;
- .2 the cross sectional area of such gas outlet pipe referred to in paragraph 13.1 shall be such that an exit velocity of at least 20 m/sec can be maintained when any three tanks are being simultaneously supplied with inert gas. Their outlets shall extend not less than 2 m above deck level;
- .3 each gas outlet referred to in paragraph 13.2 shall be fitted with suitable blanking arrangements;
- .4.1 if a connexion is fitted between the inert gas supply mains and the cargo piping system, arrangements shall be made to ensure an effective isolation having regard to the large pressure difference which may exist between the systems. This shall consist of two shut-off valves with an arrangement to vent the space between the valves in a safe manner or an arrangement consisting of a spool-piece with associated blanks;
- .4.2 the valve separating the inert gas supply main from the cargo main and which is on the cargo main side shall be a non-return valve with a positive means of closure.

14.1 One or more pressure-vacuum breaking devices shall be provided on the inert gas supply main to prevent the cargo tanks from being subject to:

- .1 a positive pressure in excess of the test pressure of the cargo tank if the cargo were to be loaded at the maximum specified rate and all other outlets were left shut; or
- .2 a negative pressure in excess of 700 mm water gauge if cargo were to be discharged at the maximum rated capacity of the cargo pumps and the inert gas blowers were to fail.

14.2 The location and design of the devices referred to in paragraph 14.1 shall be in accordance with Regulation 59.1.

15 Means shall be provided for continuously indicating the temperature and pressure of the inert gas at the discharge side of the gas blowers, whenever the gas blowers are operating.

16.1 Instrumentation shall be fitted for continuously indicating and permanently recording, when the inert gas is being supplied:

- .1 the pressure of the inert gas supply mains forward of the non-return devices required by paragraph 10.1; and
- .2 the oxygen content of the inert gas in the inert gas supply mains on

the discharge side of the gas blowers.

16.2 The devices referred to in paragraph 16.1 shall be placed in the cargo control room where provided. But where no cargo control room is provided, they shall be placed in a position easily accessible to the officer in charge of cargo operations.

16.3 In addition, meters shall be fitted:

- .1 in the navigating bridge to indicate at all times the pressure referred to in paragraph 16.1.1 and the pressure in the slop tanks of combination carriers, whenever those tanks are isolated from the inert gas supply main; and
- .2 in the machinery control room or in the machinery space to indicate the oxygen content referred to in paragraph 16.1.2.

17 Portable instruments for measuring oxygen and flammable vapour concentration shall be provided. In addition, suitable arrangement shall be made on each cargo tank such that the condition of the tank atmosphere can be determined using these portable instruments.

18 Suitable means shall be provided for the zero and span calibration of both fixed and portable gas concentration measurement instruments, referred to in paragraphs 16 and 17.

19.1 Audible and visual alarms shall be provided to indicate:

- .1 low water pressure or low water flow rate to the flue gas scrubber as referred to in paragraph 6.1;
- .2 high water level in the flue gas scrubber as referred to in paragraph 6.1;
- .3 high gas temperature as referred to in paragraph 15;
- .4 failure of the inert gas blowers referred to in paragraph 7;
- .5 oxygen content in excess of 8 per cent by volume as referred to in paragraph 16.1.2;
- .6 failure of the power supply to the automatic control system for the gas regulating valve and to the indicating devices as referred to in paragraphs 9 and 16.1;
- .7 low water level in the water seal as referred to in paragraph 10.1;
- .8 gas pressure less than 100 mm water gauge as referred to in paragraph 16.1.1. The alarm arrangement shall be such as to ensure that the pressure in slop tanks in combination carriers can be monitored at all times; and
- .9 high gas pressure as referred to in paragraph 16.1.1.

19.2 In the system with gas generators audible and visual alarms shall be provided in accordance with 19.1.1, 19.1.3, 19.1.5 to 19.1.9 and additional

alarms to indicate:

- .1 insufficient fuel oil supply;
- .2 failure of the power supply to the generator;
- .3 failure of the power supply to the automatic control system for the generator.

19.3 Automatic shut-down of the inert gas blowers and gas regulating valve shall be arranged on predetermined limits being reached in respect of paragraphs 19.1.1, 19.1.2 and 19.1.3.

19.4 Automatic shut-down of the gas regulating valve shall be arranged in respect of paragraph 19.1.4.

19.5 In respect of paragraph 19.1.5, when the oxygen content of the inert gas exceeds 8 per cent by volume, immediate action shall be taken to improve the gas quality. Unless the quality of the gas improves, all cargo tank operations shall be suspended so as to avoid air being drawn in to the tanks and the isolation valve referred to in paragraph 10.8 shall be closed.

19.6 The alarms required in paragraphs 19.1.5, 19.1.6 and 19.1.8 shall be fitted in the machinery space and cargo control room, where provided, but in each case in such a position that they are immediately received by responsible members of the crew.

19.7. In respect of paragraph 19.1.7 the Administration shall be satisfied as to the maintenance of an adequate reserve of water at all times and the integrity of the arrangements to permit the automatic formation of the water seal when the gas flow ceases. The audible and visual alarm on the low level of water in the water seal shall operate when the inert gas is not being supplied.

19.8 An audible alarm system independent of that required in paragraph 19.1.8 or automatic shut-down of cargo pumps shall be provided to operate on predetermined limits of low pressure in the inert gas mains being reached.

20 . Tankers constructed before 1 September 1984 which are required to have an inert gas system shall at least comply with the requirements of Regulation 62 of Chapter II-2 of the International Convention for the Safety of Life at Sea, 1974*. In addition they shall comply with the requirements of this Regulation, except that:

- .1 inert gas systems fitted on board such tankers before 1 June 1981 need not comply with the following paragraphs: 3.2, 6.3, 7.4, 8, 9.2, 10.2, 10.7, 10.9, 11.3, 11.4, 13.2, 13.4.2 and 19.8;
- .2 inert gas systems fitted on board such tankers on or after 1 June 1981 need not comply with the following paragraphs: 3.2, 6.3, 7.4 and 13.2.

21 Detailed instruction manuals shall be provided on board, covering the

* The text as adopted by the International Conference on Safety of Life at Sea, 1974.

operations, safety and maintenance requirements and occupational health hazards relevant to the inert gas system and its application to the cargo tank system*. The manuals shall include guidance on procedures to be followed in the event of a fault or failure of the inert gas system.

Regulation 63

Cargo pump rooms

1 Each cargo pump room shall be provided with one of the following fixed fire-extinguishing systems operated from a readily accessible position outside the pump room. Cargo pump rooms should be provided with a system suitable for machinery spaces of category A.

1.1 Either a carbon dioxide or a halogenated hydrocarbon system complying with the provisions of Regulation 5 and with the following:

- .1 the alarms referred to in Regulation 5.1.6 shall be safe for use in a flammable cargo vapour/air mixture;
- .2 a notice shall be exhibited at the controls stating that due to the electrostatic ignition hazard, the system is to be used only for fire extinguishing and not for inerting purposes.

1.2 A high expansion foam system complying with the provisions of Regulation 9, provided that the foam concentrate supply is suitable for extinguishing fires involving the cargoes carried.

1.3 A fixed pressure water-spraying system complying with the provisions of Regulation 10.

2 Where the extinguishing medium used in the cargo pump room system is also used in systems serving other spaces, the quantity of medium provided or its delivery rate need not be more than the maximum required for the largest compartment.

* Reference is made to Guidelines for Inert Gas Systems, adopted by the Maritime Safety Committee at its forty-second session in May 1980 (MSC/Circ.282)

CHAPTER III

LIFE-SAVING APPLIANCES, ETC.

Regulation 1

Application

The existing text of sub-paragraph (c)(iii)(2) is replaced by the following:

(2) Regulations II-2/28.1.5 and II-2/28.1.6; and

Regulation 27

Lifeboats, liferafts and buoyant apparatus

In sub-paragraph (c)(iii), reference to "paragraph (d) of Regulation 1 of Chapter II-1" is amended to read:

Regulation II-1/1.5

In sub-paragraph (c)(vii), the reference to "paragraph (d) of Regulation 1 of Chapter II-1" is amended to read:

Regulation II-1/1.5

Regulation 30

Lighting for deck, lifeboats, liferafts, etc.

In paragraph (a), the reference to "Regulation 25 of Chapter II-1" is amended to read:

Regulation II-1/42

Regulation 38

Emergency lighting

The reference to "Regulation 26 of Chapter II-1" is amended to read:

Regulation II-1/43

CHAPTER IV

RADIOTELEGRAPHY AND RADIOTELEPHONY

The following new Regulation is added:

Regulation 4-1

VHF radiotelephone installation

- (a) Passenger ships irrespective of size and cargo ships of 300 tons gross tonnage and upwards shall be fitted with a VHF radiotelephone installation complying with the provisions of Regulation 17.
- (b) The provisions of Regulation 17 shall also apply for VHF radiotelephone installations required by a Contracting Government for all ships to which Chapter V applies navigating in an area under its jurisdiction and for which a VHF radiotelephone installation is not made compulsory by paragraph (a).

The existing text of Regulation 7 is replaced by the following:

Regulation 7

Watches – radiotelephone

- (a) Each ship which is fitted with a radiotelephone station in accordance with Regulation 4 shall, for safety purposes while at sea, maintain continuous watch on the radiotelephone distress frequency in the place on board from which the ship is usually navigated, by use of a radiotelephone distress frequency watch receiver, using a loudspeaker, a filtered loudspeaker or radiotelephone auto alarm.
- (b) Each ship referred to in paragraph (a) shall carry qualified radiotelephone operators (who may be the master, an officer or a member of the crew) as follows:
- (i) if of 300 tons gross tonnage and upwards but less than 500 tons gross tonnage, at least one operator;
 - (ii) if of 500 tons gross tonnage and upwards but less than 1,600 tons gross tonnage, at least two operators. If such a ship carries one

radiotelephone operator exclusively employed for duties related to radiotelephony, a second operator is not obligatory.

(c) Each ship which in accordance with Regulation 3 or Regulation 4 is fitted with a radiotelegraph station shall, while at sea, maintain continuous watch on the radiotelephone distress frequency in a place to be determined by the Administration, by use of a radiotelephone distress frequency watch receiver, using a loudspeaker, a filtered loudspeaker or radiotelephone auto alarm.

The existing text of Regulation 8 is replaced by the following:

Regulation 8

Watches – VHF radiotelephone

Each ship which is fitted with a VHF radiotelephone installation in accordance with Regulation 4-1 shall at sea maintain a continuous listening watch on the navigating bridge:

- (i) on 156.8 MHz (channel 16) when practicable; and/or
- (ii) for such periods and on such channels as may be required by the Contracting Government referred to in Regulation 4-1(b).

Regulation 10

Radiotelegraph installations

The existing text of paragraph (g) is replaced by the following:

(g-1) The main and reserve transmitters shall, when connected to the main antenna, have a minimum normal range as specified below, that is to say, they must be capable of transmitting clearly perceptible signals from ship to ship by day and under normal conditions and circumstances over the specified

	Minimum normal range in miles	
	Main transmitter	Reserve transmitter
All passenger ships and cargo ships of 1,600 tons gross tonnage and upwards	150	100
Cargo ships below 1,600 tons gross tonnage	100	75

ranges.* (Clearly perceptible signals will normally be received if the R.M.S. value of the field strength at the receiver is at least 50 microvolts per metre.)

(g-2) The radiotelegraph installation shall include facilities for radiotelephone transmission and reception on the radiotelephone distress frequency. This requirement may be fulfilled by including such facilities in the main or reserve installation or other installed equipment. The transmitter power and receiver sensitivity of the radiotelephony part of the installation shall comply with Regulation 16(c)(i) and (f) respectively if that part is fitted after 1 September 1986. For installations fitted prior to that date, such transmitter power and receiver sensitivity shall be as determined by the Administration. The location and other conditions of the radiotelephony facilities required by this Regulation shall be as determined by the Administration, except when they form part of the main or reserve radiotelegraph installation.

* In the absence of a direct measurement of the field strength the following data may be used as a guide for approximately determining the normal range:

A. In the case of antennae other than self-supporting types.

Normal range in miles	Metre-amperes ^{1/}
200	128
175	102
150	76
125	58
100	45
75	34

^{1/} The product of the distance (in metres) from the highest part of the antenna to the deepest load water-line and the antenna current (in amperes).

The values given in the second column of the table correspond to an average value of the ratio

$$\frac{\text{effective antenna height}}{\text{maximum antenna height}} = 0.47$$

This ratio varies with local conditions of the antenna and may vary between about 0.3 and 0.7.

B. In the case of self-supporting transmitting antennae:

Normal range in miles	Metre-amperes ^{2/}
200	305
175	215
150	150
125	110
100	85
75	55

^{2/} The product of the distance (in metres) from the highest part of the antenna to the deepest load water-line and the current (in amperes) measured at the base of the radiating portion of the antenna. The values given in the second column are based on the propagation curves given in CCIR Recommendation 368-2 and also the method, experimental results and calculations in CCIR Report 502-1 and Opinion 43-1. The necessary value of metre-amperes varies considerably with local conditions of the antenna.

The existing text of sub-paragraph (h)(iv) is replaced by the following:

- (h)(iv)(1) The radiotelephone transmitting facility required by paragraph (g-2) shall be fitted with an automatic device for generating the radiotelephone alarm signal, so designed as to prevent actuation by mistake, and complying with the requirements of Regulation 16(e). The device shall be capable of being taken out of operation at any time in order to permit the immediate transmission of a distress message. For installations fitted prior to 1 September 1986, the fitting of automatic devices for generating the radiotelephone alarm signal shall be as determined by the Administration.
- (2) Arrangements shall be made to check periodically the proper functioning of the automatic device for generating the radiotelephone alarm signal on frequencies other than the radiotelephone distress frequency using a suitable artificial antenna. An exception shall be made for radiotelephone emergency equipment having only the radiotelephone distress frequency in which case a suitable artificial antenna shall be employed.

Note: While all reasonable steps shall be taken to maintain the apparatus in an efficient condition, malfunction of the radiotelephone transmitting facilities required by this Regulation shall not be considered as making the ship unseaworthy or as a reason for delaying the ship in ports where repair facilities are not readily available.

The existing text of sub-paragraph (1)(ii) is deleted.

The existing text of sub-paragraph (m)(iv) is replaced by the following:

- (m)(iv) the VHF installation in accordance with the provisions of Regulation 17(c);

Regulation 16

Radiotelephone installations

The existing text of paragraph (b) is amended by deleting A3H, A3A and A3J.

The existing text of paragraph (c) is replaced by the following:

- (c) (i) In the case of cargo ships of 300 tons gross tonnage and upwards but less than 1,600 tons gross tonnage the transmitter shall have a minimum normal range of 150 miles, i.e. it shall be capable of transmitting clearly perceptible signals from ship to ship by day and under normal conditions and circumstances over this range.*

* In the absence of field strength measurements, it may be assumed that this range will be obtained by a power in the antenna of 15 watts (unmodulated carrier) with an antenna efficiency of 27 per cent for double sideband emissions or 60 watts peak envelope power for single sideband full carrier emissions when 100 per cent modulated by a single sinusoidal oscillation.

(Clearly perceptible signals will normally be received if the R.M.S. value of the field strength produced at the receiver by an unmodulated carrier is at least 25 microvolts per metre for double sideband and single sideband full carrier emissions.)

- (ii) In the case of existing installations using double sideband emissions on cargo ships of 300 tons gross tonnage and upwards but less than 500 tons gross tonnage, the transmitter shall have a minimum normal range of at least 75 miles.

The existing text of sub-paragraph (j)(iv) is replaced by:

- (iv) the VHF installation in accordance with the provisions of Regulation 17(c).

The existing text of Regulation 17 is replaced by the following:

Regulation 17

VHF radiotelephone installation

- (a) The VHF radiotelephone installation shall be in the upper part of the ship complying with the provisions of this Regulation and comprising a transmitter and receiver, a source of energy capable of actuating them at their rated power levels, and an antenna suitable for efficient radiating and receiving signals at the operating frequencies.
- (b) On board passenger ships irrespective of size and cargo ships of 500 tons gross tonnage and upwards it shall be possible to operate the VHF radiotelephone installation from a source of energy which is situated in the upper part of the ship and has sufficient capacity for at least six hours of operation.
- (c) The Administration may authorize the use of the reserve source of energy of the radiotelegraph installation or the radiotelephone installation respectively referred to in Regulation 10(m) and Regulation 16(j) to supply the VHF radiotelephone installation. In this case the reserve source of energy is required to be of a capacity sufficient to operate simultaneously the VHF radiotelephone installation and:
 - (i) the reserve radiotelegraph transmitter and receiver for at least six hours unless a switching device is fitted to ensure alternate operation only; or
 - (ii) the radiotelephone transmitter and receiver for at least six hours unless a switching device is fitted to ensure alternate operation only.
- (d) The VHF radiotelephone installation shall conform to the requirements laid down in the Radio Regulations for equipment used in the VHF maritime mobile radiotelephone service and shall be capable of operation on those channels specified by the Radio Regulations and as may be required by the Contracting Government referred to in Regulation 4-1(b).

(e) The Contracting Government referred to in Regulation 4-1(b) shall not require the transmitter R.F. carrier power output to be greater than 10 watts. The antenna shall, in so far as is practicable, have an unobstructed view in all directions.*

(f) Control of the channels required for navigational safety shall be immediately available on the navigating bridge convenient to the conning position and, where necessary, facilities should be available to permit radiocommunications from the wings of the navigating bridge.

Regulation 19

Radio logs

The following paragraph is added to the existing text and the existing paragraph (c) is relettered as paragraph (d):

(c) On each ship fitted with a VHF radiotelephone installation in accordance with Regulation 4-1:

- (i) the entries required by the Radio Regulations shall be recorded in the radio log in accordance with the requirements of the Administration;
- (ii) a summary of all communications relating to distress, urgency and safety traffic shall be recorded in the ship's log.

* For guidance purposes, it is assumed that each ship is fitted with a vertically polarized unity gain antenna at a nominal height of 9.15 m above water, a transmitter R.F. power output of 10 watts, and a receiver sensitivity of 2 microvolts across the input terminals for 20 dB signal-to-noise ratio.

CHAPTER V

SAFETY OF NAVIGATION

The existing text of Regulation 12 is replaced by the following:

Regulation 12

Shipborne navigational equipment

- (a) For the purpose of this Regulation "constructed" in respect of a ship means a stage of construction where:
- (i) the keel is laid; or
 - (ii) construction identifiable with a specific ship begins; or
 - (iii) assembly of that ship has commenced comprising at least 50 tonnes or 1 per cent of the estimated mass of all structural material, whichever is less.
- (b) (i) Ships of 150 tons gross tonnage and upwards shall be fitted with:
- (1) a standard magnetic compass, except as provided in sub-paragraph (iv);
 - (2) a steering magnetic compass, unless heading information provided by the standard compass required under (1) is made available and is clearly readable by the helmsman at the main steering position;
 - (3) adequate means of communication between the standard compass position and the normal navigation control position to the satisfaction of the Administration; and
 - (4) means for taking bearings as nearly as practicable over an arc of the horizon of 360°.
- (ii) Each magnetic compass referred to in sub-paragraph (i) shall be properly adjusted and its table or curve of residual deviations shall be available at all times.
- (iii) A spare magnetic compass, interchangeable with the standard compass, shall be carried, unless the steering compass mentioned in sub-paragraph (i)(2) or a gyro compass is fitted.
- (iv) The Administration, if it considers it unreasonable or unnecessary to require a standard magnetic compass, may exempt individual ships or classes of ships from these requirements if the nature of the voyage, the ship's proximity to land or the type of ship does not warrant a standard compass, provided that a suitable steering compass is in all cases carried.

(c) Ships of less than 150 tons gross tonnage shall, as far as the Administration considers it reasonable and practicable, be fitted with a steering compass and have means for taking bearings.

(d) Ships of 500 tons gross tonnage and upwards constructed on or after 1 September 1984 shall be fitted with a gyro compass complying with the following requirements:

- (i) the master gyro compass or a gyro repeater shall be clearly readable by the helmsman at the main steering position;
- (ii) on ships of 1,600 tons gross tonnage and upwards a gyro repeater or gyro repeaters shall be provided and shall be suitably placed for taking bearings as nearly as practicable over an arc of the horizon of 360°.

(e) Ships of 1,600 tons gross tonnage and upwards, constructed before 1 September 1984 when engaged on international voyages, shall be fitted with a gyro compass complying with the requirements of paragraph (d).

(f) On ships provided with emergency steering positions, arrangements shall be made to supply heading information to such positions.

(g) Ships of 500 tons gross tonnage and upwards constructed on or after 1 September 1984 and ships of 1,600 tons gross tonnage and upwards constructed before 1 September 1984 shall be fitted with a radar installation.

(h) Ships of 10,000 tons gross tonnage and upwards shall be fitted with two radar installations, each capable of being operated independently* of the other.

(i) Facilities for plotting radar readings shall be provided on the navigating bridge of ships required by paragraph (g) or (h) to be fitted with a radar installation. In ships of 1,600 tons gross tonnage and upwards constructed on or after 1 September 1984 the plotting facilities shall be at least as effective as a reflection plotter.

(j) (i) An automatic radar plotting aid shall be fitted on:

- (1) ships of 10,000 tons gross tonnage and upwards, constructed on or after 1 September 1984;
- (2) tankers constructed before 1 September 1984 as follows:
 - (aa) if of 40,000 tons gross tonnage and upwards by 1 January 1985;
 - (bb) if of 10,000 tons gross tonnage and upwards but less than 40,000 tons gross tonnage, by 1 January 1986;

* Reference is made to section 4 of the Recommendation on Performance Standards for Radar Equipment, adopted by the Organization by resolution A.477(XII).

- (3) ships constructed before 1 September 1984, that are not tankers, as follows:
- (aa) if of 40,000 tons gross tonnage and upwards by 1 September 1986;
 - (bb) if of 20,000 tons gross tonnage and upwards, but less than 40,000 tons gross tonnage, by 1 September 1987;
 - (cc) if of 15,000 tons gross tonnage and upwards, but less than 20,000 tons gross tonnage, by 1 September 1988.
- (ii) Automatic radar plotting aids fitted prior to 1 September 1984 which do not fully conform to the performance standards adopted by the Organization may, at the discretion of the Administration, be retained until 1 January 1991.
- (iii) The Administration may exempt ships from the requirements of this paragraph, in cases where it considers it unreasonable or unnecessary for such equipment to be carried, or when the ships will be taken permanently out of service within two years of the appropriate implementation date.
- (k) When engaged on international voyages ships of 1,600 tons gross tonnage and upwards constructed before 25 May 1980 and ships of 500 tons gross tonnage and upwards constructed on or after 25 May 1980 shall be fitted with an echo-sounding device.
- (l) When engaged on international voyages ships of 500 tons gross tonnage and upwards constructed on or after 1 September 1984 shall be fitted with a device to indicate speed and distance. Ships required by paragraph (j) to be fitted with an automatic radar plotting aid shall be fitted with a device to indicate speed and distance through the water.
- (m) Ships of 1,600 tons gross tonnage and upwards constructed before 1 September 1984 and all ships of 500 tons gross tonnage and upwards constructed on or after 1 September 1984 shall be fitted with indicators showing the rudder angle, the rate of revolution of each propeller and in addition, if fitted with variable pitch propellers or lateral thrust propellers, the pitch and operational mode of such propellers. All these indicators shall be readable from the conning position.
- (n) Ships of 100,000 tons gross tonnage and upwards constructed on or after 1 September 1984 shall be fitted with a rate-of-turn indicator.
- (o) Except as provided in Regulations I/7(b)(ii), I/8 and I/9, while all reasonable steps shall be taken to maintain the apparatus referred to in paragraphs (d) to (n) in efficient working order, malfunctions of the equipment shall not be considered as making a ship unseaworthy or as a reason for delaying the ship in ports where repair facilities are not readily available.
- (p) When engaged on international voyages ships of 1,600 tons gross tonnage and upwards shall be fitted with a radio direction-finding apparatus complying with the provisions of Regulation IV/12(a). The Administration

may, in areas where it considers it unreasonable or unnecessary for such apparatus to be carried, exempt any ship of less than 5,000 tons gross tonnage from this requirement, due regard being had to the fact that radio direction-finding apparatus is of value both as a navigational instrument and as an aid to locating ships, aircraft or survival craft.

(q) When engaged on international voyages ships of 1,600 tons gross tonnage and upwards constructed on or after 25 May 1980 shall be fitted with radio equipment for homing on the radiotelephone distress frequency, complying with the relevant provisions of Regulation IV/12(b).

(r) All equipment fitted in compliance with this Regulation shall be of a type approved by the Administration. Equipment installed on board ships on or after 1 September 1984 shall conform to appropriate performance standards not inferior to those adopted by the Organization. Equipment fitted prior to the adoption of related performance standards may be exempted from full compliance with those standards at the discretion of the Administration, having due regard to the recommended criteria which the Organization might adopt in connexion with the standards concerned.

(s) A rigidly connected composite unit of a pushing vessel and associated pushed vessel, when designed as a dedicated and integrated tug and barge combination, shall be regarded as a single ship for the purpose of this Regulation.

(t) If the application of the requirements of this Regulation necessitates structural alterations to a ship constructed before 1 September 1984, the Administration may allow extension of the time limit for fitting the required equipment not later than 1 September 1989, taking into account the first scheduled dry-docking of such a ship required by the present Regulations.

(u) Except as provided elsewhere in this Regulation, the Administration may grant to individual ships exemptions of a partial or conditional nature, when any such ship is engaged on a voyage where the maximum distance of the ship from the shore, the length and nature of the voyage, the absence of general navigation hazards, and other conditions affecting safety are such as to render the full application of this Regulation unreasonable or unnecessary. When deciding whether or not to grant exemptions to an individual ship, the Administration shall have regard to the effect that an exemption may have upon the safety of all other ships.

Regulation 16

Life-saving signals

The existing text of paragraph (d) is replaced by the following:

(d) Signals used by aircraft engaged on search and rescue operations to direct ships towards an aircraft, ship or person in distress:

(i) The following manoeuvres performed in sequence by an aircraft

mean that the aircraft wishes to direct a surface craft towards an aircraft or a surface craft in distress:

- (1) circling the surface craft at least once;
- (2) crossing the projected course of the surface craft close ahead at low altitude, and:
 - rocking the wings; or
 - opening and closing the throttle; or
 - changing the propeller pitch;(Due to high noise level on board surface craft, the sound signals may be less effective than the visual signal and are regarded as alternative means of attracting attention.)
- (3) heading in the direction in which the surface craft is to be directed.

Repetition of such manoeuvres has the same meaning.

- (ii) The following manoeuvre by an aircraft means that the assistance of the surface craft to which the signal is directed is no longer required:

crossing the wake of the surface craft close astern at a low altitude, and:

- rocking the wings; or
- opening and closing the throttle; or
- changing the propeller pitch.

(Due to high noise level on board surface craft, the sound signals may be less effective than the visual signal and are regarded as an alternative means of attracting attention.)

Note: Advance notification of changes in these signals will be given by the Organization as necessary.

Regulation 18

VHF radiotelephones

The existing text of this Regulation is deleted (see Regulation IV/4-1(b)).

Regulation 19

Use of the automatic pilot

The following paragraph is added to the existing text:

- (d) The manual steering shall be tested after prolonged use of the automatic pilot, and before entering areas where navigation demands special caution.

The following Regulations are added to this Chapter:

Regulation 19-1

Operation of steering gear

In areas where navigation demands special caution, ships shall have more than one steering gear power unit in operation when such units are capable of simultaneous operation.

Regulation 19-2

Steering gear – testing and drills

- (a) Within 12 hours before departure, the ship's steering gear shall be checked and tested by the ship's crew. The test procedure shall include, where applicable, the operation of the following:
- (i) the main steering gear;
 - (ii) the auxiliary steering gear;
 - (iii) the remote steering gear control systems;
 - (iv) the steering positions located on the navigating bridge;
 - (v) the emergency power supply;
 - (vi) the rudder angle indicators in relation to the actual position of the rudder;
 - (vii) the remote steering gear control system power failure alarms;
 - (viii) the steering gear power unit failure alarms; and
 - (ix) automatic isolating arrangements and other automatic equipment.
- (b) The checks and tests shall include:
- (i) the full movement of the rudder according to the required capabilities of the steering gear;
 - (ii) a visual inspection of the steering gear and its connecting linkage; and
 - (iii) the operation of the means of communication between the navigating bridge and steering gear compartment.
- (c) (i) Simple operating instructions with a block diagram showing the change-over procedures for remote steering gear control systems and steering gear power units shall be permanently displayed on the navigating bridge and in the steering gear compartment.
- (ii) All ships' officers concerned with the operation or maintenance of steering gear shall be familiar with the operation of the steering systems fitted on the ship and with the procedures for changing from one system to another.

(d) In addition to the routine checks and tests prescribed in paragraphs (a) and (b), emergency steering drills shall take place at least once every three months in order to practise emergency steering procedures. These drills shall include direct control from within the steering gear compartment, the communications procedure with the navigating bridge and, where applicable, the operation of alternative power supplies.

(e) The Administration may waive the requirement to carry out the checks and tests prescribed in paragraphs (a) and (b) for ships which regularly engage on voyages of short duration. Such ships shall carry out these checks and tests at least once every week.

(f) The date upon which the checks and tests prescribed in paragraphs (a) and (b) are carried out and the date and details of emergency steering drills carried out under paragraph (d), shall be recorded in the log book as may be prescribed by the Administration.

CHAPTER VI

CARRIAGE OF GRAIN

PART A – GENERAL PROVISIONS

The existing text of Regulation 1 is replaced by the following:

Regulation 1

Application

Unless expressly provided otherwise this Chapter applies to the carriage of grain in all ships to which the present Regulations apply and in cargo ships of less than 500 tons gross tonnage.

PART B – CALCULATION OF ASSUMED HEELING MOMENTS

SECTION V – ALTERNATIVE LOADING ARRANGEMENTS FOR EXISTING SHIPS

(A) GENERAL

Amend the second paragraph to read:

For the purpose of this Part the term "Existing Ship" means "a ship, the keel of which is laid before 25 May 1980."

(B) STOWAGE OF SPECIALLY SUITABLE SHIPS

The existing text of sub-paragraph (a)(ii)(2) is replaced by the following:

- (2) in partly filled compartments or holds free grain surfaces settle and shift as in sub-paragraph (1) or to such larger angle as may be deemed necessary by the Administration, or by a Contracting Government on behalf of the Administration, and grain surfaces, if overstowed, with the bulk grain levelled and topped off with bagged grain or other suitable cargo tightly stowed and extending to a height of not less than 1.22 m above the top of the bulk grain within spaces divided by a longitudinal bulkhead or shifting board, and not less than 1.52 m within spaces not so divided and the bagged grain or other suitable cargo supported on suitable platforms laid over the whole surface of the bulk grain, such platforms consisting of bearers spaced not more than 1.22 m apart and 25 mm boards laid thereon spaced not more than 0.10 m apart or of strong separation cloths with adequate overlapping, will shift to an angle of 8 degrees with the original levelled surfaces. For the purpose of this paragraph shifting boards, if fitted, will be considered to limit the transverse shift of the surface of the grain.

RESOLUTION MSC.1(XLV)
adopted on 20 November 1981

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.6(48)
adopted on 17 June 1983
ADOPTION OF AMENDMENTS TO THE
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.6(48)
adopted on 17 June 1983

**ADOPTION OF AMENDMENTS TO THE
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT
SEA, 1974**

THE MARITIME SAFETY COMMITTEE,

NOTING article VIII(b) of the International Convention for the Safety of Life at Sea, 1974, hereafter referred to as "the Convention", concerning the procedure for amending the Annex to the Convention, other than the provisions of chapter I thereof,

NOTING FURTHER the functions which the Convention confers upon the Maritime Safety Committee for the consideration and adoption of amendments to the Convention,

HAVING CONSIDERED at its forty-eighth session amendments to the Convention proposed and circulated in accordance with article VIII(b)(i) thereof,

1 ADOPTS in accordance with article VIII(b)(iv) of the Convention amendments to chapters II-1, II-2, III, IV and VII of the Convention, the texts of which are given in the Annex to the present resolution;

2 DETERMINES in accordance with article VIII(b)(vi)(2)(bb) of the Convention that the amendments to chapters II-1, II-2, III, IV and VII shall be deemed to have been accepted on 1 January 1986 unless prior to this date more than one third of Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3 INVITES Contracting Governments to note that in accordance with article VIII(b)(vii)(2) of the Convention the amendments to chapters II-1, II-2, III, IV and VII shall enter into force on 1 July 1986 upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General in conformity with article VIII(b)(v) of the Convention to transmit certified copies of the present resolution and the texts of the amendments contained in the Annex to all Contracting Governments to the International Convention for the Safety of Life at Sea, 1974;

5 FURTHER REQUESTS the Secretary-General to transmit copies of the resolution and its Annex to Members of the Organization which are not Contracting Governments to the Convention.

1. At its forty-eighth session held in June 1983, the Maritime Safety Committee adopted amendments to the International Convention for the Safety of Life at Sea, 1974 (SOLAS). Thirty-three Contracting Governments to the Convention were present at the session and all the texts of the amendments were adopted in accordance with the procedure specified in Article VIII(b)(iv).
2. The amendments adopted at the session consist of complete replacement texts of Chapters III and VII and amendments to Chapters II-1, II-2 and IV.
3. The decimal numbering system has been used in Chapters II-1, II-2, III and VII. Metric and Imperial units have been replaced with those of the Système International (SI Units), except where conventionally accepted nautical units were considered more appropriate.
4. Cross references are given in a concise form, e.g. Regulation II-2/10.4 meaning paragraph 4 of Regulation 10 of Chapter II-2.
5. Footnotes given throughout the Convention, as well as amendments thereto, refer to the relevant recommendations annexed to the Convention and other internationally accepted standards. The Maritime Safety Committee has emphasized that these footnotes do not form part of the Convention and are only inserted for ease of reference. The footnotes are to be altered to reflect any changes which may be made to the resolutions, recommendations or documents on which they are based. References to draft resolutions to be considered by the Assembly at its thirteenth regular session are to be replaced by the definitive numbers of the resolutions as adopted by the Assembly.

ANNEX

**1983 AMENDMENTS TO THE INTERNATIONAL CONVENTION
 FOR THE SAFETY OF LIFE AT SEA, 1974**

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Part 1

CHAPTER II-1

**CONSTRUCTION – SUBDIVISION AND STABILITY,
MACHINERY AND ELECTRICAL INSTALLATIONS**

Chapter II-1 of the Convention is replaced by the text of chapter II-1 annexed to resolution MSC.1(XLV), further amended as follows:

Regulation 1

Application

In paragraph 1.1 line 3 delete "1 September 1984" and insert "1 July 1986".

In paragraph 1.3.2 line 2 delete "1 September 1984" and insert "1 July 1986".

Replace the whole of paragraph 2 by:

"Unless expressly provided otherwise, for ships constructed before 1 July 1986 the Administration shall ensure that the requirements which are applicable under chapter II-1 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolution MSC.1(XLV), are complied with."

Delete the footnote.

In paragraph 3 lines 4 and 9 delete "1 September 1984" and insert "1 July 1986".

Delete paragraph 5 and renumber paragraph 6 as paragraph 5.

Regulation 3

Definitions relating to Parts C, D and E

In paragraph 18 delete "fiire" and insert "fire".

Amend paragraph 19 as follows:

"'Chemical tanker' is a cargo ship constructed or adapted and used for the carriage in bulk of any liquid product listed in either:

- .1 chapter 17 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Maritime Safety Committee by resolution MSC.4(48), hereinafter referred to as 'the International Bulk Chemical Code', as may be amended by the Organization; or

- .2 chapter VI of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Assembly of the Organization by resolution A.212(VII), hereinafter referred to as 'the Bulk Chemical Code', as has been or may be amended by the Organization;

whichever is applicable."

Amend paragraph 20 to read:

" 'Gas carrier' is a cargo ship constructed or adapted and used for the carriage in bulk of any liquefied gas or other products listed in either:

- .1 chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Maritime Safety Committee by resolution MSC.5(48) hereinafter referred to as 'the International Gas Carrier Code', as may be amended by the Organization; or
- .2 chapter XIX of the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Assembly of the Organization by resolution A.328(IX), hereinafter referred to as 'the Gas Carrier Code', as has been or may be amended by the Organization;

whichever is applicable."

Regulation 4

Floodable length in passenger ships

Paragraph 1, line 3 delete "andd" and insert "and".

Regulation 5

Permeability in passenger ships

Amend paragraph 4.1 to read:

"4.1 In the case of special subdivision required in regulation 6.5, the uniform average permeability throughout the portion of the ship forward of or abaft the machinery space shall be $95 \cdot 35 \frac{b}{v}$ where:

b = the volume of the spaces below the margin line and above the tops of floors, inner bottom, or peak tanks, as the case may be, which are appropriated to and used as cargo spaces, coal or oil fuel bunkers, store-rooms, baggage and mail rooms, chain lockers and fresh water tanks, forward of or abaft the machinery space; and

v = the whole volume of the portion of the ship below the margin line forward of or abaft the machinery space."

Regulation 6

Permissible length of compartments in passenger ships

Paragraph 2.2, line 2 delete "seervice" and insert "service".

Replace the heading of section 5 by "Special subdivision standards for ships complying with regulation III/20.1.2."

Insert new paragraphs 5.3 and 5.4 as follows:

"5.3 The special provisions regarding permeability given in regulation 5.4 shall be employed when calculating the floodable length curves.

5.4 Where the Administration is satisfied that, having regard to the nature and conditions of the intended voyages compliance with the other provisions of this chapter and of chapter II-2 is sufficient, the requirements of this paragraph need not be complied with."

Regulation 41

Main source of electrical power and lighting systems

Paragraph 1.3, line 3 insert "of rotation" after "direction".

Regulation 42

Emergency source of electrical power in passenger ships

Amend sub-paragraph 2.1.1 to read:

"1 at every muster and embarkation station and over the sides as required by regulations III/11.4 and III/15.7".

Insert new sub-paragraph 2.1.2 to read:

"2 in alleyways, stairways and exits giving access to the muster and embarkation stations, as required by regulation III/11.5".

Renumber sub-paragraphs 2.1.2 to 2.1.7 to read 2.1.3 to 2.1.8.

Paragraph 2.3.4 line 2 delete "manual fire alarms" and insert "manually operated call points".

Regulation 43

Emergency source of electrical power in cargo ships

Paragraph 1.3, line 10 delete "sppace" and insert "space".

Amend paragraph 2.1 to read:

"2.1 For a period of 3 h, emergency lighting at every muster and embarkation station and over the sides as required by regulations III/11.4 and III/15.7."

Paragraph 2.4.4, line 2 delete "manual fire alarms" and insert "manually operated call points".

Regulation 49

Control of propulsion machinery from the navigating bridge

Paragraph 3, line 6 delete "the machinery space" and insert "the main machinery space"

delete "the machinery control room" and insert "the main machinery control room".

Paragraph 5, line 3 insert "of the propeller" after "thrust".

Paragraph 6.1, line 1 delete "in case" and insert "in the case".

Paragraph 6.2, line 1 delete "in case" and insert "in the case".

Part 2

CHAPTER II-2

CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION
AND FIRE EXTINCTION

Chapter II-2 of the Convention is replaced by the text of chapter II-2 annexed to resolution MSC.1(XLV), further amended as follows:

Regulation 1

Application

In paragraph 1.1 line 3 delete "1 September 1984" and insert "1 July 1986"

In paragraph 1.3.2 line 2 delete "1 September 1984" and insert "1 July 1986".

Replace the whole of paragraph 2 by:

"Unless expressly provided otherwise, for ships constructed before 1 July 1986 the Administration shall ensure that the requirements which are applicable under chapter II-2 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolution MSC.1 (XLV), are complied with."

In paragraph 3 lines 4 and 9 delete "1 September 1984" and insert "1 July 1986".

Delete the footnote.

Regulation 3

Definitions

In paragraph 12 correct "main and specie rooms" to read "mail and specie rooms".

Paragraph 30, amend to:

"'Chemical tanker' is a tanker constructed or adapted and used for the carriage in bulk of any liquid product of a flammable nature listed in either:

- .1 chapter 17 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Maritime Safety Committee by resolution MSC.4(48), hereinafter referred to as 'the International Bulk Chemical Code', as may be amended by the Organization; or

- .2 chapter VI of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Assembly of the Organization by resolution A.212(VII), hereinafter referred to as 'the Bulk Chemical Code', as has been or may be amended by the Organization;

whichever is applicable."

Paragraph 31 amend to:

"'Gas carrier' is a tanker constructed or adapted and used for the carriage in bulk of any liquefied gas or other products of a flammable nature listed in either:

- .1 chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Maritime Safety Committee by resolution MSC.5(48), hereinafter referred to as 'the International Gas Carrier Code', as may be amended by the Organization; or
- .2 chapter XIX of the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Assembly of the Organization by resolution A.328(IX), hereinafter referred to as 'the Gas Carrier Code', as has been or may be amended by the Organization;

whichever is applicable."

Add an additional paragraph to read:

"32 'Cargo area' is that part of the ship that contains cargo tanks, slop tanks and cargo pump rooms including pump rooms, cofferdams, ballast and void spaces adjacent to cargo tanks and also deck areas throughout the entire length and breadth of the part of the ship over the above-mentioned spaces."

Regulation 4

Fire pumps, fire mains, hydrants and hoses

In paragraph 3.3.2.6 line 3 delete "room" and insert "station".

Regulation 5

Fixed gas fire-extinguishing systems

In paragraph 2.2 line 2 delete "quantity" and insert "volume".

In paragraph 2.2 line 3 delete "quantities" and insert "volumes".

Regulation 6

Fire extinguishers

In paragraph 7 line 2 delete "provideed" and insert "provided".

Regulation 7

Fire-extinguishing arrangements in machinery spaces

In paragraph 1.2 lines 1 and 2 delete "air foam equipment" and insert "foam applicator unit".

Regulation 11

Special arrangements in machinery spaces

In the first line of paragraph 8 amend "An approved automatic fire detection and alarm system" to read "A fixed fire detection and alarm system".

Regulation 12

Automatic sprinkler, fire detection and fire alarm systems

In paragraph 3 correct "sppaced" to read "spaced".

Regulation 13

Fixed fire detection and fire alarm systems

In paragraph 2.1 lines 1, 2, 3 and 5 delete "Manual" and insert "Manually operated".

Regulation 14

*Fixed fire detection and fire alarm systems for
periodically unattended machinery spaces*

In paragraph 1, line 1 amend to read "A fixed fire detection and fire alarm system of an approved type in accordance with the".

Regulation 15

Arrangements for oil fuel, lubricating oil and other flammable oils

Insert a new paragraph 6 to read:

"6 *Prohibition of carriage of flammable oils in forepeak tanks*

Oil fuel, lubricating oil and other flammable oils shall not be carried in forepeak tanks".

Regulation 20

Fire control plans

Paragraph 1, lines 14 and 15 delete "national language" and insert "official language of the flag State".

Regulation 26

Fire integrity of bulkheads and decks in ships carrying more than 36 passengers

Paragraph 2.2, line 1 delete "for the purpose of" and insert "For".
line 10 delete "number".

Paragraph 2.2(1), line 4 delete "fire control and recording stations" and insert "fire control rooms and fire-recording stations".

Paragraph 2.2(5), line 3 delete "Air space" and insert "Air spaces".

Table 26.2, line 5 delete "space" and insert "spaces".

Regulation 27

Fire integrity of bulkheads and decks in ships carrying not more than 36 passengers

Paragraph 2.2(1), line 4 delete "stations" and insert "rooms".

In Table 27.1, line 2, column 4
line 3, column 4
line 4, column 4
line 4, column 5

replace B-0^{e/} by A-0^{a/}
A-0^{a/} B-0^{e/}.

Paragraph 4, line 4 delete "this chapter" and insert "this part".

Regulation 32

Ventilation systems

Paragraph 1.4.3.1, line 1 delete "restricted" and insert "low".

Replace Regulation 36 by:

"Regulation 36

*Fixed fire detection and fire alarm systems
Automatic sprinkler, fire detection and fire alarm systems*

In any ship to which this part applies, there shall be installed throughout each separate zone, whether vertical or horizontal, in all accommodation and service spaces and, where it is considered necessary by the Administration, in control stations, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc., either:

- .1 a fixed fire detection and fire alarm system of an approved type and complying with the requirements of regulation 13 and so installed and arranged as to detect the presence of fire in such spaces; or
- .2 an automatic sprinkler, fire detection and fire alarm system of an approved type and complying with the requirements of regulation 12 and so installed and arranged as to protect such spaces and in addition a fixed fire detection and fire alarm system of an approved type complying with the requirements of regulation 13 so installed and arranged as to provide smoke detection in corridors, stairways and escape routes within accommodation spaces."

Regulation 37

Protection of special category spaces

Amend the text of paragraph 1.4.1 to read:

"1.4.1 An efficient patrol system shall be maintained in special category spaces. In any such space in which the patrol is not maintained by a continuous fire watch at all times during the voyage there shall be provided a fixed fire detection and fire alarm system of an approved type complying with the requirements of regulation 13. The fixed fire detection system shall be capable of rapidly detecting the onset of fire. The spacing and location of detectors shall be tested to the satisfaction of the Administration taking into account the effects of ventilation and other relevant factors."

Amend the text of paragraph 2.2.1 to read:

"2.2.1 On any deck or platform, if fitted, on which vehicles are carried and on which explosive vapours might be expected to accumulate, except platforms with openings of sufficient size permitting penetration of petrol gases downwards, equipment which may constitute a source of ignition of flammable vapours and, in particular, electrical equipment and wiring, shall be installed at least 450 mm above the deck or platform. Electrical equipment installed at more than 450 mm above the deck or platform shall be of a type so enclosed and protected as to prevent the escape of sparks. However, if the Administration is satisfied that the installation of electrical equipment and wiring at less than 450 mm above the deck or platform is necessary for the safe operation of the ship, such electrical equipment and wiring may be installed provided that it is of a type approved for use in an explosive petrol and air mixture."

Regulation 40

Fire patrols, detection, alarms and public address systems

Amend paragraphs 1 and 2 to read:

"1 Manually operated call points complying with the requirements of regulation 13 shall be installed".

"2 A fixed fire detection and fire alarm system of an approved type shall be provided".

Regulation 42

Structure

In paragraph 1, second line, amend "deck" to read "decks".

Regulation 49

Restricted use of combustibile materials

Amend the text of paragraph 3 to read:

"Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of approved material which will not readily ignite, or give rise to toxic or explosive hazards at elevated temperatures. **"

Regulation 51

Arrangements for gaseous fuel for domestic purposes

Delete comma and insert "for the" after "arrangements".

Regulation 52

Fixed fire detection and fire alarm systems
Automatic sprinkler, fire detection and fire alarm systems

Amend the first three paragraphs to read:

“1 In ships in which method IC is adopted, a fixed fire detection and fire alarm system of an approved type complying with the requirements of regulation 13 shall be so installed and arranged as to provide smoke detection and manually operated call points in all corridors, stairways and escape routes within accommodation spaces.

2 In ships in which method IIC is adopted, an automatic sprinkler, fire detection and fire alarm system of an approved type complying with the relevant requirements of regulation 12 shall be so installed and arranged as to protect accommodation spaces, galleys and other service spaces, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc. In addition, a fixed fire detection and fire alarm system of an approved type complying with the requirements of regulation 13 shall be so installed and arranged as to provide smoke detection and manually operated call points in all corridors, stairways and escape routes within accommodation spaces.

3 In ships in which method IIIC is adopted, a fixed fire detection and fire alarm system of an approved type complying with the requirements of regulation 13 shall be so installed and arranged as to detect the presence of fire in all accommodation spaces and service spaces, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc.”

Delete paragraph 4.

Regulation 53

Fire protection arrangements in cargo spaces

In paragraph 1.3, line 4, delete “by” and insert “with”.

Amend the first sentence of paragraph 2.1 to read: “There shall be provided a fixed fire detection and fire alarm system of an approved type.”

Replace paragraph 2.4.2 by the following:

“2 Above a height of 450 mm from the deck and from each platform for vehicles, if fitted, except platforms with openings of sufficient size permitting penetration of petrol gases downwards, electrical equipment of a type so enclosed and protected as to prevent the escape of sparks shall be permitted as an alternative on condition that the ventilating system is so designed and operated as to provide continuous ventilation of the cargo spaces at the rate of at least 10 air changes per hour whenever vehicles are on board.”

Regulation 54

Special requirements for ships carrying dangerous goods

In table 54.2, note f, amend “. . . in addition to those enumerated . . .” to read “. . . in addition to meeting the requirements enumerated . . .”.

Amend the first sentence in paragraph 2.3 to read: “A fixed fire detection and fire alarm system of an approved type shall be fitted to all enclosed cargo spaces including closed vehicle deck spaces.”

Regulation 55

Application

Amend paragraph 2 to read:

“Where liquid cargoes other than those referred to in paragraph 1 or liquefied gases which introduce additional fire hazards are intended to be carried, additional safety measures shall be required to the satisfaction of the Administration, having due regard to the provisions of the International Bulk Chemical Code, the Bulk Chemical Code, the International Gas Carrier Code and the Gas Carrier Code, as appropriate.”

Amend paragraph 6 to read:

“Chemical tankers and gas carriers shall comply with the requirements of this part, except where alternative and supplementary arrangements are provided to the satisfaction of the Administration, having due regard to the provisions of the International Bulk Chemical Code, the Bulk Chemical Code, the International Gas Carrier Code and the Gas Carrier Code, as appropriate.”

Regulation 56

Location and separation of spaces

Replace the text of the whole regulation by:

“1 Machinery spaces shall be positioned aft of cargo tanks and slop tanks; they shall also be situated aft of cargo pump rooms and cofferdams, but not necessarily aft of the oil fuel bunker tanks. Any machinery space shall be isolated from cargo tanks and slop tanks by cofferdams, cargo pump rooms, oil fuel bunker tanks or permanent ballast tanks. Pump rooms containing pumps and their accessories for ballasting those spaces situated adjacent to cargo tanks and slop tanks and pumps for oil fuel transfer shall be considered as equivalent to a cargo pump room within the context of this regulation, provided that such pump rooms have the same safety standard as that required for cargo pump rooms. However, the lower portion of the pump room may be recessed into machinery spaces of category A to accommodate pumps, provided that the deck head of the recess is in general not more than one third of the moulded depth above the keel, except that in the case

of ships of not more than 25,000 tonnes deadweight, where it can be demonstrated that for reasons of access and satisfactory piping arrangements this is impracticable, the Administration may permit a recess in excess of such height, but not exceeding one half of the moulded depth above the keel.

2 Accommodation spaces, main cargo control stations, control stations and service spaces (excluding isolated cargo handling gear lockers) shall be positioned aft of all cargo tanks, slop tanks, cargo pump rooms and cofferdams which isolate cargo or slop tanks from machinery spaces but not necessarily aft of the oil fuel bunker tanks. A recess provided in accordance with paragraph 1 need not be taken into account when the position of these spaces is being determined.

3 However, where deemed necessary, accommodation spaces, control stations, machinery spaces other than those of category A, and service spaces may be permitted forward of the cargo area, provided they are isolated from the cargo tanks and slop tanks by cofferdams, cargo pump rooms, oil fuel bunker tanks or permanent ballast tanks and subject to an equivalent standard of safety and appropriate availability of fire-extinguishing arrangements being provided to the satisfaction of the Administration. In addition, where deemed necessary for the safety or navigation of the ship, the Administration may permit machinery spaces containing internal combustion machinery not being main propulsion machinery having an output greater than 375 kW to be located forward of the cargo area provided the arrangements are in accordance with the provisions of this paragraph.

4 In combination carriers only:

- 1 The slop tanks are to be surrounded by cofferdams except where the boundaries of the slop tanks where slop may be carried on dry cargo voyages are the hull, main cargo deck, cargo pump room bulkhead or oil fuel bunker tank. These cofferdams shall not be open to a double bottom, pipe tunnel, pump room or other enclosed space. Means shall be provided for filling the cofferdams with water and for draining them. Where the boundary of a slop tank is the cargo pump room bulkhead the pump room shall not be open to the double bottom, pipe tunnel or other enclosed space, however, openings provided with gastight bolted covers may be permitted.
- 2 Means shall be provided for isolating the piping connecting the pump room with the slop tanks referred to in paragraph 4.1. The means of isolation shall consist of a valve followed by a spectacle flange or a spool piece with appropriate blank flanges. This arrangement shall be located adjacent to the slop tanks, but where this is unreasonable or impracticable it may be located within the pump room directly after the piping penetrates the bulkhead. A separate pumping and piping arrangement shall be provided for discharging the contents of the slop tanks directly over the open deck when the ship is in the dry cargo mode.
- 3 Hatches and tank cleaning openings to slop tanks shall only be permitted on the open deck and shall be fitted with closing arrangements. Except where they consist of bolted plates with bolts at watertight spacing, these closing arrangements shall be provided with locking arrangements which shall be under the control of the responsible ship's officer.

- 4 Where cargo wing tanks are provided, cargo oil lines below deck shall be installed inside these tanks. However, the Administration may permit cargo oil lines to be placed in special ducts which shall be capable of being adequately cleaned and ventilated and be to the satisfaction of the Administration. Where cargo wing tanks are not provided cargo oil lines below deck shall be placed in special ducts.
- 5 Where the fitting of a navigation position above the cargo area is shown to be necessary, it shall be for navigation purposes only and it shall be separated from the cargo tank deck by means of an open space with a height of at least 2 m. The fire protection of such a navigation position shall in addition be as required for control spaces in regulation 58.1 and 58.2 and other provisions, as applicable, of this part.
- 6 Means shall be provided to keep deck spills away from the accommodation and service areas. This may be accomplished by provision of a permanent continuous coaming of a suitable height extending from side to side. Special consideration shall be given to the arrangements associated with stern loading.
- 7 Exterior boundaries of superstructures and deckhouses enclosing accommodation and including any overhanging decks which support such accommodation, shall be insulated to 'A-60' standard for the whole of the portions which face the cargo area and for 3 m aft of the front boundary. In the case of the sides of those superstructures and deckhouses, such insulation shall be carried as high as is deemed necessary by the Administration.
- 8.1 Entrances, air inlets and openings to accommodation spaces, service spaces and control stations shall not face the cargo area. They shall be located on the transverse bulkhead not facing the cargo area or on the outboard side of the superstructure or deckhouse at a distance of at least 4% of the length of the ship but not less than 3 m from the end of the superstructure or deckhouse facing the cargo area. This distance, however, need not exceed 5 m.
- 8.2 No doors shall be fitted within the limits specified in paragraph 8.1 except that doors to spaces not having access to accommodation spaces, service spaces and control stations may be permitted by the Administration. Such spaces may be cargo control stations, provision rooms and store-rooms. Where such doors are fitted to spaces located aft of the cargo area, the boundaries of the space shall be insulated to 'A-60' standard, with the exception of the boundary facing the cargo area. Bolted plates for removal of machinery may be fitted within the limits specified in paragraph 8.1. Wheelhouse doors and wheelhouse windows may be located within the limits specified in paragraph 8.1 so long as they are designed to ensure that the wheelhouse can be made rapidly and efficiently gas and vapour tight.
- 8.3 Windows and sidescuttles facing the cargo area and on the sides of the superstructures and deckhouses within the limits specified in paragraph 8.1 shall be of the fixed (non-opening) type. Such windows and sidescuttles in the first tier on the main deck shall be fitted with inside covers of steel or other equivalent material."

Regulation 58

Fire integrity of bulkheads and decks

In table 1, note b/, line 1 – delete “b” and insert “b/”.

Paragraph 4, line 4 delete “these Requirements” and insert “this part”

Regulation 59

Venting, purging, gas freeing and ventilation

Paragraph 2, line 16 delete “gas” and insert “vapour”.

line 18 delete “gas” and insert “vapour”.

lines 16, 17 and 18 “When . . . level,” forms part of paragraph 2 and must be moved to that paragraph's margin.

Amend paragraph 3.3 as follows:

In the third sentence amend “referred to in Regulation 56.1” to read “referred to in regulation 56.4”.

In the fourth sentence amend “cargo tank area” to read “cargo area”.

Regulation 61

Fixed deck foam systems

In paragraph 1 amend “cargo tank area” to read “cargo tanks deck area”.

In paragraph 2 amend “cargo tank area” to read “cargo area” in the second sentence.

In paragraph 3.1 amend “cargo deck area” to read “cargo tanks deck area”.

In paragraph 7 in the first and second sentence amend “cargo deck” to read “cargo tank deck”.

In paragraph 8, third line, amend “400 l” to read “400 l/min”. In the fourth sentence amend “any cargo tank deck area” to read “any part of the cargo tanks deck area”.

Regulation 62

Inert gas systems

In paragraph 1 delete "non flammable" and insert "non flammable".

In paragraph 9.1, lines 2 and 3 delete "19.2" and "19.3" and insert "19.3" and "19.4" respectively.

In paragraph 10.2 amend "cargo tank area" to read "cargo area".

Replace paragraph 14.1 by:

"14.1 One or more pressure vacuum breaking devices shall be provided to prevent the cargo tanks from being subject to:

- .1 a positive pressure in excess of the test pressure of the cargo tank if the cargo were to be loaded at the maximum rated capacity and all other outlets are left shut; and
- .2 a negative pressure in excess of 700 mm water gauge if cargo were to be discharged at the maximum rated capacity of the cargo pumps and the inert gas blowers were to fail.

Such devices shall be installed on the inert gas main unless they are installed in the venting system required by regulation 59.1.1 or on individual cargo tanks."

In paragraph 20.1 amend the last line to read "10.2, 10.7, 10.9, 11.3, 11.4, 12, 13.1, 13.2, 13.4.2, 14.2 and 19.8;"

In paragraph 20.2 amend the last line to read "12, 13.1, 13.2 and 14.2."

Part 3

CHAPTER III

The existing text of chapter III is replaced by the following:

LIFE-SAVING APPLIANCES AND ARRANGEMENTS

PART A – GENERAL

Regulation 1

Application

- 1 Unless expressly provided otherwise, this chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 July 1986.
- 2 For the purpose of this chapter the term "a similar stage of construction" means the stage at which:
 - .1 construction identifiable with a specific ship begins; and
 - .2 assembly of that ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less.
- 3 For the purpose of this chapter:
 - .1 the expression "ships constructed" means "ships the keels of which are laid or which are at a similar stage of construction";
 - .2 the expression "all ships" means "ships constructed before, on or after 1 July 1986"; the expressions "all passenger ships" and "all cargo ships" shall be construed accordingly;
 - .3 a cargo ship, whenever built, which is converted to a passenger ship shall be treated as a passenger ship constructed on the date on which such a conversion commences.
- 4 For ships constructed before 1 July 1986, the Administration shall:
 - .1 ensure that, subject to the provisions of paragraph 4.2 and 4.3, the requirements which are applicable under chapter III of the International Convention for the Safety of Life at Sea, 1974, in force prior to 1 July 1986 to new or existing ships as prescribed by that chapter are complied with;

- .2 consider the life-saving appliances and arrangements in ships which do not comply with the requirements referred to in paragraph 4.1, with a view to securing, so far as this is reasonable and practicable and as early as possible, substantial compliance with those requirements;
- .3 ensure that when life-saving appliances or arrangements on such ships are replaced or such ships undergo repairs, alterations or modifications of a major character which involve replacement of, or any addition to, their existing life-saving appliances or arrangements, such life-saving appliances or arrangements, in so far as is reasonable and practicable, comply with the requirements of this chapter. However, if a survival craft is replaced without replacing its launching appliance, or vice versa, the survival craft or launching appliance may be of the same type as that replaced;
- .4 approve the life-saving appliances to be provided in compliance with paragraph 6. The Administration may permit those life-saving appliances provided on board ships prior to 1 July 1991 not to comply fully with the requirements of this chapter as long as they remain in a satisfactory condition;
- .5 except as provided for survival craft and launching appliances referred to in paragraph 4.3, ensure that life-saving appliances replaced or installed on or after 1 July 1991 are evaluated, tested and approved in accordance with the requirements of regulations 4 and 5.

5 With respect to ships constructed before 1 July 1986 the requirements of regulations 8, 9, 10, 18 and 25 and, to the extent prescribed therein, regulation 19 shall apply.

6 With respect to ships constructed before 1 July 1986 the requirements of regulations 6.2.3, 6.2.4, 21.3, 21.4, 26.3, 27.2, 27.3 and 30.2.7 shall apply not later than 1 July 1991.

Regulation 2

Exemptions

1 The Administration may, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of this chapter unreasonable or unnecessary, exempt from those requirements individual ships or classes of ships which, in the course of their voyage, do not proceed more than 20 miles from the nearest land.

2 In the case of passenger ships which are employed in special trades for the carriage of large numbers of special trade passengers, such as the pilgrim trade, the Administration, if satisfied that it is impracticable to enforce compliance with the requirements of this chapter, may exempt such ships from those requirements, provided that such ships comply fully with the provisions of:

- .1 the rules annexed to the Special Trade Passenger Ships Agreement, 1971;
and

- .2 the rules annexed to the Protocol on Space Requirements for Special Trade Passenger Ships, 1973.

Regulation 3

Definitions

For the purpose of this chapter, unless expressly provided otherwise:

- 1 *Certificated person* is a person who holds a certificate of proficiency in survival craft issued under the authority of, or recognized as valid by, the Administration in accordance with the requirements of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, in force; or a person who holds a certificate issued or recognized by the Administration of a State not a Party to that Convention for the same purpose as the convention certificate.
- 2 *Detection* is the determination of the location of survivors or survival craft.
- 3 *Embarkation ladder* is the ladder provided at survival craft embarkation stations to permit safe access to survival craft after launching.
- 4 *Float-free launching* is that method of launching a survival craft whereby the craft is automatically released from a sinking ship and is ready for use.
- 5 *Free-fall launching* is that method of launching a survival craft whereby the craft with its complement of persons and equipment on board is released and allowed to fall into the sea without any restraining apparatus.
- 6 *Immersion suit* is a protective suit which reduces the body heat-loss of a person wearing it in cold water.
- 7 *Inflatable appliance* is an appliance which depends upon non-rigid, gas filled chambers for buoyancy and which is normally kept uninflated until ready for use.
- 8 *Inflated appliance* is an appliance which depends upon non-rigid, gas filled chambers for buoyancy and which is kept inflated and ready for use at all times.
- 9 *Launching appliance or arrangement* is a means of transferring a survival craft or rescue boat from its stowed position safely to the water.
- 10 *Length* is 96% of the total length on a waterline at 85% of the least moulded depth measured from the top of the keel, or the length from the fore-side of the stem to the axis of the rudder stock on that waterline, if that be greater. In ships designed with a rake of keel the waterline on which this is measured shall be parallel to the designed waterline.
- 11 *Moulded depth*
 - .1 The moulded depth is the vertical distance measured from the top of the keel to the top of the freeboard deck beam at side. In wood and composite ships the distance is measured from the lower edge of the keel rabbet. Where the form at the lower part of the midship section is of

a hollow character, or where thick garboards are fitted, the distance is measured from the point where the line of the flat of the bottom continued inwards cuts the side of the keel.

- .2 In ships having rounded gunwales, the moulded depth shall be measured to the point of intersection of the moulded lines of the deck and side shell plating, the lines extending as though the gunwale were of angular design.
- .3 Where the freeboard deck is stepped and the raised part of the deck extends over the point at which the moulded depth is to be determined, the moulded depth shall be measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part.

12 *Novel life-saving appliance or arrangement* is a life-saving appliance or arrangement which embodies new features not fully covered by the provisions of this chapter but which provides an equal or higher standard of safety.

13 *Rescue boat* is a boat designed to rescue persons in distress and to marshal survival craft.

14 *Retrieval* is the safe recovery of survivors.

15 *Retro-reflective material* is a material which reflects in the opposite direction a beam of light directed on it.

16 *Short international voyage* is an international voyage in the course of which a ship is not more than 200 miles from a port or place in which the passengers and crew could be placed in safety. Neither the distance between the last port of call in the country in which the voyage begins and the final port of destination nor the return voyage shall exceed 600 miles. The final port of destination is the last port of call in the scheduled voyage at which the ship commences its return voyage to the country in which the voyage began.

17 *Survival craft* is a craft capable of sustaining the lives of persons in distress from the time of abandoning the ship.

18 *Thermal protective aid* is a bag or suit made of waterproof material with low thermal conductivity.

Regulation 4

Evaluation, testing and approval of life-saving appliances and arrangements

1 Except as provided in paragraphs 5 and 6, life-saving appliances and arrangements required by this chapter shall be approved by the Administration.

2 Before giving approval to life-saving appliances and arrangements, the Administration shall ensure that such life-saving appliances and arrangements:

- .1 are tested, to confirm that they comply with the requirements of this chapter, in accordance with the recommendations of the Organization;* or
 - .2 have successfully undergone, to the satisfaction of the Administration, tests which are substantially equivalent to those specified in those recommendations.
- 3 Before giving approval to novel life-saving appliances or arrangements, the Administration shall ensure that such appliances or arrangements:
- .1 provide safety standards at least equivalent to the requirements of this chapter and have been evaluated and tested in accordance with the recommendations of the Organization;** or
 - .2 have successfully undergone, to the satisfaction of the Administration, evaluation and tests which are substantially equivalent to those recommendations.
- 4 Procedures adopted by the Administration for approval shall also include the conditions whereby approval would continue or would be withdrawn.
- 5 Before accepting life-saving appliances and arrangements that have not been previously approved by the Administration, the Administration shall be satisfied that life-saving appliances and arrangements comply with the requirements of this chapter.
- 6 Life-saving appliances required by this chapter for which detailed specifications are not included in part C shall be to the satisfaction of the Administration.

Regulation 5

Production tests

The Administration shall require life-saving appliances to be subjected to such production tests as are necessary to ensure that the life-saving appliances are manufactured to the same standard as the approved prototype.

* Reference is made to the "Recommendation on testing of life-saving appliances" to be submitted to the Assembly of the Organization at its thirteenth session for adoption.

** Reference is made to the "Code of practice for the evaluation, testing and acceptance of prototype novel life-saving appliances and arrangements" to be submitted to the Assembly of the Organization at its thirteenth session for adoption.

PART B – SHIP REQUIREMENTS

SECTION I – PASSENGER SHIPS AND CARGO SHIPS

Regulation 6

Communications

1 Paragraphs 2.3 and 2.4 apply to all ships. With respect to ships constructed before 1 July 1986, paragraphs 2.3 and 2.4 shall apply not later than 1 July 1991.

2 *Radio life-saving appliances*

2.1 *Portable radio apparatus for survival craft*

2.1.1 A portable radio apparatus for survival craft complying with the requirements of regulation IV/14 shall be provided. The portable radio apparatus shall be stowed in a protected and easily accessible position ready to be moved to any survival craft in an emergency, except that in the case of a ship with lifeboats stowed in widely separated positions fore and aft, the portable radio apparatus shall be stowed in the vicinity of the lifeboats which are furthest away from the ship's main transmitter.

2.1.2 The requirements of paragraph 2.1.1 need not be complied with if a radio installation complying with the requirements of regulation IV/13 is fitted in a lifeboat on each side of the ship or in the stern-launched lifeboat referred to in regulation 26.1.2.1.

2.1.3 On ships engaged on voyages of such duration that in the opinion of the Administration portable radio apparatus for survival craft is unnecessary, the Administration may allow such equipment to be dispensed with.

2.2 *Radiotelegraph installation for lifeboats*

On passenger ships engaged on international voyages which are not short international voyages:

- .1 where the total number of persons on board is more than 199 but less than 1,500, a radiotelegraph installation complying with the requirements of regulation IV/13 shall be fitted in at least one of the lifeboats required by regulation 20.1.1.1;
- .2 where the total number of persons on board is 1,500 or more, at least one lifeboat on each side shall be so fitted.

2.3 *Survival craft emergency position-indicating radio beacons*

One manually activated emergency position-indicating radio beacon complying with the requirements of regulation IV/14.1 shall be carried on each side of the ship. They shall be so stowed that they can be rapidly placed in any survival craft other than the liferaft or liferafts required by regulation 26.1.4.

2.4 *Two-way radiotelephone apparatus*

2.4.1 Two-way radiotelephone apparatus complying with the requirements of regulation IV/14-3 shall be provided for communication between survival craft, between survival craft and ship and between ship and rescue boat. An apparatus need not be provided for every survival craft; however, at least three apparatus shall be provided on each ship. This requirement may be complied with by other apparatus used on board provided such apparatus is not incompatible with the appropriate requirements of regulation IV/14-3.

2.4.2 For ships constructed before 1 July 1986 such apparatus need only comply with the frequency requirements of regulation IV/14-3.

3 *Distress flares*

Not less than 12 rocket parachute flares, complying with the requirements of regulation 35, shall be carried and be stowed on or near the navigating bridge.

4 *On-board communications and alarm systems*

4.1 An emergency means comprised of either fixed or portable equipment or both shall be provided for two-way communications between emergency control stations, muster and embarkation stations and strategic positions on board.

4.2 A general emergency alarm system complying with the requirements of regulation 50 shall be provided and shall be used for summoning passengers and crew to muster stations and to initiate the actions included in the muster list. The system shall be supplemented by either a public address system or other suitable means of communication.

Regulation 7

Personal life-saving appliances

1 *Lifebuoys*

1.1 Lifebuoys complying with the requirements of regulation 31.1 shall be:

- .1 so distributed as to be readily available on both sides of the ship and as far as practicable on all open decks extending to the ship's side; at least one shall be placed in the vicinity of the stern;
- .2 so stowed as to be capable of being rapidly cast loose, and not permanently secured in any way.

1.2 At least one lifebuoy on each side of the ship shall be fitted with a buoyant lifeline complying with the requirements of regulation 31.4 equal in length to not less than twice the height at which it is stowed above the waterline in the lightest seagoing condition, or 30 m, whichever is the greater.

1.3 Not less than one half of the total number of lifebuoys shall be provided with self-igniting lights complying with the requirements of regulation 31.2; not less than two of these shall also be provided with self-activating smoke signals complying with the requirements of regulation 31.3 and be capable of quick release from the navigating bridge; lifebuoys with lights and those with lights and smoke signals shall be equally distributed on both sides of the ship and shall not be the lifebuoys provided with lifelines in compliance with the requirements of paragraph 1.2.

1.4 Each lifebuoy shall be marked in block capitals of the Roman alphabet with the name and port of registry of the ship on which it is carried.

2 *Lifejackets*

2.1 A lifejacket complying with the requirements of regulation 32.1 or 32.2 shall be provided for every person on board the ship and, in addition:

- 1 a number of lifejackets suitable for children equal to at least 10% of the number of passengers on board shall be provided or such greater number as may be required to provide a lifejacket for each child;
- 2 a sufficient number of lifejackets shall be carried for persons on watch and for use at remotely located survival craft stations.

2.2 Lifejackets shall be so placed as to be readily accessible and their position shall be plainly indicated. Where, due to the particular arrangements of the ship, the lifejackets provided in compliance with the requirements of paragraph 2.1 may become inaccessible, alternative provisions shall be made to the satisfaction of the Administration which may include an increase in the number of lifejackets to be carried.

3 *Immersion suits*

3.1 An immersion suit, of an appropriate size, complying with the requirements of regulation 33 shall be provided for every person assigned to crew the rescue boat.

Regulation 8

Muster list and emergency instructions

- 1 This regulation applies to all ships.
- 2 Clear instructions to be followed in the event of an emergency shall be provided for every person on board.
- 3 Muster lists complying with the requirements of regulation 53 shall be exhibited in conspicuous places throughout the ship including the navigating bridge, engine-room and crew accommodation spaces.
- 4 Illustrations and instructions in appropriate languages shall be posted in passenger cabins and be conspicuously displayed at muster stations and other passenger spaces to inform passengers of:

- .1 their muster station;
- .2 the essential actions they must take in an emergency;
- .3 the method of donning lifejackets.

Regulation 9

Operating instructions

- 1 This regulation applies to all ships.
- 2 Posters or signs shall be provided on or in the vicinity of survival craft and their launching controls and shall:
 - .1 illustrate the purpose of controls and the procedures for operating the appliance and give relevant instructions or warnings;
 - .2 be easily seen under emergency lighting conditions;
 - .3 use symbols in accordance with the recommendations of the Organization.

Regulation 10

Manning of survival craft and supervision

- 1 This regulation applies to all ships.
- 2 There shall be a sufficient number of trained persons on board for mustering and assisting untrained persons.
- 3 There shall be a sufficient number of crew members, who may be deck officers or certificated persons, on board for operating the survival craft and launching arrangements required for abandonment by the total number of persons on board.
- 4 A deck officer or certificated person shall be placed in charge of each survival craft to be used. However, the Administration, having due regard to the nature of the voyage, the number of persons on board and the characteristics of the ship, may permit persons practised in the handling and operation of liferafts to be placed in charge of liferafts in lieu of persons qualified as above. A second-in-command shall also be nominated in the case of lifeboats.
- 5 The person in charge of the survival craft shall have a list of the survival craft crew and shall see that the crew under his command are acquainted with their duties. In lifeboats the second-in-command shall also have a list of the lifeboat crew.
- 6 Every lifeboat required to carry a radiotelegraph installation complying with the requirements of regulation 6.2.2 shall have a person assigned who is capable of operating the equipment.

7 Every motorized survival craft shall have a person assigned who is capable of operating the engine and carrying out minor adjustments.

8 The master shall ensure the equitable distribution of persons referred to in paragraphs 2, 3 and 4 among the ship's survival craft.

Regulation 11

Survival craft muster and embarkation arrangements

1 Lifeboats and liferafts for which approved launching appliances are required shall be stowed as close to accommodation and service spaces as possible.

2 Muster stations shall be provided close to the embarkation stations. Each muster station shall have sufficient space to accommodate all persons assigned to muster at that station.

3 Muster and embarkation stations shall be readily accessible from accommodation and work areas.

4 Muster and embarkation stations shall be adequately illuminated by lighting supplied from the emergency source of electrical power required by regulation II-1/42 or II-1/43, as appropriate.

5 Alleyways, stairways and exits giving access to the muster and embarkation stations shall be lighted. Such lighting shall be capable of being supplied by the emergency source of electrical power required by regulation II-1/42 or II-1/43, as appropriate.

6 Davit-launched survival craft muster and embarkation stations shall be so arranged as to enable stretcher cases to be placed in survival craft.

7 An embarkation ladder complying with the requirements of regulation 48.7 extending, in a single length, from the deck to the waterline in the lightest seagoing condition under unfavourable conditions of trim and with the ship listed not less than 15° either way shall be provided at each launching station or at every two adjacent launching stations. However, the Administration may permit such ladders to be replaced by approved devices to afford access to the survival craft when waterborne, provided that there shall be at least one embarkation ladder on each side of the ship. Other means of embarkation may be permitted for the liferafts required by regulation 26.1.4.

8 Where necessary, means shall be provided for bringing the davit-launched survival craft against the ship's side and holding them alongside so that persons can be safely embarked.

Regulation 12

Launching stations

Launching stations shall be in such positions as to ensure safe launching having particular regard to clearance from the propeller and steeply overhanging portions of the hull and so that, as far as possible, survival craft, except survival

craft specially designed for free-fall launching, can be launched down the straight side of the ship. If positioned forward, they shall be located abaft the collision bulkhead in a sheltered position and, in this respect, the Administration shall give special consideration to the strength of the launching appliance.

Regulation 13

Stowage of survival craft

- 1 Each survival craft shall be stowed:
 - 1 so that neither the survival craft nor its stowage arrangements will interfere with the operation of any other survival craft or rescue boat at any other launching station;
 - 2 as near the water surface as is safe and practicable and, in the case of a survival craft other than a liferaft intended for throw-overboard launching, in such a position that the survival craft in the embarkation position is not less than 2 m above the waterline with the ship in the fully loaded condition under unfavourable conditions of trim and listed up to 20° either way, or to the angle at which the ship's weatherdeck edge becomes submerged, whichever is less;
 - 3 in a state of continuous readiness so that two crew members can carry out preparations for embarkation and launching in less than 5 min;
 - 4 fully equipped as required by this chapter;
 - 5 as far as practicable, in a secure and sheltered position and protected from damage by fire and explosion.

2 Lifeboats for lowering down the ship's side shall be stowed as far forward of the propeller as practicable. On cargo ships of 80 m in length and upwards but less than 120 m in length, each lifeboat shall be so stowed that the after end of the lifeboat is not less than the length of the lifeboat forward of the propeller. On cargo ships of 120 m in length and upwards and passenger ships of 80 m in length and upwards, each lifeboat shall be so stowed that the after end of the lifeboat is not less than 1.5 times the length of the lifeboat forward of the propeller. Where appropriate, the ship shall be so arranged that lifeboats, in their stowed positions, are protected from damage by heavy seas.

3 Lifeboats shall be stowed attached to launching appliances.

4 In addition to meeting the requirements of regulations 23 and 29, liferafts shall be so stowed as to permit manual release from their securing arrangements.

5 Davit-launched liferafts shall be stowed within reach of the lifting hooks, unless some means of transfer is provided which is not rendered inoperable within the limits of trim and list prescribed in paragraph 1.2 or by ship motion or power failure.

6 Liferrafts intended for throw-overboard launching shall be so stowed as to be readily transferable for launching on either side of the ship unless liferafts, of the aggregate capacity required by regulation 26.1 to be capable of being launched on either side, are stowed on each side of the ship.

Regulation 14

Stowage of rescue boats

Rescue boats shall be stowed:

- .1 in a state of continuous readiness for launching in not more than 5 min;
- .2 in a position suitable for launching and recovery;
- .3 so that neither the rescue boat nor its stowage arrangements will interfere with the operation of any survival craft at any other launching station;
- .4 if it is also a lifeboat, in compliance with the requirements of regulation 13.

Regulation 15

Survival craft launching and recovery arrangements

1 Launching appliances complying with the requirements of regulation 48 shall be provided for all survival craft except:

- .1 survival craft which are boarded from a position on deck which is less than 4.5 m above the waterline in the lightest seagoing condition and which either:
 - .1.1 have a mass of not more than 185 kg; or
 - .1.2 are stowed for launching directly from the stowed position under unfavourable conditions of trim of up to 10° and with the ship listed not less than 20° either way;
- .2 survival craft having a mass of not more than 185 kg and which are carried in excess of the survival craft for 200% of the total number of persons on board the ship.

2 Each lifeboat shall be provided with an appliance which is capable of launching and recovering the lifeboat.

3 Launching and recovery arrangements shall be such that the appliance operator on the ship is able to observe the survival craft at all times during launching and for lifeboats during recovery.

4 Only one type of release mechanism shall be used for similar survival craft carried on board the ship.

5 Preparation and handling of survival craft at any one launching station shall not interfere with the prompt preparation and handling of any other survival craft or rescue boat at any other station.

6 Falls, where used, shall be long enough for the survival craft to reach the water with the ship in its lightest seagoing condition, under unfavourable conditions of trim and with the ship listed not less than 20° either way.

7 During preparation and launching, the survival craft, its launching appliance, and the area of water into which it is to be launched shall be adequately illuminated by lighting supplied from the emergency source of electrical power required by regulation II-1/42 or II-1/43, as appropriate.

8 Means shall be available to prevent any discharge of water on to survival craft during abandonment.

9 If there is a danger of the survival craft being damaged by the ship's stabilizer wings, means shall be available, powered by an emergency source of energy, to bring the stabilizer wings inboard; indicators operated by an emergency source of energy shall be available on the navigating bridge to show the position of the stabilizer wings.

10 If lifeboats complying with the requirements of regulation 42 or 43 are carried, a davit span shall be provided, fitted with not less than two lifelines of sufficient length to reach the water with the ship in its lightest seagoing condition, under unfavourable conditions of trim and with the ship listed not less than 20° either way.

Regulation 16

Rescue boat embarkation, launching and recovery arrangements

1 The rescue boat embarkation and launching arrangements shall be such that the rescue boat can be boarded and launched in the shortest possible time.

2 If the rescue boat is one of the ship's survival craft, the embarkation arrangements and launching station shall comply with the requirements of regulations 11 and 12.

3 Launching arrangements shall comply with the requirements of regulation 15. However, all rescue boats shall be capable of being launched, where necessary utilizing painters, with the ship making headway at speeds up to 5 knots in calm water.

4 Rapid recovery of the rescue boat shall be possible when loaded with its full complement of persons and equipment. If the rescue boat is also a lifeboat, rapid recovery shall be possible when loaded with its lifeboat equipment and the approved rescue boat complement of at least six persons.

Regulation 17

Line-throwing appliances

A line-throwing appliance complying with the requirements of regulation 49 shall be provided.

Regulation 18

Abandon ship training and drills

1 This regulation applies to all ships.

2 *Manuals*

A training manual complying with the requirements of regulation 51 shall be provided in each crew messroom and recreation room or in each crew cabin.

3 *Practice musters and drills*

3.1 Each member of the crew shall participate in at least one abandon ship drill and one fire drill every month. The drills of the crew shall take place within 24 h of the ship leaving a port if more than 25% of the crew have not participated in abandon ship and fire drills on board that particular ship in the previous month. The Administration may accept other arrangements that are at least equivalent for those classes of ship for which this is impracticable.

3.2 On a ship engaged on an international voyage which is not a short international voyage, musters of the passengers shall take place within 24 h after their embarkation. Passengers shall be instructed in the use of the lifejackets and the action to take in an emergency. If only a small number of passengers embark at a port after the muster has been held it shall be sufficient, instead of holding another muster, to draw the attention of these passengers to the emergency instructions required by regulations 8.2 and 8.4.

3.3 On a ship engaged on a short international voyage, if a muster of the passengers is not held on departure, the attention of the passengers shall be drawn to the emergency instructions required by regulations 8.2 and 8.4.

3.4 Each abandon ship drill shall include.

- .1 summoning of passengers and crew to muster stations with the alarm required by regulation 6.4.2 and ensuring that they are made aware of the order to abandon ship specified in the muster list;
- .2 reporting to stations and preparing for the duties described in the muster list;
- .3 checking that passengers and crew are suitably dressed;
- .4 checking that lifejackets are correctly donned;

- 5 lowering of at least one lifeboat after any necessary preparation for launching;
- .6 starting and operating the lifeboat engine;
- .7 operation of davits used for launching liferafts.

3.5 Different lifeboats shall, as far as practicable, be lowered in compliance with the requirements of paragraph 3.4.5 at successive drills.

3.6 Drills shall, as far as practicable, be conducted as if there were an actual emergency.

3.7 Each lifeboat shall be launched with its assigned operating crew aboard and manoeuvred in the water at least once every 3 months during an abandon ship drill. The Administration may allow ships operating on short international voyages not to launch the lifeboats on one side if their berthing arrangements in port and their trading patterns do not permit launching of lifeboats on that side. However, all such lifeboats shall be lowered at least once every 3 months and launched at least annually.

3.8 As far as is reasonable and practicable, rescue boats other than lifeboats which are also rescue boats, shall be launched each month with their assigned crew aboard and manoeuvred in the water. In all cases this requirement shall be complied with at least once every 3 months.

3.9 If lifeboat and rescue boat launching drills are carried out with the ship making headway, such drills shall, because of the dangers involved, be practised in sheltered waters only and under the supervision of an officer experienced in such drills.

3.10 Emergency lighting for mustering and abandonment shall be tested at each abandon ship drill.

4 *On-board training and instructions*

4.1 On-board training in the use of the ship's life-saving appliances, including survival craft equipment, shall be given as soon as possible but not later than 2 weeks after a crew member joins the ship. However, if the crew member is on a regularly scheduled rotating assignment to the ship, such training shall be given not later than 2 weeks after the time of first joining the ship.

4.2 Instructions in the use of the ship's life-saving appliances and in survival at sea shall be given at the same interval as the drills. Individual instruction may cover different parts of the ship's life-saving system, but all the ship's life-saving equipment and appliances shall be covered within any period of 2 months. Each member of the crew shall be given instructions which shall include but not necessarily be limited to:

- .1 operation and use of the ship's inflatable liferafts;
- .2 problems of hypothermia, first-aid treatment for hypothermia and other appropriate first-aid procedures;

- .3 special instructions necessary for use of the ship's life-saving appliances in severe weather and severe sea conditions.

4.3 On-board training in the use of davit-launched liferafts shall take place at intervals of not more than 4 months on every ship fitted with such appliances. Whenever practicable this shall include the inflation and lowering of a liferaft. This liferaft may be a special liferaft intended for training purposes only, which is not part of the ship's life-saving equipment; such a special liferaft shall be conspicuously marked.

5 *Records*

The date when musters are held, details of abandon ship drills and fire drills, drills of other life-saving appliances and on-board training shall be recorded in such log-book as may be prescribed by the Administration. If a full muster, drill or training session is not held at the appointed time, an entry shall be made in the log-book stating the circumstances and the extent of the muster, drill or training session held.

Regulation 19

Operational readiness, maintenance and inspections

1 This regulation applies to all ships. The requirements of paragraphs 3 and 6.2 shall be complied with, as far as is practicable, on ships constructed before 1 July 1986.

2 *Operational readiness*

Before the ship leaves port and at all times during the voyage, all life-saving appliances shall be in working order and ready for immediate use.

3 *Maintenance*

3.1 Instructions for on-board maintenance of life-saving appliances complying with the requirements of regulation 52 shall be provided and maintenance shall be carried out accordingly.

3.2 The Administration may accept, in lieu of the instructions required by paragraph 3.1, a shipboard planned maintenance programme which includes the requirements of regulation 52.

4 *Maintenance of falls*

Falls used in launching shall be turned end for end at intervals of not more than 30 months and be renewed when necessary due to deterioration of the falls or at intervals of not more than 5 years, whichever is the earlier.

5 *Spares and repair equipment*

Spares and repair equipment shall be provided for life-saving appliances and their components which are subject to excessive wear or consumption and need to be replaced regularly.

6 *Weekly inspection*

The following tests and inspections shall be carried out weekly:

- .1 all survival craft, rescue boats and launching appliances shall be visually inspected to ensure that they are ready for use;
- .2 all engines in lifeboats and rescue boats shall be run ahead and astern for a total period of not less than 3 min provided the ambient temperature is above the minimum temperature required for starting the engine. In special cases the Administration may waive this requirement for ships constructed before 1 July 1986;
- .3 the general emergency alarm system shall be tested.

7 *Monthly inspections*

Inspection of the life-saving appliances, including lifeboat equipment, shall be carried out monthly using the checklist required by regulation 52.1 to ensure that they are complete and in good order. A report of the inspection shall be entered in the log-book.

8 *Servicing of inflatable liferafts, inflatable lifejackets and inflated rescue boats*

8.1 Every inflatable liferaft and inflatable lifejacket shall be serviced:

- .1 at intervals not exceeding 12 months. However, in cases where it appears proper and reasonable, the Administration may extend this period to 17 months;
- .2 at an approved servicing station which is competent to service them, maintains proper servicing facilities and uses only properly trained personnel.*

8.2 All repairs and maintenance of inflated rescue boats shall be carried out in accordance with the manufacturer's instructions. Emergency repairs may be carried out on board the ship; however, permanent repairs shall be effected at an approved servicing station.

* Reference is made to the "Recommendation on the conditions for the approval of servicing stations for inflatable liferafts" adopted by the Organization by resolution A.333(IX).

9 *Periodic servicing of hydrostatic release units*

Hydrostatic release units shall be serviced:

- .1 at intervals not exceeding 12 months. However, in cases where it appears proper and reasonable, the Administration may extend this period to 17 months;
- .2 at a servicing station which is competent to service them, maintains proper servicing facilities and uses only properly trained personnel.

SECTION II – PASSENGER SHIPS

(ADDITIONAL REQUIREMENTS)

Regulation 20

Survival craft and rescue boats

1 *Survival craft*

1.1 Passenger ships engaged on international voyages which are not short international voyages shall carry:

- .1 lifeboats complying with the requirements of regulation 42, 43, or 44 on each side of such aggregate capacity as will accommodate not less than 50% of the total number of persons on board. The Administration may permit the substitution of lifeboats by liferafts of equivalent total capacity provided that there shall never be less than sufficient lifeboats on each side of the ship to accommodate 37.5% of the total number of persons on board. The liferafts shall comply with the requirements of regulation 39 or 40 and shall be served by launching appliances equally distributed on each side of the ship; and
- .2 in addition, liferafts complying with the requirements of regulation 39 or 40 of such aggregate capacity as will accommodate at least 25% of the total number of persons on board. These liferafts shall be served by at least one launching appliance on each side which may be those provided in compliance with the requirements of paragraph 1.1.1 or equivalent approved appliances capable of being used on both sides. However, stowage of these liferafts need not comply with the requirements of regulation 13.5.

1.2 Passenger ships engaged on short international voyages and complying with the special standards of subdivision prescribed by regulation II-1/6.5 shall carry:

- .1 lifeboats complying with the requirements of regulation 42, 43 or 44 equally distributed, as far as practicable, on each side of the ship and of such aggregate capacity as will accommodate at least 30% of the total

number of persons on board and liferafts complying with requirements of regulation 39 or 40 of such aggregate capacity that, together with the lifeboat capacity, the survival craft will accommodate the total number of persons on board. The liferafts shall be served by launching appliances equally distributed on each side of the ship; and

- .2 in addition, liferafts complying with the requirements of regulation 39 or 40 of such aggregate capacity as will accommodate at least 25% of the total number of persons on board. These liferafts shall be served by at least one launching appliance on each side which may be those provided in compliance with the requirements of paragraph 1.2.1 or equivalent approved appliances capable of being used on both sides. However, stowage of these liferafts need not comply with the requirements of regulation 13.5.

1.3 Passenger ships engaged on short international voyages and not complying with the special standard of subdivision prescribed by regulation II-1/6.5, shall carry survival craft complying with the requirements of paragraph 1.1.

1.4 All survival craft required to provide for abandonment by the total number of persons on board shall be capable of being launched with their full complement of persons and equipment within a period of 30 min from the time the abandon ship signal is given.

1.5 In lieu of meeting the requirements of paragraph 1.1, 1.2 or 1.3, passenger ships of less than 500 tons gross tonnage where the total number of persons on board is less than 200, may comply with the following:

- .1 They shall carry on each side of the ship, liferafts complying with the requirements of regulation 39 or 40 and of such aggregate capacity as will accommodate the total number of persons on board.
- .2 Unless the liferafts required by paragraph 1.5.1 can be readily transferred for launching on either side of the ship, additional liferafts shall be provided so that the total capacity available on each side will accommodate 150% of the total number of persons on board.
- .3 If the rescue boat required by paragraph 2.2 is also a lifeboat complying with the requirements of regulation 42, 43 or 44, it may be included in the aggregate capacity required by paragraph 1.5.1, provided that the total capacity available on either side of the ship is at least 150% of the total number of persons on board.
- .4 In the event of any one survival craft being lost or rendered unserviceable, there shall be sufficient survival craft available for use on each side to accommodate the total number of persons on board.

2 *Rescue boats*

2.1 Passenger ships of 500 tons gross tonnage and over shall carry at least one rescue boat complying with the requirements of regulation 47 on each side of the ship.

2.2 Passenger ships of less than 500 tons gross tonnage shall carry at least one rescue boat complying with the requirements of regulation 47.

2.3 A lifeboat may be accepted as a rescue boat provided it also complies with the requirements for a rescue boat.

3 *Marshalling of liferafts*

3.1 The number of lifeboats and rescue boats that are carried on passenger ships shall be sufficient to ensure that in providing for abandonment by the total number of persons on board not more than six liferafts need be marshalled by each lifeboat or rescue boat.

3.2 The number of lifeboats and rescue boats that are carried on passenger ships engaged on short international voyages and complying with the special standards of subdivision prescribed by regulation II-1/6.5 shall be sufficient to ensure that in providing for abandonment by the total number of persons on board not more than nine liferafts need be marshalled by each lifeboat or rescue boat.

Regulation 21

Personal life-saving appliances

1 *Lifebuoys*

1.1 A passenger ship shall carry not less than the number of lifebuoys complying with the requirements of regulations 7.1 and 31 prescribed in the following table:

Length of ship in metres	Minimum number of lifebuoys
Under 60	8
60 and under 120	12
120 and under 180	18
180 and under 240	24
240 and over	30

1.2 Notwithstanding regulation 7.1.3, passenger ships of under 60 m in length shall carry not less than six lifebuoys provided with self-igniting lights.

2 *Lifejackets*

In addition to the lifejackets required by regulation 7.2, every passenger ship shall carry lifejackets for not less than 5% of the total number of persons on board. These lifejackets shall be stowed in conspicuous places on deck or at muster stations.

3 *Lifejacket lights*

3.1 This paragraph applies to all passenger ships. With respect to passenger ships constructed before 1 July 1986, the requirements of this paragraph shall apply not later than 1 July 1991.

3.2 On passenger ships engaged on international voyages which are not short international voyages each lifejacket shall be fitted with a light complying with the requirements of regulation 32.3.

4 *Immersion suits and thermal protective aids*

4.1 This paragraph applies to all passenger ships. With respect to passenger ships constructed before 1 July 1986, the requirements of this paragraph shall apply not later than 1 July 1991.

4.2 Passenger ships shall carry for each lifeboat on the ship at least three immersion suits complying with the requirements of regulation 33 and, in addition, a thermal protective aid complying with the requirements of regulation 34 for every person to be accommodated in the lifeboat and not provided with an immersion suit. These immersion suits and thermal protective aids need not be carried:

- .1 for persons to be accommodated in totally or partially enclosed lifeboats;
or
- .2 if the ship is constantly engaged on voyages in warm climates where, in the opinion of the Administration, thermal protective aids are unnecessary.

4.3 The provisions of paragraph 4.2.1 also apply to totally or partially enclosed lifeboats not complying with the requirements of regulation 42, 43 or 44, provided they are carried on ships constructed before 1 July 1986.

Regulation 22

Survival craft and rescue boat embarkation arrangements

1 On passenger ships, survival craft embarkation arrangements shall be designed for:

- .1 all lifeboats to be boarded and launched either directly from the stowed position or from an embarkation deck but not both;
- .2 davit-launched liferafts to be boarded and launched from a position immediately adjacent to the stowed position or from a position to which, in compliance with the requirements of regulation 13.5, the liferaft is transferred prior to launching.

2 Rescue boat arrangements shall be such that the rescue boat can be boarded and launched directly from the stowed position with the number of persons assigned to crew the rescue boat on board. Notwithstanding the requirements of

paragraph 1.1, if the rescue boat is also a lifeboat and the other lifeboats are boarded and launched from an embarkation deck, the arrangements shall be such that the rescue boat can also be boarded and launched from the embarkation deck.

Regulation 23

Stowage of liferafts

On passenger ships, every liferaft shall be stowed with its painter permanently attached to the ship and with a float-free arrangement complying with the requirements of regulation 38.6 so that, as far as practicable, the liferaft floats free and, if inflatable, inflates automatically when the ship sinks.

Regulation 24

Muster stations

Every passenger ship shall, in addition to complying with the requirements of regulation 11, have passenger muster stations which shall:

- .1 be in the vicinity of, and permit ready access for the passengers to, the embarkation stations unless in the same location;
- .2 have ample room for marshalling and instruction of the passengers.

Regulation 25

Drills

- 1 This regulation applies to all passenger ships.
- 2 On passenger ships, an abandon ship drill and fire drill shall take place weekly.

SECTION III – CARGO SHIPS
(ADDITIONAL REQUIREMENTS)

Regulation 26

Survival craft and rescue boats

1 *Survival craft*

1.1 Cargo ships shall carry:

- 1 one or more lifeboats complying with the requirements of regulation 44 of such aggregate capacity on each side of the ship as will accommodate the total number of persons on board. The Administration may, however, permit cargo ships (except oil tankers, chemical tankers and gas carriers) operating under favourable climatic conditions and in suitable areas, to carry lifeboats complying with the requirements of regulation 43, provided the limits of the trade area are specified in the Cargo Ship Safety Equipment Certificate; and
- 2 in addition, a liferaft or liferafts, complying with the requirements of regulation 39 or 40, capable of being launched on either side of the ship and of such aggregate capacity as will accommodate the total number of persons on board. If the liferaft or liferafts cannot be readily transferred for launching on either side of the ship, the total capacity available on each side shall be sufficient to accommodate the total number of persons on board.

1.2 In lieu of meeting the requirements of paragraph 1.1, cargo ships may carry:

- 1 one or more lifeboats, complying with the requirements of regulation 44, capable of being free fall launched over the stern of the ship of such aggregate capacity as will accommodate the total number of persons on board; and
- 2 in addition, one or more liferafts complying with the requirements of regulation 39 or 40, on each side of the ship, of such aggregate capacity as will accommodate the total number of persons on board. The liferafts on at least one side of the ship shall be served by launching appliances.

1.3 In lieu of meeting the requirements of paragraph 1.1 or 1.2, cargo ships of less than 85 m in length other than oil tankers, chemical tankers and gas carriers, may comply with the following:

- 1 They shall carry on each side of the ship, one or more liferafts complying with the requirements of regulation 39 or 40 and of such aggregate capacity as will accommodate the total number of persons on board.
- 2 Unless the liferafts required by paragraph 1.3.1 can be readily transferred for launching on either side of the ship, additional liferafts shall be provided so that the total capacity available on each side will accommodate 150% of the total number of persons on board.

- .3 If the rescue boat required by paragraph 2 is also a lifeboat complying with the requirements of regulation 43 or 44, it may be included in the aggregate capacity required by paragraph 1.3.1, provided that the total capacity available on either side of the ship is at least 150% of the total number of persons on board.
- .4 In the event of any one survival craft being lost or rendered unserviceable, there shall be sufficient survival craft available for use on each side to accommodate the total number of persons on board.

1.4 Cargo ships where the survival craft are stowed in a position which is more than 100 m from the stem or stern shall carry, in addition to the liferafts required by paragraphs 1.1.2 and 1.2.2, a liferaft stowed as far forward or aft, or one as far forward and another as far aft, as is reasonable and practicable. Notwithstanding the requirements of regulation 29, such liferaft or liferafts may be securely fastened so as to permit manual release and need not be of the type which can be launched from an approved launching device.

1.5 With the exception of the survival craft referred to in regulation 15.1.1, all survival craft required to provide for abandonment by the total number of persons on board shall be capable of being launched with their full complement of persons and equipment within a period of 10 min from the time the abandon ship signal is given.

1.6 Chemical tankers and gas carriers carrying cargoes emitting toxic vapours or gases* shall carry, in lieu of lifeboats complying with the requirements of regulation 43 or 44, lifeboats complying with the requirements of regulation 45.

1.7 Oil tankers, chemical tankers and gas carriers carrying cargoes having a flash-point not exceeding 60° C (closed cup test) shall carry, in lieu of lifeboats complying with the requirements of regulation 43 or 44, lifeboats complying with the requirements of regulation 46.

2 *Rescue boats*

Cargo ships shall carry at least one rescue boat complying with the requirements of regulation 47. A lifeboat may be accepted as a rescue boat, provided that it also complies with the requirements for a rescue boat.

3 In addition to their lifeboats, cargo ships constructed before 1 July 1986 shall carry not later than 1 July 1991:

- .1 one or more liferafts of such aggregate capacity as will accommodate the total number of persons on board. The liferaft or liferafts shall be equipped with a lashing or an equivalent means of securing the liferaft which will automatically release it from a sinking ship;

* Reference is made to products for which emergency escape respiratory protection is required in chapter 17 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) adopted by the Maritime Safety Committee by resolution MSC.4(48) and in chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) adopted by the Maritime Safety Committee by resolution MSC.5(48).

- .2 where the survival craft are stowed in a position which is more than 100 m from the stem or stern, in addition to the liferafts required by paragraph 3.1, a liferaft stowed as far forward or aft, or one as far forward and another as far aft, as is reasonable and practicable. Notwithstanding the requirements of paragraph 3.1, such liferaft or liferafts may be securely fastened so as to permit manual release.

Regulation 27

Personal life-saving appliances

1 *Lifebuoys*

1.1 Cargo ships shall carry not less than the number of lifebuoys complying with the requirements of regulations 7.1 and 31 prescribed in the following table:

Length of ship in metres	Minimum number of lifebuoys
Under 100	8
100 and under 150	10
150 and under 200	12
200 and over	14

1.2 Self-igniting lights for lifebuoys on tankers required by regulation 7.1.3 shall be of an electric battery type.

2 *Lifejacket lights*

2.1 This paragraph applies to all cargo ships. With respect to cargo ships constructed before 1 July 1986, this paragraph shall apply not later than 1 July 1991.

2.2 On cargo ships, each lifejacket shall be fitted with a light complying with the requirements of regulation 32.3.

3 *Immersion suits and thermal protective aids*

3.1 This paragraph applies to all cargo ships. With respect to cargo ships constructed before 1 July 1986, this paragraph shall apply not later than 1 July 1991.

3.2 Cargo ships shall carry for each lifeboat on the ship at least three immersion suits complying with the requirements of regulation 33 or, if the Administration considers it necessary and practicable, one immersion suit complying with the requirements of regulation 33 for every person on board the ship; however, the ship shall carry in addition to the thermal protective aids required by regulations 38.5.1.24, 41.8.31 and 47.2.2.13, thermal protective aids complying with the

requirements of regulation 34 for persons on board not provided with immersion suits. These immersion suits and thermal protective aids need not be required if the ship:

- .1 has totally enclosed lifeboats on each side of the ship of such aggregate capacity as will accommodate the total number of persons on board; or
- .2 has totally enclosed lifeboats capable of being launched by free-fall over the stern of the ship of such aggregate capacity as will accommodate the total number of persons on board and which are boarded and launched directly from the stowed position, together with liferafts on each side of the ship of such aggregate capacity as will accommodate the total number of persons on board; or
- .3 is constantly engaged on voyages in warm climates where, in the opinion of the Administration, immersion suits are unnecessary.

3.3 Cargo ships complying with the requirements of regulation 26.1.3 shall carry immersion suits complying with the requirements of regulation 33 for every person on board unless the ship:

- .1 has davit-launched liferafts; or
- .2 has liferafts served by equivalent approved appliances capable of being used on both sides of the ship and which do not require entry into the water to board the liferaft; or
- .3 is constantly engaged on voyages in warm climates where, in the opinion of the Administration, immersion suits are unnecessary.

3.4 The immersion suits required by this regulation may be used to comply with the requirements of regulation 7.3.

3.5 The totally enclosed lifeboats referred to in paragraphs 3.2.1 and 3.2.2 carried on cargo ships constructed before 1 July 1986 need not comply with the requirements of regulation 44.

Regulation 28

Survival craft embarkation and launching arrangements

1 Cargo ship survival craft embarkation arrangements shall be so designed that lifeboats can be boarded and launched directly from the stowed position and davit-launched liferafts can be boarded and launched from a position immediately adjacent to the stowed position or from a position to which the liferaft is transferred prior to launching in compliance with the requirements of regulation 13.5.

2 On cargo ships of 20,000 tons gross tonnage and upwards, lifeboats shall be capable of being launched, where necessary utilizing painters, with the ship making headway at speeds up to 5 knots in calm water.

Regulation 29

Stowage of liferafts

On cargo ships, every liferaft, other than those required by regulation 26.1.4, shall be stowed with its painter permanently attached to the ship and with a float-free arrangement complying with the requirements of regulation 38.6 so that the liferaft floats free and, if inflatable, inflates automatically when the ship sinks.

PART C – LIFE-SAVING APPLIANCE REQUIREMENTS

SECTION I – GENERAL

Regulation 30

General requirements for life-saving appliances

- 1 Paragraph 2.7 applies to all ships. With respect to ships constructed before 1 July 1986, paragraph 2.7 shall apply not later than 1 July 1991.
- 2 Unless expressly provided otherwise or unless, in the opinion of the Administration having regard to the particular voyages on which the ship is constantly engaged, other requirements are appropriate, all life-saving appliances prescribed in this part shall:
 - .1 be constructed with proper workmanship and materials;
 - .2 not be damaged in stowage throughout the air temperature range -30°C to $+65^{\circ}\text{C}$;
 - .3 if they are likely to be immersed in seawater during their use, operate throughout the seawater temperature range -1°C to $+30^{\circ}\text{C}$;
 - .4 where applicable, be rot-proof, corrosion-resistant, and not be unduly affected by seawater, oil or fungal attack;
 - .5 where exposed to sunlight, be resistant to deterioration;
 - .6 be of a highly visible colour on all parts where this will assist detection;
 - .7 be fitted with retro-reflective material where it will assist in detection and in accordance with the recommendations of the Organization*;
 - .8 if they are to be used in a seaway, be capable of satisfactory operation in that environment.

* Reference is made to the "Recommendation on retro-reflective tapes on life-saving appliances" adopted by the Organization in resolution A.274(VIII).

3 The Administration shall determine the period of acceptability of life-saving appliances which are subject to deterioration with age. Such life-saving appliances shall be marked with a means for determining their age or the date by which they must be replaced.

SECTION II – PERSONAL LIFE-SAVING APPLIANCES

Regulation 31

Lifebuoys

1 *Lifebuoy specification*

Every lifebuoy shall:

- .1 have an outer diameter of not more than 800 mm and an inner diameter of not less than 400 mm;
- .2 be constructed of inherently buoyant material; it shall not depend upon rushes, cork shavings or granulated cork, any other loose granulated material or any air compartment which depends on inflation for buoyancy;
- .3 be capable of supporting not less than 14.5 kg of iron in fresh water for a period of 24 hr;
- .4 have a mass of not less than 2.5 kg;
- .5 not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s;
- .6 be constructed to withstand a drop into the water from the height at which it is stowed above the waterline in the lightest seagoing condition or 30 m, whichever is the greater, without impairing either its operating capability or that of its attached components;
- .7 if it is intended to operate the quick-release arrangement provided for the self-activated smoke signals and self-igniting lights, have a mass sufficient to operate the quick-release arrangement or 4 kg, whichever is the greater;
- .8 be fitted with a grabline not less than 9.5 mm in diameter and not less than 4 times the outside diameter of the body of the buoy in length. The grabline shall be secured at four equidistant points around the circumference of the buoy to form four equal loops.

2 *Lifebuoy self-igniting lights*

Self-igniting lights required by regulation 7.1.3 shall:

- .1 be such that they cannot be extinguished by water;

- .2 be capable of either burning continuously with a luminous intensity of not less than 2 cd in all directions of the upper hemisphere or flashing (discharge flashing) at a rate of not less than 50 flashes per minute with at least the corresponding effective luminous intensity;
 - .3 be provided with a source of energy capable of meeting the requirement of paragraph 2.2 for a period of at least 2 hr;
 - .4 be capable of withstanding the drop test required by paragraph 1.6.
- 3 *Lifebuoy self-activating smoke signals*

Self-activating smoke signals required by regulation 7.1.3 shall:

- .1 emit smoke of a highly visible colour at a uniform rate for a period of at least 15 min when floating in calm water;
 - .2 not ignite explosively or emit any flame during the entire smoke emission time of the signal;
 - .3 not be swamped in a seaway;
 - .4 continue to emit smoke when fully submerged in water for a period of at least 10 s;
 - .5 be capable of withstanding the drop test required by paragraph 1.6.
- 4 *Buoyant lifelines*

Buoyant lifelines required by regulation 7.1.2 shall:

- .1 be non-kinking;
- .2 have a diameter of not less than 8 mm;
- .3 have a breaking strength of not less than 5 kN.

Regulation 32

Lifejackets

1 *General requirements for lifejackets*

- 1.1 A lifejacket shall not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s.
- 1.2 A lifejacket shall be so constructed that:
 - .1 after demonstration, a person can correctly don it within a period of 1 min without assistance;
 - .2 it is capable of being worn inside-out or is clearly capable of being worn in only one way and, as far as possible, cannot be donned incorrectly;

- .3 it is comfortable to wear;
 - .4 it allows the wearer to jump from a height of at least 4.5 m into the water without injury and without dislodging or damaging the lifejacket.
- 1.3 A lifejacket shall have sufficient buoyancy and stability in calm fresh water to:
- .1 lift the mouth of an exhausted or unconscious person not less than 120 mm clear of the water with the body inclined backwards at an angle of not less than 20° and not more than 50° from the vertical position;
 - .2 turn the body of an unconscious person in the water from any position to one where the mouth is clear of the water in not more than 5 s.
- 1.4 A lifejacket shall have buoyancy which is not reduced by more than 5% after 24 h submersion in fresh water.
- 1.5 A lifejacket shall allow the person wearing it to swim a short distance and to board a survival craft.
- 1.6 Each lifejacket shall be fitted with a whistle firmly secured by a cord.

2 *Inflatable lifejackets*

A lifejacket which depends on inflation for buoyancy shall have not less than two separate compartments and comply with the requirements of paragraph 1 and shall:

- .1 inflate automatically on immersion, be provided with a device to permit inflation by a single manual motion and be capable of being inflated by mouth;
 - .2 in the event of loss of buoyancy in any one compartment be capable of complying with the requirements of paragraphs 1.2, 1.3 and 1.5;
 - .3 comply with the requirements of paragraph 1.4 after inflation by means of the automatic mechanism.
- ## 3 *Lifejacket lights*
- 3.1 Each lifejacket light shall:
- .1 have a luminous intensity of not less than 0.75 cd;
 - .2 have a source of energy capable of providing a luminous intensity of 0.75 cd for a period of at least 8 h;
 - .3 be visible over as great a segment of the upper hemisphere as is practicable when attached to a lifejacket.
- 3.2 If the light referred to in paragraph 3.1 is a flashing light it shall, in addition:
- .1 be provided with a manually operated switch;

- .2 not be fitted with a lens or curved reflector to concentrate the beam;
- .3 flash at a rate of not less than 50 flashes per minute with an effective luminous intensity of at least 0.75 cd.

Regulation 33

Immersion suits

1 *General requirements for immersion suits*

1.1 The immersion suit shall be constructed with waterproof materials such that:

- .1 it can be unpacked and donned without assistance within 2 min, taking into account any associated clothing*, and a lifejacket if the immersion suit is to be worn in conjunction with a lifejacket;
- .2 it will not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s;
- .3 it will cover the whole body with the exception of the face. Hands shall also be covered unless permanently attached gloves are provided;
- .4 it is provided with arrangements to minimize or reduce free air in the legs of the suit;
- .5 following a jump from a height of not less than 4.5 m into the water there is no undue ingress of water into the suit.

1.2 An immersion suit which also complies with the requirements of regulation 32 may be classified as a lifejacket.

1.3 An immersion suit shall permit the person wearing it, and also wearing a lifejacket if the immersion suit is to be worn in conjunction with a lifejacket, to:

- .1 climb up and down a vertical ladder at least 5 m in length;
- .2 perform normal duties during abandonment;
- .3 jump from a height of not less than 4.5 m into the water without damaging or dislodging the immersion suit, or being injured; and
- .4 swim a short distance through the water and board a survival craft.

1.4 An immersion suit which has buoyancy and is designed to be worn without a lifejacket shall be fitted with a light complying with the requirements of regulation 32.3 and the whistle prescribed by regulation 32.1.6.

* Reference is made to paragraph 3.1.3.1 of the "Recommendation on testing of life-saving appliances" to be submitted to the Assembly of the Organization at its thirteenth session for adoption.

1.5 If the immersion suit is to be worn in conjunction with a lifejacket, the lifejacket shall be worn over the immersion suit. A person wearing such an immersion suit shall be able to don a lifejacket without assistance.

2 *Thermal performance requirements for immersion suits*

2.1 An immersion suit made of material which has no inherent insulation shall be:

- .1 marked with instructions that it must be worn in conjunction with warm clothing;
- .2 so constructed that, when worn in conjunction with warm clothing, and with a lifejacket if the immersion suit is to be worn with a lifejacket, the immersion suit continues to provide sufficient thermal protection, following one jump by the wearer into the water from a height of 4.5 m, to ensure that when it is worn for a period of 1 h in calm circulating water at a temperature of 5°C, the wearer's body core temperature does not fall more than 2°C.

2.2 An immersion suit made of material with inherent insulation, when worn either on its own or with a lifejacket, if the immersion suit is to be worn in conjunction with a lifejacket, shall provide the wearer with sufficient thermal insulation, following one jump into the water from a height of 4.5 m, to ensure that the wearer's body core temperature does not fall more than 2°C after a period of 6 h immersion in calm circulating water at a temperature of between 0°C and 2°C.

2.3 The immersion suit shall permit the person wearing it with hands covered to pick up a pencil and write after being immersed in water at 5°C for a period of 1 h.

3 *Buoyancy requirements*

A person in fresh water wearing either an immersion suit complying with the requirements of regulation 32, or an immersion suit with a lifejacket, shall be able to turn from a face-down to a face-up position in not more than 5 s.

Regulation 34

Thermal protective aids

1 A thermal protective aid shall be made of waterproof material having a thermal conductivity of not more than 0.25 W/(m·K) and shall be so constructed that, when used to enclose a person, it shall reduce both the convective and evaporative heat loss from the wearer's body.

2 The thermal protective aid shall:

- .1 cover the whole body of a person wearing a lifejacket with the exception of the face. Hands shall also be covered unless permanently attached gloves are provided;

- .2 be capable of being unpacked and easily donned without assistance in a survival craft or rescue boat;
 - .3 permit the wearer to remove it in the water in not more than 2 min, if it impairs ability to swim.
- 3 The thermal protective aid shall function properly throughout an air temperature range -30°C to $+20^{\circ}\text{C}$.

SECTION III – VISUAL SIGNALS

Regulation 35

Rocket parachute flares

- I The rocket parachute flare shall:
- .1 be contained in a water-resistant casing;
 - .2 have brief instructions or diagrams clearly illustrating the use of the rocket parachute flare printed on its casing;
 - .3 have integral means of ignition;
 - .4 be so designed as not to cause discomfort to the person holding the casing when used in accordance with the manufacturer's operating instructions.
- 2 The rocket shall, when fired vertically, reach an altitude of not less than 300 m. At or near the top of its trajectory, the rocket shall eject a parachute flare, which shall:
- .1 burn with a bright red colour;
 - .2 burn uniformly with an average luminous intensity of not less than 30,000 cd;
 - .3 have a burning period of not less than 40 s;
 - .4 have a rate of descent of not more than 5 m/s;
 - .5 not damage its parachute or attachments while burning.

Regulation 36

Hand flares

- I The hand flare shall:
- .1 be contained in a water-resistant casing;

- .2 have brief instructions or diagrams clearly illustrating the use of the hand flare printed on its casing;
 - .3 have a self-contained means of ignition;
 - .4 be so designed as not to cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions.
- 2 The hand flare shall:
- .1 burn with a bright red colour;
 - .2 burn uniformly with an average luminous intensity of not less than 15,000 cd;
 - .3 have a burning period of not less than 1 min;
 - .4 continue to burn after having been immersed for a period of 10 s under 100 mm of water.

Regulation 37

Buoyant smoke signals

- 1 The buoyant smoke signal shall:
- .1 be contained in a water-resistant casing;
 - .2 not ignite explosively when used in accordance with the manufacturer's operating instructions;
 - .3 have brief instructions or diagrams clearly illustrating the use of the buoyant smoke signal printed on its casing.
- 2 The buoyant smoke signal shall:
- .1 emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 min when floating in calm water;
 - .2 not emit any flame during the entire smoke emission time;
 - .3 not be swamped in a seaway;
 - .4 continue to emit smoke when submerged in water for a period of 10 s under 100 mm of water.

SECTION IV – SURVIVAL CRAFT

Regulation 38

General requirements for liferafts

1 *Construction of liferafts*

1.1 Every liferaft shall be so constructed as to be capable of withstanding exposure for 30 days afloat in all sea conditions.

1.2 The liferaft shall be so constructed that when it is dropped into the water from a height of 18 m, the liferaft and its equipment will operate satisfactorily. If the liferaft is to be stowed at a height of more than 18 m above the waterline in the lightest seagoing condition, it shall be of a type which has been satisfactorily drop-tested from at least that height.

1.3 The floating liferaft shall be capable of withstanding repeated jumps on to it from a height of at least 4.5 m above its floor both with and without the canopy erected.

1.4 The liferaft and its fittings shall be so constructed as to enable it to be towed at a speed of 3 knots in calm water when loaded with its full complement of persons and equipment and with one of its sea-anchors streamed.

1.5 The liferaft shall have a canopy to protect the occupants from exposure which is automatically set in place when the liferaft is launched and waterborne. The canopy shall comply with the following:

- .1 it shall provide insulation against heat and cold by means of either two layers of material separated by an air gap or other equally efficient means. Means shall be provided to prevent accumulation of water in the air gap;
- .2 its interior shall be of a colour that does not cause discomfort to the occupants;
- .3 each entrance shall be clearly indicated and be provided with efficient adjustable closing arrangements which can be easily and quickly opened from inside and outside the liferaft so as to permit ventilation but exclude seawater, wind and cold. Liferafts accommodating more than eight persons shall have at least two diametrically opposite entrances;
- .4 it shall admit sufficient air for the occupants at all times, even with the entrances closed;
- .5 it shall be provided with at least one viewing port;
- .6 it shall be provided with means for collecting rain water;
- .7 it shall have sufficient headroom for sitting occupants under all parts of the canopy.

2 *Minimum carrying capacity and mass of liferafts*

2.1 No liferaft shall be approved which has a carrying capacity of less than six persons calculated in accordance with the requirements of regulation 39.3 or 40.3, as appropriate.

2.2 Unless the liferaft is to be launched by an approved launching appliance complying with the requirements of regulation 48 and is not required to be portable, the total mass of the liferaft, its container and its equipment shall not be more than 185 kg.

3 *Liferaft fittings*

3.1 Lifelines shall be securely becketed around the inside and outside of the liferaft.

3.2 The liferaft shall be provided with arrangements for adequately siting and securing in the operating position the antenna provided with the portable radio apparatus required by regulation 6.2.1.

3.3 The liferaft shall be fitted with an efficient painter of length equal to not less than twice the distance from the stowed position to the waterline in the lightest seagoing condition or 15 m whichever is the greater.

4 *Davit-launched liferafts*

4.1 In addition to the above requirements, a liferaft for use with an approved launching appliance shall:

- .1 when the liferaft is loaded with its full complement of persons and equipment, be capable of withstanding a lateral impact against the ship's side at an impact velocity of not less than 3.5 m/s and also a drop into the water from a height of not less than 3 m without damage that will affect its function;
- .2 be provided with means for bringing the liferaft alongside the embarkation deck and holding it securely during embarkation.

4.2 Every passenger ship davit-launched liferaft shall be so arranged that it can be rapidly boarded by its full complement of persons.

4.3 Every cargo ship davit-launched liferaft shall be so arranged that it can be boarded by its full complement of persons in not more than 3 min from the time the instruction to board is given.

5 *Equipment*

5.1 The normal equipment of every liferaft shall consist of:

- .1 one buoyant rescue quoit, attached to not less than 30 m of buoyant line;

- .2 one knife of the non-folding type having a buoyant handle and lanyard attached and stowed in a pocket on the exterior of the canopy near the point at which the painter is attached to the liferaft. In addition, a liferaft which is permitted to accommodate 13 persons or more shall be provided with a second knife which need not be of the non-folding type;
- .3 for a liferaft which is permitted to accommodate not more than 12 persons, one buoyant bailer. For a liferaft which is permitted to accommodate 13 persons or more, two buoyant bailers;
- .4 two sponges;
- .5 two sea-anchors each with a shock-resistant hawser and tripping line, one being spare and the other permanently attached to the liferaft in such a way that when the liferaft inflates or is waterborne it will cause the liferaft to lie oriented to the wind in the most stable manner. The strength of each sea-anchor and its hawser and tripping line shall be adequate for all sea conditions. The sea-anchors shall be fitted with a swivel at each end of the line and shall be of a type which is unlikely to turn inside-out between its shroud lines;
- .6 two buoyant paddles;
- .7 three tin openers. Safety knives containing special tin-opener blades are satisfactory for this requirement;
- .8 one first-aid outfit in a waterproof case capable of being closed tightly after use;
- .9 one whistle or equivalent sound signal;
- .10 four rocket parachute flares complying with the requirements of regulation 35;
- .11 six hand flares complying with the requirements of regulation 36;
- .12 two buoyant smoke signals complying with the requirements of regulation 37;
- .13 one waterproof electric torch suitable for Morse signalling together with one spare set of batteries and one spare bulb in a waterproof container;
- .14 an efficient radar reflector;
- .15 one daylight signalling mirror with instructions on its use for signalling to ships and aircraft;
- .16 one copy of the life-saving signals referred to in regulation V/16 on a waterproof card or in a waterproof container;
- .17 one set of fishing tackle;
- .18 a food ration totalling not less than 10,000 kJ for each person the liferaft is permitted to accommodate; these rations shall be kept in airtight packaging and be stowed in a watertight container;

- .19 watertight receptacles containing a total of 1.5 ℓ of fresh water for each person the liferaft is permitted to accommodate, of which 0.5 ℓ per person may be replaced by a de-salting apparatus capable of producing an equal amount of fresh water in 2 days;
- .20 one rustproof graduated drinking vessel;
- .21 six doses of anti-seasickness medicine and one seasickness bag for each person the liferaft is permitted to accommodate;
- .22 instructions on how to survive;
- .23 instructions for immediate action;
- .24 thermal protective aids complying with the requirements of regulation 34 sufficient for 10% of the number of persons the liferaft is permitted to accommodate or two, whichever is the greater.

5.2 The marking required by regulations 39.7.3.5 and 40.7.7 on liferafts equipped in accordance with paragraph 5.1 shall be "SOLAS A PACK" in block capitals of the Roman alphabet.

5.3 In the case of passenger ships engaged on short international voyages of such a nature and duration that, in the opinion of the Administration, not all the items specified in paragraph 5.1 are necessary, the Administration may allow the liferafts carried on any such ships to be provided with the equipment specified in paragraphs 5.1.1 to 5.1.6 inclusive, 5.1.8, 5.1.9, 5.1.13 to 5.1.16 inclusive and 5.1.21 to 5.1.24 inclusive and one half of the equipment specified in paragraphs 5.1.10 to 5.1.12 inclusive. The marking required by regulations 39.7.3.5 and 40.7.7 on such liferafts shall be "SOLAS B PACK" in block capitals of the Roman alphabet.

5.4 Where appropriate the equipment shall be stowed in a container which, if it is not an integral part of, or permanently attached to, the liferaft, shall be stowed and secured inside the liferaft and be capable of floating in water for at least 30 min without damage to its contents.

6 *Float-free arrangements for liferafts*

6.1 *Painter system*

The liferaft painter system shall provide a connection between the ship and the liferaft and shall be so arranged as to ensure that the liferaft when released and, in the case of an inflatable liferaft, inflated is not dragged under by the sinking ship.

6.2 *Weak link*

If a weak link is used in the float-free arrangement, it shall:

- .1 not be broken by the force required to pull the painter from the liferaft container;
- .2 if applicable, be of sufficient strength to permit the inflation of the liferaft;
- .3 break under a strain of 2.2 ± 0.4 kN.

6.3 *Hydrostatic release units*

If a hydrostatic release unit is used in the float-free arrangements, it shall:

- .1 be constructed of compatible materials so as to prevent malfunction of the unit. Galvanizing or other forms of metallic coating on parts of the hydrostatic release unit shall not be accepted;
- .2 automatically release the liferaft at a depth of not more than 4 m;
- .3 have drains to prevent the accumulation of water in the hydrostatic chamber when the unit is in its normal position;
- .4 be so constructed as to prevent release when seas wash over the unit;
- .5 be permanently marked on its exterior with its type and serial number;
- .6 be provided with a document or identification plate stating the date of manufacture, type and serial number;
- .7 be such that each part connected to the painter system has a strength of not less than that required for the painter.

Regulation 39

Inflatable liferafts

1 Inflatable liferafts shall comply with the requirements of regulation 38 and, in addition, shall comply with the requirements of this regulation.

2 *Construction of inflatable liferafts*

2.1 The main buoyancy chamber shall be divided into not less than two separate compartments, each inflated through a non-return inflation valve on each compartment. The buoyancy chambers shall be so arranged that, in the event of any one of the compartments being damaged or failing to inflate, the intact compartments shall be able to support, with positive freeboard over the liferaft's entire periphery, the number of persons which the liferaft is permitted to accommodate, each having a mass of 75 kg and seated in their normal positions.

2.2 The floor of the liferaft shall be waterproof and shall be capable of being sufficiently insulated against cold either:

- .1 by means of one or more compartments that the occupants can inflate, or which inflate automatically and can be deflated and reinflated by the occupants; or
- .2 by other equally efficient means not dependent on inflation.

2.3 The liferaft shall be inflated with a non-toxic gas. Inflation shall be completed within a period of 1 min at an ambient temperature of between 18° C and 20° C and within a period of 3 min at an ambient temperature of -30° C. After inflation the liferaft shall maintain its form when loaded with its full complement of persons and equipment.

2.4 Each inflatable compartment shall be capable of withstanding a pressure equal to at least 3 times the working pressure and shall be prevented from reaching a pressure exceeding twice the working pressure either by means of relief valves or by a limited gas supply. Means shall be provided for fitting the topping-up pump or bellows required by paragraph 10.1.2 so that the working pressure can be maintained.

3 *Carrying capacity of inflatable liferafts*

The number of persons which a liferaft shall be permitted to accommodate shall be equal to the lesser of:

- .1 the greatest whole number obtained by dividing by 0.096 the volume, measured in cubic metres of the main buoyancy tubes (which for this purpose shall include neither the arches nor the thwarts if fitted) when inflated; or
- .2 the greatest whole number obtained by dividing by 0.372 the inner horizontal cross-sectional area of the liferaft measured in square metres (which for this purpose may include the thwart or thwarts, if fitted) measured to the innermost edge of the buoyancy tubes; or
- .3 the number of persons having an average mass of 75 kg, all wearing lifejackets, that can be seated with sufficient comfort and headroom without interfering with the operation of any of the liferaft's equipment.

4 *Access into inflatable liferafts*

4.1 At least one entrance shall be fitted with a semi-rigid boarding ramp to enable persons to board the liferaft from the sea so arranged as to prevent significant deflation of the liferaft if the ramp is damaged. In the case of a davit-launched liferaft having more than one entrance, the boarding ramp shall be fitted at the entrance opposite the bowing lines and embarkation facilities.

4.2 Entrances not provided with a boarding ramp shall have a boarding ladder, the lowest step of which shall be situated not less than 0.4 m below the liferaft's light waterline.

4.3 There shall be means inside the liferaft to assist persons to pull themselves into the liferaft from the ladder.

5 *Stability of inflatable liferafts*

5.1 Every inflatable liferaft shall be so constructed that, when fully inflated and floating with the canopy uppermost, it is stable in a seaway.

5.2 The stability of the liferaft when in the inverted position shall be such that it can be righted in a seaway and in calm water by one person.

5.3 The stability of the liferaft when loaded with its full complement of persons and equipment shall be such that it can be towed at speeds of up to 3 knots in calm water.

6 *Inflatable liferaft fittings*

6.1 The breaking strength of the painter system including its means of attachment to the liferaft, except the weak link required by regulation 38.6, shall be not less than 10.0 kN for a liferaft permitted to accommodate nine persons or more, and not less than 7.5 kN for any other liferaft. The liferaft shall be capable of being inflated by one person.

6.2 A manually controlled lamp visible on a dark night with a clear atmosphere at a distance of at least 2 miles for a period of not less than 12 h shall be fitted to the top of the liferaft canopy. If the light is a flashing light it shall flash at a rate of not less than 50 flashes per minute for the first 2 h of operation of the 12 h operating period. The lamp shall be powered by a sea-activated cell or a dry chemical cell and shall light automatically when the liferaft inflates. The cell shall be of a type that does not deteriorate due to damp or humidity in the stowed liferaft.

6.3 A manually controlled lamp shall be fitted inside the liferaft capable of continuous operation for a period of at least 12 h. It shall light automatically when the liferaft inflates and be of sufficient intensity to enable reading of survival and equipment instructions.

7 *Containers for inflatable liferafts*

7.1 The liferaft shall be packed in a container that is:

- .1 so constructed as to withstand hard wear under conditions encountered at sea;
- .2 of sufficient inherent buoyancy, when packed with the liferaft and its equipment, to pull the painter from within and to operate the inflation mechanism should the ship sink;
- .3 as far as practicable watertight, except for drain holes in the container bottom.

7.2 The liferaft shall be packed in its container in such a way as to ensure, as far as possible, that the waterborne liferaft inflates in an upright position on breaking free from its container.

7.3 The container shall be marked with:

- .1 maker's name or trade mark;
- .2 serial number;
- .3 name of approved authority and the number of persons it is permitted to carry;
- .4 SOLAS;
- .5 type of emergency pack enclosed;
- .6 date when last serviced;
- .7 length of painter;

- .8 maximum permitted height of stowage above waterline (depending on drop-test height and length of painter);
- .9 launching instructions.

8 *Markings on inflatable liferafts*

The liferaft shall be marked with:

- .1 maker's name or trade mark;
- .2 serial number;
- .3 date of manufacture (month and year);
- .4 name of approving authority;
- .5 name and place of servicing station where it was last serviced;
- .6 number of persons it is permitted to accommodate over each entrance in characters not less than 100 mm in height of a colour contrasting with that of the liferaft.

9 *Davit-launched inflatable liferafts*

9.1 In addition to complying with the above requirements, a liferaft for use with an approved launching appliance shall, when suspended from its lifting hook or bridle, withstand a load of:

- .1 4 times the mass of its full complement of persons and equipment, at an ambient temperature and a stabilized liferaft temperature of $20 \pm 3^{\circ}\text{C}$ with all relief valves inoperative; and
- .2 1.1 times the mass of its full complement of persons and equipment at an ambient temperature and a stabilized liferaft temperature of -30°C with all relief valves operative.

9.2 Rigid containers for liferafts to be launched by a launching appliance shall be so secured that the container or parts of it are prevented from falling into the sea during and after inflation and launching of the contained liferaft.

10 *Additional equipment for inflatable liferafts*

10.1 In addition to the equipment required by regulation 38.5, every inflatable liferaft shall be provided with:

- .1 one repair outfit for repairing punctures in buoyancy compartments;
- .2 one topping-up pump or bellows.

10.2 The knives required by regulation 38.5.1.2 shall be safety knives.

Regulation 40

Rigid liferafts

1 Rigid liferafts shall comply with the requirements of regulation 38 and, in addition, shall comply with the requirements of this regulation.

2 *Construction of rigid liferafts*

2.1 The buoyancy of the liferaft shall be provided by approved inherently buoyant material placed as near as possible to the periphery of the liferaft. The buoyant material shall be fire-retardant or be protected by a fire-retardant covering.

2.2 The floor of the liferaft shall prevent the ingress of water and shall effectively support the occupants out of the water and insulate them from cold.

3 *Carrying capacity of rigid liferafts*

The number of persons which a liferaft shall be permitted to accommodate shall be equal to the lesser of:

- .1 the greatest whole number obtained by dividing by 0.096 the volume, measured in cubic metres of the buoyancy material multiplied by a factor of 1 minus the specific gravity of that material; or
- .2 the greatest whole number obtained by dividing by 0.372 the horizontal cross-sectional area of the floor of the liferaft measured in square metres; or
- .3 the number of persons having an average mass of 75 kg, all wearing lifejackets, that can be seated with sufficient comfort and headroom without interfering with the operation of any of the liferaft's equipment.

4 *Access into rigid liferafts*

4.1 At least one entrance shall be fitted with a rigid boarding ramp to enable persons to board the liferaft from the sea. In the case of a davit-launched liferaft having more than one entrance, the boarding ramp shall be fitted at the entrance opposite to the bowing and embarkation facilities.

4.2 Entrances not provided with a boarding ramp shall have a boarding ladder, the lowest step of which shall be situated not less than 0.4 m below the liferaft's light waterline.

4.3 There shall be means inside the liferaft to assist persons to pull themselves into the liferaft from the ladder.

5 *Stability of rigid liferafts*

5.1 Unless the liferaft is capable of operating safely whichever way up it is floating, its strength and stability shall be such that it is either self-righting or can be readily righted in a seaway and in calm water by one person.

5.2 The stability of a liferaft when loaded with its full complement of persons and equipment shall be such that it can be towed at speeds of up to 3 knots in calm water.

6 *Rigid liferaft fittings*

6.1 The liferaft shall be fitted with an efficient painter. The breaking strength of the painter system, including its means of attachment to the liferaft, except the weak link required by regulation 38.6, shall be not less than 10.0 kN for liferafts permitted to accommodate nine persons or more, and not less than 7.5 kN for any other liferaft.

6.2 A manually controlled lamp visible on a dark night with a clear atmosphere at a distance of at least 2 miles for a period of not less than 12 h shall be fitted to the top of the liferaft canopy. If the light is a flashing light it shall flash at a rate of not less than 50 flashes per minute for the first 2 h of operation of the 12 h operating period. The lamp shall be powered by a sea-activated cell or a dry chemical cell and shall light automatically when the liferaft canopy is set in place. The cell shall be of a type that does not deteriorate due to damp or humidity in the stowed liferaft.

6.3 A manually controlled lamp shall be fitted inside the liferaft, capable of continuous operation for a period of at least 12 h. It shall light automatically when the canopy is set in place and be of sufficient intensity to enable reading of survival and equipment instructions.

7 *Markings on rigid liferafts*

The liferaft shall be marked with:

- .1 name and port of registry of the ship to which it belongs;
- .2 maker's name or trade mark;
- .3 serial number;
- .4 name of approving authority;
- .5 number of persons it is permitted to accommodate over each entrance in characters not less than 100 mm in height of a colour contrasting with that of the liferaft;
- .6 SOLAS;
- .7 type of emergency pack enclosed;
- .8 length of painter;
- .9 maximum permitted height of stowage above waterline (drop-test height);
- .10 launching instructions.

8 *Davit-launched rigid liferafts*

In addition to the above requirements, a rigid liferaft for use with an approved launching appliance shall, when suspended from its lifting hook or bridle, withstand a load of 4 times the mass of its full complement of persons and equipment.

Regulation 41

General requirements for lifeboats

1 *Construction of lifeboats*

1.1 All lifeboats shall be properly constructed and shall be of such form and proportions that they have ample stability in a seaway and sufficient freeboard when loaded with their full complement of persons and equipment. All lifeboats shall have rigid hulls and shall be capable of maintaining positive stability when in an upright position in calm water and loaded with their full complement of persons and equipment and holed in any one location below the waterline, assuming no loss of buoyancy material and no other damage.

1.2 All lifeboats shall be of sufficient strength to:

- .1 enable them to be safely lowered into the water when loaded with their full complement of persons and equipment; and
- .2 be capable of being launched and towed when the ship is making headway at a speed of 5 knots in calm water.

1.3 Hulls and rigid covers shall be fire-retardant or non-combustible.

1.4 Seating shall be provided on thwarts, benches or fixed chairs fitted as low as practicable in the lifeboat and constructed so as to be capable of supporting the number of persons each weighing 100 kg for which spaces are provided in compliance with the requirements of paragraph 2.2.2.

1.5 Each lifeboat shall be of sufficient strength to withstand a load, without residual deflection on removal of that load:

- .1 in the case of boats with metal hulls, 1.25 times the total mass of the lifeboat when loaded with its full complement of persons and equipment; or
- .2 in the case of other boats, twice the total mass of the lifeboat when loaded with its full complement of persons and equipment.

1.6 Each lifeboat shall be of sufficient strength to withstand, when loaded with its full complement of persons and equipment and with, where applicable, skates or fenders in position, a lateral impact against the ship's side at an impact velocity of at least 3.5 m/s and also a drop into the water from a height of at least 3 m.

1.7 The vertical distance between the floor surface and the interior of the enclosure or canopy over 50% of the floor area shall be:

- 1 not less than 1.3 m for a lifeboat permitted to accommodate nine persons or less;
- 2 not less than 1.7 m for a lifeboat permitted to accommodate 24 persons or more;
- 3 not less than the distance as determined by linear interpolation between 1.3 m and 1.7 m for a lifeboat permitted to accommodate between nine and 24 persons.

2 *Carrying capacity of lifeboats*

2.1 No lifeboat shall be approved to accommodate more than 150 persons.

2.2 The number of persons which a lifeboat shall be permitted to accommodate shall be equal to the lesser of:

- 1 the number of persons having an average mass of 75 kg, all wearing life-jackets, that can be seated in a normal position without interfering with the means of propulsion or the operation of any of the lifeboat's equipment; or
- 2 the number of spaces that can be provided on the seating arrangements in accordance with Figure 1. The shapes may be overlapped as shown, provided footrests are fitted and there is sufficient room for legs and the vertical separation between the upper and lower seat is not less than 350 mm.

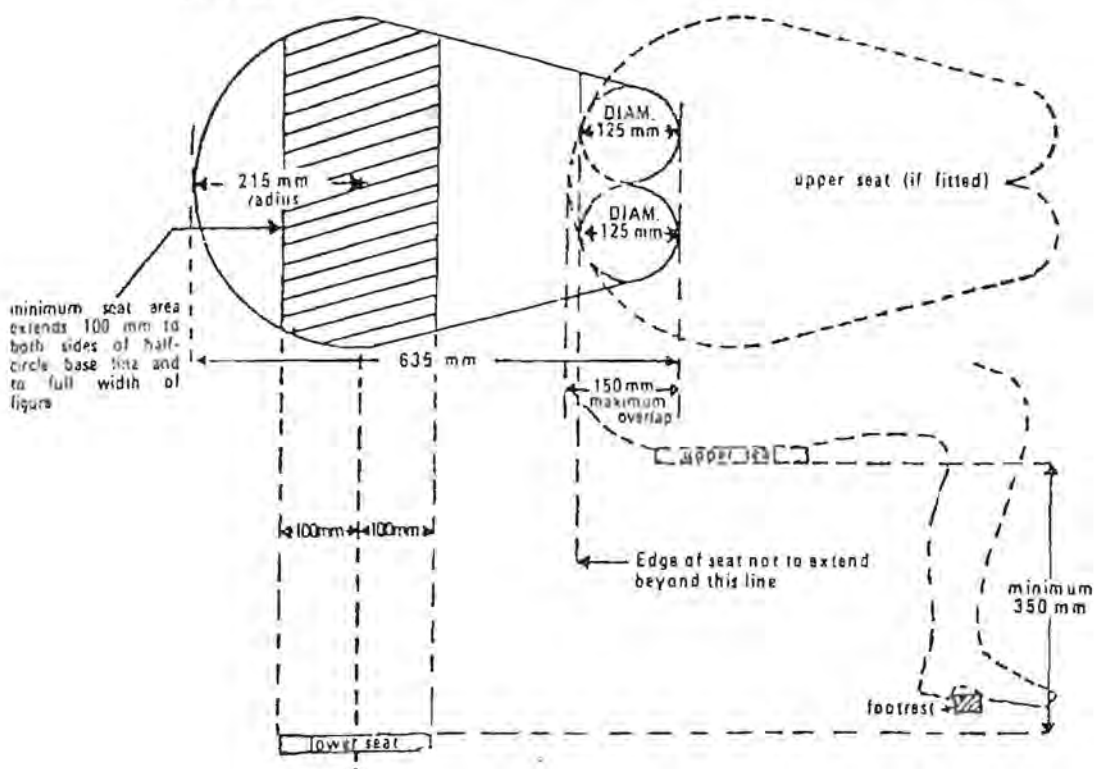


Figure 1

2.3 Each seating position shall be clearly indicated in the lifeboat.

3 *Access into lifeboats*

3.1 Every passenger ship lifeboat shall be so arranged that it can be rapidly boarded by its full complement of persons. Rapid disembarkation shall also be possible.

3.2 Every cargo ship lifeboat shall be so arranged that it can be boarded by its full complement of persons in not more than 3 min from the time the instruction to board is given. Rapid disembarkation shall also be possible.

3.3 Lifeboats shall have a boarding ladder that can be used on either side of the lifeboat to enable persons in the water to board the lifeboat. The lowest step of the ladder shall be not less than 0.4 m below the lifeboat's light waterline.

3.4 The lifeboat shall be so arranged that helpless people can be brought on board either from the sea or on stretchers.

3.5 All surfaces on which persons might walk shall have a non-skid finish.

4 *Lifeboat buoyancy*

All lifeboats shall have inherent buoyancy or shall be fitted with inherently buoyant material which shall not be adversely affected by seawater, oil or oil products, sufficient to float the lifeboat with all its equipment on board when flooded and open to the sea. Additional inherently buoyant material, equal to 280 N of buoyant force per person shall be provided for the number of persons the lifeboat is permitted to accommodate. Buoyant material, unless in addition to that required above, shall not be installed external to the hull of the lifeboat.

5 *Lifeboat freeboard and stability*

All lifeboats, when loaded with 50% of the number of persons the lifeboat is permitted to accommodate seated in their normal positions to one side of the centreline, shall have a freeboard, measured from the waterline to the lowest opening through which the lifeboat may become flooded, of at least 1.5% of the lifeboat's length or 100 mm, whichever is the greater.

6 *Lifeboat propulsion*

6.1 Every lifeboat shall be powered by a compression ignition engine. No engine shall be used for any lifeboat if its fuel has a flashpoint of 43°C or less (closed cup test).

6.2 The engine shall be provided with either a manual starting system, or a power starting system with two independent rechargeable energy sources. Any necessary starting aids shall also be provided. The engine starting systems and starting aids shall start the engine at an ambient temperature of -15°C within 2 min of commencing the start procedure unless, in the opinion of the Administration having regard to the particular voyages in which the ship carrying the lifeboat is constantly engaged, a different temperature is appropriate. The starting systems shall not be impeded by the engine casing, thwarts or other obstructions.

6.3 The engine shall be capable of operating for not less than 5 min after starting from cold with the lifeboat out of the water.

6.4 The engine shall be capable of operating when the lifeboat is flooded up to the centreline of the crank shaft.

6.5 The propeller shafting shall be so arranged that the propeller can be disengaged from the engine. Provision shall be made for ahead and astern propulsion of the lifeboat.

6.6 The exhaust pipe shall be so arranged as to prevent water from entering the engine in normal operation.

6.7 All lifeboats shall be designed with due regard to the safety of persons in the water and to the possibility of damage to the propulsion system by floating debris.

6.8 The speed of a lifeboat when proceeding ahead in calm water, when loaded with its full complement of persons and equipment and with all engine-powered auxiliary equipment in operation, shall be at least 6 knots and at least 2 knots when towing a 25-person liferaft loaded with its full complement of persons and equipment or its equivalent. Sufficient fuel, suitable for use throughout the temperature range expected in the area in which the ship operates, shall be provided to run the fully loaded lifeboat at 6 knots for a period of not less than 24 h.

6.9 The lifeboat engine, transmission and engine accessories shall be enclosed in a fire-retardant casing or other suitable arrangements providing similar protection. Such arrangements shall also protect persons from coming into accidental contact with hot or moving parts and protect the engine from exposure to weather and sea. Adequate means shall be provided to reduce the engine noise. Starter batteries shall be provided with casings which form a watertight enclosure around the bottom and sides of the batteries. The battery casings shall have a tight fitting top which provides for necessary gas venting.

6.10 The lifeboat engine and accessories shall be designed to limit electromagnetic emissions so that engine operation does not interfere with the operation of radio life-saving appliances used in the lifeboat.

6.11 Means shall be provided for recharging all engine-starting, radio and search-light batteries. Radio batteries shall not be used to provide power for engine starting. Means shall be provided for recharging lifeboat batteries from the ship's power supply at a supply voltage not exceeding 55 V which can be disconnected at the lifeboat embarkation station.

6.12 Water-resistant instructions for starting and operating the engine shall be provided and mounted in a conspicuous place near the engine starting controls.

7 *Lifeboat fittings*

7.1 All lifeboats shall be provided with at least one drain valve fitted near the lowest point in the hull, which shall automatically open to drain water from the hull when the lifeboat is not waterborne and shall automatically close to prevent entry of water when the lifeboat is waterborne. Each drain valve shall be provided with a cap or plug to close the valve, which shall be attached to the lifeboat by a lanyard, a chain, or other suitable means. Drain valves shall be readily accessible from inside the lifeboat and their position shall be clearly indicated.

7.2 All lifeboats shall be provided with a rudder and tiller. When a wheel or other remote steering mechanism is also provided the tiller shall be capable of controlling the rudder in case of failure of the steering mechanism. The rudder shall be permanently attached to the lifeboat. The tiller shall be permanently installed on, or linked to, the rudder stock; however, if the lifeboat has a remote steering mechanism, the tiller may be removable and securely stowed near the rudder stock. The rudder and tiller shall be so arranged as not to be damaged by operation of the release mechanism or the propeller.

7.3 Except in the vicinity of the rudder and propeller, a buoyant lifeline shall be becketed around the outside of the lifeboat.

7.4 Lifeboats which are not self-righting when capsized shall have suitable handholds on the underside of the hull to enable persons to cling to the lifeboat. The handholds shall be fastened to the lifeboat in such a way that, when subjected to an impact sufficient to cause them to break away from the lifeboat, they break away without damaging the lifeboat.

7.5 All lifeboats shall be fitted with sufficient watertight lockers or compartments to provide for the storage of the small items of equipment, water and provisions required by paragraph 8. Means shall be provided for the storage of collected rainwater.

7.6 Every lifeboat to be launched by a fall or falls shall be fitted with a release mechanism complying with the following requirements:

- .1 The mechanism shall be so arranged that all hooks are released simultaneously.
- .2 The mechanism shall have two release capabilities as follows:
 - .2.1 a normal release capability which will release the lifeboat when it is waterborne or when there is no load on the hooks;
 - .2.2 an on-load release capability which will release the lifeboat with a load on the hooks. This release shall be so arranged as to release the lifeboat under any conditions of loading from no-load with the lifeboat waterborne to a load of 1.1 times the total mass of the lifeboat when loaded with its full complement of persons and equipment. This release capability shall be adequately protected against accidental or premature use.
- .3 The release control shall be clearly marked in a colour that contrasts with its surroundings.
- .4 The mechanism shall be designed with a factor of safety of 6 based on the ultimate strength of the materials used, assuming the mass of the lifeboat is equally distributed between the falls.

7.7 Every lifeboat shall be fitted with a release device to enable the forward painter to be released when under tension.

7.8 Every lifeboat shall be provided with a permanently installed earth connection and arrangements for adequately siting and securing in the operating position the antenna provided with the portable radio apparatus required by regulation 6.2.1.

7.9 Lifeboats intended for launching down the side of a ship shall have skates and fenders as necessary to facilitate launching and prevent damage to the lifeboat.

7.10 A manually controlled lamp visible on a dark night with a clear atmosphere at a distance of at least 2 miles for a period of not less than 12 h shall be fitted to the top of the cover or enclosure. If the light is a flashing light, it shall initially flash at a rate of not less than 50 flashes per minute over the first 2 h of operation of the 12 h operating period.

7.11 A lamp or source of light shall be fitted inside the lifeboat to provide illumination for not less than 12 h to enable reading of survival and equipment instructions; however, oil lamps shall not be permitted for this purpose.

7.12 Unless expressly provided otherwise, every lifeboat shall be provided with effective means of bailing or be automatically self-bailing.

7.13 Every lifeboat shall be so arranged that an adequate view forward, aft and to both sides is provided from the control and steering position for safe launching and manoeuvring.

8 *Lifeboat equipment*

All items of lifeboat equipment, whether required by this paragraph or elsewhere in this chapter, with the exception of boat-hooks which shall be kept free for fending off purposes, shall be secured within the lifeboat by lashings, storage in lockers or compartments, storage in brackets or similar mounting arrangements or other suitable means. The equipment shall be secured in such a manner as not to interfere with any abandonment procedures. All items of lifeboat equipment shall be as small and of as little mass as possible and shall be packed in a suitable and compact form. Except where otherwise stated, the normal equipment of every lifeboat shall consist of:

- .1 sufficient buoyant oars to make headway in calm seas. Thole pins, crutches or equivalent arrangements shall be provided for each oar provided. Thole pins or crutches shall be attached to the boat by lanyards or chains;
- .2 two boat-hooks;
- .3 a buoyant bailer and two buckets;
- .4 a survival manual;
- .5 a binnacle containing an efficient compass which is luminous or provided with suitable means of illumination. In a totally enclosed lifeboat, the binnacle shall be permanently fitted at the steering position; in any other lifeboat, it shall be provided with suitable mounting arrangements;
- .6 a sea-anchor of adequate size fitted with a shock-resistant hawser and a tripping line which provides a firm hand grip when wet. The strength of the sea-anchor, hawser and tripping line shall be adequate for all sea conditions;
- .7 two efficient painters of a length equal to not less than twice the distance from the stowage position of the lifeboat to the waterline in the lightest

- seagoing condition or 15 m, whichever is the greater. One painter attached to the release device required by regulation 41.7.7 shall be placed at the forward end of the lifeboat and the other shall be firmly secured at or near the bow of the lifeboat ready for use;
- .8 two hatchets, one at each end of the lifeboat;
 - .9 watertight receptacles containing a total of 3 ℓ of fresh water for each person the lifeboat is permitted to accommodate, of which 1 ℓ per person may be replaced by a de-salting apparatus capable of producing an equal amount of fresh water in 2 days;
 - .10 a rustproof dipper with lanyard;
 - .11 a rustproof graduated drinking vessel;
 - .12 a food ration totalling not less than 10,000 kJ for each person the lifeboat is permitted to accommodate; these rations shall be kept in airtight packaging and be stowed in a watertight container;
 - .13 four rocket parachute flares complying with the requirements of regulation 35;
 - .14 six hand flares complying with the requirements of regulation 36;
 - .15 two buoyant smoke signals complying with the requirements of regulation 37;
 - .16 one waterproof electric torch suitable for Morse signalling together with one spare set of batteries and one spare bulb in a waterproof container;
 - .17 one daylight signalling mirror with instructions for its use for signalling to ships and aircraft;
 - .18 one copy of the life-saving signals prescribed by regulation V/16 on a waterproof card or in a waterproof container;
 - .19 one whistle or equivalent sound signal;
 - .20 a first-aid outfit in a waterproof case capable of being closed tightly after use;
 - .21 six doses of anti-seasickness medicine and one seasickness bag for each person;
 - .22 a jack-knife to be kept attached to the boat by a lanyard;
 - .23 three tin openers;
 - .24 two buoyant rescue quoits, attached to not less than 30 m of buoyant line;
 - .25 a manual pump;
 - .26 one set of fishing tackle;
 - .27 sufficient tools for minor adjustments to the engine and its accessories;

- .28 portable fire-extinguishing equipment suitable for extinguishing oil fires;
- .29 a searchlight capable of effectively illuminating a light-coloured object at night having a width of 18 m at a distance of 180 m for a total period of 6 h and of working for not less than 3 h continuously;
- .30 an efficient radar reflector;
- .31 thermal protective aids complying with the requirements of regulation 34 sufficient for 10% of the number of persons the lifeboat is permitted to accommodate or two, whichever is the greater.
- .32 In the case of ships engaged on voyages of such a nature and duration that, in the opinion of the Administration, the items specified in paragraphs 8.12 and 8.26 are unnecessary, the Administration may allow these items to be dispensed with.

9 *Lifeboat markings*

- 9.1 The dimensions of the lifeboat and the number of persons which it is permitted to accommodate shall be marked on it in clear permanent characters.
- 9.2 The name and port of registry of the ship to which the lifeboat belongs shall be marked on each side of the lifeboat's bow in block capitals of the Roman alphabet.
- 9.3 Means of identifying the ship to which the lifeboat belongs and the number of the lifeboat shall be marked in such a way that they are visible from above.

Regulation 42

Partially enclosed lifeboats

- 1 Partially enclosed lifeboats shall comply with the requirements of regulation 41 and in addition shall comply with the requirements of this regulation.
- 2 Every partially enclosed lifeboat shall be provided with effective means of bailing or be automatically self-bailing.
- 3 Partially enclosed lifeboats shall be provided with permanently attached rigid covers extending over not less than 20% of the length of the lifeboat from the stem and not less than 20% of the length of the lifeboat from the aftermost part of the lifeboat. The lifeboat shall be fitted with a permanently attached foldable canopy which together with the rigid covers completely encloses the occupants of the lifeboat in a weatherproof shelter and protects them from exposure. The canopy shall be so arranged that:
 - .1 it is provided with adequate rigid sections or battens to permit erection of the canopy;
 - .2 it can be easily erected by not more than two persons;

- .3 it is insulated to protect the occupants against heat and cold by means of not less than two layers of material separated by an air gap or other equally efficient means; means shall be provided to prevent accumulation of water in the air gap;
 - .4 its exterior is of a highly visible colour and its interior is of a colour which does not cause discomfort to the occupants;
 - .5 it has entrances at both ends and on each side, provided with efficient adjustable closing arrangements which can be easily and quickly opened and closed from inside or outside so as to permit ventilation but exclude seawater, wind and cold; means shall be provided for holding the entrances securely in the open and closed position;
 - .6 with the entrances closed, it admits sufficient air for the occupants at all times;
 - .7 it has means for collecting rainwater;
 - .8 the occupants can escape in the event of the lifeboat capsizing.
- 4 The interior of the lifeboat shall be of a highly visible colour.
- 5 The radiotelegraph installation required by regulation 6.2.2 shall be installed in a cabin large enough to accommodate both the equipment and the person using it. No separate cabin is required if the construction of the lifeboat provides a sheltered space to the satisfaction of the Administration.

Regulation 43

Self-righting partially enclosed lifeboats

- 1 Self-righting partially enclosed lifeboats shall comply with the requirements of regulation 41 and in addition shall comply with the requirements of this regulation.
- 2 *Enclosure*
- 2.1 Permanently attached rigid covers shall be provided extending over not less than 20% of the length of the lifeboat from the stem and not less than 20% of the length of the lifeboat from the aftermost part of the lifeboat.
- 2.2 The rigid covers shall form two shelters. If the shelters have bulkheads they shall have openings of sufficient size to permit easy access by persons each wearing an immersion suit or warm clothes and a lifejacket. The interior height of the shelters shall be sufficient to permit persons easy access to their seats in the bow and stern of the lifeboat.
- 2.3 The rigid covers shall be so arranged that they include windows or translucent panels to admit sufficient daylight to the inside of the lifeboat with the openings or canopies closed so as to make artificial light unnecessary.

2.4 The rigid covers shall have railings to provide a secure handhold for persons moving about the exterior of the lifeboat.

2.5 Open parts of the lifeboat shall be fitted with a permanently attached foldable canopy so arranged that:

- .1 it can be easily erected by not more than two persons in not more than 2 min;
- .2 it is insulated to protect the occupants against cold by means of not less than two layers of material separated by an air gap or other equally efficient means.

2.6 The enclosure formed by the rigid covers and canopy shall be so arranged:

- .1 as to allow launching and recovery operations to be performed without any occupant having to leave the enclosure;
- .2 that it has entrances at both ends and on each side, provided with efficient adjustable closing arrangements which can be easily and quickly opened and closed from inside or outside so as to permit ventilation but exclude seawater, wind and cold; means shall be provided for holding the entrances securely in the open and in the closed position;
- .3 that with the canopy erected and all entrances closed, sufficient air is admitted for the occupants at all times;
- .4 that it has means for collecting rainwater;
- .5 that the exterior of the rigid covers and canopy and the interior of that part of the lifeboat covered by the canopy is of a highly visible colour. The interior of the shelters shall be of a colour which does not cause discomfort to the occupants;
- .6 that it is possible to row the lifeboat.

3 *Capsizing and re-righting*

3.1 A safety belt shall be fitted at each indicated seating position. The safety belt shall be so designed as to hold a person of a mass of 100 kg securely in place when the lifeboat is in a capsized position.

3.2 The stability of the lifeboat shall be such that it is inherently or automatically self-righting when loaded with its full or a partial complement of persons and equipment and the persons are secured with safety belts.

4 *Propulsion*

4.1 The engine and transmission shall be controlled from the helmsman's position.

4.2 The engine and engine installation shall be capable of running in any position during capsize and continue to run after the lifeboat returns to the upright or shall automatically stop on capsizing and be easily restarted after the lifeboat returns to the upright and the water has been drained from the lifeboat. The design of the fuel

and lubricating systems shall prevent the loss of fuel and the loss of more than 250 ml of lubricating oil from the engine during capsize.

4.3 Air-cooled engines shall have a duct system to take in cooling air from, and exhaust it to, the outside of the lifeboat. Manually operated dampers shall be provided to enable cooling air to be taken in from, and exhausted to, the interior of the lifeboat.

5 *Construction and fendering*

5.1 Notwithstanding regulation 41.1.6, a self-righting partially enclosed lifeboat shall be so constructed and fendered as to ensure that the lifeboat renders protection against harmful accelerations resulting from an impact of the lifeboat, when loaded with its full complement of persons and equipment, against the ship's side at an impact velocity of not less than 3.5 m/s.

5.2 The lifeboat shall be automatically self-bailing.

Regulation 44

Totally enclosed lifeboats

1 Totally enclosed lifeboats shall comply with the requirements of regulation 41 and in addition shall comply with the requirements of this regulation.

2 *Enclosure*

Every totally enclosed lifeboat shall be provided with a rigid watertight enclosure which completely encloses the lifeboat. The enclosure shall be so arranged that:

- .1 it protects the occupants against heat and cold;
- .2 access to the lifeboat is provided by hatches which can be closed to make the lifeboat watertight;
- .3 hatches are positioned so as to allow launching and recovery operations to be performed without any occupant having to leave the enclosure;
- .4 access hatches are capable of being opened and closed from both inside and outside and are equipped with means to hold them securely in open positions;
- .5 it is possible to row the lifeboat;
- .6 it is capable, when the lifeboat is in the capsized position with the hatches closed and without significant leakage, of supporting the entire mass of the lifeboat, including all equipment, machinery and its full complement of persons;
- .7 it includes windows or translucent panels on both sides which admit sufficient daylight to the inside of the lifeboat with the hatches closed to make artificial light unnecessary;

- .8 its exterior is of a highly visible colour and its interior of a colour which does not cause discomfort to the occupants;
- .9 handrails provide a secure handhold for persons moving about the exterior of the lifeboat, and aid embarkation and disembarkation;
- .10 persons have access to their seats from an entrance without having to climb over thwarts or other obstructions;
- .11 the occupants are protected from the effects of dangerous subatmospheric pressures which might be created by the lifeboat's engine.

3 *Capsizing and re-righting*

3.1 A safety belt shall be fitted at each indicated seating position. The safety belt shall be designed to hold a person of a mass of 100 kg securely in place when the lifeboat is in a capsized position.

3.2 The stability of the lifeboat shall be such that it is inherently or automatically self-righting when loaded with its full or a partial complement of persons and equipment and all entrances and openings are closed watertight and the persons are secured with safety belts.

3.3 The lifeboat shall be capable of supporting its full complement of persons and equipment when the lifeboat is in the damaged condition prescribed in regulation 41.1.1 and its stability shall be such that in the event of capsizing, it will automatically attain a position that will provide an above-water escape for its occupants.

3.4 The design of all engine exhaust pipes, air ducts and other openings shall be such that water is excluded from the engine when the lifeboat capsizes and re-rights.

4 *Propulsion*

4.1 The engine and transmission shall be controlled from the helmsman's position.

4.2 The engine and engine installation shall be capable of running in any position during capsize and continue to run after the lifeboat returns to the upright or shall automatically stop on capsizing and be easily restarted after the lifeboat returns to the upright. The design of the fuel and lubricating systems shall prevent the loss of fuel and the loss of more than 250 ml of lubricating oil from the engine during capsize.

4.3 Air cooled engines shall have a duct system to take in cooling air from, and exhaust it to, the outside of the lifeboat. Manually operated dampers shall be provided to enable cooling air to be taken in from, and exhausted to, the interior of the lifeboat.

5 *Construction and fendering*

Notwithstanding regulation 41.1.6, a totally enclosed lifeboat shall be so constructed and fendered as to ensure that the lifeboat renders protection against harmful accelerations resulting from an impact of the lifeboat, when loaded with its full complement of persons and equipment, against the ship's side at an impact velocity of not less than 3.5 m/s.

6 *Free-fall lifeboats*

A lifeboat arranged for free-fall launching shall be so constructed that it is capable of rendering protection against harmful accelerations resulting from being launched, when loaded with its full complement of persons and equipment, from at least the maximum height at which it is designed to be stowed above the waterline with the ship in its lightest seagoing condition, under unfavourable conditions of trim of up to 10° and with the ship listed not less than 20° either way.

Regulation 45

Lifeboats with a self-contained air support system

In addition to complying with the requirements of regulations 41 and 44, a lifeboat with a self-contained air support system shall be so arranged that, when proceeding with all entrances and openings closed, the air in the lifeboat remains safe and breathable and the engine runs normally for a period of not less than 10 min. During this period the atmospheric pressure inside the lifeboat shall never fall below the outside atmospheric pressure nor shall it exceed it by more than 20 mbar. The system shall have visual indicators to indicate the pressure of the air supply at all times.

Regulation 46

Fire-protected lifeboats

1 In addition to complying with the requirements of regulations 41, 44 and 45, a fire-protected lifeboat when waterborne shall be capable of protecting the number of persons it is permitted to accommodate when subjected to a continuous oil fire that envelops the lifeboat for a period of not less than 8 min.

2 *Water spray system*

A lifeboat which has a water spray fire-protection system shall comply with the following:

- 1 water for the system shall be drawn from the sea by a self-priming motor pump. It shall be possible to turn "on" and turn "off" the flow of water over the exterior of the lifeboat;
- 2 the seawater intake shall be so arranged as to prevent the intake of flammable liquids from the sea surface;
- 3 the system shall be arranged for flushing with fresh water and allowing complete drainage.

SECTION V – RESCUE BOATS

Regulation 47

Rescue boats

1 *General requirements*

1.1 Except as provided by this regulation, all rescue boats shall comply with the requirements of regulations 41.1 to 41.7.4 inclusive and 41.7.6, 41.7.7, 41.7.9, 41.7.12 and 41.9.

1.2 Rescue boats may be either of rigid or inflated construction or a combination of both and shall:

- .1 be not less than 3.8 m and not more than 8.5 m in length;
- .2 be capable of carrying at least five seated persons and a person lying down.

1.3 Rescue boats which are a combination of rigid and inflated construction shall comply with the appropriate requirements of this regulation to the satisfaction of the Administration.

1.4 Unless the rescue boat has adequate sheer, it shall be provided with a bow cover extending for not less than 15% of its length.

1.5 Rescue boats shall be capable of manoeuvring at speeds up to 6 knots and maintaining that speed for a period of at least 4 h.

1.6 Rescue boats shall have sufficient mobility and manoeuvrability in a seaway to enable persons to be retrieved from the water, marshal liferafts and tow the largest liferaft carried on the ship when loaded with its full complement of persons and equipment or its equivalent at a speed of at least 2 knots.

1.7 A rescue boat shall be fitted with an inboard engine or outboard motor. If it is fitted with an outboard motor, the rudder and tiller may form part of the engine. Notwithstanding the requirements of regulation 41.6.1, petrol-driven outboard engines with an approved fuel system may be fitted in rescue boats provided the fuel tanks are specially protected against fire and explosion.

1.8 Arrangements for towing shall be permanently fitted in rescue boats and shall be sufficiently strong to marshal or tow liferafts as required by paragraph 1.6.

1.9 Rescue boats shall be fitted with weathertight stowage for small items of equipment.

2 *Rescue boat equipment*

2.1 All items of rescue boat equipment, with the exception of boat-hooks which shall be kept free for fending off purposes, shall be secured within the rescue boat by lashings, storage in lockers or compartments, storage in brackets or similar

mounting arrangements, or other suitable means. The equipment shall be secured in such a manner as not to interfere with any launching or recovery procedures. All items of rescue boat equipment shall be as small and of as little mass as possible and shall be packed in suitable and compact form.

2.2 The normal equipment of every rescue boat shall consist of:

- .1 sufficient buoyant oars or paddles to make headway in calm seas. Thole pins, crutches or equivalent arrangements shall be provided for each oar. Thole pins or crutches shall be attached to the boat by lanyards or chains;
- .2 a buoyant bailer;
- .3 a binnacle containing an efficient compass which is luminous or provided with suitable means of illumination;
- .4 a sea-anchor and tripping line with a hawser of adequate strength not less than 10 m in length;
- .5 a painter of sufficient length and strength, attached to the release device complying with the requirements of regulation 41.7.7 and placed at the forward end of the rescue boat;
- .6 one buoyant line, not less than 50 m in length, of sufficient strength to tow a liferaft as required by paragraph 1.6;
- .7 one waterproof electric torch suitable for Morse signalling, together with one spare set of batteries and one spare bulb in a waterproof container;
- .8 one whistle or equivalent sound signal;
- .9 a first-aid outfit in a waterproof case capable of being closed tightly after use;
- .10 two buoyant rescue quoits, attached to not less than 30 m of buoyant line;
- .11 a searchlight capable of effectively illuminating a light-coloured object at night having a width of 18 m at a distance of 180 m for a total period of 6 h and of working for at least 3 h continuously;
- .12 an efficient radar reflector.
- .13 thermal protective aids complying with the requirements of regulation 34 sufficient for 10% of the number of persons the rescue boat is permitted to accommodate or two, whichever is the greater.

2.3 In addition to the equipment required by paragraph 2.2, the normal equipment of every rigid rescue boat shall include:

- .1 a boat-hook;
- .2 a bucket;
- .3 a knife or hatchet.

2.4 In addition to the equipment required by paragraph 2.2 the normal equipment of every inflated rescue boat shall consist of:

- .1 a buoyant safety knife;
- .2 two sponges;
- .3 an efficient manually operated bellows or pump;
- .4 a repair kit in a suitable container for repairing punctures;
- .5 a safety boat-hook.

3 *Additional requirements for inflated rescue boats*

3.1 The requirements of regulations 41.1.3 and 41.1.5 do not apply to inflated rescue boats.

3.2 An inflated rescue boat shall be constructed in such a way that, when suspended by its bridle or lifting hook:

- .1 it is of sufficient strength and rigidity to enable it to be lowered and recovered with its full complement of persons and equipment;
- .2 it is of sufficient strength to withstand a load of 4 times the mass of its full complement of persons and equipment at an ambient temperature of $20 \pm 3^{\circ}\text{C}$ with all relief valves inoperative;
- .3 it is of sufficient strength to withstand a load of 1.1 times the mass of its full complement of persons and equipment at an ambient temperature of -30°C , with all relief valves operative.

3.3 Inflated rescue boats shall be so constructed as to be capable of withstanding exposure:

- .1 when stowed on an open deck on a ship at sea;
- .2 for 30 days afloat in all sea conditions.

3.4 In addition to complying with the requirements of regulation 41.9, inflated rescue boats shall be marked with a serial number, the maker's name or trade mark and the date of manufacture.

3.5 The buoyancy of an inflated rescue boat shall be provided by either a single tube subdivided into at least five separate compartments of approximately equal volume or two separate tubes neither exceeding 60% of the total volume. The buoyancy tubes shall be so arranged that, in the event of any one of the compartments being damaged, the intact compartments shall be able to support the number of persons which the rescue boat is permitted to accommodate, each having a mass of 75 kg, when seated in their normal positions with positive freeboard over the rescue boat's entire periphery.

3.6 The buoyancy tubes forming the boundary of the inflated rescue boat shall on inflation provide a volume of not less than 0.17 m^3 for each person the rescue boat is permitted to accommodate.

3.7 Each buoyancy compartment shall be fitted with a non-return valve for manual inflation and means for deflation. A safety relief valve shall also be fitted unless the Administration is satisfied that such an appliance is unnecessary.

3.8 Underneath the bottom and on vulnerable places on the outside of the inflated rescue boat, rubbing strips shall be provided to the satisfaction of the Administration.

3.9 Where a transom is fitted it shall not be inset by more than 20% of the overall length of the rescue boat.

3.10 Suitable patches shall be provided for securing the painters fore and aft and the becketed lifelines inside and outside the boat.

3.11 The inflated rescue boat shall be maintained at all times in a fully inflated condition.

SECTION VI – LAUNCHING AND EMBARKATION APPLIANCES

Regulation 48

Launching and embarkation appliances

1 *General requirements*

1.1 Each launching appliance together with all its lowering and recovery gear shall be so arranged that the fully equipped survival craft or rescue boat it serves can be safely lowered against a trim of up to 10° and a list of up to 20° either way:

- .1 when boarded, as required by regulation 22 or 28, by its full complement of persons;
- .2 without persons in the survival craft or rescue boat.

1.2 Notwithstanding the requirements of paragraph 1.1, lifeboat launching appliances for oil tankers, chemical tankers and gas carriers with a final angle of heel greater than 20° calculated in accordance with the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 Protocol related thereto and the recommendations of the Organization*, as applicable, shall be capable of operating at the final angle of heel on the lower side of the ship.

1.3 A launching appliance shall not depend on any means other than gravity or stored mechanical power which is independent of the ship's power supplies to launch the survival craft or rescue boat it serves in the fully loaded and equipped condition and also in the light condition.

* Reference is made to the damage stability requirements of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) adopted by the Maritime Safety Committee by resolution MSC.4(48) and the International Code for the Construction and Equipment of Ships carrying Liquefied Gases in Bulk (IGC Code) adopted by the Maritime Safety Committee by resolution MSC.5(48).

1.4 A launching mechanism shall be so arranged that it may be actuated by one person from a position on the ship's deck, and from a position within the survival craft or rescue boat; the survival craft shall be visible to the person on deck operating the launching mechanism.

1.5 Each launching appliance shall be so constructed that a minimum amount of routine maintenance is necessary. All parts requiring regular maintenance by the ship's crew shall be readily accessible and easily maintained.

1.6 The winch brakes of a launching appliance shall be of sufficient strength to withstand:

- .1 a static test with a proof load of not less than 1.5 times the maximum working load; and
- .2 a dynamic test with a proof load of not less than 1.1 times the maximum working load at maximum lowering speed.

1.7 The launching appliance and its attachments other than winch brakes shall be of sufficient strength to withstand a static proof load on test of not less than 2.2 times the maximum working load.

1.8 Structural members and all blocks, falls, padeyes, links, fastenings and all other fittings used in connection with launching equipment shall be designed with not less than a minimum factor of safety on the basis of the maximum working load assigned and the ultimate strength of the material used for construction. A minimum factor of safety of 4.5 shall be applied to all davit and winch structural members, and a minimum factor of safety of 6 shall be applied to falls, suspension chains, links and blocks.

1.9 Each launching appliance shall, as far as practicable, remain effective under conditions of icing.

1.10 A lifeboat launching appliance shall be capable of recovering the lifeboat with its crew.

1.11 The arrangements of the launching appliance shall be such as to enable safe boarding of the survival craft in accordance with the requirements of regulations 38.4.2, 38.4.3, 41.3.1 and 41.3.2.

2 *Launching appliances using falls and a winch*

2.1 Falls shall be of rotation-resistant and corrosion-resistant steel wire rope.

2.2 In the case of a multiple drum winch, unless an efficient compensatory device is fitted, the falls shall be so arranged as to wind off the drums at the same rate when lowering, and to wind on to the drums evenly at the same rate when hoisting.

2.3 Every rescue boat launching appliance shall be fitted with a powered winch motor of such capacity that the rescue boat can be raised from the water with its full complement of persons and equipment.

2.4 An efficient hand gear shall be provided for recovery of each survival craft and rescue boat. Hand gear handles or wheels shall not be rotated by moving parts of the winch when the survival craft or rescue boat is being lowered or when it is being hoisted by power.

2.5 Where davit arms are recovered by power, safety devices shall be fitted which will automatically cut off the power before the davit arms reach the stops in order to avoid overstressing the falls or davits, unless the motor is designed to prevent such overstressing.

2.6 The speed at which the survival craft or rescue boat is lowered into the water shall be not less than that obtained from the formula:

$$S = 0.4 + (0.02 \times H)$$

where S = speed of lowering in metres per second

and H = height in metres from davit head to the waterline at the lightest seagoing condition.

2.7 The maximum lowering speed shall be established by the Administration having regard to the design of the survival craft or rescue boat, the protection of its occupants from excessive forces, and the strength of the launching arrangements taking into account inertia forces during an emergency stop. Means shall be incorporated in the appliance to ensure that this speed is not exceeded.

2.8 Every rescue boat launching appliance shall be capable of hoisting the rescue boat when loaded with its full rescue boat complement of persons and equipment at a rate of not less than 0.3 m/s.

2.9 Every launching appliance shall be fitted with brakes capable of stopping the descent of the survival craft or rescue boat and holding it securely when loaded with its full complement of persons and equipment; brake pads shall, where necessary, be protected from water and oil.

2.10 Manual brakes shall be so arranged that the brake is always applied unless the operator, or a mechanism activated by the operator, holds the brake control in the "off" position.

3 *Float-free launching*

Where a survival craft requires a launching appliance and is also designed to float free, the float-free release of the survival craft from its stowed position shall be automatic.

4 *Free-fall launching*

Every free-fall launching appliance using an inclined plane shall, in addition to complying with the applicable requirements of paragraph 1, also comply with the following requirements:

- 1 The launching appliance shall be so arranged that excessive forces are not experienced by the occupants of the survival craft during launching.

- .2 The launching appliance shall be a rigid structure with a ramp angle and length sufficient to ensure that the survival craft effectively clears the ship.
- .3 The launching appliance shall be efficiently protected against corrosion and be so constructed as to prevent incendive friction or impact sparking during the launching of the survival craft.

5 *Evacuation-slide launching and embarkation*

Every evacuation-slide launching appliance shall, in addition to complying with the applicable requirements of paragraph 1, also comply with the following requirements:

- .1 The evacuation slide shall be capable of being deployed by one person at the embarkation station.
- .2 The evacuation slide shall be capable of being used in high winds and in a seaway.

6 *Liferaft launching appliances*

Every liferaft launching appliance shall comply with the requirements of paragraphs 1 and 2, except with regard to use of gravity for turning out the appliance, embarkation in the stowed position and recovery of the loaded liferaft. The launching appliance shall be so arranged as to prevent premature release during lowering and shall release the liferaft when waterborne.

7 *Embarkation ladders*

7.1 Handholds shall be provided to ensure a safe passage from the deck to the head of the ladder and vice versa.

7.2 The steps of the ladder shall be:

- .1 made of hardwood, free from knots or other irregularities, smoothly machined and free from sharp edges and splinters, or of suitable material of equivalent properties;
- .2 provided with an efficient non-slip surface either by longitudinal grooving or by the application of an approved non-slip coating;
- .3 not less than 480 mm long, 115 mm wide and 25 mm in depth, excluding any non-slip surface or coating;
- .4 equally spaced not less than 300 mm or more than 380 mm apart and secured in such a manner that they will remain horizontal.

7.3 The side ropes of the ladder shall consist of two uncovered manila ropes not less than 65 mm in circumference on each side. Each rope shall be continuous with no joints below the top step. Other materials may be used provided the dimensions, breaking strain, weathering, stretching and gripping properties are at least equivalent to those of manila rope. All rope ends shall be secured to prevent unravelling.

SECTION VII – OTHER LIFE-SAVING APPLIANCES

Regulation 49

Line-throwing appliances

- 1 Every line-throwing appliance shall:
 - .1 be capable of throwing a line with reasonable accuracy;
 - .2 include not less than four projectiles each capable of carrying the line at least 230 m in calm weather;
 - .3 include not less than four lines each having a breaking strength of not less than 2 kN;
 - .4 have brief instructions or diagrams clearly illustrating the use of the line-throwing appliance.
- 2 The rocket, in the case of a pistol fired rocket, or the assembly, in the case of an integral rocket and line, shall be contained in a water-resistant casing. In addition, in the case of a pistol-fired rocket, the line and rockets together with the means of ignition shall be stowed in a container which provides protection from the weather.

Regulation 50

General emergency alarm system

The general emergency alarm system shall be capable of sounding the general emergency alarm signal consisting of seven or more short blasts followed by one long blast on the ship's whistle or siren and additionally on an electrically operated bell or klaxon or other equivalent warning system, which shall be powered from the ship's main supply and the emergency source of electrical power required by regulation II-1/42 or II-1/43, as appropriate. The system shall be capable of operation from the navigating bridge and, except for the ship's whistle, also from other strategic points. The system shall be audible throughout all the accommodation and normal crew working spaces.

SECTION VIII – MISCELLANEOUS

Regulation 51

Training manual

The training manual, which may comprise several volumes, shall contain instructions and information, in easily understood terms illustrated wherever possible, on the life-saving appliances provided in the ship and on the best methods of survival. Any part of such information may be provided in the form of audio-visual aids in lieu of the manual. The following shall be explained in detail:

- .1 donning of lifejackets and immersion suits, as appropriate;
- .2 muster at the assigned stations;
- .3 boarding, launching, and clearing the survival craft and rescue boats;
- .4 method of launching from within the survival craft;
- .5 release from launching appliances;
- .6 methods and use of devices for protection in launching areas, where appropriate;
- .7 illumination in launching areas;
- .8 use of all survival equipment;
- .9 use of all detection equipment;
- .10 with the assistance of illustrations, the use of radio life-saving appliances;
- .11 use of drogues;
- .12 use of engine and accessories;
- .13 recovery of survival craft and rescue boats including stowage and securing;
- .14 hazards of exposure and the need for warm clothing;
- .15 best use of the survival craft facilities in order to survive;
- .16 methods of retrieval, including the use of helicopter rescue gear (slings, baskets, stretchers), breeches-buoy and shore life-saving apparatus and ship's line-throwing apparatus;
- .17 all other functions contained in the muster list and emergency instructions;
- .18 instructions for emergency repair of the life-saving appliances.

Regulation 52

Instructions for on-board maintenance

Instructions for on-board maintenance of life-saving appliances shall be easily understood, illustrated wherever possible, and, as appropriate, shall include the following for each appliance:

- .1 a checklist for use when carrying out the inspections required by regulation 19.7;
- .2 maintenance and repair instructions;
- .3 schedule of periodic maintenance;
- .4 diagram of lubrication points with the recommended lubricants;
- .5 list of replaceable parts;
- .6 list of sources of spare parts;
- .7 log for records of inspections and maintenance.

Regulation 53

Muster list and emergency instructions

1 The muster list shall specify details of the general emergency alarm signal prescribed by regulation 50 and also action to be taken by crew and passengers when this alarm is sounded. The muster list shall also specify how the order to abandon ship will be given.

2 The muster list shall show the duties assigned to the different members of the crew including:

- .1 closing of the watertight doors, fire doors, valves, scuppers, sidescuttles, skylights, portholes and other similar openings in the ship;
- .2 equipping of the survival craft and other life-saving appliances;
- .3 preparation and launching of survival craft;
- .4 general preparations of other life-saving appliances;
- .5 muster of passengers;
- .6 use of communication equipment;
- .7 manning of fire parties assigned to deal with fires;
- .8 special duties assigned in respect of the use of fire-fighting equipment and installations.

3 The muster list shall specify which officers are assigned to ensure that life-saving and fire appliances are maintained in good condition and are ready for immediate use.

4 The muster list shall specify substitutes for key persons who may become disabled, taking into account that different emergencies may call for different actions.

5 The muster list shall show the duties assigned to members of the crew in relation to passengers in case of emergency. These duties shall include:

- .1 warning the passengers;
- .2 seeing that they are suitably clad and have donned their lifejackets correctly;
- .3 assembling passengers at muster stations;
- .4 keeping order in the passageways and on the stairways and generally controlling the movements of the passengers;
- .5 ensuring that a supply of blankets is taken to the survival craft.

6 The muster list shall be prepared before the ship proceeds to sea. After the muster list has been prepared, if any change takes place in the crew which necessitates an alteration in the muster list, the master shall either revise the list or prepare a new list.

7 The format of the muster list used on passenger ships shall be approved."

Part 4

CHAPTER IV

RADIOTELEGRAPHY AND RADIOTELEPHONY

Regulation 2

Terms and definitions

The following new sub-paragraph is added:

- “(i) ‘Emergency position-indicating radio beacon’ means a station in the mobile service the emissions of which are intended to facilitate search and rescue operations.”

The following new regulations are added:

“Regulation 14-1

Survival craft emergency position-indicating radio beacons

- (a) Survival craft emergency position-indicating radio beacons required by regulation III/6.2.3 to be carried in survival craft shall provide transmissions to enable aircraft to locate the survival craft and may also provide transmissions for alerting purposes.
- (b) Survival craft emergency position-indicating radio beacons shall, at least, be capable of transmitting alternately or simultaneously signals complying with the relevant standards and recommended practices of the International Civil Aviation Organization (ICAO) on the frequencies 121.5 MHz and 243.0 MHz.
- (c) Survival craft emergency position-indicating radio beacons shall:
- (i) be of a highly visible colour, so designed that they can be used by an unskilled person and so constructed that they may be easily tested and maintained. Batteries shall not require replacement at intervals of less than 12 months, taking into account testing arrangements;
 - (ii) be watertight, capable of floating and being dropped into the water without damage from a height of at least 20 m;
 - (iii) be capable only of manual activation and de-activation;
 - (iv) be portable, lightweight, and compact;
 - (v) be provided with an indication that signals are being emitted;

- (vi) derive their energy supply from a battery forming an integral part of the device and having sufficient capacity to operate the apparatus for a period of 48 h. The transmission may be intermittent. Determination of the duty cycle should take into account the probability of homing being properly carried out, the need to avoid congestion on the frequencies and the need to comply with the requirements of the International Civil Aviation Organization (ICAO); and
- (vii) be tested and, if necessary, have their source of energy replaced at intervals not exceeding 12 months.

Regulation 14-2

Periodic inspection and testing of emergency position-indicating radio beacons

Emergency position-indicating radio beacons provided in accordance with regulation III/6.2.3 shall at intervals not exceeding 12 months be inspected, tested and, if necessary, have their source of energy replaced. However, in cases where it appears proper and reasonable, the Administration may extend this period to 17 months.

Regulation 14-3

Two-way radiotelephone apparatus for survival craft

- (a) The apparatus required by regulation III/6.2.4 shall be so designed that it can be used in an emergency by an unskilled person.
- (b) The apparatus shall be portable and capable of being used for on-board communications.
- (c) The apparatus shall conform to the requirements laid down in the relevant Radio Regulations for equipment used in the maritime mobile service for on-board communications and shall be capable of operation on those channels specified by the Radio Regulations and as required by the Administration. If the apparatus is operating in the VHF band, precautions shall be taken to prevent the inadvertent selection of VHF channel 16 on equipment capable of being operated on that frequency.
- (d) The apparatus shall be operated from a battery of adequate capacity to ensure 4 h operation with a duty cycle of 1 : 9.
- (e) While at sea, the equipment shall be maintained in satisfactory condition, and, whenever necessary, the battery shall be brought to the fully charged condition or replaced."

Part 5

CHAPTER VII

CARRIAGE OF DANGEROUS GOODS

The existing text of chapter VII is replaced by the following:

PART A – CARRIAGE OF DANGEROUS GOODS IN PACKAGED FORM
OR IN SOLID FORM IN BULK

Regulation 1

Application

- 1 Unless expressly provided otherwise, this part applies to dangerous goods, classified under regulation 2 which are carried in packaged form or in solid form in bulk (hereinafter referred to as "dangerous goods"), in all ships to which the present regulations apply and in cargo ships of less than 500 tons gross tonnage.
- 2 The provisions of this part do not apply to ships' stores and equipment.
- 3 The carriage of dangerous goods is prohibited except in accordance with the provisions of this part.
- 4 To supplement the provisions of this part, each Contracting Government shall issue, or cause to be issued, detailed instructions on safe packaging and stowage of dangerous goods which shall include the precautions necessary in relation to other cargo.*

Regulation 2

Classification

Dangerous goods shall be divided into the following classes:

- Class 1 – Explosives
- Class 2 – Gases: compressed, liquefied or dissolved under pressure

* Reference is made to the International Maritime Dangerous Goods Code (IMDG Code) adopted by the Organization by resolution A.81(IV), and to the relevant sections and the related parts of Appendix B of the Code of Safe Practice for Solid Bulk Cargoes (BC Code) adopted by the Organization by resolution A.434(XI), as have been or may be amended by the Maritime Safety Committee.

- Class 3 – Flammable* liquids
- Class 4.1 – Flammable* solids
- Class 4.2 – Substances liable to spontaneous combustion
- Class 4.3 – Substances which, in contact with water, emit flammable gases
- Class 5.1 – Oxidizing substances
- Class 5.2 – Organic peroxides
- Class 6.1 – Poisonous (toxic) substances
- Class 6.2 – Infectious substances
- Class 7 – Radioactive materials
- Class 8 – Corrosives
- Class 9 – Miscellaneous dangerous substances, that is any other substance which experience has shown, or may show, to be of such a dangerous character that the provisions of this part shall apply to it.

Regulation 3

Packaging

- 1 The packaging of dangerous goods shall be:
 - .1 well made and in good condition;
 - .2 of such a character that any interior surface with which the contents may come in contact is not dangerously affected by the substance being conveyed; and
 - .3 capable of withstanding the ordinary risks of handling and carriage by sea.
- 2 Where the use of absorbent or cushioning material is customary in the packaging of liquids in receptacles, that material shall be:
 - .1 capable of minimizing the dangers to which the liquid may give rise;
 - .2 so disposed as to prevent movement and ensure that the receptacle remains surrounded; and
 - .3 where reasonably possible, of sufficient quantity to absorb the liquid in the event of breakage of the receptacle.
- 3 Receptacles containing dangerous liquids shall have an ullage at the filling temperature sufficient to allow for the highest temperature during the course of normal carriage.

* "Flammable" has the same meaning as "inflammable".

4 Cylinders or receptacles for gases under pressure shall be adequately constructed, tested, maintained and correctly filled.

5 Empty uncleaned receptacles which have been used previously for the carriage of dangerous goods shall be subject to the provisions of this part for filled receptacles, unless adequate measures have been taken to nullify any hazard.

Regulation 4

Marking, labelling and placarding

1 Packages containing dangerous goods shall be durably marked with the correct technical name; trade names alone shall not be used.

2 Packages containing dangerous goods shall be provided with distinctive labels or stencils of the labels, or placards, as appropriate, so as to make clear the dangerous properties of the goods contained therein.

3 The method of marking the correct technical name and of affixing labels or applying stencils of labels, or of affixing placards on packages containing dangerous goods, shall be such that this information will still be identifiable on packages surviving at least three months' immersion in the sea. In considering suitable marking, labelling and placarding methods, account shall be taken of the durability of the materials used and of the surface of the package.

4 Packages containing dangerous goods shall be so marked and labelled except that:

- .1 packages containing dangerous goods of a low degree of hazard or packed in limited quantities*; or
- .2 when special circumstances permit, packages that are stowed and handled in units that are identified by labels or placards*;

may be exempted from labelling requirements.

Regulation 5

Documents

1 In all documents relating to the carriage of dangerous goods by sea where the goods are named, the correct technical name of the goods shall be used (trade names alone shall not be used) and the correct description given in accordance with the classification set out in regulation 2.

2 The shipping documents prepared by the shipper shall include, or be accompanied by, a signed certificate or declaration that the shipment offered for carriage is properly packaged and marked, labelled or placarded, as appropriate, and in proper condition for carriage.

* Reference is made to the specific exemptions provided for in the International Maritime Dangerous Goods Code (IMDG Code).

3 Each ship carrying dangerous goods shall have a special list or manifest setting forth, in accordance with the classification set out in regulation 2, the dangerous goods on board and the location thereof. A detailed stowage plan which identifies by class and sets out the location of all dangerous goods on board may be used in place of such special list or manifest.

Regulation 6

Stowage requirements

1 Dangerous goods shall be stowed safely and appropriately in accordance with the nature of the goods. Incompatible goods shall be segregated from one another.

2 Explosives (except ammunition) which present a serious risk shall be stowed in a magazine which shall be kept securely closed while at sea. Such explosives shall be segregated from detonators. Electrical apparatus and cables in any compartment in which explosives are carried shall be so designed and used as to minimize the risk of fire or explosion.

3 Dangerous goods in packaged form which give off dangerous vapours shall be stowed in a mechanically ventilated space or on deck. Dangerous goods in solid form in bulk which give off dangerous vapours shall be stowed in a well ventilated space.

4 In ships carrying flammable liquids or gases, special precautions shall be taken where necessary against fire or explosion.

5 Substances which are liable to spontaneous heating or combustion shall not be carried unless adequate precautions have been taken to minimize the likelihood of the outbreak of fire.

Regulation 7

Explosives in passenger ships

1 In passenger ships the following explosives only may be carried:

- .1 safety cartridges and safety fuses;
- .2 small quantities of explosives not exceeding 10 kg total net mass;
- .3 distress signals for use in ships or aircraft, if the total mass of such signals does not exceed 1,000 kg;
- .4 except in ships carrying unberthed passengers, fireworks which are unlikely to explode violently.

2 Notwithstanding the provisions of paragraph 1, additional quantities or types of explosives may be carried in passenger ships in which special safety measures approved by the Administration are taken.

**PART B – CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING
DANGEROUS LIQUID CHEMICALS IN BULK**

Regulation 8

Definitions

For the purpose of this part, unless expressly provided otherwise:

1. "International Bulk Chemical Code" means the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Maritime Safety Committee of the Organization by resolution MSC.4(48), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I.
2. "Chemical tanker" means a cargo ship constructed or adapted and used for the carriage in bulk of any liquid product listed in chapter 17 of the International Bulk Chemical Code.
3. For the purpose of regulation 9, "ship constructed" means a ship the keel of which is laid or which is at a similar stage of construction.
4. "At a similar stage of construction" means the stage at which:
 - .1 construction identifiable with a specific ship begins; and
 - .2 assembly of that ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less.

Regulation 9

Application to chemical tankers

1. Unless expressly provided otherwise, this part applies to chemical tankers constructed on or after 1 July 1986 including those of less than 500 tons gross tonnage. Such tankers shall comply with the requirements of this part in addition to any other applicable requirements of the present regulations.
2. Any chemical tanker, irrespective of the date of construction, which undergoes repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to the ship. Such a ship, if constructed before 1 July 1986, shall, as a rule, comply with the requirements for a ship constructed on or after that date to at least the same extent as before undergoing such repairs, alterations, modifications or outfitting. Repairs, alterations and modifications of a major character, and outfitting related thereto, shall meet the requirements for a ship constructed on or after 1 July 1986 in so far as the Administration deems reasonable and practicable.

3 A ship, irrespective of the date of construction, which is converted to a chemical tanker shall be treated as a chemical tanker constructed on the date on which such conversion commenced.

Regulation 10

Requirements for chemical tankers

1 A chemical tanker shall comply with the requirements of the International Bulk Chemical Code and shall, in addition to the requirements of regulations I/8, I/9, and I/10, as applicable, be surveyed and certified as provided for in that Code. For the purpose of this regulation, the requirements of the Code shall be treated as mandatory.

2 A chemical tanker holding a certificate issued pursuant to the provisions of paragraph 1 shall be subject to the control established in regulation I/19. For this purpose such certificate shall be treated as a certificate issued under Regulation I/12 or I/13.

PART C – CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING LIQUEFIED GASES IN BULK

Regulation 11

Definitions

For the purpose of this part, unless expressly provided otherwise:

1 "International Gas Carrier Code" means the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk as adopted by the Maritime Safety Committee of the Organization by resolution MSC.5(48), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I.

2 "Gas carrier" means a cargo ship constructed or adapted and used for the carriage in bulk of any liquefied gas or other product listed in chapter 19 of the International Gas Carrier Code.

3 For the purpose of regulation 12, "ship constructed" means a ship the keel of which is laid or which is at a similar stage of construction.

4 "At a similar stage of construction" means the stage at which:

- 1 construction identifiable with a specific ship begins; and
- 2 assembly of that ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less.

Regulation 12

Application to gas carriers

1 Unless expressly provided otherwise, this part applies to gas carriers constructed on or after 1 July 1986 including those of less than 500 tons gross tonnage. Such gas carriers shall comply with the requirements of this part in addition to any other applicable requirements of the present regulations.

2 Any gas carrier, irrespective of the date of construction, which undergoes repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to the ship. Such a ship if constructed before 1 July 1986 shall, as a rule, comply with the requirements for a ship constructed on or after that date to at least the same extent as before undergoing such repairs, alterations, modifications or outfitting. Repairs, alterations and modifications of a major character, and outfitting related thereto, shall meet the requirements for a ship constructed on or after 1 July 1986 in so far as the Administration deems reasonable and practicable.

3 A ship, irrespective of the date of construction, which is converted to a gas carrier shall be treated as a gas carrier constructed on the date on which such conversion commenced.

Regulation 13

Requirements for gas carriers

1 A gas carrier shall comply with the requirements of the International Gas Carrier Code and shall, in addition to the requirements of regulations I/8, I/9 and I/10, as applicable, be surveyed and certified as provided for in that Code. For the purpose of this regulation, the requirements of the Code shall be treated as mandatory.

2 A gas carrier holding a certificate issued pursuant to the provisions of paragraph 1 shall be subject to the control established in regulation I/19. For this purpose such certificate shall be treated as a certificate issued under regulation I/12 or I/13.

RESOLUTION MSC.6(48)
adopted on 17 June 1983
ADOPTION OF AMENDMENTS TO THE
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.13(57)
(adopted on 11 April 1989)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL
CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.13(57)
(adopted on 11 April 1989)
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CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.13(57)
(adopted on 11 April 1989)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION
FOR THE SAFETY OF LIFE AT SEA, 1974

THE MARITIME SAFETY COMMITTEE,

NOTING Article 28(b) of the Convention of the International Maritime Organization concerning the functions of the Committee,

NOTING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea, 1974, hereafter referred to as "the Convention" concerning the procedures for amending the Annex to the Convention, other than the provisions of chapter I,

HAVING CONSIDERED at its fifty-seventh session amendments to the Convention proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, the amendments to the Convention, the text of which is set out in the Annex to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 31 July 1991 unless prior to that date more than one third of the Contracting Governments to the Convention, or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;
3. INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 February 1992 upon their acceptance in accordance with paragraph 2 above;

RESOLUTION MSC.13(57)
(adopted on 11 April 1989)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL
CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

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4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annex to all Contracting Governments to the International Convention for the Safety of Life at Sea, 1974;

5. FURTHER REQUESTS the Secretary-General to transmit copies of the resolution to Members of the Organization which are not Contracting Governments to the Convention.

RESOLUTION MSC.13(57)
(adopted on 11 April 1989)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL
CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

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ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE
SAFETY OF LIFE AT SEA, 1974, AS AMENDED

Chapter II-1

CONSTRUCTION - SUBDIVISION AND STABILITY
MACHINERY AND ELECTRICAL INSTALLATIONS

Regulation 11

The existing heading is replaced by the following:

"Peak and machinery space bulkheads and stern tubes in cargo ships".

The following text is inserted after the heading:

"(Paragraphs 8 and 9 of this regulation apply to ships constructed on or
after 1 February 1992)".

The following new paragraphs 8 and 9 are added after paragraph 7:

"8 Bulkheads shall be fitted separating the machinery space from cargo and
passenger spaces forward and aft and made watertight up to the freeboard deck.

9 Stern tubes shall be enclosed in a watertight space (or spaces) of
moderate volume. Other measures to minimize the danger of water penetrating
into the ship in case of damage to stern tube arrangements may be taken at the
discretion of the Administration".

Regulation 12

Double bottoms in passenger ships

In paragraph 5 the words "regulation III/2" in the third line is replaced by
"regulation III/3.16".

RESOLUTION MSC.13(57)
(adopted on 11 April 1989)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL
CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

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Regulation 12-1

The following new regulation II-1/12-1 is added after regulation 12:

"Double bottoms in cargo ships other than tankers

(This regulation applies to ships constructed on or after 1 February 1992)

1 A double bottom shall be fitted extending from the collision bulkhead to the afterpeak bulkhead, as far as this is practicable and compatible with the design and proper working of the ship.

2 Where a double bottom is required to be fitted, its depth shall be to the satisfaction of the Administration and the inner bottom shall be continued out to the ship's side in such a manner as to protect the bottom to the turn of the bilge.

3 Small wells constructed in the double bottom, in connection with the drainage arrangements of holds, shall not extend in depth more than necessary. A well extending to the outer bottom, may, however, be permitted at the after end of the shaft tunnel of the ship. Other wells may be permitted by the Administration if it is satisfied that the arrangements give protection equivalent to that afforded by a double bottom complying with this regulation.

4 A double bottom need not be fitted in way of watertight compartments used exclusively for the carriage of liquids, provided the safety of the ship in the event of bottom damage is not, in the opinion of the Administration, thereby impaired".

RESOLUTION MSC.13(57)
(adopted on 11 April 1989)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL
CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

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Regulation 15

The existing text of this regulation is replaced by the following:

"Openings in watertight bulkheads in passenger ships

(This regulation applies to ships constructed on or after 1 February 1992)

1 The number of openings in watertight bulkheads shall be reduced to the minimum compatible with the design and proper working of the ship; satisfactory means shall be provided for closing these openings.

2.1 Where pipes, scuppers, electric cables, etc., are carried through watertight subdivision bulkheads, arrangements shall be made to ensure the watertight integrity of the bulkheads.

2.2 Valves not forming part of a piping system shall not be permitted in watertight subdivision bulkheads.

2.3 Lead or other heat sensitive materials shall not be used in systems which penetrate watertight subdivision bulkheads, where deterioration of such systems in the event of fire would impair the watertight integrity of the bulkheads.

3.1 No doors, manholes, or access openings are permitted:

.1 in the collision bulkhead below the margin line;

.2 in watertight transverse bulkheads dividing a cargo space from an adjoining cargo space or from a permanent or reserve bunker, except as provided in paragraph 10.1 and in regulation 16.

3.2 Except as provided in paragraph 3.3, the collision bulkhead may be pierced below the margin line by not more than one pipe for dealing with fluid in the forepeak tank, provided that the pipe is fitted with a screwdown valve capable of being operated from above the bulkhead deck, the valve chest being secured inside the forepeak to the collision bulkhead. The Administration

RESOLUTION MSC.13(57)
(adopted on 11 April 1989)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL
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may, however, authorize the fitting of this valve on the after side of the collision bulkhead provided that the valve is readily accessible under all service conditions and the space in which it is located is not a cargo space.

3.3 If the forepeak is divided to hold two different kinds of liquids the Administration may allow the collision bulkhead to be pierced below the margin line by two pipes, each of which is fitted as required by paragraph 3.2, provided the Administration is satisfied that there is no practical alternative to the fitting of such a second pipe and that, having regard to the additional subdivision provided in the forepeak, the safety of the ship is maintained.

4.1 Watertight doors fitted in bulkheads between permanent and reserve bunkers shall always be accessible, except as provided in paragraph 9.4 for between-deck bunker doors.

4.2 Satisfactory arrangements shall be made by means of screens or otherwise to prevent the coal from interfering with the closing of watertight bunker doors.

5 Subject to paragraph 11, not more than one door, apart from the doors to bunkers and shaft tunnels, may be fitted in each main transverse bulkhead within spaces containing the main and auxiliary propulsion machinery including boilers serving the needs of propulsion and all permanent bunkers. Where two or more shafts are fitted, the tunnels shall be connected by an intercommunicating passage. There shall be only one door between the machinery space and the tunnel spaces where two shafts are fitted and only two doors where there are more than two shafts. All these doors shall be of the sliding type and shall be so located as to have their sills as high as practicable. The hand gear for operating these doors from above the bulkhead deck shall be situated outside the spaces containing the machinery.

6.1 Watertight doors, except as provided in paragraph 10.1 or regulation 16, shall be power-operated sliding doors complying with the requirements of paragraph 7 capable of being closed simultaneously from the central operating console at the navigating bridge in not more than 60 seconds with the ship in the upright position.

RESOLUTION MSC.13(57)
(adopted on 11 April 1989)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL
CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

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6.2 The means of operation whether by power or by hand of any power-operated sliding watertight door shall be capable of closing the door with the ship listed to 15° either way. Consideration shall also be given to the forces which may act on either side of the door as may be experienced when water is flowing through the opening applying a static head equivalent to a water height of at least 1 m above the sill on the centreline of the door.

6.3 Watertight door controls, including hydraulic piping and electric cables, shall be kept as close as practicable to the bulkhead in which the doors are fitted, in order to minimize the likelihood of them being involved in any damage which the ship may sustain. The positioning of watertight doors and their controls shall be such that if the ship sustains damage within one fifth of the breadth of the ship, as defined in regulation 2, such distance being measured at right angles to the centreline at the level of the deepest subdivision load line, the operation of the watertight doors clear of the damaged portion of the ship is not impaired.

6.4 All power-operated sliding watertight doors shall be provided with means of indication which will show at all remote operating positions whether the doors are open or closed. Remote operating positions shall only be at the navigating bridge as required by paragraph 7.1.5 and, at the location where hand operation above the bulkhead deck is required by paragraph 7.1.4.

7.1 Each power-operated sliding watertight door:

- .1 shall have a vertical or horizontal motion;
- .2 shall, subject to paragraph 11, be normally limited to a maximum clear opening width of 1.2 m. The Administration may permit larger doors only to the extent considered necessary for the effective operation of the ship provided that other safety measures, including the following, are taken into consideration:
 - .1 special consideration shall be given to the strength of the door and its closing appliances in order to prevent leakages;
 - .2 the door shall be located outside the damage zone B/5;

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- .3 the door shall be kept closed when the ship is at sea, except for limited periods when absolutely necessary as determined by the Administration;
- .3 shall be fitted with the necessary equipment to open and close the door using electric power, hydraulic power, or any other form of power that is acceptable to the Administration;
- .4 shall be provided with an individual hand-operated mechanism. It shall be possible to open and close the door by hand at the door itself from either side, and in addition, close the door from an accessible position above the bulkhead deck with an all round crank motion or some other movement providing the same degree of safety acceptable to the Administration. Direction of rotation or other movement is to be clearly indicated at all operating positions. The time necessary for the complete closure of the door, when operating by hand gear, shall not exceed 90 seconds with the ship in the upright position;
- .5 shall be provided with controls for opening and closing the door by power from both sides of the door and also for closing the door by power from the central operating console at the navigating bridge;
- .6 shall be provided with an audible alarm, distinct from any other alarm in the area, which will sound whenever the door is closed remotely by power and which shall sound for at least five seconds but no more than ten seconds before the door begins to move and shall continue sounding until the door is completely closed. In the case of remote hand operation it is sufficient for the audible alarm to sound only when the door is moving. Additionally, in passenger areas and areas of high ambient noise the Administration may require the audible alarm to be supplemented by an intermittent visual signal at the door; and
- .7 shall have an approximately uniform rate of closure under power. The closure time, from the time the door begins to move to the time it reaches the completely closed position, shall in no case be less than 20 seconds or more than 40 seconds with the ship in the upright position.

7.2 The electrical power required for power-operated sliding watertight doors shall be supplied from the emergency switchboard either directly or by a dedicated distribution board situated above the bulkhead deck. The associated control, indication and alarm circuits shall be supplied from the emergency switchboard either directly or by a dedicated distribution board situated above the bulkhead deck and be capable of being automatically supplied by the transitional source of emergency electrical power required by regulation 42.3.1.3 in the event of failure of either the main or emergency source of electrical power.

7.3 Power-operated sliding watertight doors shall have either:

- .1 a centralized hydraulic system with two independent power sources each consisting of a motor and pump capable of simultaneously closing all doors. In addition, there shall be for the whole installation hydraulic accumulators of sufficient capacity to operate all the doors at least three times, i.e. closed-open-closed, against an adverse list of 15°. This operating cycle shall be capable of being carried out when the accumulator is at the pump cut-in pressure. The fluid used shall be chosen considering the temperatures liable to be encountered by the installation during its service. The power operating system shall be designed to minimize the possibility of having a single failure in the hydraulic piping adversely affect the operation of more than one door. The hydraulic system shall be provided with a low-level alarm for hydraulic fluid reservoirs serving the power-operated system and a low gas pressure alarm or other effective means of monitoring loss of stored energy in hydraulic accumulators. These alarms are to be audible and visual and shall be situated on the central operating console at the navigating bridge; or
- .2 an independent hydraulic system for each door with each power source consisting of a motor and pump capable of opening and closing the door. In addition, there shall be a hydraulic accumulator of sufficient capacity to operate the door at least three times, i.e. closed-open-closed, against an adverse list of 15°. This

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operating cycle shall be capable of being carried out when the accumulator is at the pump cut-in pressure. The fluid used shall be chosen considering the temperatures liable to be encountered by the installation during its service. A low gas pressure group alarm or other effective means of monitoring loss of stored energy in hydraulic accumulators shall be provided at the central operating console on the navigating bridge. Loss of stored energy indication at each local operating position shall also be provided; or

- .3 an independent electrical system and motor for each door with each power source consisting of a motor capable of opening and closing the door. The power source shall be capable of being automatically supplied by the transitional source of emergency electrical power as required by regulation 42.4.2 - in the event of failure of either the main or emergency source of electrical power and with sufficient capacity to operate the door at least three times, i.e. closed-open-closed against an adverse list of 15°.

For the systems specified in 7.3.1, 7.3.2 and 7.3.3, provision should be made as follows:

Power systems for power-operated watertight sliding doors shall be separate from any other power system. A single failure in the electric or hydraulic power-operated systems excluding the hydraulic actuator shall not prevent the hand operation of any door.

7.4 Control handles shall be provided at each side of the bulkhead at a minimum height of 1.6 m above the floor and shall be so arranged as to enable persons passing through the doorway to hold both handles in the open position without being able to set the power closing mechanism in operation accidentally. The direction of movement of the handles in opening and closing the door shall be in the direction of door movement and shall be clearly indicated.

7.5 As far as practicable, electrical equipment and components for watertight doors shall be situated above the bulkhead deck and outside hazardous areas and spaces.

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7.6 The enclosures of electrical components necessarily situated below the bulkhead deck shall provide suitable protection against the ingress of water.*

7.7 Electric power, control, indication and alarm circuits shall be protected against fault in such a way that a failure in one door circuit will not cause a failure in any other door circuit. Short circuits or other faults in the alarm or indicator circuits of a door shall not result in a loss of power operation of that door. Arrangements shall be such that leakage of water into the electrical equipment located below the bulkhead deck will not cause the door to open.

7.8 A single electrical failure in the power operating or control system of a power-operated sliding watertight door shall not result in a closed door opening. Availability of the power supply should be continuously monitored at a point in the electrical circuit as near as practicable to each of the motors required by paragraph 7.3. Loss of any such power supply should activate an audible and visual alarm at the central operating console at the navigating bridge.

* Reference is made to the following IEC publication 529 : 1976:

- .1 electrical motors, associated circuits and control components; protected to IP x 7 standard;
- .2 door position indicators and associated circuit components; protected to IP x 8 standard; and
- .3 door movement warning signals; protected to IP x 6 standard.

Other arrangements for the enclosures of electrical components may be fitted provided the Administration is satisfied that an equivalent protection is achieved. The water pressure testing of the enclosures protected to IP x 8 shall be based on the pressure that may occur at the location of the component during flooding for a period of 36 hours.

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8.1 The central operating console at the navigating bridge shall have a "master mode" switch with two modes of control: a "local control" mode which shall allow any door to be locally opened and locally closed after use without automatic closure, and a "doors closed" mode which shall automatically close any door that is open. The "doors closed" mode shall permit doors to be opened locally and shall automatically reclose the doors upon release of the local control mechanism. The "master mode" switch shall normally be in the "local control" mode. The "doors closed" mode shall only be used in an emergency or for testing purposes. Special consideration shall be given to the reliability of the "master mode" switch.

8.2 The central operating console at the navigating bridge shall be provided with a diagram showing the location of each door, with visual indicators to show whether each door is open or closed. A red light shall indicate a door is fully open and a green light shall indicate a door is fully closed. When the door is closed remotely the red light shall indicate the intermediate position by flashing. The indicating circuit shall be independent of the control circuit for each door.

8.3 It shall not be possible to remotely open any door from the central operating console.

9.1 All watertight doors shall be kept closed during navigation except that they may be opened during navigation as specified in paragraphs 9.2, 9.3 and 9.4. Watertight doors of width of more than 1.2 m permitted by paragraph 11 may only be opened in the circumstances detailed in that paragraph. Any door which is opened in accordance with this paragraph shall be ready to be immediately closed.

9.2 A watertight door may be opened during navigation to permit the passage of passengers or crew, or when work in the immediate vicinity of the door necessitates it being opened. The door must be immediately closed when transit through the door is complete or when the task which necessitated it being open is finished.

9.3 Certain watertight doors may be permitted to remain open during navigation only if considered absolutely necessary; that is, being open is determined essential to the safe and effective operation of the ship's

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machinery or to permit passengers normally unrestricted access throughout the passenger area. Such determination shall be made by the Administration only after careful consideration of the impact on ship operations and survivability. A watertight door permitted to remain thus open shall be clearly indicated in the ship's stability information and shall always be ready to be immediately closed.

9.4 Sliding watertight doors fitted between bunkers in the between-decks below the bulkhead deck may sometimes be open at sea for the purpose of trimming coal. The opening and closing of these doors shall be recorded in such log book as may be prescribed by the Administration.

10.1 If the Administration is satisfied that such doors are essential, watertight doors of satisfactory construction may be fitted in watertight bulkheads dividing cargo between deck spaces. Such doors may be hinged, rolling or sliding doors but shall not be remotely controlled. They shall be fitted at the highest level and as far from the shell plating as practicable, but in no case shall the outboard vertical edges be situated at a distance from the shell plating which is less than one fifth of the breadth of the ship, as defined in regulation 2, such distance being measured at right angles to the centreline at the level of the deepest subdivision load line.

10.2 Such doors shall be closed before the voyage commences and shall be kept closed during navigation; the time of opening such doors in port and of closing them before the ship leaves port shall be entered in the log book. Should any of the doors be accessible during the voyage, they shall be fitted with a device which prevents unauthorized opening. When it is proposed to fit such doors, the number and arrangements shall receive the special consideration of the Administration.

11 Portable plates on bulkheads shall not be permitted except in machinery spaces. Such plates shall always be in place before the ship leaves port, and shall not be removed during navigation except in case of urgent necessity at the discretion of the master. The times of removal and replacement of any such portable plates shall be recorded in the log book, and the necessary precautions shall be taken in replacing them to ensure that the joints are

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watertight. The Administration may permit not more than one power-operated sliding watertight door in each main transverse bulkhead larger than those specified in paragraph 7.1.2 to be substituted for these portable plates, provided these doors are closed before the ship leaves port and remain closed during navigation except in case of urgent necessity at the discretion of the master. These doors need not meet the requirements of paragraph 7.1.4 regarding complete closure by hand-operated gear in 90 seconds. The time of opening and closing these doors, whether the ship is at sea or in port, shall be recorded in the log book.

12.1 Where trunkways or tunnels for access from crew accommodation to the stokehold, for piping, or for any other purpose are carried through main transverse watertight bulkheads, they shall be watertight and in accordance with the requirements of regulation 19. The access to at least one end of each such tunnel or trunkway, if used as a passage at sea, shall be through a trunk extending watertight to a height sufficient to permit access above the margin line. The access to the other end of the trunkway or tunnel may be through a watertight door of the type required by its location in the ship. Such trunkways or tunnels shall not extend through the first subdivision bulkhead abaft the collision bulkhead.

12.2 Where it is proposed to fit tunnels piercing main transverse watertight bulkheads, these shall receive the special consideration of the Administration.

12.3 Where trunkways in connection with refrigerated cargo and ventilation or forced draught trunks are carried through more than one watertight bulkhead, the means of closure at such openings shall be operated by power and be capable of being closed from a central position situated above the bulkhead deck".

Regulation 16

Passenger ships carrying goods vehicles and accompanying personnel

The reference to "regulation 15.12" in paragraph 2 is replaced by reference to "regulation 15.10".

Regulation 21

Bilge pumping arrangements

The following text is inserted after the heading:

"(Paragraphs 1.6 and 2.9 of this regulation apply to ships constructed on or after 1 February 1992)".

The following new paragraph 1.6 is added after paragraph 1.5:

"1.6 Provisions shall be made for the drainage of enclosed cargo spaces situated on the bulkhead deck of a passenger ship and on the freeboard deck of a cargo ship, provided that the Administration may permit the means of drainage to be dispensed with in any particular compartment of any ship or class of ship if it is satisfied that by reason of size or internal subdivision of those spaces the safety of the ship is not thereby impaired.

1.6.1 Where the freeboard to the bulkhead deck or the freeboard deck, respectively, is such that the deck edge is immersed when the ship heels more than 5°, the drainage shall be by means of a sufficient number of scuppers of suitable size discharging directly overboard, fitted in accordance with the requirements of regulation 17 in the case of a passenger ship and the requirements for scuppers, inlets and discharges of the International Convention on Load Lines in force in the case of a cargo ship.

1.6.2 Where the freeboard is such that the edge of the bulkhead deck or the edge of the freeboard deck, respectively, is immersed when the ship heels 5° or less, the drainage of the enclosed cargo spaces on the bulkhead deck or on the freeboard deck, respectively, shall be led to a suitable space, or spaces, of adequate capacity, having a high water level alarm and provided with suitable arrangements for discharge overboard. In addition it shall be ensured that:

- .1 the number, size and disposition of the scuppers are such as to prevent unreasonable accumulation of free water;

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- .2 the pumping arrangements required by this regulation for passenger ships or cargo ships, as applicable, take account of the requirements for any fixed pressure water-spraying fire-extinguishing system;
- .3 water contaminated with petrol or other dangerous substances is not drained to machinery spaces or other spaces where sources of ignition may be present; and
- .4 where the enclosed cargo space is protected by a carbon dioxide fire-extinguishing system the deck scuppers are fitted with means to prevent the escape of the smothering gas".

The definition of "D" in paragraph 2.9 is replaced by the following:

"D is the moulded depth of the ship to the bulkhead deck (metres) provided that, in a ship having an enclosed cargo space on the bulkhead deck which is internally drained in accordance with the requirements of paragraph 1.6.2 and which extends for the full length of the ship, D shall be measured to the next deck above the bulkhead deck. Where the enclosed cargo spaces cover a lesser length, D shall be taken as the moulded depth to the bulkhead deck plus lh/L where l and h are the aggregate length and height respectively of the enclosed cargo spaces (metres)".

Regulation 23-1

The following new regulation 23-1 is added after regulation 23:

"Damage control in dry cargo ships

(This regulation applies to ships constructed on or after 1 February 1992)

1 There shall be permanently exhibited or readily available on the navigating bridge, for the guidance of the officer in charge of the ship, a plan showing clearly for each deck and hold the boundaries of the watertight compartments, the openings therein with the means of closure and position of any controls thereof, and the arrangements for the correction of any list due to flooding. In addition, booklets containing the aforementioned information shall be made available to the officers of the ship.

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2 Indicators shall be provided for all sliding doors and for hinged doors in watertight bulkheads. Indication showing whether the doors are open or closed shall be given on the navigating bridge. In addition, shell doors and other openings which, in the opinion of the Administration, could lead to major flooding if left open or not properly secured, shall be provided with such indicators.

3.1 General precautions shall consist of a listing of equipment, conditions and operational procedures, considered by the Administration to be necessary to maintain watertight integrity under normal ship operations.

3.2 Specific precautions shall consist of a listing of elements (i.e. closures, security of cargo, sounding of alarms, etc.) considered by the Administration to be vital to the survival of the ship and its crew".

Regulation 42

Emergency sources of electrical power in passenger ships

The following text is inserted after the heading:

"(Paragraphs 2.6.1 and 4.2 of this regulation apply to ships constructed on or after 1 February 1992)".

The second sentence in paragraph 2.6.1 is deleted.

The existing text of paragraph 4.2 is replaced by the following:

"4.2 Power to operate the watertight doors, as required by regulation 15.7.3.3, but not necessarily all of them simultaneously, unless an independent temporary source of stored energy is provided. Power to the control, indication and alarm circuits as required by regulation 15.7.2 for half an hour".

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CHAPTER II-2

CONSTRUCTION - FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

Regulation 4

Fire pumps, fire mains, hydrants and hoses

The following text is inserted after the heading:

"(Paragraph 3.3.2.5 of this regulation applies to ships constructed on or after 1 February 1992)".

The existing text of paragraph 3.3.2.5 is replaced by the following:

"2.5 The total suction head and the net positive suction head of the pump shall be such that the requirements of paragraphs 3.3.2, 3.3.2.1, 3.3.2.2 and 4.2 of this regulation shall be obtained under all conditions of list, trim, roll and pitch likely to be encountered in service".

In paragraph 7.1 between "of" and "material" in the first line the word "non-perishable" is inserted.

In paragraph 7.1, the following new sentence is inserted after the first sentence:

"Fire hoses of non-perishable material shall be provided in ships constructed on or after 1 February 1992, and on ships constructed before 1 February 1992 when the existing fire hoses are replaced".

Regulation 13-1

The following new regulation 13-1 is added after regulation 13:

"Sample extraction smoke detection systems

(This regulation applies to ships constructed on or after 1 February 1992)

1 General requirements

1.1 Wherever in the text of this regulation the word "system" appears, it shall mean "sample extraction smoke detection system".

1.2 Any required system shall be capable of continuous operation at all times except that systems operating on a sequential scanning principle may be accepted, provided that the interval between scanning the same position twice gives an overall response time to the satisfaction of the Administration.

1.3 Power supplies necessary for the operation of the system shall be monitored for loss of power. Any loss of power shall initiate a visual and audible signal at the control panel and the navigating bridge which shall be distinct from a signal indicating smoke detection.

1.4 An alternative power supply for the electrical equipment used in the operation of the system shall be provided.

1.5 The control panel shall be located on the navigating bridge or in the main fire control station.

1.6 The detection of smoke or other products of combustion shall initiate a visual and audible signal at the control panel and the navigating bridge.

1.7 Clear information shall be displayed on or adjacent to the control panel designating the spaces covered.

1.8 The sampling pipe arrangements shall be such that the location of the fire can be readily identified.

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1.9 Suitable instructions and component spares shall be provided for the testing and maintenance of the system.

1.10 The functioning of the system shall be periodically tested to the satisfaction of the Administration. The system shall be of a type that can be tested for correct operation and restored to normal surveillance without the renewal of any component.

1.11 The system shall be designed, constructed and installed so as to prevent the leakage of any toxic or flammable substances or fire-extinguishing media into any accommodation and service space, control station or machinery space.

2 Installation requirements

2.1 At least one smoke accumulator shall be located in every enclosed space for which smoke detection is required. However, where a space is designed to carry oil or refrigerated cargo alternatively with cargoes for which a smoke sampling system is required, means may be provided to isolate the smoke accumulators in such compartments for the system. Such means shall be to the satisfaction of the Administration.

2.2 Smoke accumulators shall be located for optimum performance and shall be spaced so that no part of the overhead deck area is more than 12 m measured horizontally from an accumulator. Where systems are used in spaces which may be mechanically ventilated, the position of the smoke accumulators shall be considered having regard to the effects of ventilation.

2.3 Smoke accumulators shall be positioned where impact or physical damage is unlikely to occur.

2.4 Not more than four accumulators shall be connected to each sampling point.

2.5 Smoke accumulators from more than one enclosed space shall not be connected to the same sampling point.

2.6 Sampling pipes shall be self-draining and suitably protected from impact or damage from cargo working.

3 Design requirements

3.1 The system and equipment shall be suitably designed to withstand supply voltage variations and transients, ambient temperature changes, vibration, humidity, shock, impact and corrosion normally encountered in ships and to avoid the possibility of ignition of flammable gas air mixture.

3.2 The sensing unit shall be certified to operate before the smoke density within the sensing chamber exceeds 6.65% obscuration per metre.

3.3 Duplicate sample extraction fans shall be provided. The fans shall be of sufficient capacity to operate with the normal conditions or ventilation in the protected area and shall give an overall response time to the satisfaction of the Administration.

3.4 The control panel shall permit observation of smoke in the individual sampling pipe.

3.5 Means shall be provided to monitor the airflow through the sampling pipes so designed as to ensure that as far as practicable equal quantities are extracted from each interconnected accumulator.

3.6 Sampling pipes shall be a minimum of 12 mm internal diameter except when used in conjunction with fixed gas fire-extinguishing systems when the minimum size of pipe should be sufficient to permit the fire-extinguishing gas to be discharged within the appropriate time.

3.7 Sampling pipes shall be provided with an arrangement for periodically purging with compressed air".

Regulation 15

Arrangements for oil fuel, lubricating oil and other flammable oils

The following text is inserted after the heading:

"(Paragraphs 2.6 and 3 of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of paragraph 2.6 is replaced by the following:

".6 Safe and efficient means of ascertaining the amount of oil fuel contained in any oil fuel tank shall be provided.

.6.1 Where sounding pipes are used, they shall not terminate in any space where the risk of ignition of spillage from the sounding pipe might arise. In particular, they shall not terminate in passenger or crew spaces. As a general rule, they shall not terminate in machinery spaces. However, where the Administration considers that these latter requirements are impracticable, it may permit termination of sounding pipes in machinery spaces on condition that all the following requirements are met:

.6.1.1 in addition, an oil-level gauge is provided meeting the requirements of subparagraph .6.2;

.6.1.2 the sounding pipes terminate in locations remote from ignition hazards unless precautions are taken such as the fitting of effective screens to prevent the oil fuel in the case of spillage through the terminations of the sounding pipes from coming into contact with a source of ignition;

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- .6.1.3 the termination of sounding pipes are fitted with self-closing blanking devices and with a small-diameter self-closing control cock located below the blanking device for the purpose of ascertaining before the blanking device is opened that oil fuel is not present. Provision shall be made so as to ensure that any spillage of oil fuel through the control cock involves no ignition hazard.

- .6.2 Other oil-level gauges may be used in place of sounding pipes. Such means, like the means provided in subparagraph .6.1.1, are subject to the following conditions:
 - .6.2.1 in passenger ships, such means shall not require penetration below the top of the tank and their failure or overfilling of the tanks shall not permit release of fuel;

 - .6.2.2 in cargo ships, the failure of such means or overfilling of the tank shall not permit release of fuel into the space. The use of cylindrical gauge glasses is prohibited. The Administration may permit the use of oil-level gauges with flat glasses and self-closing valves between the gauges and fuel tanks.

- 6.3 Means prescribed in .6.2.1 or .6.2.2 which are acceptable to the Administration shall be maintained in the proper condition to ensure their continued accurate functioning in service".

The existing text of paragraph 3 is replaced by the following:

"3 The arrangements for the storage, distribution and utilization of oil used in pressure lubrication systems shall be such as to ensure the safety of the ship and persons on board. The arrangements made in machinery spaces of category A, and whenever practicable in other machinery spaces, shall at least comply with the provisions of paragraphs 2.1, 2.4, 2.5, 2.6, 2.7 and 2.8, except that:

- .1 this does not preclude the use of sight-flow glasses in lubricating systems provided that they are shown by test to have a suitable degree of fire resistance;

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- .2 sounding pipes may be authorized in machinery spaces; the requirements of paragraphs 2.6.1.1 and 2.6.1.3 need not be applied on condition that the sounding pipes are fitted with appropriate means of closure".

Regulation 18

Miscellaneous items

The following text is inserted after the heading:

"(Paragraphs 2.4 and 8 of this regulation apply to ships constructed on or after 1 February 1992. Paragraph 7 of this regulation applies to all ships)".

The following new paragraph 2.4 is added after paragraph 2.3:

"2.4 For the protection of cargo tanks carrying crude oil and petroleum products having a flashpoint not exceeding 60°C, materials readily rendered ineffective by heat shall not be used for valves, fittings, tank opening covers, cargo vent piping, and cargo piping so as to prevent the spread of fire to the cargo".

The following new paragraphs 7 and 8 are added after paragraph 6:

"7 Paint lockers and flammable liquid lockers shall be protected by an appropriate fire-extinguishing arrangement approved by the Administration.

8 Helicopter decks shall be of a steel or steel equivalent fire-resistant construction. If the space below the helicopter deck is a high fire risk space, the insulation standard shall be to the satisfaction of the Administration. Each helicopter facility shall have an operations manual, including a description and a checklist of safety precautions, procedures, and equipment requirements. If the Administration permits aluminium or other low melting metal construction that is not made equivalent to steel, the following provisions shall be satisfied:

- .1 If the platform is cantilevered over the side of the ship, after each fire on the ship or on the platform, the platform shall undergo a structural analysis to determine its suitability for further use.
- .2 If the platform is located above the ship's deckhouse or similar structure, the following conditions shall be satisfied:
 - .2.1 the deckhouse top and bulkheads under the platform shall have no openings;
 - .2.2 all windows under the platform shall be provided with steel shutters;
 - .2.3 the required fire-fighting equipment shall be to the satisfaction of the Administration;
 - .2.4 after each fire on the platform or in close proximity, the platform shall undergo a structural analysis to determine its suitability for further use".

Regulation 26

Fire integrity of bulkheads and decks in ships
carrying more than 36 passengers

The following text is inserted after the heading:

"(Paragraphs 2.2(7) and 2.2(13) of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of the third sentence in paragraph 2.2(7) is replaced by the following:

"Isolated lockers and small store-rooms in accommodation spaces having areas less than 4 m² (in which flammable liquids are not stowed)".

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The following sentence is added at the end of paragraph 2.2(13):

"Lockers and store-rooms having areas greater than 4 m², other than those spaces that have provisions for the storage of flammable liquids".

Regulation 27

Fire integrity of bulkheads and decks in ships
carrying not more than 36 passengers

The following text is inserted after the heading:

"(Paragraph 2.(5) and 2.(9) of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of paragraphs 2.(5) and 2.(9) are replaced by the following:

"(5) Service spaces (low risk)

Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m² and drying rooms and laundries".

"(9) Service spaces (high risk)

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces".

Regulation 38

Protection of cargo spaces, other than special category
spaces, intended for the carriage of motor vehicles
with fuel in their tanks for their own propulsion

The following text is inserted after the heading:

"(Paragraph 1 of this regulation applies to ships constructed on or after 1 February 1992)".

The existing text of paragraph 1 is replaced by the following:

"1 Fixed Fire Detection

There shall be provided a fixed fire detection and fire alarm system complying with the requirements of regulation 13 or a sample extraction smoke detection system complying with the requirements of regulation 13-1. The design and arrangements of this system shall be considered in conjunction with the ventilation requirements referred to in paragraph 3".

Regulation 40

Fire patrols, detection, alarms and public address systems

The following text is inserted after the heading:

"(Paragraph 2 of this regulation applies to ships constructed on or after 1 February 1992)".

The existing text of paragraph 2 is replaced by the following:

"2 A fixed fire detection and fire alarm system complying with the requirements of regulation 13 or a sample extraction smoke detection system complying with the requirements of regulation 13-1 shall be provided in any cargo space which, in the opinion of the Administration, is not accessible, except where it is shown to the satisfaction of the Administration that the ship is engaged on voyages of such short duration that it would be unreasonable to apply this requirement".

Regulation 44

Fire integrity of bulkheads and decks

The following text is inserted after the heading:

"(Paragraphs 2.(5) and 2.(9) of this regulation apply to ships constructed on or after 1 February 1992)".

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The existing text of paragraphs 2.(5) and 2.(9) is replaced by the following:

"(5) Service spaces (low risk)

Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m^2 and drying rooms and laundries".

"(9) Service spaces (high risk)

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 4 m^2 or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces".

Regulation 50

Details of construction

The following text is inserted after the heading:

"(Paragraphs 3.2 and 3.3 of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of paragraph 3.2 is replaced by the following:

"3.2 Where non-combustible bulkheads, linings and ceilings are fitted in accommodation and service spaces they may have a combustible veneer with a calorific value not exceeding 45 MJ/m^2 of the area for the thickness used".

The following new paragraph 3.3 is added after paragraph 3.2:

"3.3 The total volume of combustible facings, mouldings, decorations and veneers in any accommodation and service space bounded by non-combustible bulkheads, ceilings and linings shall not exceed a volume equivalent to a 2.5 mm veneer on the combined area of the walls and ceilings".

The existing paragraph 3.3 is renumbered paragraph 3.4.

Regulation 53

Fire protection arrangements in cargo spaces

The following text is inserted after the heading:

(Paragraphs 2.1 and 3 of this regulation apply to ships constructed on or after 1 February 1992)".

In paragraph 1.2 the word "and" between "timber" and "non-combustible" in the third line is replaced by ",".

An asterisk is added at the end of paragraph 1.2 and the following text of a footnote is inserted:

"* Reference is made to the Code of Safe Practice for Solid Bulk Cargoes - Emergency Schedule B14, entry for coal".

The existing text of paragraph 2.1 is replaced by the following:

"2.1 There shall be provided a fixed fire detection and fire alarm system complying with the requirements of regulation 13. The fixed fire detection system shall be capable of rapidly detecting the onset of fire. The type of detectors and their spacing and location shall be to the satisfaction of the Administration taking into account the effects of ventilation and other relevant factors. After being installed, the system shall be tested under normal ventilation conditions and shall give an overall response time to the satisfaction of the Administration".

The existing text of paragraph 3 is replaced by the following:

"3 Cargo spaces, other than ro-ro cargo spaces, intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion

Cargo spaces, other than ro-ro spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion shall comply with the requirements of paragraph 2 except that in lieu of the requirements of

paragraph 2.1 a sample extraction smoke detection system complying with the requirements of regulation 13-1 may be permitted and paragraph 2.2.4 need not be complied with".

Regulation 54

Special requirements for ships carrying dangerous goods

The following text is inserted after the heading:

"(Paragraph 2.3 of this regulation applies to ships constructed on or after 1 February 1992)".

The existing text of paragraph 1.1 and footnote is replaced by the following:

"1.1 In addition to complying with the requirements of regulation 53 for cargo ships and with the requirements of regulations 37*, 38 and 39 for passenger ships as appropriate, ship-types and cargo spaces, referred to in paragraph 1.2, intended for the carriage of dangerous goods shall comply with the requirements of this regulation, as appropriate, except when carrying dangerous goods in limited quantities** unless such requirements have already been met by compliance with the requirements elsewhere in this chapter. The types of ships and modes of carriage of dangerous goods are referred to in paragraph 1.2 and in table 54.1, where the numbers appearing in paragraph 1.2 are referred to in the top line. Cargo ships of less than 500 tons gross tonnage constructed on or after 1 February 1992 shall comply with this regulation, but Administrations may reduce the requirements and such reduced requirements shall be recorded in the document of compliance referred to in paragraph 3.

* Reference is made to section 17 of the General Introduction to the International Maritime Dangerous Goods Code (IMDG Code) for operational measures in association with the requirements of this regulation.

** Reference is made to section 18 of the General Introduction to the International Maritime Dangerous Goods Code (IMDG Code) for a definition of the term 'limited quantities'".

The existing text of paragraph 2.3 is replaced by the following:

"2.3 Detection system

Ro-ro cargo spaces shall be fitted with a fixed fire detection and fire alarm system complying with the requirements of regulation 13. All other types of cargo spaces shall be fitted with either a fixed fire detection and fire alarm system complying with the requirements of regulation 13 or a sample extraction smoke detection system complying with the requirements of regulation 13-1. If a sample extraction smoke detection system is fitted, particular attention shall be made to regulation 13-1.1.11 in order to prevent the leakage of toxic fumes into occupied areas".

Regulation 55

Application

The existing text of paragraph 5 is replaced by the following:

"5 The requirements for inert gas systems of regulation 60 need not be applied to:

- .1 chemical tankers constructed before, on or after 1 July 1986 when carrying cargoes described in paragraph 1, provided that they comply with the requirements for inert gas systems on chemical tankers developed by the Organization*; or
- .2 chemical tankers constructed before 1 July 1986, when carrying crude oil or petroleum products, provided that they comply with the requirements for inert gas systems on chemical tankers carrying petroleum products developed by the Organization**; or
- .3 gas carriers constructed before, on or after 1 July 1986 when carrying cargoes described in paragraph 1, provided that they are fitted with cargo tank inerting arrangements equivalent to those specified in paragraph 5.1 or 5.2; or

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- .4 chemical tankers and gas carriers when carrying flammable cargoes other than crude oil or petroleum products such as cargoes listed in chapters VI and VII of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk or chapters 17 and 18 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk:
- .4.1 if constructed before 1 July 1986; or
- .4.2 if constructed on or after 1 July 1986, provided that the capacity of tanks used for their carriage does not exceed 3,000 m³ and the individual nozzle capacities of tank washing machines do not exceed 17.5 m³/h and the total combined throughput from the number of machines in use in a cargo tank at any one time does not exceed 110 m³/h.

* Reference is made to Regulation for Inert Gas Systems on Chemical Tankers adopted by the Organization by resolution A.567(14).

** Reference is made to Interim Regulation for Inert Gas Systems on Chemical Tankers Carrying Petroleum Products, adopted by the Organization by resolution A.473(XII)".

Regulation 56

Location and separation of spaces

The existing text of this regulation is replaced by the following:

"(This regulation applies to ships constructed on or after 1 February 1992)

1 Machinery spaces shall be positioned aft of cargo tanks and slop tanks; they shall also be situated aft of cargo pump-rooms and cofferdams, but not necessarily aft of the oil fuel bunker tanks. Any machinery space shall be

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isolated from cargo tanks and slop tanks by cofferdams, cargo pump-rooms, oil fuel bunker tanks or ballast tanks. Pump-rooms containing pumps and their accessories for ballasting those spaces situated adjacent to cargo tanks and slop tanks and pumps for oil fuel transfer shall be considered as equivalent to a cargo pump-room within the context of this regulation, provided that such pump-rooms have the same safety standard as that required for cargo pump-rooms. However, the lower portion of the pump-room may be recessed into machinery spaces of category A to accommodate pumps, provided that the deck head of the recess is in general not more than one third of the moulded depth above the keel, except that in the case of ships of not more than 25,000 tonnes deadweight, where it can be demonstrated that for reasons of access and satisfactory piping arrangements this is impracticable, the Administration may permit a recess in excess of such height, but not exceeding one half of the moulded depth above the keel.

2 Accommodation spaces, main cargo control stations, control stations and service spaces (excluding isolated cargo handling gear lockers) shall be positioned aft of all cargo tanks, slop tanks, and spaces which isolate cargo or slop tanks from machinery spaces but not necessarily aft of the oil fuel bunker tanks and ballast tanks, but shall be arranged in such a way that a single failure of a deck or bulkhead shall not permit the entry of gas or fumes from the cargo tanks into an accommodation space, main cargo control stations, control station, or service spaces. A recess provided in accordance with paragraph 1 need not be taken into account when the position of these spaces is being determined.

3 However, where deemed necessary, the Administration may permit accommodation spaces, main cargo control stations, control stations, and service spaces forward of the cargo tanks, slop tanks and spaces which isolate cargo and slop tanks from machinery spaces, but not necessarily forward of oil fuel bunker tanks or ballast tanks. Machinery spaces, other than those of category A, may be permitted forward of the cargo tanks and slop tanks provided they are isolated from the cargo tanks and slop tanks by cofferdams, cargo pump-rooms, oil fuel bunker tanks or ballast tanks. All of the above spaces shall be subject to an equivalent standard of safety and appropriate

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availability of fire-extinguishing arrangements being provided to the satisfaction of the Administration. Accommodation spaces, main cargo control spaces, control stations and service spaces shall be arranged in such a way that a single failure of a deck or bulkhead shall not permit the entry of gas or fumes from the cargo tanks into such spaces. In addition, where deemed necessary for the safety or navigation of the ship, the Administration may permit machinery spaces containing internal combustion machinery not being main propulsion machinery having an output greater than 375 kW to be located forward of the cargo area provided the arrangements are in accordance with the provisions of this paragraph.

4 In combination carriers only:

- .1 The slop tanks shall be surrounded by cofferdams except where the boundaries of the slop tanks where slop may be carried on dry cargo voyages are the hull, main cargo deck, cargo pump-room bulkhead or oil fuel bunker tank. These cofferdams shall not be open to a double bottom, pipe tunnel, pump-room or other enclosed space. Means shall be provided for filling the cofferdams with water and for draining them. Where the boundary of a slop tank is the cargo pump-room bulkhead the pump-room shall not be open to the double bottom, pipe tunnel or other enclosed space; however, openings provided with gastight bolted covers may be permitted.
- .2 Means shall be provided for isolating the piping connecting the pump-room with the slop tanks referred to in paragraph 4.1. The means of isolation shall consist of a valve followed by a spectacle flange or a spool piece with appropriate blank flanges. This arrangement shall be located adjacent to the slop tanks, but where this is unreasonable or impracticable, it may be located within the pump-room directly after the piping penetrates the bulkhead. A separate pumping and piping arrangement incorporating a manifold shall be provided for discharging the contents of the slop tanks directly to the open deck for disposal to shore reception facilities when the ship is in the dry cargo mode.

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- .3 Hatches and tank cleaning openings to slop tanks shall only be permitted on the open deck and shall be fitted with closing arrangements. Except where they consist of bolted plates with bolts at watertight spacing, these closing arrangements shall be provided with locking arrangements which shall be under the control of the responsible ship's officer.
- .4 Where cargo wing tanks are provided, cargo oil lines below deck shall be installed inside these tanks. However, the Administration may permit cargo oil lines to be placed in special ducts which shall be capable of being adequately cleaned and ventilated and be to the satisfaction of the Administration. Where cargo wing tanks are not provided cargo oil lines below deck shall be placed in special ducts.
- 5 Where the fitting of a navigation position above the cargo area is shown to be necessary, it shall be for navigation purposes only and it shall be separated from the cargo tank deck by means of an open space with a height of at least 2 m. The fire protection of such a navigation position shall in addition be as required for control spaces in regulation 58.1 and 58.2 and other provisions, as applicable, of this part.
- 6 Means shall be provided to keep deck spills away from the accommodation and service areas. This may be accomplished by provision of a permanent continuous coaming of a suitable height extending from side to side. Special consideration shall be given to the arrangements associated with stern loading.
- 7 Exterior boundaries of superstructures and deckhouses enclosing accommodation and including any overhanging decks which support such accommodation, shall be insulated to "A-60" standard for the whole of the portions which face the cargo area and on the outward sides for a distance of 3 m from the end boundary facing the cargo area. In the case of the sides of those superstructures and deckhouses, such insulation shall be carried as high as is deemed necessary by the Administration.
- 8.1 Except as permitted in paragraph 8.2 below, access doors, air inlets and openings to accommodation spaces, service spaces, control stations and machinery spaces shall not face the cargo area. They shall be located on the

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transverse bulkhead not facing the cargo area or on the outboard side of the superstructure or deckhouse at a distance of at least 4% of the length of the ship but not less than 3 m from the end of the superstructure or deckhouse facing the cargo area. This distance need not exceed 5 m.

8.2 The Administration may permit access doors in boundary bulkheads facing the cargo area or within the 5 m limits specified in paragraph 8.1, to main cargo control stations and to such service spaces as provision rooms, store rooms and lockers, provided they do not give access directly or indirectly, to any other space containing or provided for accommodation, control stations or service spaces such as galleys, pantries or workshops, or similar spaces containing sources of vapour ignition. The boundary of such a space shall be insulated to "A-60" standard, with the exception of the boundary facing the cargo area. Bolted plates for the removal of machinery may be fitted within the limits specified in paragraph 8.1. Wheelhouse doors and wheelhouse windows may be located within the limits specified in paragraph 8.1 so long as they are designed to ensure that the wheelhouse can be made rapidly and efficiently gas and vapour tight.

8.3 Windows and sidescuttles facing the cargo area and on the sides of the superstructures and deckhouses within the limits specified in paragraph 8.1 shall be of the fixed (non-opening) type. Such windows and sidescuttles in the first tier on the main deck shall be fitted with inside covers of steel or other equivalent material".

Regulation 58

Fire integrity of bulkheads and decks

The following text is inserted after the heading:

"(Paragraph 2.(5) and 2.(9) of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of paragraphs 2.(5) and 2.(9) is replaced by the following:

"(5) Service spaces (low risk)

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Lockers and store-rooms not having provision for the storage of flammable liquids and having areas less than 4 m² and drying rooms and laundries".

"(9) Service spaces (high risk)

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces".

Regulation 59

Venting, purging, gas-freeing and ventilation

The following text is inserted after the heading:

"(Paragraph 2 of this regulation applies to ships constructed on or after 1 February 1992)".

The existing text of paragraph 2 is replaced by the following:

"2 Cargo tank purging and/or gas-freeing*

Arrangements for purging and/or gas-freeing shall be such as to minimize the hazards due to the dispersal of flammable vapours in the atmosphere and to flammable mixtures in a cargo tank. Accordingly:

- .1 When the ship is provided with an inert gas system, the cargo tanks shall first be purged in accordance with the provisions of regulation 62.13 until the concentration of hydrocarbon vapours in the cargo tanks has been reduced to less than 2% by volume. Thereafter, gas-freeing may take place at the cargo tank deck level.
- .2 When the ship is not provided with an inert gas system, the operation shall be such that the flammable vapour is discharged initially:

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- .2.1 through the vent outlets as specified in paragraph 1.9; or
- .2.2 through outlets at least 2 m above the cargo tank deck level with a vertical efflux velocity of at least 30 m/sec maintained during the gas-freeing operation; or
- .2.3 through outlets at least 2 m above the cargo tank deck level with a vertical efflux velocity of at least 20 m/sec and which are protected by suitable devices to prevent the passage of flame.

When the flammable vapour concentration at the outlet has been reduced to 30% of the lower flammable limit, gas-freeing may thereafter be continued at cargo tank deck level.

* Reference is made to the Revised Standards for the Design, Testing and Locating of Devices to Prevent the Passage of Flame into Cargo Tanks in Tankers (MSC/Circ.373/Rev.1) and to Revised Factors to be taken into Consideration when Designing Cargo Tank Venting and Gas-Freeing Arrangements (MSC/Circ.450/Rev.1)".

Regulation 62

Inert gas systems

The following text is inserted after the heading:

"(Paragraphs 19.1 and 19.2 of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of the first line of paragraph 19.1 is replaced by the following:

"For inert gas systems of both the flue, gas type and the inert gas generator type, audible and visual alarms shall be provided to indicate:".

The existing text of the first three lines of paragraph 19.2 is replaced by the following:

"For inert gas systems of the inert gas generator type, additional visual and audible alarms shall be provided to indicate:".

CHAPTER III

LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Regulation 41

General requirements for lifeboats

The existing text of paragraph 8.18 is replaced by the following:

"One copy of the life-saving signals referred to in regulation V/16 on a waterproof card or in a waterproof container;"

Regulation 48

Launching and embarkation appliances

For the existing text of paragraph 1.4 "o" is replaced by "y" (Spanish text only).

CHAPTER IV

Regulation 13

Radiotelegraph installations for fitting in motor lifeboats

The existing title is replaced by "Radiotelegraph installations for lifeboats".

In paragraph (a), first line, the existing words "Regulation 14 of Chapter III" are replaced by "regulation III/6.2.2".

In paragraph (h), second line, the existing words "Regulation 14 of Chapter III" are replaced by "regulation III/41.8.29".

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Regulation 14

Portable radio apparatus for survival craft

In paragraph (a), first line, the existing words "Regulation 13 of Chapter III" are replaced by "regulation III/6.2.1".

CHAPTER V

SAFETY OF NAVIGATION

Regulation 3

Information required in danger messages

The reference to "Greenwich Mean Time" in subparagraph (a)(iii), (b)(ii) and (e)(i) is replaced by reference to "Universal Co-ordinated Time".

The references to "GMT" under "Examples" is replaced by "UTC".

Regulation 9

Misuse of distress signals

The existing text of this regulation is replaced by the following:

"The use of an international distress signal, except for the purpose of indicating that a ship, aircraft or person is in distress, and the use of any signal which may be confused with an international distress signal, are prohibited".

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Regulation 12

Shipborne navigational equipment

The existing text of paragraph (f) is replaced by the following:

"(f) Ships with emergency steering positions shall at least be provided with a telephone or other means of communication for relaying heading information to such positions. In addition, ships of 500 tons gross tonnage and upwards constructed on or after 1 February 1992, shall be provided with arrangements for supplying visual compass readings to the emergency steering position".

Regulation 13

Manning

The existing text of regulation V/13 is renumbered as paragraph (a).

The following new paragraph (b) is added:

"(b) Every ship to which chapter I of this Convention applies shall be provided with an appropriate safe manning document or equivalent issued by the Administration as evidence of the minimum safe manning considered necessary to comply with the provisions of paragraph (a)".

Regulation 16

Life-saving signals

The existing text of this regulation is replaced by the following:

"Life-saving signals* shall be used by life-saving stations, maritime rescue units and aircraft engaged in search and rescue operations when communicating with ships or persons in distress or to direct ships, and by ships or persons in distress when communicating with life-saving stations, maritime rescue units and aircraft engaged in search and rescue operations. An illustrated table describing the life-saving signals shall be readily available to the officer of the watch of every ship to which this chapter applies.

* Such life-saving signals are described in the Merchant Ship Search and Rescue Manual (MERSAR) (resolution A.229(VII), as amended), the IMO Search and Rescue Manual (IMOSAR) (resolution A.439(XI), as amended) and illustrated in the International Code of Signals as amended pursuant to resolution A.80(IV)".

CHAPTER VII

CARRIAGE OF DANGEROUS GOODS

Regulation 7

The existing text of regulation is replaced by the following:

"Explosives in passenger ships"

1 Explosives in division 1.4, compatibility group S may be carried in any amount in passenger ships. No other explosives may be carried except any one of the following:

- .1 explosive articles for life-saving purposes, if the total net explosives mass of such articles does not exceed 50 kg per ship; or

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- .2 explosives in compatibility groups C, D and E, if the total net explosives mass does not exceed 10 kg per ship; or
 - .3 explosive articles in compatibility group G other than those requiring special stowage, if the total net explosives mass does not exceed 10 kg per ship; or
 - .4 explosive articles in compatibility group B, if the total net explosives mass does not exceed 5 kg per ship.
- 2 Notwithstanding the provisions of paragraph 1, additional quantities or types of explosives may be carried in passenger ships in which special safety measures approved by the Administration are taken.

* Reference is made to class 1 of the International Maritime Dangerous Goods Code (IMDG Code)".

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6. Otras hipótesis

Una Administración o un Gobierno contratante en nombre de la Administración podrá autorizar a apartarse de los supuestos del presente Código en los casos en que lo consideren justificado, teniendo en cuenta las disposiciones relativas a la carga o a los medios estructurales, y a condición de que se satisfagan los criterios de estabilidad enunciados en A 7. Cuando se conceda la autorización prevista en la presente regla, los pormenores correspondientes figurarán en el documento de autorización o entre los datos de carga de grano.

Las presentes enmiendas entraron en vigor el 1 de enero de 1994, de conformidad con lo establecido en el artículo VIII, b), vii), 2), del Convenio.

Lo que se hace público para conocimiento general. Madrid, 13 de junio de 1994.—El Secretario general técnico, Antonio Bellver Manrique.

15124 ENMIENDAS al Convenio Internacional para la Seguridad de la Vida Humana en el Mar, 1974 (Londres 1 de noviembre de 1974), publicado en el «Boletín Oficial del Estado» del 16 al 18 de junio de 1980, aprobadas en 23 de mayo de 1991 por el Comité de Seguridad Marítima de la Organización Marítima Internacional en su 59 período de sesiones.

RESOLUCION MSC.22(59)
(Aprobada el 23 de mayo de 1991)

APROBACION DE ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974

El Comité de Seguridad Marítima.

Recordando el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

Tomando nota del artículo VIII b) del Convenio Internacional para la Seguridad de la Vida Humana en el Mar, 1974, en adelante llamado «el Convenio», artículo que trata de los procedimientos de enmienda al anexo del Convenio, no referida a las disposiciones del capítulo I,

Habiendo examinado en su 59 período de sesiones las enmiendas al Convenio propuestas o distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del mismo,

1. *Aprueba*, de conformidad con lo dispuesto en el artículo VIII b) vi) del Convenio, las enmiendas al Convenio cuyo texto constituye el anexo de la presente resolución;

2. *Decide* de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que las enmiendas se considerarán aceptadas el 1 de julio de 1993 a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio, o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 por 100 del tonelaje bruto de la 1.ª flota mercante mundial, hayan puesto objeciones a las enmiendas;

3. *Invitan* a los Gobiernos Contratantes a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de enero de 1994, una vez aceptadas de conformidad con lo dispuesto en el párrafo 2 *supra*;

4. *Pide* al Secretario General que de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, envíe copias certificadas de la presente resolución y del texto de las enmiendas que figuran en el anexo a todos los Gobiernos Contratantes del Convenio Internacional para la Seguridad de la Vida Humana en el Mar, 1974.

5. *Pide además* al Secretario General que envíe copias de la resolución a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

ANEXO

Enmiendas al Convenio Internacional para la Seguridad de la Vida Humana en el Mar, 1974, en su forma enmendada

CAPITULO II-2

Construcción-prevención, detección y extinción de incendios

Regla 20. Planos de lucha contra incendios.

El título actual se sustituye por el siguiente:

«Planos y ejercicios de lucha contra incendios.»

Después del título se intercala el texto siguiente:

«(Esta regla es aplicable a todos los buques).»

Después del párrafo 2 se añade el nuevo párrafo 3 siguiente:

«3. Los ejercicios de lucha contra incendios se realizarán de conformidad con lo dispuesto en la regla III/18.»

Regla 21. Disponibilidad inmediata de los dispositivos extintores de incendios.

Después del título se añade el texto siguiente:

«(Esta regla es aplicable a todos los buques).»

El texto actual de esta regla se sustituye por el siguiente:

«Los dispositivos de extinción de incendios se mantendrán en buen estado de funcionamiento y listos para su empleo inmediato en cualquier momento.»

Regla 28. Medios de evacuación.

Después del título se inserta el texto siguiente:

«(El párrafo 1.8 de esta regla es aplicable a los buques construidos el 1 de enero de 1994 o posteriormente).»

Se agrega el siguiente nuevo subpárrafo 1.8 a continuación del subpárrafo 1.7 existente.

«9. Cuando los espacios públicos abarquen tres o más cubiertas y contengan materiales combustibles como mobiliario, y espacios cerrados como tiendas, despachos y restaurantes, cada nivel del espacio tendrá dos medios de evacuación, uno de los cuales tendrá acceso directo a un medio de evacuación vertical cerrado que cumpla con las prescripciones del párrafo 5.»

Regla 32. Sistemas de ventilación.

Después del título se inserta el texto siguiente:

«(El párrafo 1.7 de esta regla es aplicable a los buques construidos el 1 de enero de 1994 o posteriormente.)»

Se inserta el nuevo párrafo 1.7 siguiente entre los párrafos 1.6 y 2 existentes:

«1.7 cuando los espacios públicos abarquen tres o más cubiertas expuestas y contengan materiales combustibles como mobiliario, y espacios cerrados como tiendas, despachos y restaurantes, estarán equipados con un sistema de extracción de humo. El sistema de extracción de humo será activado por el sistema de detección de humo prescrito y se podrá accionar manualmente. El tamaño de los ventiladores será tal que permita extraer todo el humo acumulado en el espacio en diez minutos como máximo.»

Regla 36. Sistemas fijos de detección de incendios y de alarma contraincendios. Sistemas automáticos de rociadores, de detección de incendios y de alarma contraincendios.

Después del título se inserta el texto siguiente:

«(El párrafo 2 es aplicable a los buques construidos el 1 de enero de 1994 o posteriormente.)»

El párrafo existente pasa a ser el párrafo 1, y se agrega a continuación el siguiente nuevo párrafo 2:

«2. Cuando los espacios públicos abarquen tres o más cubiertas expuestas y contengan materiales combustibles como mobiliario, y espacios cerrados como tiendas, despachos y restaurantes, toda la zona vertical principal que contenga el espacio estará protegida por un sistema automático de rociadores que cumpla con lo prescrito en la regla 12.»

Regla 40. Patrullas y sistemas de detección de incendios, alarma y altavoces.

Después del título se inserta el texto siguiente:

«(El párrafo 7 es aplicable a los buques construidos el 1 de enero de 1994 o posteriormente.)»

Se agrega el siguiente nuevo párrafo 7 a continuación del párrafo 6 existente:

«7. Cuando los espacios públicos abarquen tres o más cubiertas expuestas y contengan materiales combustibles como mobiliario y espacios cerrados como tiendas, despachos y restaurantes, toda la zona vertical principal que contenga el espacio estará protegida con un sistema de detección de humo que cumpla con lo prescrito en la regla 13, con excepción del párrafo 1.9.»

CAPITULO III**Dispositivos y medios de salvamento****Regla 18. Formación y ejercicios periódicos relativos al abandono del buque.**

El título y texto actuales de esta regla se sustituyen por lo siguiente:

«Formación y ejercicios periódicos para casos de emergencia.

1. Esta regla es aplicable a todos los buques.

2. Manuales. En cada comedor y local de recreo de la tripulación o en cada camarote de la tripulación habrá un manual de formación que cumpla con lo prescrito en la regla 5.1.

3. Llamadas y ejercicios periódicos:

3.1 Cada uno de los tripulantes participará al menos en un ejercicio de abandono del buque y en un ejercicio de lucha contra incendios todos los meses. Los ejercicios de la tripulación se realizarán dentro de las veinticuatro horas siguientes a la salida de un puerto, si más del 25 por 100 de los tripulantes no ha participado en ejercicio de abandono del buque y de lucha contra incendios a bordo del buque de que se trate durante un mes con anterioridad a esa salida. Para las clases de buques en que esto resulte imposible, la Administración podrán aceptar procedimientos que sean al menos equivalentes.

3.2 En un buque que realice un viaje internacional que no sea un viaje internacional corto, las llamadas a los pasajeros se efectuarán dentro de las veinticuatro horas siguiente al embarco. Se darán instrucciones a los pasajeros acerca de la utilización de los chalecos salvavidas y de cómo deben actuar en caso de emergencia. Si sólo embarca un número reducido de pasajeros en un puerto después de efectuada la llamada, bastará con que, en lugar de efectuar otra llamada, se señalen a la atención de estos pasajeros las instrucciones para casos de emergencia que figuran en las reglas 8.2 y 8.4.

3.3 En un buque que realice un viaje internacional corto, si al salir de puerto no se efectúa una llamada a los pasajeros, se señalarán a la atención de éstos las instrucciones para casos de emergencia que figuran en las reglas 8.2 y 8.4.

3.4 Cada ejercicio de abandono del buque comprenderá:

1. La convocación de los pasajeros y de la tripulación a los puestos de reunión por medio del sistema de alarma prescrito en la regla 6.4.2 y la comprobación de que quedan enterados de lo relativo a la orden de abandono del buque que figura en el cuadro de obligaciones.

2. La prestación en los puestos y la preparación para los cometidos indicados en el cuadro de obligaciones.

3. La comprobación de que los pasajeros y la tripulación llevan indumentaria adecuada.

4. La comprobación de que se han puesto correctamente los chalecos salvavidas.

5. El arriado al menos de un bote salvavidas tras los preparativos necesarios para la puesta a flote.

6. Las operaciones necesarias para poner en marcha y hacer funcionar el motor del bote salvavidas.

7. El accionamiento de los pescantes utilizados para poner a flote las balsas salvavidas.

3.5 Dentro de lo posible se arriarán, de conformidad con lo prescrito en el párrafo 3.4.5, botes salvavidas distintos en ejercicios sucesivos.

3.6 Cada uno de los botes salvavidas, llevando a bordo la dotación que tenga asignada, se pondrá a flote y maniobrará en el agua por lo menos una vez cada tres meses durante la realización de un

ejercicio de abandono del buque. La Administración podrá permitir a los buques que realicen viajes internacionales cortos, cuyos medios de atraque en puerto y cuyas modalidades de tráfico impidan poner a flote los botes salvavidas por una banda, que no pongan a flote los botes salvavidas por esa banda. No obstante, todos los botes salvavidas se arriarán por lo menos una vez cada tres meses y se pondrán a flote por lo menos una vez al año.

3.7 En la medida de lo razonable y posible, los botes de rescate que no sean botes salvavidas también utilizados como botes de rescates, se pondrán a flote todos los meses llevando a bordo la dotación que tengan asignada y se maniobrarán en el agua. En todo caso se dará cumplimiento a esta prescripción al menos una vez cada tres meses.

3.8 Si los ejercicios de puesta a flote de los botes salvavidas y botes de rescate se efectúan con el buque en movimiento, se hará esto, por los peligros que ello entraña, sólo en aguas abrigadas y bajo la supervisión de un oficial que tenga experiencia en tales ejercicios.

3.9 En todo ejercicio de abandono del buque se probará el alumbrado de emergencia necesario para realizar las reuniones y el abandono.

3.10 Cada ejercicio de lucha contra incendios comprenderá:

1. La reunión en los puestos pertinentes y la preparación para los cometidos indicados en el cuadro de obligaciones prescritos por la regla 8.3 para caso de incendio.

2. La puesta en marcha de una bomba contraincendios utilizando por lo menos los dos chorros de agua prescritos de modo que se vea que el sistema se encuentra en perfecto estado de funcionamiento.

3. La comprobación de los equipos de bombero y del resto del equipo individual de salvamento.

4. La comprobación del equipo de comunicaciones pertinente.

5. La comprobación del funcionamiento de las puertas estancas, de las puertas contraincendios.

6. La comprobación de los procedimientos necesarios para el abandono del buque.

3.11 Los ejercicios de lucha contra incendios se organizarán de forma que se tenga debidamente en cuenta el procedimiento habitual en los diversos casos de emergencia que puedan presentarse según el tipo de buque y la carga que transporte.

3.12 El equipo utilizado en los ejercicios se volverá inmediatamente a poner en condiciones operacionales y cualquier fallo o defecto descubierto durante el ejercicio se subsanará lo antes posible.

3.13 Los ejercicios de lucha contra incendios se realizarán, en la medida de lo posible, como si realmente se hubiese producido una emergencia.

4. Formación e instrucciones impartidas a bordo:

4.1 A todo nuevo tripulante se le darán formación e instrucciones a bordo lo antes posible y desde luego no más de dos semanas después de su incorporación al buque, respecto de la utilización de los dispositivos de salvamento del buque, incluido el equipo de las embarcaciones de supervivencia, y de los dispositivos de extinción de incendios. No obstante, si el tripulante se halla adscrito al buque en comisión de servicio según

el programa de turnos regulares, recibirá esa formación a más tardar dos semanas después de la fecha en que por primera vez se incorporó al buque. Podrán darse instrucciones por separado acerca de diferentes partes de los dispositivos de extinción de incendios del buque, pero en un plazo de dos meses se habrán dado instrucciones sobre todos ellos.

4.2 Todo tripulante recibirá instrucciones entre las que figurarán, sin que esta enumeración sea exhaustiva, las siguientes:

1. El manejo y la utilización de las balsas salvavidas inflables del buque.

2. Problemas planteados por la hipotermia, el tratamiento de primeros auxilios indicado en casos de hipotermia y otros procedimientos apropiados de administración de primeros auxilios.

3. Cualesquiera instrucciones especiales que se necesiten para utilizar los dispositivos de salvamento que lleve el buque con mal tiempo y mala mar.

4. El manejo y la utilización de los dispositivos de extinción de incendios.

4.3 A intervalos que no excedan de cuatro meses se impartirá formación en la utilización de balsas salvavidas de pescante, a bordo de todo buque provisto de tales pescantes. Siempre que sea posible, esto comprenderá el inflado y el arriado de una balsa salvavidas. Esta podrá ser una balsa especial, destinada únicamente a la formación, que no forme parte del equipo de salvamento del buque; dicha balsa especial habrá de estar claramente marcada.

5. Anotaciones.

Se notarán en el diario de navegación que prescriba la Administración las fechas en que se efectúen las llamadas y pormenores de los ejercicios de abandono del buque y de los de lucha contra incendios, de los ejercicios con otros dispositivos de salvamento y de la formación impartida a bordo. Si en el momento prefijado no se efectúa en su totalidad una llamada, un ejercicio o una sesión de formación, se hará contar esto en el diario de navegación, indicando las circunstancias que concurrieron y el alcance de la llamada, el ejercicio o la sesión de formación que se llevó a cabo.»

CAPITULO V

Seguridad de la navegación

Regla 17. *Escalas de práctico y escalas mecánicas de práctico.*

El título y texto actuales de esta regla se sustituyen por lo siguiente:

«Medios para el transbordo de prácticos.

a) Ambito de aplicación.

i) Los buques que realicen viajes en el curso de los cuales exista la posibilidad de que hayan de tomar práctico irán provistos de medios para efectuar el transbordo de prácticos.

ii) El equipo y los medios para el transbordo de prácticos que se instalen el 1 de enero de 1994 o posteriormente cumplirán con las prescripciones de la presente regla, y se tendrán debidamente

en cuenta las normas aprobadas por la Organización.

iii) El equipo y los medios para el transbordo de prácticos que haya instalados en los buques antes del 1 de enero de 1994 cumplirán al menos con las prescripciones de la regla 17 en vigor antes de esa fecha, y se tendrán debidamente en cuenta las normas aprobadas por la Organización antes de dicha fecha.

iv) El equipo y los medios que se repongan después del 1 de enero de 1994 cumplirán, siempre que sea razonable y factible, con las prescripciones de la presente regla.

b) Asuntos generales.

i) Todos los medios destinados a facilitar el transbordo de prácticos estarán concebidos de modo que éstos puedan embarcar y desembarcar con seguridad. Los dispositivos se conservarán limpios y correctamente estibados, siendo objeto del adecuado mantenimiento y de inspecciones regulares a fin de garantizar que se pueden utilizar en condiciones de seguridad. Los dispositivos se utilizarán exclusivamente para el embarco y desembarco de personal.

ii) La colocación de los medios para el transbordo del práctico y la maniobra de embarco y desembarco serán vigilados por un oficial del buque que disponga de medios de comunicación con el puente, quien dispondrá también lo necesario para acompañar al práctico sin riesgo desde el punto de acceso hasta el puente de navegación y viceversa. El personal que intervenga en la colocación y maniobra de cualquier equipo mecánico habrá sido adiestrado y deberá conocer las medidas de seguridad que quepa adoptar. El equipo será sometido a prueba antes de utilizarlo.

c) Medios para el transbordo.

i) Se dispondrán los medios necesarios para que el práctico pueda embarcar y desembarcar con seguridad por ambos costados del buque.

ii) En todos los buques en que la distancia desde el nivel del mar hasta el punto de acceso a los mismos o salida de éstos sea superior a 9 metros, y cuando se tenga el propósito de que los prácticos embarquen y desembarquen con la ayuda de una escala real, elevadores mecánicos de práctico u otro medio igualmente seguro y cómodo en combinación con una escala de práctico, se deberá llevar tal equipo en ambas bandas, a menos que éste pueda ser trasladado de una banda a la otra.

iii) Se habilitarán medios seguros y cómodos de acceso y salida del buque consistentes en:

1. Una escala de práctico, cuando no sea necesario trepar menos de 1,5 metros ni más de 9 metros desde la superficie del agua, colocada y fijada de modo que:

aa) Quede a resguardo de cualquier posible descarga del buque.

bb) Quede situada en la parte del buque en que los costados son paralelos y, en la medida de lo posible, dentro de la mitad central del buque.

cc) Cada peldaño esté asentado firmemente contra el costado del buque; cuando haya elementos estructurales del buque, tales como cintones, que impidan el cumplimiento de esta disposición, se habilitarán los medios necesarios para garantizar de manera satisfactoria a juicio de la Administra-

ción el embarco y desembarco de las personas en condiciones de seguridad.

dd) La escala, de un solo tramo, baste para alcanzar el agua desde el lugar de acceso o salida del buque, y se tomen las medidas necesarias para que esta condición se cumpla en cualquier estado de carga y asiento del buque y con una escora a la banda contraria de 15 °; los puntos de sujeción reforzados, los grilletes y los cabos de sujeción serán al menos tan resistentes como los cabos laterales.

2. Una escala real en combinación con la escala de práctico, u otro medio igualmente seguro y cómodo, siempre que la distancia desde el nivel del mar hasta el punto de acceso al buque sea superior a 9 metros. La escala real se emplazará orientada hacia popa. Cuando se utilice, su extremo inferior quedará firmemente apoyado contra el costado en la parte del buque en que los costados son paralelos y, en la medida de lo posible, dentro de la mitad central y alejado de toda descarga, o bien

3. Un elevador mecánico de práctico colocado de modo que quede en la parte del buque en que los costados son paralelos y, en la medida de lo posible, dentro de la mitad central y alejado de toda descarga.

d) Acceso a la cubierta del buque.

Se dispondrán los medios necesarios para garantizar el paso seguro, cómodo y expedito de toda persona que embarque o desembarque, entre la parte alta de la escala de práctico, la escala real u otro medio y la cubierta del buque. Cuando tal paso se efectúe a través de:

i) Una porta abierta en la barandilla o amurada, se colocarán asideros adecuados.

ii) Una escala de amurada, se fijarán dos candeleros rígidamente a la estructura del buque por su base o por un punto próximo a éste, y por un punto superior. La escala de amurada se afirmará al buque de modo seguro para impedir que se revire.

e) Portas del costado del buque.

Las portas del costado del buque utilizadas para el transbordo de prácticos no abrirán hacia fuera.

f) Elevador mecánico de práctico:

i) El elevador mecánico de práctico y su equipo auxiliar serán de un tipo aprobado por la Administración. Estará proyectado de modo que funcione como una escala móvil para izar y bajar a una persona por el costado del buque, o como una plataforma para izar y bajar a una o varias personas al costado del buque. Estará proyectado y construido de tal modo que asegure que el práctico puede embarcar y desembarcar, y pasar del elevador a la cubierta y viceversa, todo ello de manera segura. El acceso se efectuará directamente a través de una plataforma protegida eficazmente por un pasamanos.

ii) Se dispondrá de un equipo manual que permita bajar o recoger a la(s) persona(s) transportada(s) y se lo mantendrá listo para ser utilizado en caso de fallar la energía.

iii) El elevador se fijará con firmeza a la estructura del buque. El afirmado del elevador no se hará nunca solamente al pasamanos del buque. Para los elevadores de tipo portátil se colocarán a cada

banda del buque puntos de fijación adecuados y sólidamente aferrados.

iv) Si en la posición del elevador hay instalada una defensa, ésta se rebajará lo suficiente para que el elevador pueda operar contra el costado del buque.

v) Próxima al elevador se tendrá lista para uso inmediato una escala de práctico que permita el acceso a ella desde cualquier punto del recorrido del elevador. La escala de práctico habrá de poder alcanzar el agua desde su lugar de acceso al buque.

vi) En el costado del buque se indicará la posición en que se arriará el elevador.

vii) Para el elevador portátil se dispondrá un lugar de estiba adecuadamente protegido. Con tiempo muy frío, para evitar el riesgo de formación de hielo, sólo se instalará el elevador portátil cuando su utilización sea inminente.

g) Equipo conexo.

i) Se tendrá a mano y listo para su utilización inmediata para el transbordo de personas el siguiente equipo conexo:

1) Dos guardamancebos firmemente sujetos al buque, si lo pide el práctico, de diámetro no inferior a 28 milímetros.

2) Un aro salvavidas con una luz de encendido automático.

3) Una guía.

ii) Cuando lo exija el párrafo d), se colocarán candeleros y escalas de amurada.

h) Alumbrado.

Habrà alumbrado para iluminar los medios de transbordo en el costado, la parte de la cubierta por donde embarque o desembarque cualquier persona y los mandos del elevador mecánico del práctico.»

CAPITULO VI

El título y texto del capítulo VI se sustituyen por lo siguiente:

«TRANSPORTE DE CARGAS

PARTE A

Disposiciones generales

Regla 1. *Ambito de aplicación.*

1. El presente capítulo regirá el transporte de cargas (excepto líquidos y gases a granel y los aspectos del transporte ya tratados en otros capítulos) que, debido a los riesgos particulares que entrañan para los buques y las personas a bordo, puedan requerir precauciones especiales en todos los buques a los que se apliquen las presentes reglas y en los buques de carga de arqueo bruto inferior a 500 toneladas. Sin embargo, si la Administración considera que el viaje se efectúa en aguas abrigadas y en condiciones que hacen irrazonable o innecesaria la aplicación de cualquiera de las prescripciones que figuran en las partes A o B del presente capítulo, podrá adoptar otras medidas eficaces para garantizar la seguridad exigida respecto de los buques de carga de arqueo bruto inferior a 500 toneladas.

2. Como complemento de lo dispuesto en las partes A y B del presente capítulo, cada Gobierno Con

tratante se asegurará de que se facilita la información adecuada sobre las cargas y la estiba y sujeción de las mismas, especificando, en particular, las precauciones necesarias para el transporte sin riesgos de tales cargas.

Regla 2. *Información sobre la carga.*

1. El expedidor facilitará al capitán o a su representante información apropiada sobre la carga con tiempo suficiente antes del embarque para que puedan tomarse las precauciones necesarias para su estiba adecuada y su transporte sin riesgo. Tal información se confirmará por escrito y mediante los oportunos documentos de expedición antes de embarcar la carga en el buque.

2. La información sobre la carga deberá incluir:

1. En el caso de la carga general y de la transportada en unidades de carga, una descripción general de la carga, la masa bruta de la carga o de las unidades de carga y las propiedades especiales de la carga que sean pertinentes.

2. En el caso de las cargas a granel, datos relativos al factor de estiba de la carga, los procedimientos de enrasado y, si se trata de concentrados y otras cargas que puedan licuarse, información adicional en forma de un certificado del contenido de humedad de la carga y su límite de humedad admisible para el transporte.

3. En el caso de una carga a granel que no esté clasificada de conformidad con lo dispuesto en la regla VII/2, pero cuyas propiedades químicas puedan constituir un riesgo potencial, además de la información exigida en los subpárrafos procedentes, datos relativos a sus propiedades químicas.

3. Antes de embarcar unidades de carga a bordo de un buque, el expedidor se cerciorará de que la masa bruta de dichas unidades coincide con la masa bruta declarada en los documentos de embarque.

Regla 3. *Equipo analizador de oxígeno y detector de gas.*

1. Cuando se transporte a granel una carga que pueda emitir un gas tóxico o inflamable, o causar que se agote el oxígeno en el espacio de carga, se dispondrá un instrumento apropiado para medir la concentración de gas o de oxígeno en el aire, acompañado de instrucciones detalladas sobre el modo de utilizarlo. Dicho instrumento habrá de ser satisfactorio a juicio de la Administración.

2. La Administración tomara medidas para que las tripulaciones de los buques reciban formación sobre el uso de tales instrumentos.

Regla 4. *Utilización de plaguicidas en los buques.*

Se tomarán precauciones apropiadas de seguridad cuando se utilicen plaguicidas en los buques, especialmente si se trata de fumigar.

Regla 5. *Estiba y sujeción.*

1. La carga y las unidades de carga transportadas en cubierta o bajo cubierta se embarcarán, estibarán y sujetarán de modo apropiado para impedir en la medida de lo posible, durante todo el viaje que el buque y las personas a bordo sufran daños o corran riesgos y que la carga caiga al mar.

2. La carga transportada en unidades de carga irá arrumada y sujeta dentro de dichas unidades de modo apropiado para impedir durante todo el viaje

que el buque y las personas a bordo sufran daños o corran riesgos.

3. Se tomarán precauciones apropiadas durante el embarque y el transporte de cargas pesadas y de cargas de dimensiones anormales para garantizar que el buque no sufra daños estructurales y para mantener una estabilidad adecuada durante todo el viaje.

4. Se tomarán precauciones apropiadas durante el embarque y el transporte de unidades de carga en buques de transbordo rodado, especialmente con respecto a los medios de sujeción a bordo de tales buques y en las unidades de carga, y a la resistencia de los puntos y trincas de sujeción.

5. Una vez cargados, los contenedores no deberán exceder del peso bruto máximo indicado en la placa de aprobación relativa a la seguridad, prescrita en el Convenio sobre seguridad de los contenedores (CSC).

PARTE B

Disposiciones especiales aplicables a las cargas a granel que no sean grano

Regla 6. *Aceptabilidad para el embarque.*

1. Antes de embarcar carga a granel, el capitán deberá disponer de información completa sobre la estabilidad del buque y la distribución de la carga en las condiciones de carga normales. El método para facilitar esa información habrá de ser satisfactorio a juicio de la Administración.

2. Los concentrados u otras cargas que puedan licuarse sólo se aceptarán para el embarque cuando su contenido efectivo de humedad sea inferior a su límite de humedad admisible para el transporte. Sin embargo, podrán aceptarse para embarque concentrados y otras cargas que pueden licuarse aun cuando su contenido de humedad exceda del límite arriba indicado, a condición de que se tomen medidas de seguridad que garanticen, a juicio de la Administración, una estabilidad adecuada aunque se produzca corrimiento de la carga, y siempre que el buque tenga una integridad estructural adecuada.

3. Antes de embarcar carga a granel que no sea carga clasificada conforme a lo dispuesto en la regla VII/2, pero cuyas propiedades químicas puedan constituir un riesgo, se tomarán las precauciones necesarias para efectuar el transporte de dicha carga en condiciones de seguridad.

Regla 7. *Estiba de la carga a granel.*

1. Las cargas a granel se embarcarán y enrasarán de modo que queden aceptablemente niveladas, según sea preciso, hasta los límites del espacio de carga, a fin de reducir al mínimo riesgo de corrimiento y garantizar el mantenimiento de una estabilidad adecuada durante todo el viaje.

2. Cuando la carga a granel se transporte en entrepuente, se cerrarán las escotillas de éstos en los casos en que la información sobre la carga indique que la estructura del fondo estaría sometida a esfuerzos inaceptables si se dejasen abiertas. Se enrasará la carga de modo que quede aceptablemente nivelada y extendida de banda a banda o sujeta mediante divisiones longitudinales adicionales de resistencia suficiente. Se respetará el límite

de seguridad para el transporte de carga en los entrepuentes a fin de garantizar que la estructura de cubierta no quede sobrecargada.

PARTE C

Transporte de grano

Regla 8. *Definiciones.*

Salvo disposición expresa en otro sentido, a los efectos de la presente parte regirán las siguientes definiciones:

1. "Código internacional para el transporte de grano": El Código internacional para el transporte sin riesgos de grano a granel, aprobado por el Comité de Seguridad Marítima de la Organización mediante la resolución MSC. 23(59) y en la forma en que pueda ser enmendado por la Organización, a condición de que tales enmiendas sean aprobadas, puestas en vigor y llevadas a efecto de conformidad con lo dispuesto en el artículo VIII del presente Convenio acerca de los procedimientos de enmienda aplicables al anexo en lo no referente al capítulo I.

2. "Grano": término que comprende trigo, maíz, avena, centeno, cebada, arroz, legumbres secas, semillas y derivados correspondientes de características análogas a las del grano en estado natural.

Regla 9. *Prescripciones relativas a los buques de carga que transporten grano.*

1. Además de cualquier otra prescripción de las presentes reglas que resulte aplicable, todo buque de carga que transporte grano cumplirá con lo dispuesto en el Código internacional para el transporte de grano y tendrá el documento de autorización que se prescribe en ese Código. A los efectos de la presente regla, se considerará que las prescripciones del Código son obligatorias.

2. No se cargará grano en ningún buque que no tenga dicho documento de autorización hasta que el capitán demuestre a la Administración, o al Gobierno Contratante del puesto de carga en nombre de aquélla, que en las condiciones de carga propuestas el buque cumple con las prescripciones del Código internacional para el transporte de grano.»

CAPITULO VII

Transporte de mercancías peligrosas

Regla 5. *Documentos.*

El texto actual del párrafo 3 de esta regla se sustituye por los siguientes párrafos 3, 4 y 5:

«3. La persona responsable de la arrumazón de mercancías peligrosas en un contenedor o un vehículo de carretera facilitará un certificado firmado de arrumazón del contenedor o una declaración firmada de arrumazón del vehículo que haga constar que el cargamento de la unidad ha sido adecuadamente arrumado y afianzado y que se han cumplido todas las prescripciones aplicables de transporte. Tal certificado o declaración podrá combinarse con los documentos mencionados en el párrafo 2.

4. Cuando haya motivo fundado para sospechar que un contenedor o un vehículo de carretera en que vayan arrumadas mercancías peligrosas no se ajusta a lo dispuesto en los párrafos 2 ó 3, o cuando no se disponga de un certificado de arrumazón del contenedor o una declaración de arrumazón del

vehículo, no se aceptará para embarque dicho contenedor o vehículo.

5. Todo buque que transporte mercancías peligrosas llevará una lista o un manifiesto especial que, ajustándose a la clasificación establecida en la regla 2, indique las mercancías peligrosas embarcadas y el emplazamiento de éstas a bordo. En lugar de tal lista o manifiesto cabrá utilizar un plano detallado de estiba que especifique por clases todas las mercancías peligrosas embarcadas y su emplazamiento a bordo. Antes de la partida se entregará una copia de uno de estos documentos a la persona o la organización designada por la autoridad del Estado rector del puerto.»

Después de la regla 7 se intercala la nueva regla 7-1 siguiente:

«Regla 7-1. *Notificación de sucesos en que inter vengan mercancías peligrosas.*

1. Cuando se produzca un suceso que entrañe la pérdida efectiva o probable en el mar de mercancías peligrosas transportadas en bultos, el capitán o cualquier otra persona que esté al mando del buque notificará los pormenores de tal suceso, sin demora y con los mayores detalles posibles, al Estado ribereño más próximo. La notificación estará basada en las directrices y los principios generales aprobados por la Organización.

2. En caso de que el buque a que se hace referencia en el párrafo 1 sea abandonado, o en caso de que un informe procedente de ese buque esté incompleto o no pueda recibirse, el propietario, el fletador, el gestor naval o el armador del buque, o sus agentes, asumirán en la mayor medida posible las obligaciones que, con arreglo a lo dispuesto en esta regla, recaen en el capitán.»

Las presente Enmiendas entraron en vigor el 1 de enero de 1994, de conformidad con lo establecido en el artículo VIII b) vii) 2) del Convenio.

Lo que hace público para conocimiento general.

Madrid, 13 de junio de 1994.—El Secretario general técnico, Antonio Bellver Manrique.

MINISTERIO DE JUSTICIA E INTERIOR

15125 REAL DECRETO 1183/1994, de 3 de junio, por el que se crea un Registro Civil Consular en Andorra la Vella.

El artículo 67 del Reglamento del Registro Civil establece en su segundo párrafo una norma especial de competencia territorial en virtud de la cual la competencia del Registro Civil de La Seu d'Urgell se extiende, en cuanto a súbditos españoles, al territorio de Andorra. Esta regla singular obedecía al «status» especialísimo de este territorio, pero hoy no tiene razón de ser después de la aprobación de la nueva Constitución Andorrana, de la creación de una Embajada de España en el nuevo Estado y del establecimiento de una Oficina Consular, con categoría de Consulado General, en Andorra la Vella. En efecto, por imperativo del artículo 10.2 de la Ley

del Registro Civil, a este Consulado General deben corresponder las funciones propias de todo Registro Consular.

En su virtud, a propuesta del señor Ministro de Justicia e Interior, de acuerdo con el Consejo de Estado y previa deliberación del Consejo de Ministros en su reunión del día 3 de junio de 1994,

DISPONGO:

Artículo único.

Se crea un Registro Civil Consular en Andorra la Vella, a cargo del Cónsul general en esta ciudad.

Disposición derogatoria única.

Queda suprimido el párrafo segundo del artículo 67 del Reglamento del Registro Civil, aprobado por Decreto de 14 de noviembre de 1958.

Disposición final única.

El presente Real Decreto entrará en vigor el día 1 de septiembre de 1994.

Dado en Madrid a 3 de junio de 1994.

JUAN CARLOS R.

El Ministro de Justicia e Interior,
JUAN ALBERTO BELLOCH JULBE

MINISTERIO DE ECONOMIA Y HACIENDA

15126 ORDEN de 16 de junio de 1994 por la que se determinan los representantes de la Administración General del Estado en el Comité Interterritorial de Estadística.

La Ley 12/1989, de 9 de mayo, de la Función Estadística Pública establece que el Comité Interterritorial de Estadística estará integrado, entre otros, por el número de representantes de los servicios estadísticos de los departamentos ministeriales que reglamentariamente se determinen, disponiendo que éstos tendrán un número de votos igual al del conjunto de representantes de las Comunidades Autónomas.

Como consecuencia de lo dispuesto en el Real Decreto 907/1994, de 5 de mayo, de reestructuración de los departamentos ministeriales resulta necesario adecuar la composición del Comité Interterritorial de Estadística respecto a la representación de la Administración General del Estado.

Consecuentemente, y en virtud de lo establecido en el apartado 2 del artículo único del Real Decreto 264/1992, de 20 de marzo, por el que se modifica la disposición adicional del Real Decreto 1036/1990, de 27 de julio, relativa a la composición del Comité Interterritorial de Estadística, dispongo:

Primero.—A los efectos previstos en el artículo 42.1 de la Ley 12/1989 de 9 de mayo, de la Función Estadística Pública, serán representantes estatales en el Comité Interterritorial de Estadística los tres Directores generales del Instituto Nacional de Estadística, el Subdirector general de Coordinación y Planificación Esta-

I. Disposiciones generales

MINISTERIO DE ASUNTOS EXTERIORES

25578 *ENMIENDAS al Convenio Internacional para la Seguridad de la Vida Humana en el Mar, 1974 (Londres, 1 de noviembre de 1974, publicado en el «Boletín Oficial del Estado» del 16 al 18 de junio de 1980) aprobadas el 11 de diciembre de 1992 por el Comité de Seguridad Marítima de la Organización Marítima Internacional en su 61.º período de sesiones.*

RESOLUCION MSC.27(61)
(aprobada el 11 de diciembre de 1992)

Aprobación de Enmiendas al Convenio Internacional para la Seguridad de la Vida Humana en el Mar, 1974

El Comité de Seguridad Marítima,

Recordando el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional que trata de las funciones del Comité,

Recordando asimismo el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar, 1974, en adelante denominado «el Convenio», relativo al procedimiento para enmendar el Anexo del Convenio, salvo las disposiciones del capítulo I del mismo,

Habiendo examinado, en su 61.º período de sesiones, las enmiendas al Convenio propuestas y distribuidas de conformidad con el artículo VIII b) i) de éste,

1. Aprueba, de conformidad con el artículo VIII b) iv) del Convenio, las enmiendas al mismo, cuyos textos figuran en el anexo de la presente resolución;

2. Decide, de conformidad con el artículo VIII b) vi) 2) bb) del Convenio, que las enmiendas se considerarán aceptadas el 1 de abril de 1994, a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio, o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 por 100 del tonelaje bruto de la flota mercante mundial, haya manifestado objeciones acerca de las enmiendas;

3. Invita a los Gobiernos Contratantes a que tomen nota de que, de conformidad con el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de octubre de 1994, una vez que hayan sido aceptadas de acuerdo con el párrafo 2 *supra*;

4. Pide al Secretario General que, de conformidad con el artículo VIII b) v) del Convenio, envíe copias certificadas de la presente resolución y de los textos de las enmiendas que figuran en el anexo a todos los Gobiernos Contratantes del Convenio;

5. Pide además al Secretario General que envíe copias de la resolución a los Miembros de la Organización que no sean Gobiernos Contratantes del Convenio.

ANEXO

Enmiendas al Convenio Solas 1974

Acceso a los espacios situados en la zona de la carga de los petroleros.

1. Añádase el párrafo siguiente después del párrafo 11 de la regla II-1/2:

«12. Petrolero: según está definido en la regla 1 del Anexo I del Protocolo de 1978 relativo al Convenio internacional para prevenir la contaminación por los buques, 1973.»

2. Añádase una nueva regla II 1/12-2:

«Regla 12 2.

Acceso a los espacios situados en la zona de la carga de los petroleros.

1. Esta regla es aplicable a los petroleros construidos el 1 de octubre de 1994 o posteriormente.

2. El acceso a coferdanes, tanques de lastre, de carga u otros espacios situados en la zona de la carga será directo desde la cubierta expuesta, y estará dispuesto de tal modo que permita la inspección completa de los mismos. El acceso a los espacios del doble fondo podrá efectuarse a través de una cámara de bombas de carga, una cámara de bombas, un coferdán profundo, un túnel de tuberías o compartimientos análogos, siempre que se tengan en cuenta los aspectos de la ventilación.

3. Los accesos a través de aberturas, escotillas o registros horizontales tendrán dimensiones suficientes para que una persona provista de un aparato respiratorio autónomo y de equipo protector pueda subir o bajar por cualquier escala sin impedimento alguno, y también un hueco libre que permita izar fácilmente a una persona lesionada desde el fondo del espacio de que se trate. El hueco libre deberá ser como mínimo de 600 mm × 600 mm.

4. En los accesos a través de aberturas o registros verticales que permitan atravesar el espacio a lo largo y a lo ancho, el hueco libre deberá ser como mínimo de 600 mm × 800 mm, y estar a una altura de la chapa del forro del fondo, que no exceda de 600 mm, a menos que se hayan provisto teclas o apoyapiés de otro tipo.

5. En los petroleros de peso muerto inferior a 5.000 toneladas, la Administración podrá aprobar dimensiones menores en circunstancias especiales si se demuestra de forma satisfactoria a su juicio que es posible pasar por dichas aberturas o retirar una persona lesionada a través de ellas.»

Regla II-1/37. Comunicación entre el puente de navegación y el espacio de máquinas.

3. Numérese el párrafo existente como párrafo 1 y añádase el párrafo siguiente:

«2. En los buques construidos el 1 de octubre de 1994 o posteriormente se aplicarán las prescripciones siguientes en lugar de las disposiciones del párrafo 1:

Habrà por lo menos dos medios independientes para la transmisión de órdenes desde el puente de navegación hasta el puesto situado en el espacio de máquinas o en la cámara de mando de máquinas desde el cual se controlen normalmente la velocidad y dirección de empuje de las hélices: uno de ellos será un telégrafo de máquinas que indique visualmente las órdenes y respuestas tanto en la cámara de máquinas como en el puente de navegación. Se instalarán medios de comunicación adecuados entre el puente de navegación, la cámara de máquinas y cualquier otro puesto desde el cual se pueda controlar la velocidad o la dirección de empuje de las hélices.»

Regla II-1/42. Fuente de energía eléctrica de emergencia en los buques de pasaje.

4. Después del párrafo 3.2 de la regla II 1/42, insértese el párrafo siguiente:

«3.3. La siguiente disposición del párrafo 3.1.2 no será aplicable a los buques construidos el 1 de octubre de 1994 o posteriormente:

a menos que el grupo electrógeno de emergencia tenga un segundo dispositivo de arranque independiente, la fuente única de energía acumulada estará protegida de modo que no la pueda agotar completamente el sistema de arranque automático.»

Regla II-1/43. Fuente de energía eléctrica de emergencia en los buques de carga.

5. Después del párrafo 3.2 de la regla II 1/43, insértese el párrafo siguiente:

«3.3 La siguiente disposición del párrafo 3.1.2 no será aplicable a los buques construidos el 1 de octubre de 1994 o posteriormente:

a menos que el grupo electrógeno de emergencia tenga un segundo dispositivo de arranque independiente, la fuente única de energía acumulada estará protegida de modo que no la pueda agotar completamente el sistema de arranque automático.»

Regla II-1/44. Medios de arranque de los grupos electrógenos de emergencia.

6. Después del párrafo 2 de la regla II-1/44, insértese el párrafo siguiente:

«2.1 Los buques construidos el 1 de octubre de 1994 o posteriormente cumplirán con las prescripciones siguientes en lugar de las disposiciones de la segunda frase del párrafo 2:

La fuente de energía acumulada estará protegida de modo que el sistema de arranque automático no la pueda agotar hasta un punto crítico, a menos que se disponga de un segundo medio de arranque independiente. Además se proveerá una segunda fuente de energía que permita efectuar otros tres arranques en treinta minutos, a menos que se demuestre que el arranque por medios manuales es eficaz.»

Regla II-1/45. Precauciones contra descargas eléctricas, incendios de origen eléctrico y otros riesgos del mismo tipo.

7. Después del párrafo 3.2 de la regla II-1/45, insértese lo siguiente:

«3.2.1 En los buques construidos el 1 de octubre de 1994 o posteriormente, lo prescrito en el párrafo 3.1 no excluye la utilización de sistemas limitados y puestos a masa localmente, a condición de que cualquier posible corriente resultante no circule directamente por ninguno de los espacios peligrosos.»

8. Después del párrafo 4.2, insértese lo siguiente:

«4.3. Los buques construidos el 1 de octubre de 1994 o posteriormente cumplirán con las prescripciones siguientes en lugar de las disposiciones del párrafo 4.1:

1 salvo en los casos previstos en el párrafo 4.3.2, en los buques tanque no se utilizarán sistemas de distribución puestos a masa;

2 lo prescrito en el párrafo 4.1 no excluye la utilización de circuitos puestos a masa intrínsecamente seguros ni tampoco, según las condiciones aprobadas por la Administración, la utilización de los siguientes sistemas puestos a masa:

2.1 suministro de energía, circuitos de control y circuitos de los instrumentos en los casos en que por razones técnicas o de seguridad no sea posible utilizar un sistema no conectado a masa, a condición de que la corriente de retorno por el casco no sea superior a 5 amp., tanto en condiciones normales como de avería; o

2.2 sistemas limitados y localmente puestos a masa, a condición de que cualquier posible corriente resultante no circule directamente por ninguno de los espacios peligrosos; o

2.3 redes de energía de corriente alterna de un valor eficaz igual o superior a 1.000 V (entre fases), a condición de que cualquier posible corriente resultante no circule directamente por ninguno de los espacios peligrosos.»

Enmiendas al capítulo II 2 relativas a las prescripciones sobre prevención de incendios en los buques nuevos.

Regla II-2/1. Ambito de aplicación.

9. Modifíquese el párrafo 1 de modo que diga:

«1.1 Salvo disposición expresa en otro sentido las partes A, C y D del presente capítulo se aplicarán a todos los buques cuya quilla haya sido colocada, o cuya construcción se halle en una fase equivalente, el 1 de julio de 1986 o posteriormente, y la parte B del presente capítulo se aplicará a los buques cuya quilla haya sido colocada, o cuya construcción se halle en una fase equivalente, el 1 de octubre de 1994 o posteriormente.»

10. Añádase lo siguiente a la frase del actual párrafo 2:

«y respecto de los buques construidos antes del 1 de octubre de 1994, la Administración asegurará el cumplimiento de las prescripciones aplicables en virtud de la parte B del capítulo II-2 del Convenio internacional para la seguridad de la vida humana en el mar, 1-4, en su forma enmendada por las resoluciones MSC.1(XLV), MSC.6(48), MSC.13(57), MSC.22(59) y MSC.24(60).»

Regla II-2/3. Definiciones.**11. Añádase el nuevo párrafo 33 siguiente:**

«33. Respecto de los buques construidos el 1 de octubre de 1994 o posteriormente, en vez de la definición de zonas principales verticales que figura en el párrafo 9, se aplicará la definición siguiente:

Zonas verticales principales: aquellas en que quedan subdivididos el casco, las superestructuras y las casetas mediante divisiones de clase "A" cuya longitud y anchura medias no exceden en general, en ninguna cubierta, de 40 m.»

Dimensionamiento de los colectores y de las bombas contraincendios.**Regla II-2/4.4.2.****12. Después del párrafo 4.2, añádase lo siguiente:**

«4.2.1 Los buques de pasaje construidos el 1 de octubre de 1994 o posteriormente cumplirán con las prescripciones siguientes en lugar de las disposiciones del párrafo 4.2.

Cuando las dos bombas descarguen simultáneamente por las lanzas de manguera especificadas en el párrafo 8 y existan suficientes bocas contraincendios para suministrar el caudal de agua especificado en el párrafo 4.1, se mantendrán las siguientes presiones mínimas en todas las bocas contraincendios: 0,4 N/mm² en buques de arqueo bruto igual o superior a 4.000 toneladas, y 0,3 N/mm² en buques de arqueo bruto inferior a 4.000 toneladas.»

Regla II-2/4.3.3.3.**13. Después del párrafo 3.3.3, añádase lo siguiente:**

«3.3.3.1 En los buques construidos el 1 de octubre de 1994 o posteriormente el medio que además deberá haber de conformidad con lo dispuesto en el párrafo 3.3.3 será una bomba contraincendios motorizada de emergencia de accionamiento independiente y con su fuente de energía y conexión al mar situadas fuera del espacio de máquinas.»

Regla II-2/4.3.3.2.9.**14. Después del párrafo 3.3.2.8, añádase lo siguiente:**

«3.3.2.9 Los buques construidos el 1 de octubre de 1994 o posteriormente cumplirán con las prescripciones siguientes en lugar de las disposiciones del párrafo 3.3.2.6:

El espacio en que se halle dicha bomba contraincendios no estará contiguo a los mamparos límite de los espacios de máquinas de categoría A o de aquellos espacios en que se encuentren las bombas contraincendios principales. Cuando esto no sea factible, el mamparo común entre los dos espacios estará aislado de conformidad con unas normas de protección estructural contra incendios equivalentes a las prescritas en la regla 44 para los puestos de control.»

Mecanismo de descarga de CO₂.**15. Después del párrafo 2.4 de la regla II 2/5 se añaden los párrafos siguientes:**

«2.5 Los sistemas de dióxido de carbono que se instalen el 1 de octubre de 1994 o posteriormente cumplirán con las prescripciones siguientes:

1. Se instalarán dos mandos separados para la descarga de anhídrido carbónico en un espacio protegido y para garantizar la actividad de la alarma. Un mando se utilizará para descargar el gas de las botellas. El segundo mando se utilizará para abrir la válvula de las tuberías que conducen el gas hacia el espacio protegido.

2. Los dos mandos estarán situados dentro de una caja de descarga que indique claramente el espacio de que se trate. Si la caja que contiene los mandos debe estar cerrada con llave, ésta se dejará en un receptáculo con tapa de vidrio rompible, colocado de manera bien visible junto a la caja.»

Prohibición de instalar nuevos sistemas a base de halones.**16. Sustitúyase el párrafo 3.1 de la regla II-2/5 por el siguiente:**

«3.1 El empleo de hidrocarburos halogenados como agentes extintores de incendios sólo estará permitido en espacios de máquinas, cámaras de bombas y espacios de carga destinados exclusivamente al transporte de vehículos que no lleven ninguna carga. Se prohíbe instalar nuevos sistemas de hidrocarburos halogenados en todos los buques.»

Regla II-2/13. Sistemas fijos de selección de incendios y de alarma contraincendios.**17. Sustitúyase el párrafo 1.6 por el siguiente:**

«1.6 Los indicadores, como mínimo, señalarán la sección en que haya entrado en acción un detector o un puesto de llamada de accionamiento manual. Al menos un indicador estará situado de modo que sea fácilmente accesible en todo momento para los tripulantes responsables, bien en la mar, bien en puerto, salvo cuando el buque esté fuera de servicio. Habrá un indicador situado en el puente de navegación si el cuadro de control se encuentra en el puesto principal de control contraincendios.»

18. Sustitúyase el párrafo 1.8 por el siguiente:

«1.8 Cuando el sistema de detección de incendios no cuente con medios que permitan identificar individualmente por telemando cada detector, no se autorizará normalmente que ninguna sección que dé servicio a más de una cubierta esté instalada en espacios de alojamiento o de servicio ni en puestos de control, salvo cuando dicha sección comprenda una escalera cerrada. A fin de evitar retrasos en la identificación del foco del incendio, el número de espacios cerrados que comprenda cada sección estará limitado según determine la Administración. En ningún caso se autorizará que en una sección cualquiera haya más de 50 espacios cerrados. Si el sistema de detección está provisto de detectores de incendio que puedan identificarse individualmente por telemando, las secciones pueden abarcar varias cubiertas y dar servicio a cualquier número de espacios cerrados.»

19. Sustitúyase el párrafo 1.9 por el siguiente:

«1.9 En los buques de pasaje, cuando no haya un sistema de detección de incendios que permita identificar individualmente por telemando cada detector, ninguna sección de detectores dará servicio a espacios situados en ambas bandas ni en

más de una cubierta, ni tampoco estará instalada en más de una zona vertical principal. No obstante, la Administración podrá autorizar que una misma sección abarque ambas bandas y más de una cubierta si considera que con ello no disminuye la protección del buque contra los incendios. En los buques de pasaje provistos de detectores de incendios identificables individualmente, una misma sección puede dar servicio a espacios situados en ambas bandas y en varias cubiertas pero sin abarcar más de una zona vertical principal.»

20. Añádase el párrafo 1.15 siguiente:

«1.15 Los sistemas de detección de incendios con localización de la dirección de zona instalados el 1 de octubre de 1994 o posteriormente estarán dispuestos de modo que:

- un bucle no pueda ser dañado en más de un punto por un incendio;
- se provean medios que garanticen que cualquier avería (por ejemplo, fallo de energía, cortocircuito, puesta a tierra) que ocurra en un bucle no deja a todo el bucle fuera de servicio;
- dispongan de todas las medidas necesarias que permitan restablecer la configuración inicial del sistema en caso de fallo (eléctrico, electrónico, informático);
- la primera alarma contra incendios que se produzca no impida que otro detector inicie nuevas alarmas contra incendios.»

REGLA 20

Planos y ejercicios de lucha contra incendios

21. Añádase la nueva regla 20.4 siguiente:

«En los buques que transporten más de 36 pasajeros, los planos y folletos prescritos en esta regla contendrán la información sobre prevención, detección y extinción de incendios basada en las directrices elaboradas por la Organización.»

Regla II-2/24. Zonas verticales principales y zonas horizontales.

22. Modifíquese el párrafo 1.1 de modo que diga:

«1.1 En los buques que transporten más de 36 pasajeros, el casco, la superestructura y las casetas estarán subdivididos en zonas verticales principales por divisiones de clase A-60. Habrá el menor número posible de bayonetas y nichos, pero cuando éstos sean necesarios estarán también constituidos por divisiones de clase A-60. Cuando en uno de los lados de la división haya un espacio de categoría 26.2.2 5), 26.2.2 9) ó 26.2.2 10), la norma se podrá reducir a A-0.»

23. Modifíquese el párrafo 2 de modo que diga:

«2. En la medida de lo posible, los mamparos que limitan las zonas verticales principales situadas por encima de la cubierta de cierre estarán en la misma vertical que los mamparos estancos de compartimentado situados inmediatamente debajo de la cubierta de cierre. La longitud y anchura de las zonas verticales principales pueden extenderse hasta un máximo de 48 m a fin de que los extremos de las zonas verticales coincidan con los mamparos estancos de compartimentado o a fin de dar cabida a amplios espacios públicos que ocupen toda la longitud de la zona vertical principal, siempre que el área total de la zona vertical principal no sea superior a 1.600 m² en ninguna cubierta. La lon-

gitud o anchura de la zona vertical principal están definidas como la distancia máxima entre los puntos más alejados de los mamparos que la limitan.»

24. Suprímase la referencia a la tabla 26.3.

Regla II-2/25. Mamparos situados en el interior de una zona vertical principal.

25. Añádase al comienzo de la primera frase del párrafo 2 lo siguiente:

«En los buques que no transporten más de 36 pasajeros,...»

26. Sustitúyase el párrafo 3 por el siguiente:

«3. Todos los mamparos que tengan que ser divisiones de clase "B", excepto los mamparos de los pasillos prescritos en el párrafo 2, se extenderán de cubierta a cubierta y hasta el forro exterior u otros límites, a menos que los cielos rasos o revestimientos continuos de clase "B" instalados a ambos lados de los mamparos tengan por lo menos la misma resistencia al fuego que dichos mamparos, en cuyo caso éstos podrán terminar en el cielo raso o revestimiento continuos.»

Regla II-2/26. Integridad al fuego de los mamparos y cubiertas en buques que transporten más de 36 pasajeros.

27. Modifíquese el párrafo 2.1 de modo que diga:

«2.1 La tabla 26.1 se aplicará a mamparos que no limiten zonas verticales principales ni zonas horizontales. La tabla 26.2 se aplicará a las cubiertas que no forman bayonetas en zonas verticales principales ni limiten zonas horizontales.»

28. En el párrafo 2.2 3, suprimanse las palabras «y vestíbulos».

29. Modifíquese el párrafo 2.2 4) de modo que diga:

«4) Puestos de evacuación y vías exteriores de evacuación.

Zona de estiba de embarcaciones de supervivencia.

Espacios de cubierta expuesta y zonas protegidas del paseo de cubierta que sirvan como puesto de embarco y de arriado de botes y balsas salvavidas.

Puestos de reunión internos y externos.

Escaleras exteriores y cubiertas expuestas que se utilizan como vías de evacuación.

El costado del buque hasta la flotación correspondiente a la condición de navegación marítima con calado mínimo y los costados de la superestructura y de las casetas que se encuentren por debajo y adyacentes a las zonas de embarco en balsas salvavidas y rampas de evacuación.»

30. En el párrafo 2.2 7, añádese al final «Salas de operaciones».

31. En el párrafo 2.2 9), suprimanse las «Salas de operaciones».

32. En el párrafo 2.2 11), suprimanse las palabras «de emergencia» entre «generadores» y «y bombas», así como las referencias a los «espacios de categoría especial» en las líneas primera, segunda y vigésima quinta.

33. Suprimanse los párrafos 2.4 y 2.5 y numérese el actual párrafo 2.6 como nuevo párrafo 2.4.

34. Suprímase el actual párrafo 2.7 y añádese el nuevo párrafo 2.5 siguiente:

«5. En cuanto a los espacios de categoría (5), la Administración determinará si procede aplicar a los extremos de casetas y superestructuras los

TABLA 26.2 CUBIERTAS QUE NO FORMAN BAYONETAS EN ZONAS VERTICALES PRINCIPALES NI LIMITAN ZONAS HORIZONTALES

Espacio inferior	Espacio superior	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Puestos de control.	(1)	A-30	A-30	A-15	A-0	A-0	A-0	A-15	A-30	A-0	A-0	A-0	A-60	A-0	A-60
Escaleras.	(2)	A-0	A-0	—	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-30	A-0	A-30
Pasillos.	(3)	A-15	A-0	A-0 ^a	A-60	A-0	A-0	A-15	A-15	A-0	A-0	A-0	A-30	A-0	A-30
Puesto de evacuación y vías exteriores de evacuación.	(4)	A-0	A-0	A-0	A-0	—	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Espacios de cubierta expuesta.	(5)	A-0	A-0	A-0	A-0	—	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Alojamientos con escaso riesgo de incendio.	(6)	A-60	A-15	A-0	A-60	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Alojamientos con moderado riesgo de incendio.	(7)	A-60	A-15	A-15	A-60	A-0	A-0	A-15	A-15	A-0	A-0	A-0	A-0	A-0	A-0
Alojamientos con considerable riesgo de incendio.	(8)	A-60	A-15	A-15	A-60	A-0	A-15	A-15	A-30	A-0	A-0	A-0	A-0	A-0	A-0
Espacios para fines sanitarios y similares.	(9)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Tanques, espacios perdidos y de maquinaria auxiliar con pequeño o ningún riesgo de incendio.	(10)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0 ^a	A-0	A-0	A-0	A-0
Espacios de maquinaria auxiliar, espacios de carga, tanques de hidrocarburos llevados como cargamento o para otros fines y demás espacios análogos con moderado riesgo de incendio.	(11)	A-60	A-60	A-60	A-60	A-0	A-0	A-15	A-30	A-0	A-0	A-0 ^a	A-0	A-0	A-30
Espacios de máquinas y cocinas principales.	(12)	A-60	A-60	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0	A-30	A-30 ^a	A-0	A-60
Gambuzas o pañoles, talleres, despensas, etcétera.	(13)	A-60	A-30	A-15	A-60	A-0	A-15	A-30	A-30	A-0	A-0	A-0	A-0	A-0	A-0
Otros espacios en que se almacenan líquidos inflamables.	(14)	A-60	A-60	A-60	A-60	A-0	A-30	A-60	A-60	A-0	A-0	A-0	A-0	A-0	A-0

a Cuando los espacios adyacentes sean de la misma categoría numérica y aparezca el índice * no hará falta colocar un mamparo o una cubierta entre dichos espacios si la Administración no lo considera necesario. Por ejemplo, en la categoría (12) no hará falta colocar un mamparo entre una cocina y sus oficinas anexas siempre que los mamparos y cubiertas de los oficios mantengan la integridad de los mamparos límite de la cocina. Sin embargo, entre una cocina y un espacio de máquinas deberá colocarse un mamparo, aunque ambos espacios sean de categoría (12).

b En los costados del buque, hasta la flotación correspondiente a la condición de navegación marítima con calado mínimo, y en los costados de la superestructura y de las casetas que se encuentren por debajo y adyacentes a las balsas salvavidas y las rampas de evacuación, la norma se puede reducir a la de clase A-30.

c Cuando los aseos públicos estén instalados totalmente dentro del tronco de la escalera, la integridad del mamparo del aseo público que se encuentre dentro del tronco de la escalera puede tener una integridad de clase «B».

36. Suprímense las tablas 26.3 y 26.4.

Regla II-2/28. Medios de evacuación.

37. En la última frase del párrafo 1.1, suprímase «alojadas o».

38. Sustitúyase el párrafo 1.4 por el siguiente:

«1.4 Estará prohibido que haya un pasillo, vestíbulo o parte de un pasillo desde el cual sólo exista una vía de evacuación.»

39. Sustitúyase el párrafo 1.5 por el siguiente:

«5. Uno por lo menos de los medios de evacuación prescritos en los párrafos 1.1 y 1.2 consistirá en una escalera de fácil acceso, encerrada en un tronco, que proteja de modo continuo contra el fuego desde su nivel de arranque hasta la cubierta que corresponda para embarcar en los botes y balsas salvavidas o hasta la cubierta de intemperie más alta si la de embarco no se extiende hasta la zona vertical principal de que se trate. En este último caso se dispondrá de acceso directo a la cubierta de embarco mediante escaleras y pasillos exteriores abiertos, así como de alumbrado de emergencia, de conformidad con la regla III/11.5, y de unas superficies del piso antirresbaladizas. Los mamparos que den a escaleras y pasillos abiertos exteriores que formen parte de una vía de evacuación, y los mamparos que estén en puntos en los que su fallo durante un incendio impediría la salida hasta la cubierta de embarco, tendrán una integridad al fuego, incluidos los valores de aislamiento, que se ajuste a las tablas de la regla II-2/26. La anchura, el número y la continuidad de las vías de evacuación serán como sigue:

5.1 La anchura libre de las escaleras no será inferior a 900 mm. Las escaleras irán provistas de pasamanos a cada lado. La anchura mínima de las escaleras se aumentará en 10 mm por cada persona prevista por encima de 90. La anchura libre máxima entre pasamanos cuando las escaleras sean más anchas de 900 mm será de 1.800 mm. Se supondrá que el número total de personas que vayan a ser evacuadas por dichas escaleras será igual a dos tercios de la tripulación y del número total de pasajeros que haya en las zonas en que se encuentren dichas escaleras. La anchura de las escaleras se ajustará a unas normas no inferiores a las aprobadas por la Organización».

5.2 Todas las escaleras previstas para más de 90 personas irán alineadas en sentido longitudinal.

5.3 Las puertas, pasillos y rellanos intermedios incluidos en los medios de evacuación tendrán unas dimensiones análogas a las de las escaleras.

5.4 Las escaleras no tendrán una elevación vertical superior a 3,5 m sin disponer de un rellano, y su ángulo de inclinación no será superior a 45°.

5.5 Los rellanos a nivel de cada cubierta tendrán una superficie no inferior a 2 m², la cual se aumentará en 1 m² por cada diez personas previstas por encima de 20, aunque no es necesario que excedan de 16 m², salvo los utilizados en los espacios públicos que tengan acceso directo al tronco de escalera.»

Añádanse los nuevos párrafos 1.9 y 1.10 siguientes:

«9. Cuando la Administración haya concedido una exención en virtud de lo dispuesto en el párrafo

1.1, el único medio de evacuación habrá de ofrecer la debida seguridad. No obstante, las escaleras tendrán una anchura libre no inferior a 800 mm e irán provistas de pasamanos a cada lado.

10. Además del alumbrado de emergencia prescrito en las reglas II-1/42 y III/11.5, los medios de evacuación, incluidas las escaleras y salidas, estarán indicados mediante alumbrado o franjas fotoluminiscentes que no se encuentren a más de 0,3 m por encima de la cubierta en todos los puntos de las vías de evacuación, incluidos ángulos e intersecciones. Estas indicaciones deberán permitir a los pasajeros identificar todas las vías de evacuación y localizar fácilmente las salidas de evacuación. Si se utiliza iluminación eléctrica, ésta procederá de una fuente de energía de emergencia y estará dispuesta de tal modo que, aunque falle una sola luz o se produzca un corte en la franja de iluminación, la indicación seguirá siendo eficaz. Además, todos los signos de las vías de evacuación y las marcas de ubicación del equipo contraincendios serán de material fotoluminiscente o estarán iluminadas. La Administración se asegurará de que dicha iluminación o equipo fotoluminiscente se ha evaluado, comprobado y aplicado de conformidad con las directrices elaboradas por la Organización.»

41. Añádase el nuevo párrafo 3.3 siguiente:

«3.3 Se proveerán dos vías de evacuación desde la sala de control de máquinas situada en los espacios de máquinas, una de las cuales por lo menos proporcionará una protección continua contra el fuego hasta una posición segura fuera del espacio de máquinas.»

Regla II-2/29. Protección de escaleras y ascensores en espacios de alojamiento y de servicio.

42. Sustitúyase el párrafo 2 por el siguiente:

«2. Los troncos de escalera tendrán acceso directo a los pasillos y serán de amplitud suficiente para evitar que se produzcan aglomeraciones, teniendo en cuenta el número de personas que puedan utilizarlos en caso de emergencia. Dentro del perímetro de tales troncos sólo se permitirá que haya aseos públicos, armarios de material incombustible para el almacenamiento del equipo de seguridad y mostradores de información. Sólo se permitirá que tengan acceso directo a esos troncos de escalera los espacios públicos, pasillos, aseos públicos, espacios de categoría especial, otras escaleras de evacuación prescritas en el párrafo 28.1.5 y zonas exteriores.»

Regla II-2/30. Aberturas en divisiones de clase «A».

43. Sustitúyase el párrafo 4 por el siguiente:

«4. Las puertas contraincendios de los mamparos de zonas verticales principales y troncos de escalera se ajustarán a las siguientes prescripciones:

1. Las puertas serán de cierre automático y se podrán cerrar venciendo un ángulo de inclinación de hasta 3,5° a una velocidad aproximadamente uniforme en no más de 40 segundos, y en no menos de 10 segundos, cuando el buque esté en posición de equilibrio.

2. Las puertas de corredera teleaccionadas o accionadas a motor irán provistas de una alarma que suene al menos 5 segundos, pero no más de 10 segundos, antes de que la puerta empiece a moverse, y que continúe sonando hasta que la puerta se haya cerrado del todo. Las puertas proyectadas para volver a abrirse tras tropezar con un obstáculo se abrirán de nuevo lo suficiente para dejar un paso libre de al menos 0,75 m, pero no superior a 1 m.

3. Todas las puertas podrán accionarse por telemando y automáticamente desde un puesto central de control con dotación permanente, ya sea todas a la vez o por grupos, y también cada una por separado desde un punto a ambos lados de la puerta. Deberá proporcionarse indicación en el panel de control de incendios situado en el puesto central de control con dotación permanente acerca de si las puertas teleaccionadas están cerradas. El mecanismo accionador estará proyectado de modo que la puerta se cierre automáticamente en caso de avería del sistema de control o de fallo del suministro central de energía. Los interruptores de accionamiento tendrán una función de conexión-desconexión para evitar la reposición automática del sistema. No se permitirán ganchos de retención que no se puedan accionar desde el puesto central de control.

4. En las proximidades de las puertas accionadas a motor se dispondrán acumuladores locales de energía que permitan el funcionamiento de éstas al menos diez veces (completamente abiertas y cerradas) utilizando los mandos locales.

5. Las puertas de doble hoja que tengan un dispositivo sujetador para asegurar su integridad al fuego estarán concebidas de modo que dicho dispositivo actúe automáticamente cuando el sistema ponga en movimiento las puertas.

6. Las puertas que den acceso directo a espacios de categoría especial y que sean de accionamiento motor y cierre automático no necesitan estar equipadas con las alarmas y mecanismos de teleaccionamiento que se estipulan en los apartados 2 y 3.»

44. En el párrafo 5, añádase al principio la frase siguiente:

«En los buques que no transporten más de 36 pasajeros.»

45. En el párrafo 6, añádanse las palabras siguientes al final de la primera frase:

«..., siempre que en la regla 33.3 no se estipule que tales límites exteriores deban tener una integridad de clase "A".»

46. Insértese el nuevo párrafo 7 siguiente:

«7. Todas las puertas de clase "A" situadas en escaleras, espacios públicos y mamparos de zonas verticales principales en las vías de evacuación irán provistas de una portilla para manguera de cierre automático, de material, construcción y resistencia al fuego equivalentes a los de la puerta en que vaya instalada, que tendrá una abertura libre de 150 mm² con la puerta cerrada e irá emplazada en el borde inferior de la puerta, en el lado opuesto al de las bisagras o, en el caso de puertas de corredera, lo más cerca posible de la abertura.»

Regla II-2/31. Aberturas en divisiones de clase «B».

47. Numérese el párrafo 1 de modo que pase a ser el párrafo 1.1 y modifíquese la primera frase de modo que diga:

«Las puertas y los marcos de puertas situados en divisiones de clase "B", así como sus dispositivos de sujeción, constituirán un medio de cierre cuya resistencia al fuego será equivalente a la de las divisiones», salvo que en la parte inferior de dichas puertas se podrán autorizar aberturas de ventilación.»

48. Añádase el nuevo párrafo 1.2 siguiente:

«1.2 Las puertas de camarote de las divisiones de clase "B" serán de cierre automático. En ellas no se permiten ganchos de retención.»

49. En el párrafo 3, añádase al comienzo lo siguiente:

«En buques que no transporten más de 36 pasajeros.»

Regla II-2/32. Sistemas de ventilación.

Se modifica el párrafo 1.1 suprimiendo «16.2 a 16.9» al final de la frase y sustituyéndolo por «16.2 a 16.6, 16.8 y 16.9».

50. Sustitúyase el párrafo 1.5 por el siguiente:

«1.5 Los troncos de escalera estarán ventilados por medio de un solo ventilador independiente y sistema de conductos que no se utilizarán para ningún otro espacio del sistema de ventilación.»

Se insertan los nuevos párrafos 1.8 y 1.9 siguientes:

«1.8 Los conductos de ventilación irán provistos de escotillas convenientemente situadas a efectos de inspección y de limpieza cuando sea razonable y viable.

1.9 Los conductos de salida de los fogones de las cocinas en que se pueda acumular la grasa cumplirán con lo dispuesto en las reglas II-2/16.3.2.1 y 16.3.2.2 y estarán dotados de:

1. un filtro de grasas que se pueda quitar fácilmente para su limpieza, a menos que se haya instalado otro sistema aprobado para la eliminación de la grasa;

2. una válvula de mariposa contra incendios situada en la parte inferior del conducto que funcione de forma automática por telemando y, además, una válvula de mariposa contra incendios que funcione por telemando situada en la parte superior del conducto;

3. un medio fijo para la extinción de incendios dentro del conducto;

4. medios de telemando para apagar los extractores y los ventiladores de inyección, poner en funcionamiento las válvulas de mariposa contra incendios mencionadas en 2 y activar el sistema de extinción de incendios, que se encuentren situados en un lugar próximo a la entrada de las cocinas. Cuando se instalen sistemas de ramales múltiples, se dispondrá de medios que permitan cerrar todos los ramales que salgan del mismo conducto principal antes de que se descargue el agente extintor en el sistema; y

5. escotillas convenientemente situadas a efectos de inspección y de limpieza.»

* Véase la Recomendación sobre procedimientos de ensayo de exposición al fuego para divisiones de clase "A", "B" y "F", aprobada mediante la resolución A.517(13).»

Regla II-2/33. Ventanas y portillos.

51. Modifíquese el párrafo 2 de modo que diga:

«2. No obstante lo prescrito en las tablas de las reglas 26 y 27, todas las ventanas y portillos de los mamparos que separen del exterior los espacios de alojamiento y de servicio y los puestos de control tendrán marcos de acero o de otro material adecuado. El cristal se sujetará con listones o piezas angulares de metal.»

52. Añádase el nuevo párrafo 3 siguiente:

«3. Las ventanas que den a dispositivos salvavidas, zonas de embarco y de reunión, escaleras exteriores y cubiertas expuestas que sirvan de vías de evacuación, así como las ventanas situadas debajo de las zonas de embarco en balsas salvavidas y rampas de evacuación, tendrán la misma integridad al fuego que la prescrita en las tablas de la regla II-2/26. Cuando se hayan previsto para las ventanas cabezales rociadores automáticos especiales, podrán admitirse como equivalentes ventanas de clase A-0. Las ventanas situadas en el costado del buque por debajo de las zonas de embarco en botes salvavidas tendrán una integridad al fuego igual por lo menos a la de clase "A-0".»

Regla II-2/34. Uso restringido de materiales combustibles.

53. En la primera frase del párrafo 1 insértense las palabras «pantallas supresoras de corrientes de aire» entre «rastres» y «cielos rasos».

54. Modifíquese el párrafo 6 de modo que diga:

«6. El mobiliario de los troncos de escalera estará constituido únicamente por asientos. Serán de tipo fijo, con un máximo de seis asientos por cubierta y tronco de escalera, presentarán un riesgo reducido de incendio y no obstaculizarán las vías de evacuación de los pasajeros. La Administración podrá permitir asientos adicionales en la zona principal de recepción dentro del tronco de escalera si aquéllos son fijos, incombustibles y no obstaculizan las vías de evacuación de los pasajeros. No se permitirá la instalación de mobiliario en los pasillos para pasajeros y tripulación que sirvan de vías de evacuación en las zonas de los camarotes. Además de lo antedicho, se permitirá instalar armarios de material incombustible para el almacenamiento del equipo de seguridad exigido en las reglas.»

Regla II-2/36. Sistemas fijos de detección de incendios y de alarma contra incendios. Sistemas automáticos de rociadores, de detección de incendios y de alarma contra incendios.

55. Sustitúyase la regla 36 por la siguiente:

«Sistemas fijos de detección de incendios y alarma contra incendios, y sistemas automáticos de rociadores, detección de incendios y alarma contra incendios.

1. En los buques de pasaje que no transporten más de 36 pasajeros se instalará en cada una de las zonas separadas, tanto vertical como horizontal, en todos los espacios de alojamiento y de servicio, y, cuando la Administración lo estime necesario, en los puestos de control, exceptuados los espacios

que no ofrezcan verdadero peligro de incendio, tales como espacios perdidos, locales sanitarios, etc.:

.1 un sistema fijo de detección de incendios y alarma contra incendios de tipo aprobado que cumpla con lo prescrito en la regla 13, instalado y dispuesto de modo que señale la presencia de un incendio en dichos espacios; o

.2 un sistema automático de rociadores, detección de incendios y alarma contra incendios de tipo aprobado que cumpla con lo prescrito en la regla 12 o en las directrices elaboradas por la Organización para un sistema aprobado equivalente de rociadores, instalado y dispuesto de modo que proteja dichos espacios y, además, un sistema fijo de detección de incendios y alarma contra incendios de tipo aprobado que cumpla con lo prescrito en la regla 13, instalado y dispuesto de modo que detecte la presencia de humo en pasillos, escaleras y vías de evacuación en el interior de los espacios de alojamiento.

2. En los buques de pasaje que transporten más de 36 pasajeros, todos los espacios de servicio, puestos de control y espacios de alojamiento, incluidos pasillos y escaleras, estarán equipados con un sistema automático de rociadores, detección de incendios y alarma contra incendios de un tipo aprobado que cumpla con lo prescrito en la regla 12 o en las directrices elaboradas por la Organización para un sistema aprobado equivalente de rociadores. En su lugar, los puestos de control en que el agua pueda dañar equipo esencial podrán ir equipados con un sistema fijo de extinción de incendios aprobado de tipo distinto. Los espacios de servicio, puestos de control y espacios de alojamiento, incluidos pasillos y escaleras, estarán equipados con un sistema fijo de detección de incendios y alarma contra incendios de tipo aprobado que cumpla con lo prescrito en la regla 13, instalado y dispuesto de modo que detecte la presencia de humo. No es necesario instalar detectores de humo en los baños privados ni en las cocinas. En espacios con pequeño o ningún riesgo de incendio, tales como espacios perdidos, aseos públicos u otros análogos, tampoco es necesario que haya un sistema automático de rociadores o un sistema fijo de detección de incendios y de alarma.»

Regla II-2/37. Protección de los espacios de categoría especial.

56. Modifíquese el párrafo 1.2.1 como sigue:

«1.2.1 En los buques de pasaje que transporten más de 36 pasajeros, los mamparos límite y las cubiertas de los espacios de categoría especial estarán aislados conforme a la norma de clase A-60. Sin embargo, cuando a uno de los lados de la división haya un espacio de categoría 26.2.2. 5), 26.2.2.9) ó 26.2.2 10), la norma se puede reducir a la de clase A-0.»

57. Cámbiense la numeración del presente párrafo 1.2.2 de modo que pase a ser 1.2.3 e insértense un nuevo párrafo 1.2.2 que diga:

«1.2.2 En los buques de pasaje que no transporten más de 36 pasajeros, los mamparos límite de los espacios de categoría especial estarán ais-

lados según se estipula para los espacios de categoría (11) en la tabla 27.1, y las cubiertas que constituyen los límites horizontales según se estipula para los espacios de categoría (11) en la tabla 27.2.»

Regla II-2/40. Patrullas y sistemas de detección de incendios, alarma y altavoces.

58. En el párrafo 5, sustitúyanse las palabras «puestos de control» por «puestos de control y cubiertas expuestas».

59. Modifíquese el párrafo 5, añadiendo al final lo siguiente:

«Cada miembro de la patrulla estará provisto de un aparato radiotelefónico bidireccional portátil.»

60. Añádase los nuevos párrafos 7.1 y 7.2 siguientes:

«7.1 En los buques de pasaje que transporten más de 36 pasajeros, las alarmas de detección de los sistemas prescritos en la regla 36.2 estarán centralizadas en un puesto central de control con dotación permanente. Además, los mandos para cerrar por telemando las puertas contraincendios y desconectar los ventiladores estarán centralizados en ese mismo puesto. La tripulación podrá poner en marcha los ventiladores desde el puesto de control con dotación permanente. Los paneles de los mandos del puesto central de control deberán poder indicar si las puertas contraincendios están abiertas o cerradas, y si los detectores, alarmas y ventiladores están conectados o apagados. El panel de control estará alimentado continuamente, y deberá disponer de un medio de conmutación automática a la fuente de energía de reserva en caso de fallo de la fuente de energía principal. El panel de control estará conectado a la fuente principal de energía eléctrica, y a la fuente de energía eléctrica de emergencia, según se define ésta en la regla II 1/42, a menos que en las reglas se permitan aplicar otras medidas, según proceda.

7.2 El panel de control estará proyectado conforme a un principio a prueba de fallos, es decir, que un circuito detector abierto dará lugar a una condición de alarma, según se indica en las reglas II-2/13.1.3 y II-1/51.1.4.»

Regla 59. Aireación, purga, desgasificación y ventilación.

60.1 Después del actual párrafo 3 se deberá insertar el nuevo párrafo 4 siguiente:

«4. Inertización, ventilación y mediciones de los gases.

4.1 Este párrafo será aplicable a petroleros construidos el 1 de octubre de 1994 o posteriormente.

4.2 Los espacios del doble casco o del doble fondo estarán dotados de conexiones adecuadas para el suministro de aire.

4.3 En los buques tanque en que haya que instalar sistemas de gas inerte:

1 los espacios del doble casco estarán dotados de conexiones adecuadas para el suministro de gas inerte;

2 cuando dichos espacios estén conectados a un sistema de distribución de gas inerte instalado permanentemente, se dispondrá de medios para

evitar que los gases de hidrocarburos procedentes de los tanques de carga pasen a los espacios del doble casco a través de dicho sistema;

3 cuando dichos espacios no estén conectados permanentemente a un sistema de distribución de gas inerte, se dispondrá de medios adecuados que permitan conectarlos al colector de gas inerte.

4.4.1 Se dispondrá de instrumentos portátiles adecuados para medir las concentraciones de oxígeno y de vapores inflamables. Al elegir dichos instrumentos, se tendrá debidamente en cuenta su utilización en combinación con los sistemas fijos de conductos de muestreo de gases a que se hace mención en el párrafo 4.4.2.

4.4.2 Cuando la atmósfera de los espacios del doble casco no se pueda medir de forma fiable utilizando tuberías flexibles de muestreo de gases, se instalarán en dichos espacios conductos permanentes de muestreo de gases. La configuración de tales sistemas de conductos deberá adaptarse al proyecto de dichos espacios.

4.4.3 Los materiales de construcción y las dimensiones de los conductos de muestreo de gases serán tales que impidan que se formen obstrucciones. Cuando se utilicen materiales de plástico, éstos deberán ser eléctricamente conductores.»

CAPITULO III

Regla 50.

Sistema de alarma general de emergencia.

61. En la última frase de la regla, suprimase el punto final y añádase lo siguiente:

«y en las cubiertas expuestas, y el nivel de presión acústica deberá ajustarse a la norma elaborada por la Organización. La alarma deberá seguir funcionando después de que se haya activado hasta que se apague manualmente o se interrumpa temporalmente por un mensaje emitido a través del sistema megafónico.»

Enmiendas aprobadas al capítulo IV.

Regla IV/13. Fuentes de energía.

62. Sustitúyase el texto actual de los párrafos 2.1 a 2.3 por el siguiente:

«1 una hora en los buques provistos de una fuente de energía eléctrica de emergencia, si ésta cumple con todas las disposiciones pertinentes de las reglas II-1/42 o II-1/43, incluidas las relativas a la alimentación de las instalaciones radioeléctricas; y

2 seis horas en los buques no provistos de una fuente de energía eléctrica de emergencia que cumplan plenamente con todas las disposiciones pertinentes de las reglas II-1/42 o II-1/43, incluidas las relativas a la alimentación de las instalaciones radioléctricas.

63. Suprimase la referencia que se hace en la regla IV/13.4 al párrafo 2.3.

Regla IV/14. Normas de funcionamiento.

64. Modifíquese el texto de la primera frase de la regla IV/14.2 de modo que diga:

«El equipo instalado con anterioridad a las fechas de aplicación prescritas en la regla 1...»

ANEXO 3**Proyecto de Resolución de la Asamblea****ENMIENDAS AL CONVENIO INTERNACIONAL SOBRE LA SEGURIDAD DE LOS CONTENEDORES, 1972**

La Asamblea,

Recordando el artículo IX del Convenio internacional sobre la seguridad de los contenedores, 1972, artículo que trata del procedimiento para enmendar una o varias partes del Convenio,

Habiendo examinado las enmiendas al Convenio internacional sobre la seguridad de los contenedores, 1972, aprobadas por el Comité de Seguridad Marítima en su 61.º período de sesiones y comunicadas a todas las Partes Contratantes de conformidad con el párrafo 2 a) del artículo IX de dicho Convenio,

1. *Aprueba* de conformidad con el párrafo 2 b) del artículo IX del Convenio internacional sobre la seguridad de los contenedores, 1972, las enmiendas al Convenio y sus anexos cuyo texto figura en el anexo de la presente Resolución.

2. *Toma nota* de que, de conformidad con el párrafo 2 c) del artículo IX del Convenio, las enmiendas entrarán en vigor doce meses después de la fecha en que hayan sido aceptadas por los dos tercios de las Partes Contratantes.

3. *Pide* al Secretario General que, de conformidad con el párrafo 2 b) del artículo IX del Convenio, comunique las enmiendas mencionadas a todas las Partes Contratantes para su aceptación.

ANEXO**Propuesta de enmiendas del Convenio sobre la seguridad de los contenedores, 1972, enmendado y sus anexos**

1. Los párrafos 14 a 16 del artículo II (Definiciones) se enmiendan de modo que digan:

«14. Por "masa bruta máxima de utilización" o "R" se entiende la suma de las masas máximas permitidas del contenedor y de su carga. La letra "R" se expresa en unidades de masa. Cuando los anexos estén basados en fuerzas gravitacionales derivadas de este valor, dichas fuerzas, que son fuerzas de inercia, se representan por "Rg".

15. Por "lara" se entiende la masa del contenedor vacío, incluido el material auxiliar fijado al mismo con carácter permanente.

16. Por "carga útil máxima admisible" o "P" se entiende la diferencia entre la masa bruta máxima de utilización y la tara. La letra "P" se expresa en unidades de masa. Cuando los anexos estén basados en fuerzas gravitacionales derivadas de este valor, dichas fuerzas, que son fuerzas de inercia, se representan por "Pg".»

Se añaden los nuevos párrafos 17 a 19 siguientes:

«17. Cuando la palabra "carga" se utilice para describir una cantidad física a la que se puedan atribuir unas unidades, dicha palabra indica una masa.

18. La palabra "carga", como en "carga interior", por ejemplo, indica una fuerza.

19. La letra "g" representa la aceleración normal de la gravedad, cuyo valor es igual a 9,8 m/s².»

2. En el Anexo I se modifica el texto de la regla 11 b), de modo que diga:

«Toda marca indicadora de la masa bruta máxima que se coloque en un contenedor se ajustará a la información que figure al respecto en la placa de aprobación de seguridad.»

Se enmienda el subpárrafo 2 a) de modo que diga:

«La placa contendrá la información siguiente, en inglés o en francés, por lo menos:

Aprobación de seguridad CSC.

País de aprobación y referencia de aprobación.

Fecha (mes y año) de fabricación.

Número de identificación del fabricante del contenedor o, en el caso de los contenedores existentes cuyo número no se conozca, el número asignado por la Administración.

Masa bruta máxima de utilización (kilogramos y libras).

Carga de apilamiento autorizada para 1,8 (kilogramos y libras).

Fuerza utilizada para la prueba de rigidez transversal (newtons o N).»

Se añade el nuevo párrafo 5 siguiente:

«5. Un contenedor cuya construcción se haya terminado antes del ...*, podrá conservar la placa de aprobación de seguridad permitida por el Convenio antes de esa fecha, a condición de que aquél no sufra modificaciones estructurales.»

3. En el Anexo I se modifican los subpárrafos 1 c) y 1 e) de la regla 9, de modo que digan:

«c) masa bruta máxima de utilización;

e) carga de apilamiento autorizada para 1,8 g (kilogramos y libras; y)».

* Fecha de entrada en vigor de las enmiendas.

4. En el Anexo I se modifican los subpárrafos c) y e) de la regla 10, de modo que digan:

«c) masa bruta máxima de utilización;

e) carga de apilamiento autorizada para 1,8 g (kilogramos y libras; y)».

5. En el Anexo I, la cuarta, quinta y sexta líneas del modelo de placa de aprobación de seguridad que figura en el apéndice se modifican, de modo que digan:

«Masa bruta máxima de utilización ... Kg ... lbs.

Carga de apilamiento autorizada para 1,8 g ...

Kg ... lbs.

Fuerza utilizada para la prueba de rigidez transversal Newtons.

6. En el Anexo I se modifican los puntos 4 a 8 del apéndice, de modo que digan:

«4. Masa bruta máxima de utilización (kilogramos y libras).

5. Carga de apilamiento autorizada para 1,8 g (kilogramos y libras).

6. Fuerza utilizada para la prueba de rigidez transversal (Newtons o N).

7. La resistencia de las paredes extremas sólo debe indicarse en la placa si dichas paredes están proyectadas para resistir una fuerza inferior o superior a 0,4 veces la fuerza gravitacional correspondiente a la carga útil máxima admisible, es decir, 0,4 Pg.

8. La resistencia de las paredes laterales sólo debe indicarse en la placa si dichas paredes están proyectadas para resistir una fuerza inferior o superior a 0,6 veces la fuerza gravitacional correspondiente a la máxima admisible, es decir, 0,6 Pg.»

7. Se modifica la primera frase de la Introducción del Anexo II (Normas y pruebas de seguridad estructural), de modo que diga:

«En las disposiciones del presente anexo queda implícito que en todas las fases de la utilización de los contenedores, los esfuerzos resultantes de los movimientos, de la colocación, del apilamiento y del efecto gravitacional del contenedor cargado, así como las fuerzas exteriores, no excederán de la resistencia para la que fue proyectado el contenedor.»

8. En el Anexo II, sección 1 A) —Izada para las cantoneras—, se modifica el texto relativo a cargas de prueba y fuerzas aplicadas, de modo que diga:

«Carga de prueba y fuerzas aplicadas.

Carga interior:

Carga uniformemente distribuida, tal que la suma de la masa del contenedor y la carga de prueba es igual a 2R. Si se trata de un contenedor cisterna, cuando la carga de prueba de la carga interna más la tara sea inferior a 2R se agregará al contenedor una carga adicional distribuida a lo largo de la cisterna.

Fuerzas aplicadas exteriormente:

Las que permitan izar la suma de la masa de 2R del modo prescrito (véanse los procedimientos de prueba).»

9. En el Anexo II, sección 1 B) —Izada por cualesquiera otros métodos adicionales—, se modifica de modo que diga:

«Carga de prueba y fuerzas aplicadas: Procedimiento de prueba:

Carga interior:

i) Izada por los huecos de entrada de las horquillas:

Carga uniformemente distribuida, tal que la suma de la masa del contenedor y la carga de prueba es igual a 1,25R.

Fuerzas aplicadas externamente:

Las que permitan izar la suma de una masa de 1,25R del modo prescrito (véanse los procedimientos de prueba).

El contenedor será colocado en barras que se encuentren en el mismo plano horizontal, centrandó una barra dentro de cada uno de los huecos de entrada de las horquillas que se utilicen para izar los contenedores cargados. Las barras tendrán la misma anchura que las horquillas que se vayan a utilizar para la manipulación y penetrarán en los huecos de entrada de las horquillas hasta el 75 por 100 de la longitud del hueco.

Carga interior:

Carga uniformemente distribuida, tal que la suma de la masa del contenedor y la carga de prueba es igual a 1,25R. Si se trata de un contenedor cisterna, cuando la carga de prueba de la carga interna más la tara sea inferior a 1,25R se agregará al contenedor una carga adicional distribuida a lo largo de la cisterna.

Fuerzas aplicadas externamente:

Las que permitan izar la suma de una masa de 1,25R del modo prescrito (véanse los procedimientos de prueba).

iii) Otros métodos:

Si los contenedores van a ser izados, una vez cargados, por cualquier método no mencionado en los epígrafes A) o B) i) y ii), serán también sometidos a prueba con una carga interior y unas fuerzas aplicadas externamente que representen las aceleraciones propias de dicho método.»

10. En el Anexo II se modifican los párrafos 1 y 2 de la sección 2 —Apilamiento, de modo que digan:

«1. Cuando, en condiciones de transporte internacional, la aceleración vertical máxima se aparte significativamente de 1,8 g y cuando conste clara y efectivamente que el contenedor está limitado a esas condiciones de transporte, se podrá variar la carga de apilamiento en la correspondiente proporción de la aceleración.

2. Efectuada esta prueba con éxito, el contenedor será clasificado para una carga de apilamiento estática superpuesta que debe indicarse en la placa de aprobación de seguridad frente a las palabras carga de apilamiento autorizada para 1,8 g (Kg y lbs).»

11. En el Anexo II, sección 2 —Apilamiento, se modifica el texto de cargas de prueba y fuerzas aplicadas de modo que diga:

«Carga de prueba y fuerzas aplicadas.

Carga interior:

Carga uniformemente distribuida, tal que la suma de la masa del contenedor y la carga de prueba es igual a 1,8R. Los contenedores cisterna se podrán someter a prueba en estado de tara.

Fuerzas aplicadas externamente:

Las que se sometan a cada una de las cuatro cantoneras superiores a una fuerza vertical descendente igual a $1/4 \times 1,8 \times$ la fuerza gravitacional de la carga de apilamiento estática superpuesta autorizada.»

12. En el Anexo II, sección 3, —Cargas concentradas, se modifica de modo que diga:

«Carga de prueba y fuerzas aplicadas:

Procedimientos de prueba:

a) Sobre el techo:

Carga interior:

Ninguna.

Fuerzas aplicadas externamente:

Fuerza gravitacional concentrada de 300 kg (660 lbs) distribuida uniformemente sobre una superficie de 600 mm x 300 mm (24 pulgadas x 12 pulgadas).

Las fuerzas aplicadas externamente se aplicarán verticalmente y en sentido descendente a la superficie exterior de la parte más débil del contenedor.

b) Sobre el piso.

Carga interior:

Dos cargas concentradas de 2.730 kilogramos (6.000 libras) cada una que se agregarán al piso del contenedor en una superficie de contacto de 142 cm² (22 pulgadas cuadradas).

La prueba se deberá efectuar con el contenedor apoyado en cuatro soportes a nivel bajo sus cuatro esquinas inferiores de manera que la base del contenedor pueda deformarse libremente.

Se deberá desplazar por toda la superficie del piso del contenedor un dispositivo de prueba cargado con una masa de 5.460 kilogramos (12.000 libras), es decir, 2.730 kilogramos (6.000 libras) sobre cada una de dos caras cuya superficie de contacto total, una vez aplicada la carga, sea de 284 cm² (44 pulgadas cuadradas), es decir, de 142 cm² (22 pulgadas cuadradas) en cada cara, las cuales tendrán una anchura de 180 mm (7 pulgadas) y distarán entre sí 760 mm (30 pulgadas) de centro a centro.

Fuerzas aplicadas externamente:

Ninguna.»

13. En el Anexo II se modifican los encabezamientos de la sección 4 de modo que digan:

«Carga de prueba y fuerzas aplicadas» y «Carga interior».

14. En el Anexo II, sección 5 —Resistencia longitudinal (prueba estática), se modifica el texto de cargas de prueba y fuerzas aplicadas de modo que diga:

«Carga de prueba y fuerzas aplicadas.

Carga interior:

Carga uniformemente distribuida, tal que la suma de la masa del contenedor y la carga de prueba es igual a la masa bruta máxima de utilización R. Si se trata de un contenedor cisterna, cuando la masa de la carga interna más la tara sea inferior a la masa bruta máxima R se agregará al contenedor una carga complementaria.

Fuerzas aplicadas externamente:

Las que sometan cada lado del contenedor a fuerzas longitudinales de compresión y de tracción de magnitud Rg, es decir, una fuerza combinada de 2 Rg sobre toda la base del contenedor.»

15. En el Anexo II, se modifica el primer párrafo de la sección 6 —Paredes extremas, de modo que diga:

«Las paredes extremas deberán resistir una fuerza no inferior a 0,4 veces una fuerza igual a la fuerza gravitacional correspondiente a la carga útil máxima admisible. No obstante, si las paredes extremas están proyectadas para resistir una fuerza inferior o superior a 0,4 veces la fuerza gravitacional correspondiente a la carga útil máxima admisible, deberá indicarse ese factor de resistencia en la placa de aprobación de seguridad, de conformidad con la regla 1 del Anexo I.»

16. En el Anexo II, sección 6 —Paredes laterales, se modifica el texto de cargas de prueba y fuerzas aplicadas, de modo que diga:

«Carga de prueba y fuerzas aplicadas.

Carga interior:

La que someta la superficie interior de la pared extrema a una fuerza uniformemente distribuida de 0,4 Pg o cualquier otra fuerza para la que se haya proyectado el contenedor.

Fuerzas aplicadas externamente:

Ninguna.»

17. En el Anexo II, sección 7 —Paredes laterales, se modifica el primer párrafo, de modo que diga:

«Las paredes laterales deberán resistir una fuerza no inferior a 0,6 veces una fuerza igual a la fuerza gravitacional correspondiente a la carga útil máxima admisible. No obstante, si las paredes laterales están proyectadas para resistir una fuerza inferior o superior a 0,6 veces la fuerza gravitacional correspondiente a la carga útil máxima admisible, deberá indicarse este factor de resistencia en la placa de aprobación de seguridad, de conformidad con la regla 1 del Anexo I.»

18. En el Anexo II, sección 7 —Paredes laterales, se modifica el texto de cargas de prueba y fuerzas aplicadas, de modo que diga:

«Carga de prueba y fuerzas aplicadas.

Carga interior:

La que someta la superficie interior de la pared lateral a una fuerza uniformemente distribuida de 0,6 Pg o cualquier otra fuerza para la que se haya proyectado el contenedor.

Fuerzas aplicadas externamente:

Ninguna.»

Las presentes Enmiendas entraron en vigor el 1 de octubre de 1994, de conformidad con lo dispuesto en el artículo VIII b) vii 2) del Convenio.

Lo que se hace público para conocimiento general.

Madrid, 8 de noviembre de 1994.—El Secretario general técnico, Antonio Bellver Manrique.

25579 ENMIENDAS al Convenio Internacional para la seguridad de la vida humana en el mar, 1974 (Londres, 1 de noviembre de 1974, publicado en el «Boletín Oficial del Estado» del 16 a 18 de junio de 1980), aprobadas el 10 de abril de 1992 por el Comité de Seguridad Marítima de la Organización Marítima Internacional en su 60 período de sesiones.

RESOLUCION MSC.26(60)

(aprobada el 10 de abril de 1992)

Aprobación de enmiendas al capítulo II-1 del Convenio Internacional para la seguridad de la vida humana en el mar, 1974

BUQUES DE PASAJE DE TRANSBORDO RODADO EXISTENTES

El Comité de Seguridad Marítima,

Recordando el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

Recordando asimismo del artículo VIII b) del Convenio Internacional para la seguridad de la vida humana en el mar, 1974, en adelante llamado «el Convenio», artículo que trata de los procedimientos de enmienda al anexo del Convenio, no referida a las disposiciones del capítulo I,

Recordando además que la Asamblea, mediante la resolución A.596(15), había resuelto que la Organización diera un alto grado de prioridad a la labor destinada a acrecentar la seguridad de los transbordadores de pasajeros y vehículos,

Habiendo examinado en su 60 período de sesiones las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del mismo,

1. *Aprueba*, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;

2. *Decide*, de conformidad con lo dispuesto en el artículo VIII b) iv) 2) bb) del Convenio, que las enmiendas se considerarán aceptadas el 1 de abril de 1994 a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio, o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen, como mínimo, el 50 por 100 del tonelaje bruto de la flota mercante mundial, hayan notificado objeciones a las enmiendas;

3. *Invita* a los Gobiernos Contratantes a que tomen nota de que, en virtud de lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas, una vez aceptadas con arreglo a lo dispuesto en el párrafo 2 *supra* entrarán en vigor el 1 de octubre de 1994;

4. *Pide* al Secretario general que, de conformidad con el artículo VIII b) v) del Convenio, envíe copias certificadas de la presente resolución y del texto de las enmiendas que figuran en el anexo a todos los Gobiernos Contratantes del Convenio;

5. *Pide además* al Secretario general que envíe copias de la resolución a los Miembros de la Organización que no sean Gobiernos Contratantes del Convenio.

ANEXO

Enmiendas al capítulo II-1 del Convenio Internacional para la seguridad de la vida humana en el mar, 1974

Regla 1. Ambito de aplicación.

El actual párrafo 3 pasa a ser 3.1 y a continuación de este párrafo se intercala el siguiente nuevo párrafo 3.2:

«3.2 No obstante lo dispuesto en el párrafo 3.1 no se considerará que las reparaciones, reformas y modificaciones de que sean objeto los buques de pasaje a fin de cumplir con las prescripciones de la regla 8.9 constituyan reparaciones, reformas y modificaciones de importancia.»

Regla 8. Estabilidad de los buques de pasaje después de avería.

1. El texto actual que figura a continuación del título se sustituye por el siguiente:

«(A reserva de lo prescrito en el párrafo 9, lo dispuesto en los párrafos 2.3.1 a 2.3.4, 2.4, 5 y 6.2 es aplicable a los buques de pasaje construidos el 29 de abril de 1990, o posteriormente. Lo dispuesto en los párrafos 7.2, 7.3 y 7.4 se aplica a todos los buques de pasaje.)»

2. A continuación del actual párrafo 2.3.4 se añade el nuevo párrafo 2.3.5 siguiente:

«2.3.5 En los buques de pasaje con espacios de carga rodada o espacios de categoría especial, tal como se definen en la regla II-2/3, que hayan sido construidos antes del 29 de abril de 1990, la Administración podrá permitir:

1. la reducción de la gama mínima de la curva de brazos adrizantes residuales definida en el párrafo 2.3.1, y

2. el cálculo del brazo adrizante residual (GZ) a que hace referencia el párrafo 2.3.3 mediante la siguiente fórmula:

$$GZ \text{ (metros)} = \frac{\text{momento escorante}}{\text{desplazamiento}}$$

a condición de que en ningún caso GZ sea inferior a 0,09 metros.»

3. A continuación del párrafo 8 se inserta el nuevo párrafo 9 siguiente:

«9. Los buques de pasaje con espacios de carga rodada o espacios de categoría especial, tal como se definen en la regla II-2/3, que hayan sido construidos antes del 29 de abril de 1990, cumplirán con lo dispuesto en la presente regla, en su forma enmendada por la resolución MSC.12(56), y además con lo dispuesto en el párrafo 2.3.5, a más tardar en la fecha prescrita a continuación, con arreglo al valor de la relación A/Amáx que se define en el anexo de la circular MSC/Circ.574-Procedimiento de cálculo para evaluar las características de conservación de la flotabilidad de los buques de pasaje de transbordo rodado existentes si se utiliza un método simplificado basado en la resolución A.265(VIII), elabo-

SEGURIDAD DE LA VIDA HUMANA EN EL MAR Enmiendas 1996 (Capítulos II-1, III, VI, XI) al Convenio Internacional, adoptadas por Resolución MSC 47(66).

RESOLUCION MSC.47(66)

(aprobada el 4 de junio de 1996)

Aprobación de Enmiendas al Convenio Internacional para la Seguridad de la Vida Humana en el Mar, 1974

El Comité de Seguridad Marítima,

Recordando el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

Recordando además el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar, 1974, llamado en adelante «el Convenio», relativo a los procedimientos de enmienda del Anexo del Convenio, con excepción de las disposiciones del capítulo I.

Habiendo examinado en su 66.º período de sesiones las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del mismo,

1. Aprueba, de conformidad con el artículo VIII b) iv) del Convenio, las enmiendas cuyo texto figura en el anexo de la presente resolución;
2. Decide, de conformidad con el artículo VIII b) vi) 2) bb) del Convenio, que las enmiendas se considerarán aceptadas el 1 de enero de 1998, a menos que, con anterioridad a esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio SOLAS o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 por 100 del tonelaje bruto de la flota mercante mundial, hayan notificado objeciones a las enmiendas;
3. Invita a los Gobiernos Contratantes a que tomen nota de que, de conformidad con el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de julio de 1998, una vez que hayan sido aceptadas con arreglo al párrafo 2 supra;
4. Pide al Secretario general que, de conformidad con el artículo VIII b)v) del Convenio, envíe copias certificadas de la presente resolución y del texto de las enmiendas que figuran en el anexo a todos los Gobiernos Contratantes del Convenio;
5. Pide además al Secretario general que envíe copias de la presente resolución y de su anexo a los Miembros de la Organización que no sean Gobiernos Contratantes del Convenio.

ANEXO

Enmiendas al Convenio Internacional para la Seguridad de la Vida Humana en el Mar, 1974

CAPITULO II-1

Construcción-Compartimentado y estabilidad, instalaciones de máquinas o instalaciones eléctricas

1. Se sustituye el título actual del capítulo II-1 por el siguiente:

«Construcción-Estructura, compartimentado y estabilidad, instalaciones de máquinas e instalaciones eléctricas».

2. Entre la parte A y la parte B se intercala la nueva parte A-1 siguiente:

«PARTE A-1

Estructura de los buques

Regla 3-1. Prescripciones sobre aspectos estructurales, mecánicos y eléctricos aplicables a los buques

Además de las prescripciones que figuran en otras partes de las presentes reglas, los buques se proyectarán, construirán y mantendrán cumpliendo las prescripciones sobre aspectos estructurales, mecánicos y eléctricos de una sociedad de clasificación que haya sido reconocida por la Administración de conformidad con las disposiciones de la regla XI/1, o las normas nacionales aplicables de la Administración que ofrezcan un grado de seguridad equivalente.

Regla 3-2. Protección contra la corrosión de los tanques de lastre de agua de mar

1. La presente regla es aplicable a los petroleros y graneleros construidos el 1 de julio de 1998 o posteriormente.

2. Todos los tanques dedicados a lastre de agua de mar tendrán un sistema eficaz de protección contra la corrosión, tal como un revestimiento protector duro u otro sistema equivalente. Los revestimientos serán, preferentemente, de color claro. El programa de selección, aplicación y mantenimiento del sistema habrá de ser aprobado por la Administración sobre la base de las directrices aprobadas por la Organización. Cuando proceda, se utilizarán también ánodos fungibles».

Regla 8. Estabilidad de los buques de pasaje después de avería

3. Se añade el siguiente texto al final del párrafo 2.3.1:

«Esta gama puede reducirse hasta un mínimo de 10.º, en el caso en que el área situada bajo la curva de brazos adrizantes sea la especificada en el párrafo 2.3.2, más el valor de la relación:

15/Gama

donde la gama se expresa en grados».

4. En el párrafo 2.3.3, se sustituyen las palabras «la gama especificada en el párrafo 2.3.1» por «la gama de estabilidad positiva».

Regla 25-1. Ambito de aplicación

5. Se añade la frase siguiente, al final del párrafo 1 existente:

«Lo prescrito en esta parte se aplicará también a los buques de carga de eslora Ls, igual o superior a 80 m, pero no superior a 100 m, construidos el 1 de julio de 1998 o posteriormente».

Regla 25-3. Índice de subdivisión prescrito R

6. Se sustituye el texto existente del párrafo 2 por el siguiente:

«2. El grado de compartimentado necesario se determinará mediante el índice de subdivisión prescrito R, como se indica a continuación:

2.1. para los buques de eslora L(s), superior a 100 m:

$R = (0,002 + 0,0009L(s))^{1/3}$, donde L(s) se expresa en metros; y

2.2. para los buques de eslora Ls igual o superior a 100 m, pero no superior a 100 m:

$R = 1 - [1/(1 + L(s)/100 \cdot R(o)/1 - R(o) \cdot)]$, donde Ro es el valor de R calculado de conformidad con la fórmula indicada en el párrafo 2.1».

Regla 45. Precauciones contra descargas eléctricas, incendios de origen eléctrico y otros riesgos del mismo tipo

7. En el párrafo 1.1.1, se sustituye «55 V» por «50 V».

8. Se sustituye el texto existente del capítulo III por el siguiente:

«CAPITULO III

Dispositivos y medios de salvamento

PARTE A

Generalidades

Regla 1. Ambito de aplicación

1. Salvo disposición expresa en otro sentido, el presente capítulo se aplicará a todo buque cuya quilla haya sido colocada, o cuya construcción se halle en una fase equivalente, el 1 de julio de 1998 o posteriormente.

2. A los efectos del presente capítulo, la expresión "cuya construcción se halle en una fase equivalente" indica la fase en que:

2.1. Comienza la construcción que puede identificarse como propia de un buque concreto; y

2.2. Ha comenzado el montaje del buque de que se trate, utilizando al menos 50 toneladas del total estimado del material estructural o un 1 por 100 de dicho total, si este segundo valor es menor.

3. A los efectos del presente capítulo:

3.1. La expresión "buque construido" quiere decir todo buque cuya quilla haya sido colocada, o cuya construcción se halle en una fase equivalente;

3.2. La expresión "todos los buques" quiere decir los buques construidos antes del 1 de julio de 1998: en esa fecha o posteriormente; las expresiones "todos los buques de pasaje y todos los buques de carga" se entenderán en ese mismo sentido;

3.3. Todo buque de carga, independientemente del tiempo que lleve construido, que sea transformado en buque de pasaje será considerado como buque de pasaje construido en la fecha en que comience tal transformación.

4. En el caso de los buques construidos antes del 1 de julio de 1998, la Administración:

4.1. Se asegurará, a reserva de lo dispuesto en el párrafo 4.2, de que se cumplen las prescripciones que, en virtud del capítulo III del Convenio

internacional para la seguridad de la vida humana en el mar, 1974, estaban en vigor antes del 1 de julio de 1998 y eran aplicables a los buques nuevos o existentes, tal como se prescribe en ese capítulo; y

4.2. Se asegurará, cuando se sustituyan los dispositivos o los medios de salvamento de esos buques o cuando esos buques sean sometidos a reparaciones, reformas o modificaciones de carácter importante que entrañen la sustitución o la adición de dispositivos o medios de salvamento, de que dichos dispositivos o medios cumplen, dentro de lo que sea factible y razonable, las prescripciones del presente capítulo. No obstante, si se sustituye una embarcación de supervivencia que no sea una balsa salvavidas inflable sin sustituir su dispositivo de puesta a flote, o viceversa, la embarcación de supervivencia o el dispositivo de puesta a flote podrán ser del mismo tipo que la embarcación o el dispositivo sustituidos.

Regla 2. Exenciones

1. La Administración, si considera que la ausencia de riesgos y las condiciones del viaje hacen irrazonable o innecesaria la aplicación de cualquier prescripción particular del presente capítulo, podrá eximir de ella a determinados buques o clases de buques que en el curso de su viaje no se alejen más de 20 millas de la tierra más próxima.

2. En el caso de los buques de pasaje utilizados en tráficos especiales para el transporte de un gran número de pasajeros, como ocurre con el transporte de peregrinos, la Administración, si considera que el cumplimiento de las prescripciones establecidas en el presente capítulo es imposible en la práctica, podrá eximir de dichas prescripciones a tales buques, a condición de que éstos satisfagan lo dispuesto en:

2.1. El Reglamento anexo al Acuerdo sobre buques de pasaje que prestan servicios especiales, 1971; y

2.2. El Reglamento anexo al Protocolo sobre espacios habitables en buques de pasaje que prestan servicios especiales, 1973.

Regla 3. Definiciones

Salvo disposición expresa en otro sentido, a los efectos del presente capítulo regirán las siguientes definiciones:

1. "Traje de protección contra la intemperie": Traje protector diseñado para que lo utilicen las tripulaciones de los botes de rescate y las cuadrillas encargadas de los sistemas de evacuación marinos.

2. "Persona titulada": La que posee un título de suficiencia en el manejo de embarcaciones de supervivencia, expedido en virtud de la autoridad conferida por la Administración o reconocido como válido por ésta, de conformidad con lo prescrito en el vigente Convenio internacional sobre normas de formación, titulación y guardia para la gente de mar; o bien la persona que posee un título expedido o reconocido por la Administración de un Estado que no sea Parte en el citado Convenio para los mismos fines que el título regido por el Convenio.

3. "Detección": Determinación del punto en que están los supervivientes o la embarcación de supervivencia.

4. "Escala de embarco": Escala provista en los puestos de embarco de las embarcaciones de supervivencia para que se pueda acceder a ellas con seguridad después de su puesta a flote.

5. "Puesta a flote por zafada": Método de puesta a flote de la embarcación de supervivencia por el cual ésta se suelta automáticamente del buque que se está hundiendo y queda lista para ser utilizada.

6. "Puesta a flote por caída libre": Método de puesta a flote de la embarcación de supervivencia por el cual ésta se suelta con su asignación de personas y equipo y cae al agua sin medios retardadores del descenso.

7. "Traje de inmersión": Traje protector que reduce la pérdida de calor corporal de un naufrago que lo lleve puesto en aguas frías.

8. "Dispositivo inflable": Dispositivo que para flotar necesita cámaras que no sean rígidas llenas de gas y que normalmente se guarda desinflado hasta el momento de utilizarlo.

9. "Dispositivo inflado": Dispositivo que para flotar necesita cámaras que no sean rígidas llenas de gas y que se guarda inflado y listo para utilizarlo en todo momento.

10. "Código internacional de dispositivos de salvamento" (Código IDS) (llamado "el Código" en el presente capítulo): El Código internacional de dispositivos de salvamento (Código IDS) aprobado por el Comité de Seguridad Marítima de la Organización mediante la resolución MSC.48 (66), tal como lo enmienda la Organización, a condición de que tales enmiendas sean aprobadas, entren en vigor y se hagan efectivas de conformidad con las disposiciones del artículo VIII del presente Convenio relativas a los procedimientos de enmienda del anexo, excepto el capítulo I.

11. "Dispositivo o medio de puesta a flote": Medio por el que se traslada con seguridad una embarcación de supervivencia o un bote de rescate desde su puesto de estiba al agua.

12. "Eslora": El 96 por 100 de la eslora total medida en una flotación cuya distancia al canto superior de la quilla sea igual al 85 por 100 del puntal mínimo de trazado, o la eslora medida en esa flotación desde la cara proel de la roda hasta el eje de la mecha del timón, si esta segunda magnitud es mayor. En los buques proyectados con quilla inclinada, la flotación en que se mida la eslora será paralela a la flotación de proyecto.

13. "Flotación de navegación marítima con calado mínimo": Estado de carga del buque con la quilla a nivel, sin carga y con 10 por 100 de las provisiones y del combustible, y en el caso de un buque de pasaje, con todos los pasajeros, la tripulación y su equipaje.

14. "Sistema de evacuación marino": Dispositivo para transferir rápidamente a las personas desde la cubierta de embarco del buque a una embarcación de supervivencia que esté a flote.

15. "Puntal de trazado":

15.1. Distancia vertical medida desde la cara alta de la quilla hasta la cara alta del bao de la cubierta de francobordo en el costado; en los buques de madera y en los de construcción mixta esta distancia se mide desde el canto inferior del alefriz; cuando la forma de la parte inferior de la cuaderna maestra sea cóncava o cuando las tracas de apareadura sean de gran espesor, esta distancia se medirá desde la intersección del plano del fondo, prolongado hacia el interior, con la cara lateral de la quilla en la sección media;

15.2. En los buques de trancañil alomado, el puntal de trazado se medirá hasta el punto en que, prolongadas idealmente, se corten las líneas de trazado de la cubierta y del costado como si la unión del trancañil con la traca de cinta formase un ángulo;

15.3. Cuando la cubierta de francobordo tenga saltillo y la parte elevada de la cubierta está por encima del punto en el que ha de determinarse el puntal de trazado, éste se medirá hasta una línea de referencia paralela a la parte elevada de la cubierta, obtenido por prolongación de la parte inferior de la cubierta.

16. "Dispositivo o medio de salvamento de carácter innovador»: Dispositivo o medio de salvamento que reúne características nuevas no totalmente regidas por las disposiciones del presente capítulo o del Código, pero que depara un grado de seguridad igual o superior.

17. "Estabilidad positiva": Capacidad de una embarcación de volver a su posición original una vez que se elimina el momento escorante.

18. "Tiempo de recuperación de un bote de rescate": Tiempo necesario para izar el bote hasta una posición desde la que las personas que vayan a bordo puedan desembarcar sobre la cubierta del buque. El tiempo de recuperación incluye el tiempo necesario para efectuar los preparativos de recuperación a bordo del bote de rescate, tales como pasar y fijar una boza, amarrar el bote de rescate al dispositivo de puesta a flote, y el tiempo necesario para izarlo. El tiempo de recuperación no incluye el tiempo necesario para arriar el dispositivo de puesta a flote hasta la posición que permita recuperar el bote de rescate.

19. "Bote de rescate": Bote proyectado para salvar a personas en peligro y concentrar embarcaciones de supervivencia.

20. "Rescate": La recogida y puesta a salvo de supervivientes.

21. "Buque de pasaje de transbordo rodado": Buque de pasaje con espacios de carga rodada o espacios de categoría especial, tal como se definen en la regla II-2/3.

22. "Viaje internacional corto": Viaje internacional en el curso del cual un buque no se aleja más de 200 millas de un puerto o un lugar que pueda servir de refugio seguro a los pasajeros y a la tripulación. Ni la distancia del último puerto de escala del país en que comienza el viaje al puerto final de destino ni el viaje de regreso excederán de 600 millas. El puerto final de destino es el último puerto de escala del viaje regular programado en cual el buque inicia regreso hacia el país en que comenzó el viaje.

23. "Embarcación de supervivencias": Embarcación con la que se puede preservar la vida de personas que están en peligro desde el momento en que abandonan el buque.

24. "Ayuda térmica": Saco o traje hecho de un material impermeable de baja conductancia térmica.

Regla 4. Evaluación, prueba y aprobación de dispositivos y medios de salvamento

1. Salvo por lo que respecta a lo dispuesto en los párrafos 5 y 6, los dispositivos y medios de salvamento prescritos en el presente capítulo necesitarán la aprobación de la Administración.

2. Antes de aprobar dispositivos y medios de salvamento la Administración se asegurará de que éstos:

2.1. Se someten a prueba de conformidad con las recomendaciones de la Organización para comprobar que cumplen lo prescrito en el presente capítulo y en el Código; o

2.2. Se han sometido, con resultados satisfactorios a juicio de la Administración, a pruebas que en lo esencial son equivalentes a las que se especifican en dichas recomendaciones.

3. Antes de aprobar dispositivos o medios de salvamento de carácter innovador, la Administración se asegurará de que éstos:

3.1. Se ajustan a normas de seguridad al menos equivalentes a las prescripciones del presente capítulo y del Código, y se han evaluado y sometido a prueba de conformidad con las recomendaciones de la Organización; o

3.2. Se han sometido, con resultados satisfactorios a juicio de la Administración, a una evaluación y pruebas que en lo esencial son equivalentes a las de dichas recomendaciones.

4. Los procedimientos adoptados por la Administración para la aprobación comprenderán asimismo las condiciones con arreglo a las cuales continuará o se retirará la aprobación.

5. Antes de aceptar dispositivos y medios de salvamento que no hayan sido previamente aprobados por la Administración, ésta se cerciorará de que los dispositivos y medios de salvamento cumplen lo prescrito en el presente capítulo y en el Código.

6. Los dispositivos de salvamento prescritos en el presente capítulo acerca de los cuales no figuren especificaciones detalladas en el Código deberán ser satisfactorios a juicio de la Administración.

Regla 5. Realización de pruebas durante la fabricación

La Administración exigirá que los dispositivos de salvamento sean sometidos durante su fabricación a las pruebas necesarias para que respondan a la misma norma que el prototipo aprobado.

PARTE B

Prescripciones relativas a los buques y a los dispositivos de salvamento

SECCION 1.ª BUQUES DE PASAJE Y BUQUES DE CARGA

Regla 6. Comunicaciones

1. El párrafo 2 es aplicable a todos los buques de pasaje y a todos los buques de carga de arqueo bruto igual o superior a 300 toneladas.
2. Dispositivos radioeléctricos de salvamento.

2.1. Aparatos radiotelefónicos bidireccionales de ondas métricas.

2.1.1. En todo buque de pasaje y en todo buque carga de arqueo bruto igual o superior a 500 se proveerán por lo menos tres aparatos radiotelefónicos bidireccionales de ondas métricas. En todo buque de carga de arqueo bruto igual o superior a 300 pero inferior a 500 se proveerán por lo menos dos aparatos radiotelefónicos bidireccionales de ondas métricas. Dichos aparatos se ajustarán a normas de funcionamiento no inferiores a las aprobadas por la Organización. Si se instala un aparato radiotelefónico fijo bidireccional de ondas métricas en una embarcación de supervivencia, éste deberá ajustarse a normas de funcionamiento no inferiores a las aprobadas por la Organización.

2.1.2. Los aparatos radiotelefónicos bidireccionales de ondas métricas provistos a bordo de los buques antes del 1 de febrero de 1992 que no se ajusten enteramente a las normas de funcionamiento aprobadas por la Organización pueden ser aceptados por la Administración hasta el 1 de febrero de 1999, a condición de que ésta se cerciore de que son compatibles con los aparatos radiotelefónicos bidireccionales de ondas métricas aprobados.

2.2. Respondedores de radar.-Todo buque de pasaje y todo buque de carga de arqueo bruto igual o superior a 500 llevará por lo menos un respondedor de radar a cada banda. Todo buque de carga de arqueo bruto igual o superior a 300 pero inferior a 500 llevará por lo menos un respondedor de radar. Dichos respondedores de radar se ajustarán a normas de funcionamiento no inferiores a las aprobadas por la Organización. Los respondedores de radar irán estibados en lugares desde los que se puedan colocar rápidamente en cualquier embarcación de supervivencia que no sea la balsa o las balsas salvavidas prescritas en la regla 31.1.4. Otra posibilidad es estibar un respondedor de radar en todas las embarcaciones de supervivencia que no sean las prescritas en la regla 31.1.4. En los buques que lleven por lo menos dos respondedores de radar y que estén equipados con botes salvavidas de caída libre, uno de los respondedores de radar irá estibado en un bote salvavidas de caída libre y el otro estará situado en las proximidades inmediatas del puente de navegación de modo que se pueda utilizar a bordo y esté listo para trasladarlo rápidamente a cualquiera de las otras embarcaciones de supervivencia.

3. Bengalas para señales de socorro.-Se llevarán por lo menos 12 cohetes lanzabengalas con paracaídas que cumplan lo prescrito en la sección 3.1 del Código, estibados en el puente de navegación o cerca de éste.

4. Sistema de comunicaciones de a bordo y sistema de alarma.

4.1. Se proveerá un sistema de emergencia constituido por equipo fijo o portátil, o por ambos, para comunicaciones bidireccionales entre puestos de control de emergencia, puestos de reunión y de embarco y puntos estratégicos a bordo.

4.2. Se proveerá un sistema de alarma general de emergencia que cumpla la prescrito en el párrafo 7.2.1 del Código y que se utilizará para convocar a pasajeros y tripulantes a los puestos de reunión e iniciar las operaciones indicadas en el cuadro de obligaciones. Este sistema estará complementado por un sistema megafónico que cumpla lo prescrito en el párrafo 7.2.2 del Código o por otros medios de comunicación adecuados. Los sistemas de sonido para actividades recreativas se apagarán automáticamente cuando se active el sistema de alarma general de emergencia.

4.3. En los buques de pasaje, el sistema de alarma general de emergencia será audible en todas las cubiertas expuestas.

4.4. En los buques dotados de un sistema de evacuación marino, se garantizará la comunicación entre el puesto de embarco y la plataforma o la embarcación de supervivencia.

5. Sistemas megafónicos de los buques de pasaje.

5.1. Además de lo prescrito en las reglas II-2/40.5 o II-2/41.2, según proceda, y en el párrafo 6.4.2, se instalará en todos los buques de pasaje un sistema megafónicos. Respecto de los buques construidos antes del 1 de julio de 1997, las prescripciones de los párrafos 5.2 y 5.4, a reserva de las disposiciones del párrafo 5.5, se cumplirán a más tardar en la fecha del primer reconocimiento periódico efectuado después del 1 de julio de 1997.

5.2. El sistema megafónico será claramente audible por encima del ruido ambiental en todos los espacios prescritos en el párrafo 7.2.2.1 del Código y estará provisto de una función de neutralización controlada desde un lugar situado en el puente de navegación y otros lugares que la Administración considere necesarios, de modo que se emitan todos los mensajes de emergencia, aun cuando uno cualquiera de los altavoces de los espacios de que se trate esté desconectado o se haya reducido su volumen, o se esté utilizando el sistema megafónico para otros fines.

5.3. En los buques de pasaje construidos el 1 de julio de 1997 o posteriormente:

5.3.1. El sistema megafónico tendrá dos bucles como mínimo, que estarán suficientemente separados en toda su longitud, y dispondrá de dos amplificadores distintos o independientes; y

5.3.2. El sistema megafónico y sus normas de funcionamiento deberán ser aprobados por la Administración teniendo en cuenta las recomendaciones de la Organización.

5.4. El sistema megafónico estará conectado a la fuente de energía eléctrica de emergencia prescrita en la regla II-1/42.2.2.

5.5. No será preciso cambiar el sistema megafónico de los buques construidos antes del 1 de julio de 1997 que ya dispongan de un sistema aprobado por la Administración, que se ajuste sustancialmente a lo prescrito en los párrafos 5.2 y 5.4 supra y en el párrafo 7.2.2.1 del Código.

Regla 7. Dispositivos individuales de salvamento

1. Aros salvavidas.

1.1. Los aros salvavidas, que cumplirán lo prescrito en el párrafo 2.1.1 del Código, irán:

1.1.1. Distribuidos de modo que estén fácilmente disponibles a ambas bandas del buque, y, en la medida de lo posible, en todas las cubiertas expuestas que se extiendan hasta el costado del buque; habrá por lo menos uno en las proximidades de la popa; y

1.1.2. Estibados de modo que sea posible soltarlos rápidamente y no estarán sujetos de ningún modo por elementos de fijación permanente.

1.2. A cada banda del buque habrá como mínimo un aro salvavidas provisto de una rabiza flotante que cumpla lo prescrito en el párrafo 2.1.4 del Código, de una longitud igual por lo menos al doble de la altura a la cual vaya estibado por encima de la flotación de navegación marítima con calado mínimo, o a 30 m, si este valor es superior.

1.3. La mitad al menos del número total de aros salvavidas estarán provistos de luces de encendido automático que cumplan lo prescrito en el párrafo 2.1.2 del Código; al menos dos de estos aros llevarán también señales fumígenas de funcionamiento automático que cumplan lo prescrito en el párrafo 2.1.3 del Código y se podrán soltar rápidamente desde el puente de navegación; los aros salvavidas provistos de luces y los provistos de luces y de señales fumígenas irán distribuidos por igual a ambas bandas del buque y no serán aquellos que estén provistos de rabiza de conformidad con lo prescrito en el párrafo 1.2.

1.4. En cada aro salvavidas se marcará con letras mayúsculas del alfabeto romano el nombre del buque que lo lleve y su puerto de matrícula.

2. Chalecos salvavidas.

2.1. Para cada una de las personas que vayan a bordo se proveerá un chaleco salvavidas que cumpla lo prescrito en los párrafos 2.2.1 ó 2.2.2 del Código y, además:

2.1.1. Un número de chalecos salvavidas apropiados para niños igual por lo menos al 10 por 100 del total de pasajeros que vayan a bordo, o un número mayor si es necesario, de modo que haya un chaleco salvavidas para cada niño; y

2.1.2. Un número suficiente de chalecos salvavidas para las personas encargadas de la guardia y para utilizarlos en los puestos de embarcaciones de supervivencia alejados. Los chalecos salvavidas destinados a las personas encargadas de la guardia se estibarán en el puente, la cámara de control de máquinas y cualquier otro puesto que tenga dotación de guardia.

2.2. Los chalecos salvavidas se colocarán de modo que sean fácilmente accesibles y su emplazamiento estará claramente indicado. Cuando a causa de la disposición especial del buque los chalecos salvavidas provistos de conformidad con lo prescrito en el párrafo 2.1 resulten inaccesibles, se tomarán otras medidas que la Administración juzgue satisfactorias, como por ejemplo un aumento del número de chalecos salvavidas que se han de llevar.

2.3. Los chalecos salvavidas que se utilicen en botes salvavidas totalmente cerrados, salvo los botes salvavidas de caída libre, no deberán ser un obstáculo para entrar en el bote o sentarse, ni para ponerse los cinturones instalados en los asientos del bote.

2.4. Los chalecos salvavidas elegidos para los botes salvavidas de caída libre, así como la forma en que se lleven o pongan, no deberán entorpecer la

entrada en el bote ni afectar a la seguridad de los ocupantes o al manejo del bote.

3. Trajes de inmersión y trajes de protección contra la intemperie.-Para cada una de las personas designadas como tripulantes del bote de rescate o como miembros de la cuadrilla encargada del sistema de evacuación marina se proveerá un traje de inmersión de talla adecuada que cumpla lo prescrito en la sección 2.3 del Código o un traje de protección contra la intemperie de talla adecuada que cumpla lo prescrito en la sección 2.4 del Código. Cuando el buque esté destinado continuamente a efectuar viajes en zonas de clima cálido en las que a juicio de la Administración la protección térmica es innecesaria, no habrá que llevar dicha indumentaria protectora.

Regla 8. Cuadro de obligaciones e instrucciones para casos de emergencia

1. La presente regla es aplicable a todos los buques.
2. Para cada persona que vaya a bordo se proveerán instrucciones claras que habrá que seguir en caso de emergencia. En los buques de pasaje, estas instrucciones se formularán en el idioma o los idiomas exigidos por el Estado de abanderamiento del buque y en inglés.
3. En lugares bien visibles de todo el buque, incluidos el puente de navegación, la cámara de máquinas y los espacios de alojamiento de la tripulación, se fijarán cuadros de obligaciones e instrucciones para casos de emergencia que cumplan lo prescrito en la regla 37.
4. En los camarotes de los pasajeros se fijarán ilustraciones e instrucciones en los idiomas apropiados, y éstas se expondrán claramente en los puestos de reunión y en otros espacios destinados a los pasajeros, con objeto de informar a éstos sobre:
 - 4.1. Su puesto de reunión;
 - 4.2. Su comportamiento esencial en caso de emergencia; y
 - 4.3. La forma de ponerse los chalecos salvavidas.

Regla 9. Instrucciones de funcionamiento

1. La presente regla es aplicable a todos los buques.
2. En las embarcaciones de supervivencia y en sus mandos de puesta a flote, o en sus proximidades, se pondrán carteles o señales que deberán:
 - 2.1. Ilustrar la finalidad de los mandos y el modo de funcionamiento del dispositivo de que se trate, y contener las instrucciones o advertencias pertinentes;
 - 2.2. Ser fácilmente visibles con alumbrado de emergencia; y
 - 2.3. Utilizar signos conformes con las recomendaciones de la Organización.

Regla 10. Dotación de la embarcación de supervivencia y supervisión

1. La presente regla es aplicable a todos los buques.
2. Habrá a bordo un número suficiente de personas con la formación necesaria para reunir y ayudar a las personas que no hayan recibido formación.
3. Habrá a bordo un número suficiente de tripulantes, que pueden ser oficiales de puente o personas tituladas, para manejar las embarcaciones de supervivencia y los medios de puesta a flote que se necesiten para que todas las personas que vayan a bordo puedan abandonar el buque.
4. De cada embarcación de supervivencia que vaya a utilizarse estará encargado un oficial de puente o una persona titulada. No obstante, la Administración, teniendo en cuenta la naturaleza

del viaje, el número de personas que vayan a bordo y las características del buque, podrá permitir que de las balsas salvavidas queden encargadas personas adiestradas en el manejo y el gobierno de las mismas, en vez de personas que tengan la competencia a que antes se alude. Se nombrará asimismo un patrón suplente en el caso de los botes salvavidas.

5. El encargado de la embarcación de supervivencia tendrá una lista de sus tripulantes y se asegurará de que los tripulantes que se encuentren a sus órdenes estén familiarizados con las obligaciones que les correspondan. En el caso de los botes salvavidas, el patrón suplente tendrá asimismo una lista de los tripulantes del mismo.

6. A toda embarcación motorizada de supervivencia se le asignará una persona que sepa manejar el motor y realizar pequeños ajustes.

7. El capitán se asegurará de que las personas a que se hace referencia en los párrafos 2, 3 y 4 quedan equitativamente distribuidas entre las embarcaciones de supervivencia del buque.

Regla 11. Disposiciones para la reunión y el embarco en las embarcaciones de supervivencia

1. Los botes y balsas salvavidas para los cuales se exijan dispositivos aprobados de puesta a flote irán colocados lo más cerca posible de los espacios de alojamiento y de servicio.

2. Se dispondrán puestos de reunión cerca de los puestos de embarco. El espacio libre de cubierta de cada puesto de reunión será suficiente para dar cabida a todas las personas que hayan de reunirse en él, esto es 0,35 metros cuadrados por persona como mínimo.

3. Los puestos de reunión y los puestos de embarco serán fácilmente accesibles desde las zonas de alojamiento y de trabajo.

4. Los puestos de reunión y los puestos de embarco estarán adecuadamente iluminados con el alumbrado que suministre la fuente de energía eléctrica de emergencia prescrita en la regla II-1/42 o II-1/43, según proceda.

5. Los pasillos, escaleras y salidas que den acceso a los puestos de reunión y a los puestos de embarco estarán alumbrados. La fuente de energía eléctrica de emergencia prescrita en las reglas II-1/42 o II-1/43, según proceda, podrá suministrar la energía necesaria para ese alumbrado. Además de la señalización prescrita en la regla II-2/28.1.10 o como parte de ella, las vías que conduzcan a los puestos de reunión y de embarco estarán indicadas con el signo de puesto de reunión destinado a ese fin, de conformidad con las recomendaciones de la Organización.

6. Los puestos de reunión y los puestos de embarco para embarcaciones de supervivencia de pescantes de puesta a flote por cada libre estarán dispuestos de modo que permitan colocar en las embarcaciones a personas transportadas en camilla.

7. Para cada puesto de embarco de las embarcaciones de supervivencia que se arríen por el costado del buque, o para cada dos de estos puestos que sean adyacentes, se proveerá una escala de embarco de un solo tramo que cumpla lo prescrito en el párrafo 6.1.6 del Código y que llegue desde la cubierta hasta la flotación de navegación marítima con calado mínimo, en condiciones desfavorables, con un asiento de hasta 10° y una escora de hasta 20° a una u otra banda. No obstante, la Administración podrá permitir la sustitución de tales escalas por dispositivos aprobados que den acceso a la embarcación de supervivencia cuando ésta esté a flote, a condición de que haya al menos una escala de embarco en cada costado del buque. Podrán autorizarse otros medios de embarco que permitan el descenso hasta el agua de forma ordenada para las balsas salvavidas prescritas en la regla 31.1.4.

8. Cuando sea necesario, se proveerán medios para atracar al costado del buque las embarcaciones de supervivencia de pescante y mantenerlas abarloadas, de modo que se pueda embarcar en ellas sin riesgos.

Regla 12. Puestos de puesta a flote

Los puestos de puesta a flote estarán situados en emplazamientos que permitan la puesta a flote sin riesgos, teniendo particularmente en cuenta que deben estar apartados de las hélices y de las partes muy lanzadas del casco, y de modo que, en la medida de lo posible, las embarcaciones de supervivencia, salvo las proyectadas especialmente para ser puestas a flote

por caída libre, se puedan poner a flote por la parte recta del costado del buque. Si se hallan a proa, estarán situados en la parte posterior del mamparo de colisión en un emplazamiento protegido y, a este respecto, la Administración considerará especialmente la resistencia del dispositivo de puesta a flote.

Regla 13. Estiba de las embarcaciones de supervivencia

1. Cada embarcación de supervivencia irá estibada:

1.1. De modo que ni la embarcación ni sus medios de estiba entorpezcan el funcionamiento de ninguna de las demás embarcaciones de supervivencia o de los botes de rescate en los otros puestos de puesta a flote;

1.2. Tan cerca de la superficie del agua como sea prudente y posible y, en el caso de las embarcaciones de supervivencia que no sean balsas salvavidas destinadas a ser puestas a flote lanzándolas por la borda, de modo que la embarcación de supervivencia, en su posición de embarco, quede como mínimo a 2 m por encima de la flotación correspondiente a la carga máxima del buque, en condiciones desfavorables, con un asiento de hasta 10° y una escora de hasta 20° a una u otra banda, o de los grados necesarios para que el borde de la cubierta de intemperie se sumerja, si este segundo valor es menor;

1.3. De modo que esté siempre lista para ser utilizada y que dos tripulantes puedan llevar a cabo los preparativos para el embarco y la puesta a flote en menos de cinco minutos.

1.4. Totalmente equipada, de acuerdo con lo prescrito en el presente capítulo y en el Código; y

1.5. Siempre que sea posible, en un emplazamiento seguro y protegido, y a resguardo de los daños que puedan ocasionar el fuego o las explosiones. En particular, las embarcaciones de supervivencia de los buques tanque que no sean las balsas salvavidas prescritas en la regla 31.1.4 no se estibarán sobre o por encima de un tanque de carga, un tanque de lavazas u otro tanque que contenga cargas explosivas o potencialmente peligrosas.

2. Los botes salvavidas destinados a ser puestos a flote por el costado del buque irán estibados por delante de la hélice, a la mayor distancia posible de ésta. En los buques de carga de eslora igual o superior a 80 m pero inferior a 120 m, cada bote salvavidas irá estibado de modo que su parte popel quede por delante de la hélice, a una distancia al menos igual a la eslora del bote. En los buques de carga de eslora igual o superior a 120 m y en los buques de pasaje de eslora igual o superior a 80 m, cada bote salvavidas irá estibado de modo que su parte popel quede por delante de la hélice, a una distancia al menos igual a una vez y media la eslora del bote. Cuando proceda, el buque estará acondicionado de modo que los botes salvavidas estén protegidos en su posición de estiba contra los desperfectos que pudiera causarles la mar gruesa.

3. Los botes salvavidas se estibarán fijados a los dispositivos de puesta a flote.

4.1. Toda balsa salvavidas se estibará con su boza permanentemente amarrada al buque;

4.2. Toda balsa salvavidas o todo grupo de balsas salvavidas se estibará con un medio de zafada que cumpla lo prescrito en el párrafo 4.1.6 del Código de modo que cada balsa salvavidas se suelte y, si es inflable, se infle automáticamente cuando el buque se hunda;

4.3. Las balsas salvavidas se estibarán de modo que éstas o sus envolturas puedan soltarse manualmente de una en una de sus medios de sujeción;

4.4. Los párrafos 4.1 y 4.2 no son aplicables a las balsas salvavidas prescritas en la regla 31.1.4.

5. Las balsas salvavidas de pescante irán estibadas al alcance de los ganchos de izada, a menos que se provea algún medio de traslado que no resulte inservible dentro de los límites de asiento y eslora prescritos en el párrafo 1.2, o por el movimiento del buque o por un fallo en el suministro de energía.

6. Las balsas salvavidas destinadas a ser puestas a flote lanzándolas por la borda irán estibadas de modo que se puedan trasladar fácilmente para lanzarlas por una u otra banda del buque, a menos que a cada banda vayan estibadas balsas salvavidas que se puedan poner a flote por una u otra banda, cuya capacidad conjunta sea la prescrita en la regla 31.1.

Regla 14. Estiba de los botes de rescate

Los botes de rescate irán estibados:

1. De modo que estén siempre listos para ponerlos a flote en cinco minutos como máximo;
2. En un emplazamiento adecuado para su puesta a flote y recuperación;
3. De modo que ni el bote de rescate ni sus medios de estiba entorpezcan el funcionamiento de ninguna de las demás embarcaciones de supervivencia en los otros puestos de puesta a flote; y
4. Conforme a lo prescrito en la regla 13, si también son botes salvavidas.

Regla 15. Estiba de los sistemas de evacuación marinos

1. El costado del buque carecerá de aberturas desde el puesto de embarco del sistema de evacuación marino hasta la flotación de navegación marítima con calado mínimo y se proveerán medios para proteger el sistema contra los salientes.
2. Los sistemas de evacuación marinos estarán situados en emplazamientos que permitan la puesta a flote sin riesgos, teniendo particularmente en cuenta que deben estar apartados de las hélices y de las partes muy lanzadas del casco y de modo que, en la medida de lo posible, los sistemas se puedan poner a flote por la parte recta del costado del buque.
3. Cada sistema de evacuación marino irá estibado de forma que ni el pasadizo, ni la plataforma, ni sus medios de estiba o de funcionamiento entorpezcan el funcionamiento de ningún otro dispositivo de salvamento en los demás puestos de puesta a flote.
4. Cuando proceda, el buque estará acondicionado de modo que los sistemas de evacuación marinos estén protegidos en su posición de estiba contra los desperfectos que pudiera causarles la mar gruesa.

Regla 16. Medios de puesta a flote y de recuperación de las embarcaciones de supervivencia

1. Salvo disposición expresa en otro sentido, se proveerán dispositivos de puesta a flote y de embarco que cumplan lo prescrito en la sección 6.1 del Código para todas las embarcaciones de supervivencia, excepto aquéllas:

1.1. En las que se embarque desde un lugar en cubierta a menos de 4,5 m por encima de la flotación de navegación marítima con calado mínimo y cuya masa no exceda de 185 kg; o

1.2. En las que se embarque desde un lugar en cubierta situado a menos de 4,5 m por encima de la flotación de navegación marítima con calado mínimo y que estén estibadas de forma que se puedan poner a flote directamente desde la posición de estiba, en condiciones desfavorables, con un asiento de hasta 10° y una escora de hasta 20° a una u otra banda; o

1.3. Que haya además de las embarcaciones de supervivencia para el 200 por 100 del número total de personas que vayan a bordo del buque y cuya masa no exceda de 185 kg, o

1.4. Que haya además de las embarcaciones de supervivencia para el 200 por 100 del número total de personas que vayan a bordo del buque y que estén

estibadas de forma que se puedan poner a flote directamente desde la posición de estiba, en condiciones desfavorables, con un asiento de hasta 10° y una escora de hasta 20° a una u otra banda; o

- 1.5. Que se provean para ser utilizados con un sistema de evacuación marino que cumpla lo prescrito en la sección 6.2 del Código y que estén estibadas de forma que se puedan poner a flote directamente desde la posición de estiba, en condiciones desfavorables, con un asiento de hasta 10° y una escora de hasta 20° a una u otra banda.
2. Cada bote salvavidas irá provisto de un dispositivo que permita ponerlo a flote y recuperarlo. Además se dispondrá de medios para suspender el bote salvavidas de modo que se pueda liberar el aparejo de suelta para su mantenimiento.
3. Los medios de puesta a flote y de recuperación serán tales que el operario encargado del dispositivo a bordo del buque pueda observar la embarcación de supervivencia en todo momento durante la puesta a flote y, si se trata de botes salvavidas, en todo momento durante la recuperación.
4. Se utilizará un solo tipo de mecanismo de suelta para las embarcaciones de supervivencia de tipo análogo que se lleven en el buque.
5. La preparación y el manejo de embarcaciones de supervivencia en uno cualquiera de los puestos de puesta a flote no deberá entorpecer la preparación y el manejo rápidos de ninguna otra embarcación de supervivencia o bote de rescate en ningún otro puesto.
6. Cuando se utilicen tiras en los dispositivos de puesta a flote, éstas tendrán la longitud suficiente para que las embarcaciones de supervivencia lleguen al agua cuando el buque está en la flotación de navegación marítima con calado mínimo y en condiciones desfavorables, con un asiento de hasta 10° y una escora de hasta 20° a una u otra banda.
7. Durante la preparación y la puesta a flote, la embarcación de supervivencia, su dispositivo de puesta a flote y la zona del agua en que la embarcación vaya a ser puesta a flote estarán adecuadamente iluminados con alumbrado suministrado por la fuente de energía eléctrica de emergencia prescrita en la regla II-1/42 o II-1/43, según proceda.
8. Se dispondrá de medios para evitar cualquier descarga de agua en la embarcación de supervivencia mientras se esté abandonando el buque.
9. Si hay peligro de que las aletas estabilizadoras del buque causen daños a la embarcación de supervivencia, se dispondrá de medios alimentados por una fuente de energía de emergencia para retraer las aletas hacia el interior del buque; en el puente de navegación habrá indicadores alimentados por una fuente de energía de emergencia que muestren la posición de las aletas.
10. Si se llevan botes salvavidas parcialmente cerrados que cumplan lo prescrito en la sección 4.5 del Código, se proveerá un nervio tendido entre las cabezas de los pescantes al que vayan fijados dos cabos salvavidas al menos cuya longitud sea suficiente para llegar al agua cuando el buque está en la flotación de navegación marítima con calado mínimo y en condiciones desfavorables, con un asiento de hasta 10° y una eslora de hasta 20° a una u otra banda.

Regla 17. Medios de embarco, de puesta a flote y de recuperación de los botes de rescate

1. Los medios de embarco y de puesta a flote de los botes de rescate serán tales que permitan efectuar el embarco en dichos botes y ponerlos a flote en el menor tiempo posible.
2. Si el bote de rescate es una de las embarcaciones de supervivencia del buque, los medios de embarco y el puesto de puesta a flote cumplirán lo prescrito en las reglas 11 y 12.
3. Los medios de puesta a flote cumplirán lo prescrito en la regla 16. No obstante, todos los botes de rescate se podrán poner a flote, utilizando bozas en caso necesario, cuando el buque lleve una arrancada avante de hasta 5 nudos en aguas tranquilas.
4. El tiempo de recuperación del bote de rescate cuando lleve su asignación completa de personas y equipo no será superior a cinco minutos con mar moderada. Si el bote de rescate es también un bote salvavidas, será posible recuperarlo en ese tiempo cuando lleve todo el equipo que le corresponda como bote salvavidas y la asignación de personas aprobada que le corresponda como bote de rescate, la cual será como mínimo de seis personas.

5. Los medios de embarco y de recuperación de los botes de rescate estarán dispuestos de modo que permitan manejar con seguridad y eficacia a una persona transportada en camilla. Con fines de seguridad, se proveerán estobos de recuperación para cuando haga mal tiempo si los cuadernales pesados constituyen un peligro.

Regla 18. Aparatos lanzacabos

Se proveerá un aparato lanzacabos que cumpla lo prescrito en la sección 7.1 del Código.

Regla 19. Formación y ejercicios periódicos para casos de emergencia

1. La presente regla es aplicable a todos los buques.

2. Familiarización con las instalaciones de seguridad y los ejercicios de reunión.

2.1. Todo tripulante al que se le hayan asignado tareas en casa de emergencia estará familiarizado con dichas tareas antes de iniciar el viaje.

2.2. En un buque que realice un viaje en el que esté previsto que los pasajeros permanezcan a bordo más de veinticuatro horas, se efectuará la reunión de los pasajeros en las veinticuatro horas siguientes al embarco. Se darán instrucciones a los pasajeros acerca de la utilización de los chalecos salvavidas y de cómo deben actuar en caso de emergencia.

2.3. Siempre que embarquen nuevos pasajeros se les dará instrucciones sobre seguridad inmediatamente antes o inmediatamente después de hacerse a la mar. Dichas instrucciones incluirán las prescritas en las reglas 8.2 y 8.4, y se darán mediante un anuncio en uno o varios idiomas que puedan ser comprendidos por los pasajeros. El anuncio se hará a través del sistema megafónico del buque o utilizando otro medio equivalente que pueda ser escuchado al menos por los pasajeros que no lo hayan oído durante el viaje. Las instrucciones se podrán dar durante la reunión prescrita en el párrafo 2.2 si dicha reunión se celebra inmediatamente después de la salida. Como complemento de tales instrucciones se podrán utilizar tarjetas o carteles informativos o programas de vídeo presentados en las pantallas de vídeo del buque, pero éstos no se podrán utilizar para reemplazar el anuncio.

3. Ejercicios.

3.1. Los ejercicios se realizarán, en la medida de lo posible, como si realmente se hubiera producido un caso de emergencia.

3.2. Todo tripulante participará al menos en un ejercicio de abandono del buque y un ejercicio de lucha contra incendios todos los meses. Los ejercicios de la tripulación se realizarán en las veinticuatro horas siguientes a la salida de un puerto si más del 25 por 100 de los tripulantes no han participado en ejercicios de abandono del buque y de lucha contra incendios a bordo de ese buque durante el mes anterior. Cuando un buque entre en servicio por primera vez después de haber sido objeto de una modificación de carácter importante o cuando se contrate a una nueva tripulación, estos ejercicios se realizarán antes de hacerse a la mar. Para las clases de buque en que esto resulte imposible, la Administración podrá aceptar procedimientos que sean al menos equivalentes.

3.3. Ejercicio de abandono del buque.

3.3.1. En cada ejercicio de abandono del buque habrá que:

3.3.1.1. Convocar a los pasajeros y a la tripulación a los puestos de reunión por medio del sistema de alarma prescrito en la regla 6.4.2, antes de anunciar el

ejercicio por el sistema megafónico u otro sistema de comunicación, y comprobar que han comprendido en qué consiste la orden de abandono del buque;

3.3.1.2. Acudir a los puestos y prepararse para los cometidos indicados en el cuadro de obligaciones;

3.3.1.3. Comprobar que los pasajeros y la tripulación llevan indumentaria adecuada;

3.3.1.4. Comprobar que se han puesto correctamente los chalecos salvavidas;

3.3.1.5. Arriar al menos un bote salvavidas tras los preparativos necesarios para la puesta a flote;

3.3.1.6. Poner en marcha y hacer funcionar el motor del bote salvavidas;

3.3.1.7. Accionar los pescantes utilizados para poner a flote las balsas salvavidas;

3.3.1.8. Simular la búsqueda y el salvamento de Pasajeros atrapados en sus camarotes; y

3.3.1.9. Dar instrucciones sobre la utilización de los dispositivos radioeléctricos de salvamento.

3.3.2. Siempre que sea posible, se arriarán, de conformidad con lo prescrito en el párrafo 3.3.1.5, botes salvavidas distintos en ejercicios sucesivos.

3.3.3. Salvo lo dispuesto en los párrafos 3.3.4 y 3.3.5, cada uno de los botes salvavidas se pondrá a flote con la dotación que tenga que llevar a bordo para su manejo y se maniobrará en el agua por lo menos una vez cada tres meses durante un ejercicio de abandono del buque.

3.3.4. Cuando no sea factible poner a flote por caída libre un bote salvavidas que esté previsto para ponerlo a flote de esa forma, éste se podrá arriar al agua, siempre que se ponga a flote por caída libre con la dotación que tenga que llevar a bordo para su manejo y se manibre en el agua por lo menos una vez cada seis meses. No obstante, cuando esto no sea posible, la Administración podrá extender este período a doce meses a condición de que se haga lo necesario para realizar una puesta a flote simulada cada seis meses como mínimo.

3.3.5. La Administración podrá permitir que los buques que realicen viajes internacionales cortos no pongan a flote los botes salvavidas por una de sus bandas si los medios de atraque en puerto y las modalidades de tráfico del buque impiden poner a flote los botes salvavidas por esa banda. No obstante, todos los botes salvavidas se arriarán por lo menos una vez cada tres meses y se pondrán a flote por lo menos una vez al año.

3.3.6. En la medida de lo razonable y posible, los botes de rescate que no sean botes salvavidas utilizados también, como botes de rescate se pondrán a flote todos los meses con la dotación que tengan que llevar a bordo y se maniobrarán en el agua. En todo caso se dará cumplimiento a este prescripción al menos una vez cada tres meses.

3.3.7. Si los ejercicios de puesta a flote de los botes salvavidas y botes de rescate se efectúan llevando el buque arrancada avante, dichos ejercicios, por los peligros que ello entraña, sólo se realizarán en aguas abrigadas y bajo la supervisión de un oficial que tenga experiencia de ellos.

3.3.8. Si un buque está equipado con sistemas de evacuación marinos, los ejercicios incluirán prácticas de los procedimientos necesarios para desplegar dichos sistemas hasta el momento inmediatamente anterior al despliegue efectivo de los mismos. Se reforzará este aspecto de los ejercicios con instrucciones periódicas relativas a la utilización de los medios de formación de a bordo prescritos en la regla 35.4. Además, todo miembro de una cuadrilla encargada de un sistema deberá recibir una formación adicional participando en el despliegue completo en el agua de un sistema análogo, ya sea a bordo de un buque o en tierra, a intervalos no superiores a dos años, en la medida de lo posible pero en ningún caso superiores a tres años. Esta formación podrá impartirse en relación con los despliegues prescritos en la regla 20.8.2.

3.3.9. El alumbrado de emergencia para la reunión de los pasajeros y el abandono del buque se comprobará en cada ejercicio de abandono del buque.

3.4. Ejercicios de lucha contra incendios.

3.4.1. Los ejercicios de lucha contra incendios se planearán de tal modo que se tengan debidamente en cuenta las prácticas habituales para las diversas emergencias que se puedan producir según el tipo de buque y de carga.

3.4.2. En cada ejercicio de lucha contra incendios habrá que:

3.4.2.1. Acudir a los puestos y prepararse para los cometidos indicados en el cuadro de obligaciones prescrito en la regla 8;

3.4.2.2. Poner en marcha una bomba contra incendios utilizando por lo menos los dos chorros de agua prescritos, para comprobar que el sistema se encuentra en perfecto estado de funcionamiento;

3.4.2.3. Comprobar los equipos de bombero y demás equipo individual de salvamento;

3.4.2.4. Comprobar el equipo de comunicaciones pertinente;

3.4.2.5. Comprobar el funcionamiento de las puertas estancas, las puertas contraincendios, las válvulas de mariposa contraincendios y los orificios principales de entrada y salida de los sistemas de ventilación, y

3.4.2.6. Comprobar las disposiciones necesarias para el abandono ulterior del buque.

3.4.3. El equipo utilizado en los ejercicios se volverá inmediatamente a poner en condiciones de funcionamiento y cualquier fallo o defecto descubierto durante el ejercicio se subsanará lo antes posible.

4. Formación e instrucciones impartidas a bordo.

4.1. A todo nuevo tripulante se le dará formación a bordo lo antes posible, y desde luego no más de dos semanas después de su incorporación al buque, sobre la utilización de los dispositivos de salvamento del buque, incluido el equipo de las embarcaciones de supervivencia, y de los dispositivos de extinción de incendios. No obstante, si el tripulante se halla adscrito al buque según un programa de turnos regulares, recibirá esa formación no más de dos semanas después de la fecha de su primera incorporación al buque. Las instrucciones para la utilización de los dispositivos de lucha contra incendios y los dispositivos de salvamento del buque y para la supervivencia en el mar se darán a los mismos intervalos que los ejercicios. Podrá darse instrucción por separado acerca de diferentes partes de los dispositivos de salvamento y de extinción de incendios del buque, pero se deberán abarcar todos ellos en un plazo de dos meses.

4.2. Todos los tripulantes recibirán instrucciones que incluirán, sin que la enumeración sea exhaustiva:

4.2.1. El manejo y la utilización de las balsas salvavidas inflables del buque;

4.2.2. Los problemas planteados por la hipotermia, los primeros auxilios indicados en caso de hipotermia y otros casos en que es apropiado dar primeros auxilios;

4.2.3. Las instrucciones especiales necesarias para utilizar los dispositivos de salvamento que lleve el buque con mal tiempo y mala mar; y

4.2.4. El manejo y la utilización de los dispositivos de extinción de incendios.

4.3. A intervalos que no excedan de cuatro meses se impartirá formación sobre la utilización de las balsas salvavidas de pescante a bordo de todo buque provisto de tales dispositivos. Siempre que sea posible, esto comprenderá el inflado y arriado de una balsa salvavidas. Esta podrá ser una balsa especial destinada únicamente a impartir formación y que no forme parte del equipo de salvamento del buque, dicha balsa especial estará claramente marcada.

5. Anotaciones.-Se anotarán en el diario de navegación que prescriba la Administración las fechas en que se efectúe la reunión y los pormenores de los ejercicios de abandono del buque y de lucha contra incendios, de los ejercicios realizados con otros dispositivos de salvamento y de la formación impartida a bordo. Si en el momento prefijado no se efectúa en su totalidad una reunión, un ejercicio o una sesión de formación, se hará constar esto en el diario de navegación, indicando las circunstancias que concurrieron y el alcance de la reunión, el ejercicio o la sesión de formación que se llevó a cabo.

Regla 20. Disponibilidad funcional, mantenimiento e inspección

1. La presente regla es aplicable a todos los buques. En la medida de lo posible, los buques construidos antes del 1 de julio de 1986 cumplirán lo prescrito en los párrafos 3 y 6.2.

2. Disponibilidad funcional.-Antes de que el buque salga de puerto y en todo momento durante el viaje, todos los dispositivos de salvamento estarán en condiciones de servicio y listos para utilizarlos inmediatamente.

3. Mantenimiento.

3.1. Se proveerán instrucciones que cumplan lo prescrito en la regla 36 para el mantenimiento a bordo de los dispositivos de salvamento y las operaciones de mantenimiento se realizarán de acuerdo con ellas.

3.2. En lugar de las instrucciones prescritas en el párrafo 3.1, la Administración podrá aceptar un programa planificado de mantenimiento a bordo que incluya lo prescrito en la regla 36.

4. Mantenimiento de las tiras.

4.1. Los extremos de las tiras utilizadas en los dispositivos de puesta a flote se invertirán a intervalos que no excedan de treinta meses y éstas se renovarán cuando, debido a su deterioro, sea necesario, o a intervalos que no excedan de cinco años, si este plazo es más corto.

4.2. En lugar de la inversión de las tiras prescrita en el párrafo 4.1, la Administración podrá aceptar la inspección periódica de éstas y su renovación cuando, debido a su deterioro, sea necesario, o a intervalos que no excedan de cuatro años, si este plazo es más corto.

5. Piezas de repuesto y equipo de reparación.-Se proveerán piezas de repuesto y equipo de reparación para los dispositivos de salvamento y los componentes de éstos sometidos a intenso desgaste o deterioro y que hayan de ser sustituidos periódicamente.

6. Inspección semanal.-Cada semana se efectuarán las pruebas a inspecciones siguientes:

6.1. Todas las embarcaciones de supervivencia y todos los botes de rescate y dispositivos de puesta a flote serán objeto de una inspección ocular a fin de verificar que están listos para ser utilizados;

6.2. Se harán funcionar todos los motores de los botes salvavidas y de los botes de rescate durante un período total de al menos tres minutos, a condición de que la temperatura ambiente sea superior a la temperatura mínima necesaria para poner en marcha el motor. Durante dicho período se comprobará que la caja y el tren de engranajes embragan de forma satisfactoria. Si las características especiales del motor fueraborda instalado en un bote de rescate no le permiten funcionar durante un período de tres minutos a menos que tenga la hélice sumergida, se le hará funcionar durante el período que prescriba el manual del fabricante. En casos especiales, la Administración podrá eximir de esta prescripción a los buques construidos antes del 1 de julio de 1986; y

6.3. Se ensayará el sistema de alarma general de emergencia.

7. Inspecciones mensuales.-Todos los meses se efectuará una inspección de los dispositivos de salvamento, incluido el equipo de los botes salvavidas, utilizando la lista de comprobaciones prescrita en la regla 36.1, a fin de verificar que están completos y en buen estado. El informe correspondiente a la inspección se incluirá en el diario de navegación.

8. Servicio de mantenimiento de las balsas salvavidas inflables, los chalecos salvavidas inflables, los sistemas de evacuación marinos y los botes de rescate inflados.

8.1. Cada balsa salvavidas inflable, cada chaleco salvavidas inflable y cada sistema de evacuación marino será objeto de un servicio:

8.1.1. A intervalos que no excedan de doce meses, si bien en los casos en que ello no resulte viable, la Administración podrá ampliar este período a diecisiete meses; y

8.1.2. En una estación de servicio aprobada que sea competente para efectuarlo, tenga instalaciones de servicio apropiadas y utilice sólo personal debidamente capacitado.

8.2. Despliegue alternado de los sistemas de evacuación marinos.-Además de desplegar los sistemas de evacuación marinos a los intervalos de servicio prescritos en el párrafo 8.1, o al mismo tiempo que dichos servicios, todos los sistemas se desplegarán desde el buque de forma alternada a los intervalos que decida la Administración, a condición de que cada sistema se despliegue una vez por lo menos cada seis años.

8.3. La Administración que apruebe dispositivos nuevos e innovadores para las balsas salvavidas inflables en cumplimiento de la regla 4 podrá permitir la ampliación de los intervalos de servicio con las condiciones siguientes:

8.3.1. Se haya demostrado que los dispositivos nuevos e innovadores para las balsas salvavidas, cuyo servicio se haga a intervalos más amplios, siguen ajustándose a la norma prescrita para el procedimiento de prueba.

8.3.2. El sistema de las balsas salvavidas será comprobado a bordo por personal debidamente titulado, de conformidad con el párrafo 8.1.1.

8.3.3. Se efectuará un servicio a intervalos que no excedan de cinco años de conformidad con las recomendaciones de la Organización.

8.4. Todas las reparaciones y operaciones de mantenimiento de los botes de rescate inflados se realizarán de conformidad con las instrucciones facilitadas por el fabricante. Las reparaciones de emergencia podrán realizarse a bordo del buque, pero las reparaciones definitivas se efectuarán en una estación de servicio aprobada.

8.5. La Administración que permita una ampliación de los intervalos de servicio de las balsas salvavidas de conformidad con el párrafo 8.3 comunicará este hecho a la Organización de conformidad con la regla 1/5 b).

9. Servicio periódico de mantenimiento de las unidades de destrinca hidrostática.-Las unidades de destrinca hidrostática que no sean desechables serán objeto de un servicio:

9.1. A intervalos que no excedan de doce meses, si bien en los casos en que ello no resulte viable, la Administración podrá ampliar este período a diecisiete meses; y

9.2. En una estación de servicio que sea competente para efectuarlo, tenga instalaciones de servicio apropiadas y utilice sólo personal debidamente capacitado.

10. Marcado de los lugares de estiba.-Las envolturas, carteras, repisas y demás lugares análogos para la estiba de los dispositivos de salvamento estarán marcados con signos conformes con las recomendaciones de la Organización, que indiquen los dispositivos que se encuentran estibados en el lugar dedicado a ese efecto. Si hay más de un dispositivo estibado en un lugar, también se indicará el número de dispositivos.

11. Servicio periódico de los dispositivos de puesta a flote y de los mecanismos de suelta con carga.

11.1. Los dispositivos de puesta a flote:

11.1.1. Serán objeto de un servicio a los intervalos recomendados de conformidad con instrucciones de mantenimiento a bordo, según lo prescrito en la regla 36;

11.1.2. Se someterán a un examen minucioso a intervalos que no excedan de cinco años; y

11.1.3. Al término del examen que se especifica en 11.1.2, el freno del chigre se someterá a una prueba dinámica, de conformidad con el párrafo 6.1.2.5.2 del Código.

11.2. Los mecanismos de suelta con carga de los botes salvavidas:

11.2.1. Serán objeto de un servicio a los intervalos recomendados de conformidad con instrucciones de mantenimiento a bordo, según lo prescrito en la regla 36;

11.2.2. Serán objeto de un examen minucioso y de una prueba durante las inspecciones prescritas en las reglas 1/7 y 1/8, por personal debidamente capacitado y familiarizado con el sistema; y

11.2.3. Se someterán a una prueba de funcionamiento, con una carga equivalente a 1,1 veces la masa total del bote salvavidas con su asignación completa de personas y equipo cada vez que se examine el mecanismo de suelta. El examen y la prueba se llevarán a cabo como mínimo una vez cada cinco años.

SECCION 2.^a BUQUES DE PASAJE (prescripciones complementarias)

Regla 21. Embarcaciones de supervivencia y botes de rescate

1. Embarcaciones de supervivencia.

1.1. Los buques de pasaje destinados a viajes internacionales que no sean viajes internacionales cortos llevarán:

1.1.1. Botes salvavidas total o parcialmente cerrados que cumplan lo prescrito en las secciones 4.5 ó 4.6 del Código y cuya capacidad conjunta en cada banda baste para dar cabida al 50 por 100 por la menos del número total de personas que vayan a bordo. La Administración podrá permitir que se sustituyan botes por balsas salvavidas de una capacidad total equivalente, a condición de que a cada banda del buque no haya nunca menos botes que los necesarios para dar cabida al 37,5 por 100 del número total de personas que vayan a bordo. Las balsas salvavidas inflables o rígidas cumplirán lo prescrito en las secciones 4.2 ó 4.3 del Código y dispondrán de dispositivos de puesta a flote distribuidos por igual a cada banda del buque; y

1.1.2. Además, balsas salvavidas inflables o rígidas que cumplan lo prescrito en las secciones 4.2 ó 4.3 del Código y cuya capacidad conjunta baste para dar cabida al 25 por 100 por lo menos del número total de personas que vayan a bordo. Estas balsas salvavidas dispondrán al menos de un dispositivo de puesta a flote a cada banda; estos dispositivos podrán ser los provistos de conformidad con el párrafo 1.1.1 u otros dispositivos equivalentes aprobados que puedan utilizarse a ambas bandas. No obstante, no será necesario que para la estiba de estas balsas salvavidas se cumpla lo prescrito en la regla 13.5.

1.2. Los buques de pasaje destinados a viajes internacionales cortos y que cumplan las normas especiales de compartimentado establecidas en la regla II-1/6.5 llevarán:

1.2.1. Botes salvavidas total o parcialmente cerrados que cumplan lo prescrito en las secciones 4.5 ó 4.6 del Código y cuya capacidad conjunta baste para dar cabida al 30 por 100 por lo menos del número total de personas que vayan a bordo. Los botes salvavidas estarán distribuidos por igual, en la medida de lo posible, a cada banda del buque. Además, llevarán balsas salvavidas inflables o rígidas que cumplan lo prescrito en las secciones 4.2 ó 4.3 del Código y cuya capacidad conjunta sea tal que, junto con la capacidad de los botes salvavidas, la capacidad total de las embarcaciones de supervivencia baste para dar cabida al número total de personas que vayan a bordo. Las balsas salvavidas dispondrán de dispositivos de puesta a flote distribuidos por igual a cada banda del buque; y

1.2.2. Además, balsas salvavidas inflables o rígidas que cumplan lo prescrito en las secciones 4.2 ó 4.3 del Código y cuya capacidad conjunta baste para dar cabida al 25 por 100 por lo menos del número total de personas que vayan a bordo. Estas balsas salvavidas dispondrán al menos de un dispositivo de puesta a flote a cada banda; estos dispositivos podrán ser los provistos de conformidad con lo prescrito en el párrafo 1.2.1 u otros dispositivos equivalentes aprobados que puedan utilizarse a ambas bandas. No obstante, no será necesario que para la estiba de estas balsas salvavidas se cumpla lo prescrito en la regla 13.5.

1.3. Los buques de pasaje destinados a viajes internacionales cortos y que no cumplan las normas especiales de compartimentado establecidas en la regla II-1/6.5 llevarán las embarcaciones de supervivencia necesarias para dar cumplimiento a lo prescrito en el párrafo 1.1.

1.4. Todas las embarcaciones de supervivencia prescritas para que todas las personas que vayan a bordo abandonen el buque se podrán poner a flote con su asignación completa de personas y equipo en un período máximo de treinta minutos desde el momento en que se dé la señal de abandono del buque.

1.5. En lugar de cumplir lo prescrito en los párrafos 1.1, 1.2 ó 1.3, los buques de pasaje de arqueo bruto inferior a 500 en los que el número de personas que vayan a bordo sea inferior a 200, podrán ajustarse a las prescripciones siguientes:

1.5.1. Llevarán a cada banda balsas salvavidas inflables o rígidas que cumplan lo prescrito en las secciones 4.2 ó 4.3 del Código y cuya capacidad conjunta baste para dar cabida al número total de personas que vayan a bordo;

1.5.2. A menos que las balsas salvavidas prescritas en el párrafo 1.5.1 vayan estibadas en un emplazamiento que permita su fácil traslado de una banda a otra en el mismo nivel de la cubierta expuesta, se proveerán balsas salvavidas adicionales de modo que la capacidad total disponible en cada banda baste para dar cabida al 150 por 100 del número total de personas que vayan a bordo;

1.5.3. Si el bote de rescate prescrito en el párrafo 2.2 es también un bote salvavidas total o parcialmente cerrado que cumple lo prescrito en las secciones 4.5 ó 4.6 del Código, podrá quedar incluido en la capacidad conjunta prescrita en el párrafo 1.5.1, a condición de que la capacidad total disponible en cada banda sea suficiente al menos para el 150 por 100 del número total de personas que vayan a bordo; y

1.5.4. En previsión de que alguna de las embarcaciones de supervivencia pueda perderse o quedar inservible, habrá suficientes embarcaciones de supervivencia en cada banda, incluidas las estibadas en un emplazamiento que permita su fácil traslado de una banda a otra en el mismo nivel de la cubierta expuesta, para dar cabida al número total de personas que vayan a bordo.

1.6. Se podrán sustituir las balsas salvavidas y dispositivos de puesta a flote prescritos en el párrafo 1.1.1 ó 1.2.1 por uno o varios sistemas de evacuación marinos que cumplan lo prescrito en la sección 6.2 del Código y cuya capacidad sea equivalente.

2. Botes de rescate.

2.1. Los buques de pasaje de arqueo bruto igual o superior a 500 llevarán a cada banda al menos un bote de rescate que cumpla lo prescrito en la sección 5.1 del Código.

2.2. Los buques de pasaje de arqueo bruto inferior a 500 llevarán al menos un bote de rescate que cumpla lo prescrito en la sección 5.1 del Código.

2.3. Podrá aceptarse un bote salvavidas como bote de rescate a condición de que cumpla también lo prescrito para un bote de rescate.

3. Concentración de las balsas salvavidas.

3.1. El número de botes salvavidas y de botes de rescate que se lleven en buques de pasaje será suficiente para que, permitiendo que todas las personas que vayan a bordo puedan abandonar el buque, no sea necesario que cada bote salvavidas o de rescate concentre más de seis balsas.

3.2. El número de botes salvavidas y de botes de rescate que se lleven en buques de pasaje destinados a viajes internacionales cortos y que cumplan las normas especiales de compartimentado prescritas en la regla II-1/6.5 será suficiente para que, permitiendo que todas las personas que vayan a bordo puedan abandonar el buque, no sea necesario que cada bote salvavidas o de rescate concentre más de nueve balsas.

Regla 22. Dispositivos individuales de salvamento

1. Aros salvavidas.

1.1. Todo buque de pasaje llevará al menos el número de aros salvavidas conformes con lo prescrito en la regla 7.1 y la sección 2.1 del Código que se establece en el cuadro siguiente:

1.2. No obstante lo dispuesto en la regla 7.1.3, los buques de pasaje de eslora inferior a 60 m llevarán al menos seis aros salvavidas provistos de luces de encendido automático.

2. Chalecos salvavidas.

2.1. Además de los chalecos salvavidas prescritos en la regla 7.2, todo buque de pasaje llevará chalecos salvavidas para el 5 por 100 al menos del número total de personas que vayan a bordo. Estos chalecos irán estibados en cubierta o en los puestos de reunión, en lugares bien visibles.

2.2. Cuando los chalecos salvavidas para los pasajeros están estibados en camarotes que se encuentren alejados de las vías directas que van de los espacios públicos a los puestos de reunión, los chalecos salvavidas adicionales prescritos en la regla 7.2.2 para dichos pasajeros se estibarán en los espacios públicos, en los puestos de reunión o en las vías directas entre ambos. Los chalecos salvavidas se estibarán de modo que al distribuirlos o ponérselos no se impida el desplazamiento ordenado hacia los puestos de reunión o los puestos de embarco en las embarcaciones de supervivencia.

3. Luces de los chalecos salvavidas.

3.1. En todos los buques de pasaje, cada uno de los chalecos salvavidas irá provisto de una luz que cumpla lo prescrito en el párrafo 2.2.3 del Código.

3.2. La Administración podrá aceptar las luces de los chalecos salvavidas de los buques de pasaje instaladas con anterioridad al 1 de julio de 1998 y que no cumplan plenamente lo dispuesto en el párrafo 2.2.3 del Código hasta que éstas se hayan de cambiar normalmente o hasta el primer reconocimiento periódico posterior al 1 de julio de 2002, si esta fecha es anterior.

4. Trajes de inmersión y ayudas térmicas.

4.1. Todos los buques de pasaje llevarán, por cada bote salvavidas que haya a bordo, al menos tres trajes de inmersión que cumplan lo prescrito en la sección 2.3 del Código y, además, una ayuda térmica que cumpla lo prescrito en la sección 2.5 del Código para cada una de las personas que haya de ir en el bote salvavidas y para la cual no se haya provisto un traje de inmersión. No será necesario llevar tales trajes de inmersión y ayudas térmicas:

4.1.1. Para las personas que hayan de ir en botes salvavidas total o parcialmente cerrados; ni

4.1.2. Cuando el buque esté destinado continuamente a efectuar viajes en zonas de clima cálido en las que a juicio de la Administración no sean necesarias las ayudas térmicas.

4.2. Lo dispuesto en el párrafo 4.1.1 es aplicable también a los botes salvavidas total o parcialmente cerrados que no cumplan lo prescrito en las secciones 4.5 ó 4.6 del Código, a condición de que vayan en buques construidos antes del 1 de julio de 1986.

Regla 23. Medios de embarco en las embarcaciones de supervivencia y en los botes de rescate

1. En los buques de pasaje, los medios de embarco en las embarcaciones de supervivencia se proyectarán de modo que:

1.1. Se embarque en todos los botes salvavidas y éstos se pongan a flote directamente desde su posición de estiba o desde una cubierta de embarco, pero no desde ambas; y

1.2. Se embarque en las balsas salvavidas de pescante y éstas se pongan a flote desde un lugar contiguo a su posición de estiba o desde un lugar al que, de conformidad con lo prescrito en la regla 13.5, se traslade la balsa antes de su puesta a flote.

2. Los medios de embarco en los botes de rescate serán tales que permitan embarcar en éstos y ponerlos a flote directamente desde su posición de estiba con el número de personas a bordo que tengan que llevar como dotación. No obstante lo prescrito en el párrafo 1.1, si el bote de rescate es también un bote salvavidas y el embarco en los otros botes salvavidas y su puesta a flote se efectúan desde una cubierta de embarco, los medios de embarco en el bote de rescate serán tales que también se pueda embarcar en él y ponerlo a flote desde la cubierta de embarco.

Regla 24. Estiba de las embarcaciones de supervivencia

La altura de estiba de una embarcación de supervivencia en un buque de pasaje se determinará teniendo en cuenta lo prescrito en la regla 13.1.2, las disposiciones relativas a los medios de evacuación de la regla II-2/28, el tamaño del buque y las condiciones meteorológicas que puedan darse en la zona de explotación prevista. En el caso de una embarcación de supervivencia de pescante, la altura desde la cabeza del pescante, con la embarcación de supervivencia en la posición de embarco, hasta la línea de flotación no será superior, en la medida de lo posible, a 15 m cuando el buque está en la flotación de navegación marítima con calado mínimo.

Regla 25. Puestos de reunión

Además de cumplir lo prescrito en la regla 11, todo buque de pasaje tendrá puestos de reunión de pasajeros que:

1. Esten en las proximidades de los puestos de embarco y permitan que los pasajeros tengan fácil acceso a los mismos, a menos que ambos puestos estén en el mismo lugar, y
2. Tengan espacio suficiente para concentrar a los pasajeros y darles instrucciones, esto es 0,35 metros cuadrados por persona como mínimo.

Regla 26. Prescripciones complementarias aplicables a los buques de pasaje de transbordo rodado

1. La presente regla es aplicable a todos los buques de pasaje de transbordo rodado. Los buques de pasaje de transbordo rodado construidos:

1.1. El 1 de julio de 1998 o posteriormente cumplirán lo prescrito en los párrafos 2.3, 2.4, 3.1, 3.2, 3.3, 4 y 5;

1.2. El 1 de julio de 1986 o posteriormente y antes del 1 de julio de 1998 cumplirán lo prescrito en el párrafo 5 a más tardar en la fecha del primer reconocimiento periódico posterior al 1 de julio de 1998 y lo prescrito en los párrafos 2.3, 2.4, 3 y 4 a más tardar en la fecha del primer reconocimiento periódico posterior al 1 de julio de 2000; y

1.3. Antes del 1 de julio de 1986 cumplirán lo prescrito en el párrafo 5 a más tardar en la fecha del primer reconocimiento periódico posterior al 1 de julio de 1998 y lo prescrito en los párrafos 2.1, 2.2, 2.3, 2.4, 3 y 4 a más tardar en la fecha del primer reconocimiento periódico posterior al 1 de julio de 2000.

2. Balsas salvavidas.

2.1. Las balsas salvavidas de los buques de pasaje de transbordo rodado dispondrán de sistemas de evacuación marinos que cumplan lo dispuesto en la sección 6.2 del Código, o dispositivos de puesta a flote que cumplan lo dispuesto en el párrafo 6.1.5 del Código, distribuidos uniformemente a cada banda del buque.

2.2. Todas las balsas salvavidas de los buques de pasaje de transbordo rodado estarán provistas de medios de estiba de zafada automática que cumplan lo dispuesto en la regla 13.4.

2.3. Todas las balsas salvavidas de los buques de pasaje de transbordo rodado estarán dotadas de una rampa de acceso que cumpla lo dispuesto en los párrafos 4.2.4.1 ó 4.3.4.1 del Código, según proceda.

2.4. Todas las balsas salvavidas de los buques de pasaje de transbordo rodado serán balsas salvavidas autoadrizables o balsas salvavidas reversibles con toldo que sean estables en mar encrespada y capaces de funcionar de manera segura cualquiera que sea el lado sobre el que floten. En su defecto, el buque llevará balsas salvavidas autoadrizables o balsas salvavidas reversibles con toldo, además de su asignación habitual de balsas salvavidas, cuya capacidad conjunta baste para dar cabida al 50 por 100, como mínimo de las personas que no quepan en los botes salvavidas. Esta capacidad adicional de las balsas salvavidas vendrá determinada por la diferencia entre el número total de personas que vayan a bordo y el de personas que quepan en los botes salvavidas. Todas esas balsas deberán estar aprobadas por la Administración teniendo en cuenta las recomendaciones de la Organización.

3. Botes de rescate rápidos.

3.1. Por lo menos uno de los botes de rescate de los buques de pasaje de transbordo rodado será un bote de rescate rápido aprobado por la Administración teniendo en cuenta las recomendaciones de la Organización.

3.2. Cada bote de rescate rápido dispondrá de un dispositivo de puesta a flote idóneo aprobado por la Administración. Al aprobar tal dispositivo, la Administración tendrá en cuenta que ha de ser posible poner a flote y recuperar los botes de rescate rápidos incluso en condiciones meteorológicas muy desfavorables, y tendrá en cuenta también las recomendaciones de la Organización.

3.3. Al menos dos tripulantes de cada bote de rescate rápido recibirán formación y efectuarán ejercicios periódicos, teniendo en cuenta lo estipulado en el Código de formación, titulación y guardia para la gente de mar y las recomendaciones aprobadas por la Organización, así como todos los aspectos de rescate, el manejo, la maniobra y el funcionamiento de dichas embarcaciones en diversas condiciones y su adrizamiento en caso de zozobra.

3.4. En caso de que la disposición o las dimensiones de un buque de pasaje de transbordo rodado construido antes del 1 de julio de 1997 sean tales que impidan la instalación del bote de rescate rápido prescrito en el párrafo 3.1, éste podrá instalarse en lugar de un bote salvavidas que está aceptado como

bote del rescate o, tratándose de buques construidos antes del 1 de julio de 1986, en lugar de embarcaciones para emergencias, siempre que se cumplan las condiciones siguientes:

3.4.1. Que el bote de rescate rápido instalado disponga de un dispositivo de puesta a flote que cumpla lo dispuesto en el párrafo 3.2;

3.4.2. Que la reducción de la capacidad de las embarcaciones de supervivencia debida a la sustitución antedicha se compense mediante la instalación de balsas salvavidas capaces de transportar al menos un número de personas igual al que hubiera dado cabida el bote salvavidas que se sustituye; y

3.4.3. Que dichas balsas salvavidas sean utilizables con los dispositivos de puesta a flote o los sistemas de evacuación marinos existentes.

4. Medios de salvamento.

4.1. Todo buque de pasaje de transbordo rodado estará equipado con medios eficaces para rescatar del agua a los supervivientes y trasladarlos desde las unidades de rescate o las embarcaciones de supervivencia al buque.

4.2. Los medios para trasladar a los supervivientes podrán formar parte de un sistema de evacuación marino o de un sistema proyectado para fines de salvamento.

4.3. Si la rampa de un sistema de evacuación marino constituye un medio para trasladar a los supervivientes desde la plataforma a la cubierta del buque, la rampa estará dotada de pasamanos o escalas que faciliten la subida por ella.

5. Chalecos salvavidas.

5.1. Independientemente de lo prescrito en las reglas 7.2 y 22.2, se dispondrá de un número suficiente de chalecos salvavidas en las proximidades de los puestos de reunión para que los pasajeros no tengan que regresar a sus camarotes a recoger los chalecos.

5.2. En los buques de pasaje de transbordo rodado, todos los chalecos salvavidas irán provistos de una luz que cumpla lo dispuesto en el párrafo 2.2.3 del Código.

Regla 27. Información sobre los pasajeros

1. Se contarán antes de la salida todas las personas que vayan a bordo de todo buque de pasaje.

2. Se registrarán los pormenores de las personas que hayan declarado que precisan asistencia o cuidados especiales en situaciones de emergencia y se dará parte al capitán antes de la salida.

3. Además, a efectos de búsqueda y salvamento, desde el 1 de enero de 1999 a más tardar se llevará un registro en el que se hagan constar el nombre y sexo de las personas que vayan a bordo y se indique si se trata de adultos, niños o lactantes.

4. La información prescrita en los párrafos 1, 2 y 3 se conservará en tierra y se pondrá rápidamente a disposición de los servicios de búsqueda y salvamento cuando la necesiten.

5. Las administraciones podrán eximir a los buques de pasaje, del cumplimiento de lo prescrito en el párrafo 3 si los viajes regulares de tales buques no permiten en la práctica el mantenimiento de esos registros.

Regla 28. Zonas de aterrizaje y de evacuación para helicópteros

1. Todos los buques de pasaje de transbordo rodado dispondrán de una zona de evacuación para helicópteros aprobada por la Administración teniendo en cuenta las recomendaciones de la Organización.
2. Los buques de pasaje de eslora igual o superior a 130 m, construidos el 1 de julio 1999 o posteriormente, dispondrán de una zona de aterrizaje para helicópteros aprobada por la Administración teniendo en cuenta las recomendaciones de la Organización.

Regla 29. Sistema de ayuda para la toma de decisiones por los capitanes de los buques de pasaje

1. Esta regla es aplicable a todos los buques de pasaje. Los buques de pasaje construidos antes del 1 de julio de 1997 cumplirán las prescripciones de la presente regla a más tardar en la fecha del primer reconocimiento periódico posterior al 1 de julio de 1999.
2. En el puente de navegación de todos los buques de pasaje habrá un sistema de ayuda para la gestión de emergencias.
3. Dicho sistema consistirá, por lo menos, en uno o varios planes de emergencia impresos. Las situaciones previsibles de emergencia de a bordo incluirán, sin que esta enumeración sea exhaustiva, las siguientes categorías:
 - 3.1. Incendio;
 - 3.2. Avería del buque;
 - 3.3. Contaminación;
 - 3.4. Actos ilícitos que pongan en peligro la seguridad del buque, de sus pasajeros o de la tripulación;
 - 3.5. Accidentes del personal;
 - 3.6. Accidentes relacionados con la carga; y
 - 3.7. Ayuda de emergencia a otros buques.
4. Los procedimientos de emergencia que se establezcan en los planes de emergencia constituirán una ayuda para la toma de decisiones por los capitanes en cualquier combinación de situaciones de emergencia.
5. Los planes de emergencia tendrán una estructura uniforme y serán fáciles de utilizar. Cuando proceda, el estado de carga real calculado para determinar la estabilidad del buque durante la travesía se utilizará para la lucha contra averías.
6. Además de los planes de emergencia impresos, la Administración podrá aceptar la utilización de un sistema informatizado de ayuda para la toma de decisiones en el puente de navegación que agrupe toda la información contenida en los planes de emergencia, los procedimientos, las listas de comprobación, etc., y que pueda presentar una lista de las medidas recomendadas para los casos de emergencia previsibles.

Regla 30. Ejercicios periódicos

1. La presente regla es aplicable a todos los buques de pasaje.
2. En los buques de pasaje se realizará una vez por semana un ejercicio de abandono del buque y un ejercicio de lucha contra incendios. No es necesario que toda la tripulación intervenga en cada ejercicio periódico, si bien cada miembro de la tripulación deberá participar en un ejercicio de abandono del buque y en un ejercicio de lucha contra incendios todos los meses, según lo prescrito en la regla 19.3.2. Se alentará encarecidamente a los pasajeros a que asistan a dichos ejercicios periódicos.

SECCION 3.^a BUQUES DE CARGA

(prescripciones complementarias)

Regla 31. Embarcaciones de supervivencia y botes de rescate

1. Embarcaciones de supervivencia.

1.1. Los buques de carga llevarán:

1.1.1. Uno o varios botes salvavidas totalmente cerrados que cumplan lo prescrito en la sección 4.6 del Código y cuya capacidad conjunta en cada banda baste para dar cabida al número total de personas que vayan a bordo; y

1.1.2. Además, una o varias balsas salvavidas inflables o rígidas que cumplan lo prescrito en las secciones 4.2 ó 4.3 del Código, estibadas en un emplazamiento que permita su fácil traslado de una banda a otra en el mismo nivel de la cubierta expuesta y cuya capacidad conjunta baste para dar cabida al número total de personas que vayan a bordo. Si la balsa o las balsas salvavidas no están estibadas en un emplazamiento que permita su fácil traslado de una banda a otra en el mismo nivel de la cubierta expuesta, la capacidad total disponible en cada banda bastará para dar cabida al número total de personas que vayan a bordo.

1.2. En lugar de cumplir lo prescrito en el párrafo 1.1, los buques de carga podrán llevar:

1.2.1. Uno o varios botes salvavidas de caída libre que cumplan lo prescrito en la sección 4.7 del Código, que puedan ponerse a flote por caída libre por la popa del buque y cuya capacidad conjunta baste para dar cabida al número total de personas que vayan a bordo; y

1.2.2. Además, una o varias balsas salvavidas inflables o rígidas que cumplan lo prescrito en las secciones 4.2 ó 4.3 del Código y cuya capacidad conjunta en cada banda baste para dar cabida al número total de personas que vayan a bordo. Las balsas salvavidas, por lo menos a una banda de buque, dispondrán de dispositivos de puesta a flote.

1.3. En lugar de cumplir lo prescrito en los párrafos 1.1 ó 1.2, los buques de carga de eslora inferior a 85 m que no sean petroleros, buques tanque quimiqueros o buques gaseros, podrán cumplir las siguientes prescripciones:

1.3.1. Llevarán a cada banda una o varias balsas salvavidas inflables o rígidas que cumplan lo prescrito en las secciones 4.2 ó 4.3 del Código y cuya capacidad conjunta baste para dar cabida al número total de personas que vayan a bordo;

1.3.2. A menos que las balsas salvavidas prescritas en el párrafo 1.3.1 vayan estibadas en un emplazamiento que permita su fácil traslado de una banda a otra en el mismo nivel de la cubierta expuesta, se proveerán balsas salvavidas adicionales de modo que la capacidad total disponible en cada banda baste para dar cabida al 150 por 100 del número total de personas que vayan a bordo;

1.3.3. Si el bote de rescate prescrito en el párrafo 2 es también un bote salvavidas totalmente cerrado que cumple lo prescrito en la sección 4.6 del Código, podrá quedar incluido en la capacidad conjunta prescrita en el párrafo 1.3.1, a condición de que la capacidad total disponible en cada banda sea

suficiente al menos para el 150 por 100 del número total de personas que vayan a bordo, y

1.3.4. En previsión de que alguna de las embarcaciones de supervivencia pueda perderse o quedar inservible, habrá suficientes embarcaciones de supervivencia en cada banda, incluidas las estibadas en un emplazamiento que permita su fácil traslado de una banda a otra en el mismo nivel de la cubierta expuesta, para dar cabida al número total de personas que vayan a bordo.

1.4. Los buques de carga en que la distancia horizontal desde el extremo de la roda o de la popa del buque hasta el extremo más próximo de la embarcación de supervivencia más cercana sea más de 100 m llevarán, además de las balsas salvavidas prescritas en los párrafos 1.1.2 y 1.2.2, una balsa salvavidas estibada tan a proa o tan a popa, o bien una tan a proa y otra tan a popa, como sea razonable y posible. Esta balsa o estas balsas salvavidas podrán ir sujetas firmemente de modo que se puedan soltar a mano y no necesiten ser de un tipo que se pueda poner a flote desde un dispositivo aprobado de puesta a flote.

1.5. Exceptuando las embarcaciones de supervivencia a que se hace referencia en la regla 16.1.1, todas las embarcaciones de supervivencia prescritas para que todas las personas que vayan a bordo abandonen el buque deberán poder ponerse a flote con su asignación completa de personas y equipo en un período máximo de diez minutos desde el momento en que se dé la señal de abandono del buque.

1.6. Los buques tanque quimiqueros y los buques gaseros que transporten cargas que emitan vapores o gases tóxicos, en lugar de llevar botes salvavidas totalmente cerrados que cumplan lo prescrito en la sección 4.6 del Código, llevarán botes salvavidas provistos de un sistema autónomo de abastecimiento de aire que cumplan lo prescrito en la sección 4.8 del Código.

1.7. Los petroleros, los buques tanque quimiqueros y los buques gaseros que transporten cargas cuyo punto de inflamación no exceda de 60 °C (prueba en vaso cerrado), en lugar de llevar botes salvavidas totalmente cerrados que cumplan lo prescrito en la sección 4.6 del Código, llevarán botes salvavidas protegidos contra incendios que cumplan lo prescrito en la sección 4.9 del Código.

2. Botes de rescate.-Los buques de carga llevarán al menos un bote de rescate que cumpla lo prescrito en la sección 5.1 del Código. Podrá aceptarse un bote salvavidas como bote de rescate a condición de que cumpla también lo prescrito para un bote de rescate.

3. Además de los botes salvavidas que les correspondan, todos los buques de carga construidos antes del 1 de julio de 1986 llevarán:

3.1. Una o varias balsas salvavidas que puedan ponerse a flote por una u otra banda del buque, cuya capacidad conjunta baste para dar cabida al número total de personas que vayan a bordo. La balsa o las balsas salvavidas estarán equipadas con una trinca o un medio de sujeción equivalente que las suelte automáticamente cuando el buque se está hundiendo; y

3.2. Cuando la distancia horizontal desde el extremo de la roda o de la popa del buque hasta el extremo más próximo de la embarcación de supervivencia más cercana sea más de 100 m, además de las balsas salvavidas prescritas en el párrafo 3.1, una balsa salvavidas estibada tan a proa o tan a popa, o bien una tan a proa y otra tan a popa, como sea razonable y posible. No obstante lo prescrito en el párrafo 3.1, esta balsa o estas balsas salvavidas podrán ir sujetas firmemente de modo que se puedan soltar a mano.

Regla 32. Dispositivos individuales de salvamento

1. Aros salvavidas.

1.1. Los buques de carga llevarán al menos el número de aros salvavidas conformes con lo prescrito en la regla 7.1 y en la sección 2.1 del Código que se indica en el cuadro siguiente:

1.2. Las luces de encendido automático de los aros salvavidas de los buques tanque prescritos en la regla 7.1.3 estarán alimentadas por baterías eléctricas.

2. Luces de los chalecos salvavidas.

2.1. El presente párrafo es aplicable a todos los buques de carga.

2.2. En los buques de carga, cada uno de los chalecos salvavidas irá provisto de una luz para chaleco salvavidas que cumpla lo prescrito en el párrafo 2.2.3 del Código.

2.3. La Administración podrá aceptar las luces de los chalecos salvavidas de los buques de carga instaladas con anterioridad al 1 de julio de 1998 y que no cumplan plenamente lo dispuesto en el párrafo 2.2.3 del Código hasta que éstas se hayan de cambiar normalmente o hasta el primer reconocimiento periódico posterior al 1 de julio del 2001, si esta fecha es anterior.

3. Trajes de inmersión y ayudas térmicas.

3.1. El presente párrafo es aplicable a todos los buques de carga.

3.2. Los buques de carga llevarán, por cada bote salvavidas que haya a bordo, al menos tres trajes de inmersión que cumplan lo prescrito en la sección 2.3 del Código, o, si la Administración lo considera necesario y posible, un traje de inmersión que cumpla lo prescrito en la sección 2.3 del Código para cada persona que vaya a bordo; no obstante, además de las ayudas térmicas prescritas en los párrafos 4.1.5.1.24, 4.4.8.31 y 5.1.2.2.13 del Código, el buque llevará ayudas térmicas que cumplan lo prescrito en la sección 2.5 del Código destinadas a las personas que vayan a bordo a las que no se haya provisto de trajes de inmersión. No será necesario llevar tales trajes de inmersión y ayudas térmicas cuando el buque:

3.2.1. Lleve botes salvavidas totalmente cerrados cuya capacidad conjunta en cada banda baste para dar cabida al número total de personas que vayan a bordo; o

3.2.2. Lleve botes salvavidas totalmente cerrados que puedan ponerse a flote por caída libre por la popa del buque y cuya capacidad conjunta baste para dar cabida a todas las personas que vayan a bordo y que estén situados de modo que sea posible embarcar en ellos y ponerlos a flote directamente desde su posición de estiba, así como balsas salvavidas cuya capacidad conjunta en cada banda baste para dar cabida al número total de personas que vayan a bordo; o

3.2.3. Esté destinado continuamente a efectuar viajes en zonas de clima cálido en las que a juicio de la Administración no sean necesarios los trajes de inmersión.

3.3. Los buques de carga que cumplan lo prescrito en la regla 31.1.3 llevarán trajes de inmersión que cumplan lo prescrito en la sección 2.3 del Código para todas las personas que vayan a bordo a menos que el buque:

3.3.1. Lleve balsas salvavidas de pescante; o

3.3.2. Lleve balsas salvavidas que dispongan de dispositivos equivalentes aprobados que puedan utilizarse a ambas bandas del buque y que permitan embarcar en ellas sin meterse en el agua; o

3.3.3. Está destinado continuamente a efectuar viajes en zonas de clima cálido en las que a juicio de la Administración no sean necesarios los trajes de inmersión.

3.4. Los trajes de inmersión prescritos en la presente regla podrán utilizarse para cumplir lo prescrito en la regla 7.3.

3.5. No es necesario que los botes salvavidas totalmente cerrados mencionados en los párrafos 3.2.1 y 3.2.2, que se lleven a bordo de buques de carga construidos antes del 1 de julio de 1986, cumplan lo prescrito en la sección 4.6 del Código.

Regla 33. Medios de embarco y de puesta a flote de las embarcaciones de supervivencia

1. Los medios provistos en los buques de carga para el embarco en las embarcaciones de supervivencia se proyectarán de modo que se pueda embarcar en los botes salvavidas y ponerlos a flote directamente desde su posición de estiba y embarcar en las balsas salvavidas de pescante y ponerlas a flote desde un lugar contiguo a su posición de estiba o desde un lugar al que se traslade la balsa antes de efectuar la puesta a flote, de conformidad con lo prescrito en la regla 13.5.

2. En los buques de carga de arqueos brutos igual o superior a 20.000 los botes salvavidas podrán ponerse a flote, utilizando bozas si es necesario, llevando el buque una arrancada adelante de hasta 5 nudos en aguas tranquilas.

SECCION 4.^a PRESCRIPCIONES RELATIVAS A LOS DISPOSITIVOS Y MEDIOS DE SALVAMENTO

Regla 34. Todos los dispositivos y medios de salvamento cumplirán las prescripciones aplicables del Código.

SECCION 5.^a VARIOS

Regla 35. Manual de formación y medios auxiliares para la formación a bordo

1. La presente regla es aplicable a todos los buques.

2. En todos los comedores y zonas de recreo de la tripulación o en todos los camarotes de la tripulación, habrá un manual de formación que se ajuste a lo prescrito en el párrafo 3.

3. Dicho manual de formación, que podrá comprender varios volúmenes, contendrá instrucciones e informaciones, fácilmente comprensibles e ilustradas siempre que sea posible, relativas a los dispositivos de salvamento del buque y a los métodos óptimos de supervivencia. Cualquier parte de esa información podrá facilitarse en forma de medios audiovisuales en lugar de figurar en el manual. Habrá explicaciones detalladas sobre los puntos siguientes:

3.1. Modo de ponerse los chalecos salvavidas, los trajes de emersión y los trajes de protección contra la intemperie, según proceda;

- 3.2. Reunión en los puestos asignados;
 - 3.3. Embarco en las embarcaciones de supervivencia y en los botes de rescate, puesta a flote y separación del costado del buque y, cuando proceda, empleo de sistemas de evacuación marinos;
 - 3.4. Método de puesta a flote desde el interior de la embarcación de supervivencia;
 - 3.5. Suelta desde los dispositivos de puesta a flote;
 - 3.6. Métodos de protección y empleo de los dispositivos de protección en las zonas de puesta a flote, según proceda;
 - 3.7. Iluminación en las zonas de puesta a flote;
 - 3.8. Empleo de todo el equipo de supervivencia;
 - 3.9. Empleo de todo el equipo de detección;
 - 3.10. Con la ayuda de ilustraciones, empleo de los dispositivos radioeléctricos de salvamento;
 - 3.11. Empleo de anclas flotantes;
 - 3.12. Empleo del motor y sus accesorios;
 - 3.13. Recuperación de las embarcaciones de supervivencia y de los botes de rescate, incluida su estiba y sujeción;
 - 3.14. Peligros de la exposición a la intemperie y necesidad de llevar prendas de abrigo;
 - 3.15. Utilización óptima, para sobrevivir, de los medios provistos en las embarcaciones de supervivencia;
 - 3.16. Métodos de recogida, incluido el empleo del equipo de rescate de los helicópteros (eslingas, cestos, camillas), pantalones salvavidas y aparatos de salvamento en tierra y aparato lanzacabos del buque;
 - 3.17. Todas las demás funciones que consten en el cuadro de obligaciones e instrucciones para casos de emergencia, y
 - 3.18. Instrucciones para la reparación de emergencia de los dispositivos de salvamento.
4. Todos los buques provistos de un sistema de evacuación marino llevarán medios auxiliares para impartir formación a bordo sobre el empleo de dicho sistema.

Regla 36. Instrucciones para el mantenimiento a bordo

Las instrucciones para el mantenimiento a bordo de los dispositivos de salvamento serán fácilmente comprensibles, llevarán ilustraciones siempre que sea posible y, según proceda, contendrán lo siguiente para cada dispositivo:

1. Una lista de comprobaciones que se utilizará cuando se realicen las inspecciones prescritas en la regla 20.7;
2. Instrucciones de mantenimiento y reparación;
3. Un programa de mantenimiento periódico;
4. Un diagrama de los puntos de lubricación con los lubricantes recomendados;
5. Una lista de piezas recambiables;
6. Una lista de proveedores de piezas de repuesto, y

7. Un registro en el que anotar las inspecciones y las operaciones de mantenimiento.

Regla 37. Cuadro de obligaciones e instrucciones para casos de emergencia

1. En el cuadro de obligaciones se especificarán pormenores relativos al sistema de alarma general de emergencia y de megafonía prescrito en la sección 7.2 del Código, así como las medidas que la tripulación y los pasajeros deben tomar cuando suene esa alarma. En el cuadro de obligaciones se especificará asimismo el modo en que se dará la orden de abandono del buque.

2. En todos los buques de pasaje habrá procedimientos establecidos para localizar y rescatar a los pasajeros atrapados en los camarotes.

3. En el cuadro de obligaciones se indicarán los cometidos de los diversos tripulantes, incluidos:

3.1. El cierre de las puertas estancas, las puertas contraincendios, las válvulas, los imbornales, los portillos, las lumbreras, los portillos de luz y otras aberturas análogas del buque;

3.2. La colocación de equipo en las embarcaciones de supervivencia y en los demás dispositivos de salvamento;

3.3. La preparación y la puesta a flote de las embarcaciones de supervivencia;

3.4. La preparación general de los otros dispositivos de salvamento;

3.5. La reunión de los pasajeros;

3.6. El empleo del equipo de comunicaciones;

3.7. La composición de las cuadrillas de lucha contra incendios, y

3.8. Los cometidos especiales asignados en relación con la utilización del equipo y de las instalaciones contraincendios.

4. En el cuadro de obligaciones se especificará cuáles son los oficiales designados para hacer que los dispositivos de salvamento y de lucha contra incendios se conserven en buen estado y estén listos para su utilización inmediata.

5. En el cuadro de obligaciones se especificarán los sustitutos de las personas clave susceptibles de quedar incapacitadas, teniendo en cuenta que distintas situaciones de emergencia pueden exigir actuaciones distintas.

6. En el cuadro de obligaciones se indicarán los diversos cometidos que se asignen a los tripulantes en relación con los pasajeros en casos de emergencia. Estos cometidos consistirán en:

6.1. Avisar a los pasajeros;

6.2. Comprobar que los pasajeros están adecuadamente abrigados y se han puesto bien el chaleco salvavidas;

6.3. Reunir a los pasajeros en los puestos de reunión;

6.4. Mantener el orden en pasillos y escaleras y, en general, vigilar los movimientos de los pasajeros, y

6.5. Comprobar que se lleva una provisión de mantas a las embarcaciones de supervivencia.

7. El cuadro de obligaciones se preparará antes de que el buque se haga a la mar. Si una vez preparado el cuadro de obligaciones se produce algún cambio en la tripulación que obligue a modificarlo, el capitán lo revisará o preparará uno nuevo.

8. El formato del cuadro de obligaciones utilizado en los buques de pasaje deberá estar aprobado».

CAPITULO VI

Transporte de cargas

Regla 2. Información sobre la carga

9. El subpárrafo 2 existente del párrafo 2 se sustituye por el siguiente:

«2.2. En el caso de las cargas a granel, información sobre el factor de estiba de la carga, los procedimientos de enrasado, la posibilidad de corrimiento, incluido el ángulo de reposo, si procede, y cualquier otra propiedad especial pertinente. En el caso de concentrados y otras cargas que puedan licuarse, información adicional en forma de un certificado del contenido de humedad de la carga y su límite de humedad admisible para el transporte».

Regla 7. Estiba de la carga a granel

10. Se sustituye el texto existente de la regla 7 por el siguiente:

«Regla 7. Embarque, desembarque y estiba de cargas a granel

1. A los efectos de la presente regla, por representante de la terminal se entiende una persona designada por la terminal u otra instalación en la que el buque esté efectuando operaciones de carga y descarga, que es responsable de las operaciones realizadas por dicha terminal o instalación en lo que respecta al buque en cuestión.

2. Para que el capitán pueda evitar que la estructura del buque sufra esfuerzos excesivos, se llevará a bordo un cuadernillo escrito en un idioma que conozcan los oficiales del buque responsables de las operaciones de carga. Si dicho idioma no fuera el inglés, el buque estará provisto de un cuadernillo traducido a ese idioma. El cuadernillo incluirá, como mínimo:

2.1. Los datos sobre estabilidad prescritos en la regla II-1/22;

2.2. La capacidad y el régimen de lastrado y deslastrado;

2.3. La carga máxima admisible por unidad de superficie del techo del doble fondo;

2.4. La carga máxima admisible por bodega;

2.5. Instrucciones generales sobre carga y descarga relativas a la resistencia de la estructura del buque, incluida toda limitación en cuanto a las condiciones de explotación más desfavorables durante las operaciones de carga, descarga y, lastrado y durante el viaje;

2.6. Toda restricción especial como, por ejemplo, limitaciones en cuanto a las condiciones de explotación más desfavorables impuestas por la Administración o la organización reconocida por ésta, si procede, y

2.7. Cuando sea preciso calcular la resistencia, las fuerzas y momentos máximos permisibles a que puede estar sometido el casco durante las operaciones de carga y descarga y durante el viaje.

3. Antes de embarcar o desembarcar una carga sólida a granel, el capitán y el representante de la terminal convendrán un plan que garantizará que durante el embarque o el desembarque de carga no se sobrepasen las fuerzas y momentos permisibles a que puede estar sometido el buque, e incluirá la secuencia, la cantidad y el régimen de carga o descarga teniendo presente la velocidad con que se realiza el embarque o desembarque de carga, el número de vertidos, y

la capacidad de deslastrado o lastrado del buque. El plan y toda enmienda posterior de éste se depositarán ante la autoridad pertinente del Estado rector del puerto.

4. Las cargas a granel se embarcarán y enrasarán de modo que queden aceptablemente niveladas, según sea preciso, hasta los límites del espacio de carga, a fin de reducir al mínimo el riesgo de corrimiento y garantizar el mantenimiento de una estabilidad adecuada durante todo el viaje.

5. Cuando la carga a granel se transporte en entrepuentes, se cerrarán las escotillas de éstos en los casos en que la información sobre la carga indique que la estructura del fondo estaría sometida a esfuerzos inaceptables si se dejasen abiertas. Se enrasará la carga de modo que quede aceptablemente nivelada y se extenderá de un costado al otro o se sujetará mediante divisiones longitudinales adicionales de resistencia suficiente. Se respetará el límite de seguridad para el transporte de carga en los entrepuentes a fin de no someter la estructura de cubierta a una carga excesiva.

6. El capitán y el representante de la terminal garantizarán que las operaciones de embarque y desembarque de carga se llevan a cabo de conformidad con el plan convenido.

7. En caso de que durante el embarque o desembarque de carga se sobrepase cualquiera de las restricciones citadas en el párrafo 2 o sea probable que se sobrepasen si continúa el embarque o desembarque de carga, el capitán tiene derecho a suspender la operación y obligación de comunicar el hecho a la autoridad pertinente del Estado rector del puerto ante la que se ha depositado el plan. El capitán y el representante de la terminal harán lo necesario para que se tomen medidas correctivas. Cuando se desembarque carga, el capitán y el representante de la terminal se cerciorarán de que el método de desembarque no daña la estructura del buque.

8. El capitán se cerciorará de que el personal del buque supervisa sin interrupción las operaciones de carga. En la medida de lo posible, se comprobará regularmente el calado del buque durante las operaciones de carga o descarga para confirmar las cifras de tonelaje proporcionadas. Los calados y tonelajes observados se registrarán en un libro de registro de carga. Si se observan diferencias importantes respecto del plan convenido, se ajustará la operación de carga o de lastrado, o ambas, a fin de corregir dichas diferencias».

CAPITULO XI

Medidas especiales para incrementar la seguridad marítima

Regla 1. Autorización de las organizaciones reconocidas

11. Se sustituye el texto existente de la regla por el siguiente:

«Las organizaciones que se mencionan en la regla I/6 cumplirán las directrices aprobadas por la organización mediante la resolución A.739 (18), tal como las enmiende la organización, y las especificaciones aprobadas por la organización mediante la resolución A.789 (19), tal como las enmiende la organización, a condición de que tales enmiendas sean aprobadas, entren en vigor y se hagan efectivas de conformidad con las disposiciones del artículo VIII del presente Convenio relativas a los procedimientos de enmienda del anexo, excepto el capítulo I».

Las presentes enmiendas entraron en vigor de forma general y para España el 1 de julio de 1998 de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio.

I. Disposiciones generales

MINISTERIO DE ASUNTOS EXTERIORES

6785 *ENMIENDAS al Convenio Internacional para la Seguridad de la Vida Humana en el Mar, 1974. Enmendado (publicado en el «Boletín Oficial del Estado» del 16 al 18 de junio de 1980), aprobadas el 26 de mayo de 2000 mediante Resolución MSC 91(72).*

RESOLUCIÓN MSC.91(72)
(Aprobada el 26 de mayo de 2000)

Enmiendas al Convenio Internacional para la Seguridad de la Vida Humana en el Mar, 1974, enmendado

El Comité de Seguridad Marítima, Recordando el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

Recordando además el artículo VIII.b) del Convenio Internacional para la Seguridad de la Vida Humana en el Mar (SOLAS), 1974, en adelante denominado «el Convenio», relativo a los procedimientos de enmienda aplicables al anexo del Convenio, con la excepción del capítulo I,

Tomando nota de la decisión adoptada en su 70.º período de sesiones de que la prescripción de la regla III/28.2 del Convenio SOLAS (que estipula que los buques de pasaje de eslora igual o superior a 130 metros, construidos el 1 de julio de 1999 o posteriormente, dispondrán de una zona de aterrizaje para helicópteros) debería revocarse por lo que respecta a los buques de pasaje que no son de transbordo rodado, y de la posterior publicación a tal efecto de la circular MSC/Circ.907 sobre la Aplicación de la regla III/28.2 del Convenio SOLAS por lo que se refiere a las zonas de aterrizaje para helicópteros en los buques de pasaje que no son de transbordo rodado,

Tomando nota además de la adición al Convenio SOLAS 1974 de un nuevo capítulo XII (Medidas de seguridad adicionales aplicables a los graneleros), aprobado mediante la resolución 1 de la Conferencia de 1997 sobre el Convenio SOLAS,

Habiendo examinado en su 72.º período de sesiones las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII.b).i) del mismo,

1. *Aprueba*, de conformidad con lo dispuesto en el artículo VIII.b).iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;

2. *Decide*, de conformidad con lo dispuesto en el artículo VIII.b).vi).2).bb) del Convenio, que las enmiendas

se considerarán aceptadas el 1 de julio de 2001 a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio, o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 por 100 del tonelaje bruto de la flota mercante mundial, hayan notificado que recusar las enmiendas;

3. *Invita* a los Gobiernos Contratantes a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII.b).vii).2) del Convenio, las enmiendas entrarán en vigor el 1 de enero de 2002, una vez que hayan sido aceptadas con arreglo a lo dispuesto en el párrafo 2 anterior;

4. *Pide* al Secretario General que, de conformidad con lo dispuesto en el artículo VIII.b).v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;

5. *Pide además* al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

ANEXO

Enmiendas al Convenio Internacional para la Seguridad de la Vida Humana en el Mar, 1974, enmendado

CAPÍTULO III

Dispositivos y medios de salvamento

Regla 28. Zonas de aterrizaje y de evacuación para helicópteros.

1. En el párrafo 2 de la regla, la expresión «buques de pasaje» se sustituye por «buques de pasaje de transbordo rodado».

APÉNDICE

Certificados

2. En los modelos del Certificado de seguridad de construcción para buque de carga y del Certificado de seguridad del equipo para buque de carga que figuran en el apéndice del anexo del Convenio Internacional para la Seguridad de la Vida Humana en el Mar, 1974, bajo el epígrafe «Tipo de buque», se añade la palabra «Granelero» entre el epígrafe y la palabra «Petrolero».

Las presentes Enmiendas entraron en vigor de forma general y para España el 1 de enero de 2002 de conformidad con lo dispuesto en el artículo VIII.b).vii).2) del Convenio.

Lo que se hace público para conocimiento general.
Madrid, 3 de abril de 2002.—El Secretario general técnico, Julio Núñez Montesinos.

I. Disposiciones generales

MINISTERIO DE ASUNTOS EXTERIORES Y DE COOPERACIÓN

1536 *ENMIENDAS de 2002 al Convenio Internacional para la Seguridad de la Vida humana en el mar, 1974, enmendado (publicado en el «Boletín Oficial del Estado» del 16 al 18 de junio de 1980), adoptadas el 12 de diciembre de 2002 mediante Resolución MSC 134(76).*

**Resolución MSC.134(76)
(adoptada el 12 de diciembre de 2002)**

Adopción de enmiendas al Convenio Internacional para la Seguridad de la Vida humana en el mar, 1974, enmendado

El Comité de Seguridad Marítima,

Recordando el artículo 28.b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

Recordando además el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar (Convenio SOLAS), 1974 (en adelante «el Convenio»), relativo al procedimiento de enmienda aplicable al Anexo del Convenio, con excepción de las disposiciones del capítulo I del mismo,

Habiendo examinado en su 76.º periodo de sesiones las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del mismo,

1. *Adopta*, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;

2. *Decide*, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que las enmiendas se considerarán aceptadas el 1 de enero de 2004 a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50% del tonelaje bruto de la flota mercante mundial, hayan notificado que recusan las enmiendas;

3. *Invita* a los Gobiernos Contratantes del Convenio SOLAS a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del mismo, las enmiendas entrarán en vigor el 1 de julio de 2004, una vez que hayan sido aceptadas conforme a lo dispuesto en el párrafo 2 anterior;

4. *Pide* al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;

5. *Pide además* al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no sean Gobiernos Contratantes del Convenio.

ANEXO

Enmiendas al Convenio Internacional para la Seguridad de la Vida Humana en el Mar, 1974, enmendado

CAPÍTULO II-1

Construcción-estructura, compartimentado y estabilidad, instalaciones de máquinas e instalaciones eléctricas

PARTE A-1. ESTRUCTURA DE LOS BUQUES

1. Después de la regla existente 3-5 se añade la nueva regla 3-6:

«Regla 3-6. *Acceso exterior e interior a los espacios situados en la zona de la carga de los petroleros y graneleros*

1. *Ámbito de aplicación.*

1.1 Salvo por lo dispuesto en el párrafo 1.2, la presente regla es aplicable a los petroleros de arqueo bruto igual o superior a 500 y a los graneleros, tal como se definen éstos en la regla IX/1, de arqueo bruto igual o superior a 20.000, construidos el 1 de enero de 2005 o posteriormente.

1.2 Los petroleros de arqueo bruto igual o superior a 500 construidos el 1 de octubre de 1994 o posteriormente, pero antes del 1 de enero de 2005, cumplirán las disposiciones de la regla II-1/12-2 adoptadas mediante la resolución MSC.27(61).

2. *Medios de acceso a los espacios de carga y otros espacios*

2.1 Todo espacio situado dentro de la zona de la carga dispondrá de medios de acceso permanentes que permitan, durante la vida útil del buque, las inspecciones generales y minuciosas y las mediciones de espesores de las estructuras del buque que llevarán a cabo la Administración, la compañía, tal como se define ésta en la regla IX/I, y el personal del buque u otras partes, según sea necesario. Dichos medios de acceso cumplirán las prescripciones del párrafo 5 y las Disposiciones técnicas relativas a los medios de acceso para las inspecciones, adoptadas por el Comité de Seguridad Marítima mediante la resolución MSC.133(76), según las enmiende la Organización, a reserva de que dichas enmiendas se aprueben, entren en vigor y se apliquen de conformidad con lo dis-

puesto en el artículo VIII del presente Convenio, relativo a los procedimientos de enmienda aplicables al Anexo, con excepción del capítulo I.

2.2 Cuando un medio de acceso permanente sea susceptible de sufrir daños durante las operaciones normales de carga y descarga, o cuando sea impracticable instalar medios de acceso permanentes, la Administración podrá disponer, en su lugar, la provisión de medios de acceso móviles o portátiles, según lo especificado en las Disposiciones técnicas, siempre que los medios de unión, sujeción, suspensión o apoyo de los medios de acceso portátiles formen parte permanente de la estructura del buque. Todo el equipo portátil podrá ser instalado o puesto en servicio fácilmente por el personal del buque.

2.3 La construcción y los materiales de todos los medios de acceso y sus uniones a la estructura del buque serán satisfactorios a juicio de la Administración. Los medios de acceso serán objeto de reconocimiento antes de su uso, o durante éste, al procederse a efectuar los reconocimientos prescritos por la regla I/10.

3. Acceso sin riesgos a las bodegas de carga, tanques de carga, tanques de lastre y otros espacios.

3.1 El acceso sin riesgos* a las bodegas de carga, coferdanes, tanques de lastre, tanques de carga y otros espacios de la zona de la carga será directo desde la cubierta expuesta y permitirá la inspección completa de los mismos. El acceso sin riesgos* a los espacios del doble fondo podrá efectuarse desde una cámara de bombas, un coferdán profundo, un túnel de tuberías, una bodega de carga, un espacio del doble casco o compartimientos similares no destinados al transporte de hidrocarburos o de cargas potencialmente peligrosas.

3.2 Los tanques y compartimientos de tanques que tengan una longitud igual o superior a 35 m contarán por lo menos con dos escotillas y escalas de acceso que estén tan separadas entre sí como sea posible. Los tanques que tengan una longitud inferior a 35 m contarán por lo menos con una escotilla y escala de acceso. Cuando los tanques estén compartimentados por uno o más mamparos de balance, u obstrucciones similares que no permitan acceder fácilmente a otras partes del tanque, contarán por lo menos con dos escotillas y escalas.

3.3 Todas las bodegas de carga estarán provistas como mínimo de dos medios de acceso que estén tan separados entre sí como sea posible. En general, estos accesos estarán dispuestos diagonalmente, por ejemplo, uno cerca del mamparo proel, a babor, y el otro cerca del mamparo popel, a estribor.

4. Manual de acceso a la estructura del buque.

4.1 Los medios de acceso instalados en el buque que permitan inspecciones generales y minuciosas y mediciones de espesores se describirán en un Manual de acceso a la estructura del buque aprobado por la Administración, del cual se llevará a bordo un ejemplar actualizado. El Manual de acceso a la estructura del buque incluirá la siguiente información respecto de cada espacio de la zona de la carga:

1. planos en los que figuren los medios de acceso al espacio, con las oportunas especificaciones técnicas y dimensiones;

2. planos en los que figuren los medios de acceso interiores de cada espacio que permitan que se realice una inspección general, con las oportunas especificaciones técnicas y dimensiones. Los planos indicarán el lugar desde el que podrá inspeccionarse cada zona del espacio;

* Véanse las Recomendaciones relativas a la entrada en espacios cerrados a bordo de los buques, adoptadas por la Organización mediante la resolución A.864(20).

3. planos en los que figuren los medios de acceso interiores del espacio que permitan que se realicen las inspecciones minuciosas, con las oportunas especificaciones técnicas y dimensiones. Los planos indicarán la posición de las zonas críticas de la estructura, si los medios de acceso son permanentes o portátiles y el lugar desde el que podrá inspeccionarse cada zona;

4. instrucciones para la inspección y el mantenimiento de la resistencia estructural de todos los medios de acceso y de unión, teniendo en cuenta cualquier atmósfera corrosiva que pueda existir en el espacio;

5. instrucciones sobre orientaciones de seguridad cuando se usen balsas para las inspecciones minuciosas y las mediciones de espesores;

6. instrucciones para el montaje y utilización sin riesgos de todo medio portátil de acceso;

7. un inventario de todos los medios portátiles de acceso; y

8. un registro de las inspecciones y el mantenimiento periódico de los medios de acceso instalados en el buque.

4.2 A los efectos de la presente regla, por "zonas críticas de la estructura" se entenderán las que, a juzgar por los cálculos pertinentes, necesitan vigilancia o que, a la vista del historial de servicio de buques similares o gemelos, son susceptibles de agrietarse, pandearse, deformarse o corroerse de forma que se menoscabaría la integridad estructural del buque.

5. Especificaciones técnicas generales.

5.1 Los accesos a través de aberturas, escotillas o registros horizontales tendrán dimensiones suficientes para que una persona provista de un aparato respiratorio autónomo y de equipo protector pueda subir o bajar por cualquier escala sin impedimento alguno, y también un hueco libre que permita izar fácilmente a una persona lesionada desde el fondo del espacio de que se trate. El hueco libre será como mínimo de 600 mm x 600 mm. Cuando el acceso a una bodega de carga sea a través de la escotilla de carga, la parte superior de la escala se situará lo más cerca posible de la brazola de la escotilla. Las brazolas de las escotillas de acceso que tengan una altura superior a 900 mm también tendrán peldaños en el exterior, en combinación con la escala.

5.2 En los accesos a través de aberturas o registros verticales en los mamparos de balance, las varengas, las vagras y las bulárcamas que permitan atravesar el espacio a lo largo y a lo ancho, el hueco libre será como mínimo de 600 mm x 800 mm, y estará a una altura de la chapa del forro del fondo que no exceda de 600 mm, a menos que se hayan provisto rejillas o apoyapiés de otro tipo.

5.3 En los petroleros de peso muerto inferior a 5.000 toneladas, la Administración podrá aprobar, en casos especiales, dimensiones menores para las aberturas citadas en los párrafos 5.1 y 5.2 anteriores, si puede probarse de forma satisfactoria, a juicio de la Administración, que es posible atravesar dichas aberturas o evacuar a una persona lesionada a través de ellas.»

PARTE B. COMPARTIMENTADO Y ESTABILIDAD

Regla 12-2. *Acceso a los espacios situados en la zona de la carga de los petroleros.*

2. La actual regla 12-2 se suprime.

PARTE C. INSTALACIONES DE MÁQUINAS

Regla 31. *Mandos de las máquinas.*

3. Se añade el siguiente nuevo subpárrafo 10 al párrafo 2 de la regla:

«10. los sistemas automáticos se proyectarán de modo que garanticen que el oficial a cargo de la guardia de navegación reciba un aviso previo de desaceleración o cierre próximo o inminente del sistema de propulsión con tiempo suficiente para analizar las condiciones de navegación en caso de emergencia. En particular, los sistemas deberán ejecutar funciones de control, supervisión, información y alerta, así como medidas de seguridad para reducir o detener la propulsión, dando al mismo tiempo al oficial a cargo de la guardia de navegación la oportunidad de intervenir manualmente, excepto en aquellos casos en que la intervención manual ocasionaría un fallo total de los motores y/o del equipo de propulsión a corto plazo, por ejemplo, en caso de sobrevelocidad.»

CAPÍTULO II-2

Construcción-prevención, detección y extinción de incendios

Regla 3. *Definiciones.*

4. En el párrafo 20, las palabras «en la regla VII/2» se sustituyen por «en el Código IMDG, según se define éste en la regla VII/1.1».

Regla 19. *Transporte de mercancías peligrosas.*

5. En la tabla 19.3, en las columnas 7 y 8 (correspondientes a los puntos de inflamación de la Clase 3) los números «3.1, 3.2» y «3.3» se sustituyen por el número «3».

6. En la tabla 19.3, en la columna 13 (correspondiente a la Clase 5.2), el carácter «X» de las filas 15 (correspondiente al párrafo 3.10.1) y 16 (correspondiente al párrafo 3.10.2) se sustituye por el carácter «X¹⁶» y se añade la nueva nota 16 siguiente:

«¹⁶ En virtud de lo dispuesto en el Código IMDG, enmendado, la estiba de mercancías peligrosas de la Clase 5.2 bajo cubierta o en los espacios cerrados de carga rodada está prohibida.»

CAPÍTULO III

Dispositivos y medios de salvamento

Regla 26. *Prescripciones complementarias aplicables a los buques de pasaje de transbordo rodado.*

7. Al final del párrafo 1 se añade el nuevo subpárrafo 4 siguiente:

«4. antes del 1 de julio de 2004 cumplirán lo prescrito en el párrafo 2.5 a más tardar en el primer reconocimiento que se efectúe en esa fecha o posteriormente.»

8. Al final del párrafo 2 se añade el nuevo subpárrafo 5 siguiente:

«5. Las balsas salvavidas transportadas a bordo de los buques de pasaje de transbordo rodado irán provistas de un respondedor* de radar a razón de un respondedor por cada cuatro balsas salvavidas. El respondedor estará instalado en el interior de la balsa de modo que su antena se encuentre a más de un metro sobre el nivel del mar cuando la balsa salvavidas esté desplegada, con la excepción de que para las balsas salvavidas reversibles con capota el respondedor estará dispuesto de modo que los supervivientes puedan acceder al mismo e instalarlo fácilmente. Cada respondedor estará dispuesto de modo que sea posible instalarlo manualmente cuando la balsa salvavidas esté desplegada. Las envolturas de las balsas salvavidas dotadas de respondedores estarán claramente marcadas.»

* Véanse las Normas de funcionamiento de los respondedores de radar para embarcaciones de supervivencia destinados a las operaciones de búsqueda y salvamento, adoptadas por la Organización mediante la resolución A.802(19).

CAPÍTULO XII

Medidas de seguridad adicionales aplicables a los graneleros

9. Después de la regla 11 existente se añaden las nuevas reglas 12 y 13 siguientes:

«Regla 12. *Detectores del nivel del agua en bodegas, espacios de lastre y espacios secos.*

(La presente regla es aplicable a los graneleros independientemente de su fecha de construcción.)

1. Los graneleros estarán equipados con detectores del nivel del agua:

1) en cada bodega de carga, provistos de alarmas audibles y visuales que se activen, una de ellas, cuando el nivel del agua llegue a una altura de 0,5 m por encima del doble fondo de cualquier bodega, y la otra, cuando llegue a una altura no inferior al 15% de la profundidad de la bodega de carga pero no superior a 2 m. En los graneleros a los que se aplique la regla 9.2 sólo es necesario instalar detectores con la segunda alarma. Los detectores del nivel del agua se instalarán en el extremo de popa de las bodegas de carga. En el caso de las bodegas de carga que se usen para lastre de agua se podrá instalar un dispositivo neutralizador de las alarmas. Las alarmas visuales permitirán distinguir claramente entre los dos diferentes niveles del agua detectados en cada bodega;

2) en todo tanque de lastre situado a proa del mamparo de colisión prescrito en la regla II-1/11, provistos de una alarma audible y visual que se active cuando el líquido del tanque llegue a un nivel que no exceda del 10% de la capacidad del tanque. Se podrá instalar un dispositivo neutralizador de la alarma que se active cuando el tanque esté en uso; y

3) en todo espacio seco o vacío que no sea la caja de cadenas y que tenga alguna parte situada a proa de la bodega de carga más cercana a la proa, provistos de una alarma audible y visual que se active cuando el nivel del agua llegue a una altura de 0,1 m por encima de la cubierta. No se requiere instalar tales alarmas en espacios cerrados cuyo volumen no exceda del 0,1% del volumen de desplazamiento máximo del buque.

2. Las alarmas audibles y visuales especificadas en el párrafo 1 estarán situadas en el puente de navegación.

3. Los graneleros construidos antes del 1 de julio de 2004 cumplirán lo prescrito en la presente regla a más tardar en la fecha del primer reconocimiento anual, intermedio o de renovación del buque que se lleve a cabo después del 1 de julio de 2004.

Regla 13. *Disponibilidad de los sistemas de bombeo.*

(La presente regla es aplicable a los graneleros independientemente de su fecha de construcción.)

1. En los graneleros, los medios de drenaje y bombeo de los tanques de lastre situados a proa del mamparo de colisión y de las sentinas de los espacios secos que tengan alguna parte situada a proa de la bodega de carga más cercana a la proa se podrán poner en funcionamiento desde un espacio cerrado al cual se acceda fácilmente desde el puente de navegación o desde el puesto de control de la maquinaria de propulsión sin tener que atravesar la cubierta de francobordo expuesta o las cubiertas de la superestructura. Cuando las tuberías de dichos tanques o sentinas atraviesen el mamparo de colisión se podrá aceptar el accionamiento de las válvulas mediante dispositivos teledirigidos como medio alternativo del control de las válvulas prescrito en la regla II-1/11.4, siempre que

la ubicación de los controles de las mismas se ajuste a lo dispuesto en la presente regla.

2. Los graneleros construidos antes del 1 de julio de 2004 cumplirán lo prescrito en la presente regla a más tardar en la fecha del primer reconocimiento intermedio o de renovación del buque que se lleve a cabo después del 1 de julio de 2004, pero en ningún caso después del 1 de julio de 2007.»

Las presentes Enmiendas entraron en vigor de forma general y para España el 1 de julio de 2004, de conformidad con lo dispuesto en el Artículo VIII (b) y vii (2) del Convenio.

Lo que se hace público para conocimiento general.

Madrid, 11 de enero de 2005.—El Secretario General Técnico, Francisco Fernández Fábregas.

1537 *RESOLUCIÓN de 11 de enero de 2005, de la Secretaría General Técnica, relativa al Acuerdo Multilateral M-160 en virtud de la Sección 1.5.1 del Acuerdo Europeo sobre transporte internacional de mercancías peligrosas por carretera (ADR) (publicado en el «Boletín Oficial del Estado» núm. 33, de 7 de febrero de 2003), relativo al tipo de recipientes utilizados en globos aerostáticos y dirigibles de aire caliente, hecho en Madrid el 7 de septiembre de 2004.*

ACUERDO MULTILATERAL M-160

En virtud del apartado 1.5.1 del ADR, relativo al tipo de recipientes utilizados en globos aerostáticos y dirigibles de aire caliente

1. Por derogación de las disposiciones de los párrafos 6.2.1.1.1, 6.2.1.2 y de la instrucción de embalaje P200 del párrafo 4.1.4.1 del Anexo A del ADR, los recipientes de acero inoxidable austenítico soldados, de acero ferrítico austenítico (dúplex) y de titanio, que no cumplen las disposiciones el capítulo 6.2 del ADR, pero que se han construido y aprobado de acuerdo con las disposiciones de aviación nacionales para su uso como recipientes de combustible para globos aerostáticos y dirigibles de aire caliente y se han puesto en servicio (fecha de la inspección inicial) antes del 1 de julio de 2004, pueden transportarse por carretera si cumplen las siguientes condiciones:

- (a) las disposiciones generales del 6.2.1;
- (b) el diseño y la construcción de los recipientes se ha aprobado para uso aéreo por las autoridades nacionales de aviación;
- (c) por derogación del 6.2.1.1.1, la presión de cálculo se basará en una temperatura ambiente máxima reducida de + 40°C;
 - i. por derogación del 6.2.1.2, los cilindros se pueden construir de titanio puro comercial templado y laminado con los requisitos mínimos de $R_m > 450$ MPa, $\epsilon_A > 20\%$ (ϵ_A =deformación después de fractura);
 - ii. los cilindros de acero inoxidable austenítico soldados y de acero ferrítico austenítico (dúplex) se pueden utilizar con un nivel de tensión hasta el 85% de la resistencia elástica mínima garantizada (R_e) a la presión de cálculo basada en una temperatura ambiente máxima reducida de + 40°C;
 - iii. los recipientes se equiparán con un dispositivo de alivio de presión tarados a una presión nominal de 26 bar, y la presión de prueba de estos recipientes será no inferior a 30 bar;

(d) los recipientes en los que (c) no sea aplicable y se hayan diseñado de acuerdo con la temperatura de referencia del ADR (65°C), se equiparán con dispositivos de alivio de presión tarados a la presión que especifique la autoridad competente del país de utilización;

(e) el cuerpo principal de los recipientes se equipará con una capa exterior protectora resistente al agua de al menos 25 mm de espesor de espuma celular estructural o material similar;

(f) el cilindro se transportará fijado en una cesta o en otro dispositivo de seguridad adicional;

(g) los recipientes se marcarán con una etiqueta clara, visible y perdurable en la que se indique que los recipientes sólo son aptos para su uso en globos aerostáticos y dirigibles de aire caliente;

(h) la vida útil (desde la fecha de la inspección inicial) no excederá de 25 años.

2. El expedidor introducirá el siguiente texto en la carta de porte: «Transporte acordado bajo las condiciones del párrafo 1.5.1 del ADR M-160». Se llevará a bordo del vehículo una copia de este Acuerdo.

3. Este Acuerdo se aplicará hasta el 30 de junio de 2007 para el transporte en el territorio de las Partes contratantes del ADR que hayan firmado este acuerdo. En caso de que fuera revocado antes por alguno de los signatarios permanecerá en vigor hasta la fecha antes mencionada únicamente respecto del transporte en los territorios de las Partes contratantes en el ADR signatarias del presente Acuerdo que no lo hayan revocado.

4. Este acuerdo no se aplica al transporte a través del Túnel del Canal de la Mancha (Channel Tunnel).

Madrid, 7 de septiembre de 2004.—La Autoridad Competente para el ADR en España, Juan Miguel Sánchez García, Director General de Transportes por Carretera.

El presente Acuerdo ha sido firmado por las Autoridades competentes del ADR de:

Alemania.
Bélgica.
España.
Luxemburgo.
Noruega.
Portugal.
Reino Unido.
República Checa.

Lo que se hace público para conocimiento general.

Madrid, 11 de enero de 2005.—El Secretario General Técnico, Francisco Fernández Fábregas.

MINISTERIO DE INDUSTRIA, TURISMO Y COMERCIO

1538 *ORDEN ITC/102/2005, de 28 de enero, por la que se establece la retribución de las actividades reguladas del sector gasista.*

El Real Decreto 949/2001, de 3 de agosto, por el que se regula el acceso de terceros a las instalaciones gasistas y se establece un sistema económico integrado del sector de gas natural, en su artículo 15 establece que las activi-

4370 *ENMIENDAS de 2004 al Convenio Internacional para la seguridad de la vida humana en el Mar, 1974 Enmendado (publicado en el «Boletín Oficial del Estado» de 16, 17 y 18 de junio de 1980), adoptadas el 20 de mayo de 2004, mediante Resolución MSC 152(78).*

ENMIENDAS DE 2004 AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974 ENMENDADO
[Resolución MSC.152(78)]

RESOLUCIÓN MSC.152(78)
 (adoptada el 20 de mayo de 2004)

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

El Comité de Seguridad Marítima,

Recordando el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

Recordando asimismo el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar (Convenio SOLAS), 1974 (en adelante denominado «el Convenio»), relativo al procedimiento de enmienda aplicable al anexo del Convenio, con excepción de las disposiciones del capítulo 1,

Habiendo examinado en su 78.º periodo de sesiones enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del mismo,

1. *Adopta*, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;

2. *Decide*, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que las enmiendas se considerarán aceptadas el 1 de enero de 2006, a menos que, antes de dicha fecha, más de un tercio de los Gobiernos Contratantes del Convenio, o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50% del tonelaje bruto de la flota mercante mundial, hayan notificado que recusan las enmiendas;

3. *Invita* a los Gobiernos Contratantes del Convenio a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de julio de 2006, una vez que hayan sido aceptadas con arreglo a lo dispuesto en el párrafo 2 anterior;

4. *Pide* al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;

5. *Pide además* al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no sean Gobiernos Contratantes del Convenio.

ANEXO

Enmiendas al Convenio Internacional para la seguridad de la vida humana en el mar, 1974, enmendado

CAPÍTULO III

Dispositivos y medios de salvamento

Regla 19. *Formación y ejercicios periódicos para casos de emergencia.*

1. El texto actual del párrafo 3.3.3 se sustituye por el siguiente:

«3.3.3 Salvo lo dispuesto en los párrafos 3.3.4 y 3.3.5, cada uno de los botes salvavidas será puesto a flote y maniobrado en el agua por la tripulación asignada para su manejo al menos una vez cada tres meses durante un ejercicio de abandono del buque.»

Regla 20. *Disponibilidad funcional, mantenimiento e inspección.*

2. En la segunda frase del párrafo 1 las palabras «los párrafos 3 y 6.2» se sustituyen por «los párrafos 3.2, 3.3 y 6.2».

3. El texto actual del párrafo 3 se sustituye por el siguiente:

«3. Mantenimiento:

3.1 El mantenimiento, prueba e inspección de los dispositivos de salvamento se efectuarán basándose en las directrices elaboradas por la Organización* y de forma tal que se tome debidamente en consideración el garantizar la fiabilidad de tales dispositivos.

3.2 Se proveerán instrucciones que cumplan lo prescrito en la regla 36 para el mantenimiento a bordo de los dispositivos de salvamento y las operaciones de mantenimiento se realizarán de acuerdo con ellas.

3.3 La Administración podrá aceptar, en cumplimiento de las prescripciones del párrafo 3.2, un programa planificado de mantenimiento a bordo que incluya lo prescrito en la regla 36.»

4. El texto actual del párrafo 6 se sustituye por el siguiente:

«6. Inspección semanal:

Cada semana se efectuarán las pruebas e inspecciones siguientes y el informe correspondiente a la inspección se incluirá en el diario de navegación:

.1 todas las embarcaciones de supervivencia y todos los botes de rescate y dispositivos de puesta a flote serán objeto de una inspección ocular a fin de verificar que están listos para ser utilizados. Esa inspección incluirá, sin que esta enumeración sea exhaustiva, el estado de los ganchos, su sujeción a los botes salvavidas y que el mecanismo de suelta con carga está debida y completamente ajustado;

.2 se harán funcionar todos los motores de los botes salvavidas y de los botes de rescate durante un periodo total de al menos tres minutos, a condición de que la temperatura ambiente sea superior a la temperatura mínima necesaria para poner en marcha el motor. Durante dicho periodo se comprobará que la caja y el tren de engranajes embragan de

* Véanse las Directrices sobre el servicio y mantenimiento periódicos de los botes salvavidas, dispositivos de puesta a flote y aparejos de suelta con carga (MSC/Circ.1093).

forma satisfactoria. Si las características especiales del motor fueraborda instalado en un bote de rescate no le permiten funcionar durante un periodo de tres minutos a menos que tenga la hélice sumergida, se le hará funcionar durante el periodo que prescriba el manual del fabricante. En casos especiales, la Administración podrá eximir de esta prescripción a los buques construidos antes del 1 de julio de 1986;

.3 los botes salvavidas, excepto los botes salvavidas de caída libre, de los buques de carga se moverán de su posición de estiba, sin nadie a bordo, hasta donde sea necesario para demostrar el funcionamiento satisfactorio de los dispositivos de puesta a flote, siempre que las condiciones meteorológicas y el estado de la mar lo permitan; y

.4 se ensayará el sistema de alarma general de emergencia.»

5. En el párrafo 7 el texto actual pasa a ser el párrafo 7.2 y se añade el nuevo párrafo 7.1 siguiente:

«7.1 Todos los botes salvavidas, excepto los de caída libre, se sacarán de su posición de estiba, sin nadie a bordo, siempre que las condiciones meteorológicas y el estado de la mar lo permitan.»

6. El texto actual del párrafo 11 se sustituye por el siguiente:

«11 Servicio periódico de los dispositivos de puesta a flote y de los mecanismos de suelta con carga

11.1 Los dispositivos de puesta a flote:

.1 serán objeto de mantenimiento de conformidad con las instrucciones para el mantenimiento a bordo prescritas en la regla 36;

.2 serán objeto de un examen minucioso durante los reconocimientos anuales prescritos en las reglas I/7 o I/8, según corresponda; y

.3 al término del examen indicado en .2, se someterán a una prueba dinámica del freno del chigre a la máxima velocidad de arriado. La carga que se aplique será igual a la masa del bote salvavidas sin nadie a bordo, con la excepción de que al menos una vez cada cinco años la prueba se realizará con una carga de prueba equivalente a 1,1 veces la carga máxima de trabajo del chigre.

11.2 Los mecanismos de suelta con carga de los botes salvavidas:

.1 serán objeto de mantenimiento de conformidad con las instrucciones para el mantenimiento a bordo prescritas en la regla 36;

.2 serán objeto de un examen minucioso y de una prueba operacional durante las inspecciones anuales prescritas en las reglas I/7 y I/8, por personal debidamente capacitado y familiarizado con el sistema; y

.3 se someterán a una prueba de funcionamiento con una carga equivalente a 1,1 veces la masa total del bote salvavidas con su asignación completa de personas y equipo cada vez que se examine el mecanismo de suelta. El examen y la prueba se llevarán a cabo como mínimo una vez cada cinco años.*»

* Véase la Recomendación sobre las pruebas de los dispositivos de salvamento, adoptada por la Organización mediante la resolución A.689(17). Para los dispositivos de salvamento instalados a bordo el 1 de julio de 1999 o posteriormente, véase la Recomendación revisada sobre las pruebas de los dispositivos de salvamento, adoptada por la Organización mediante la resolución MSC.81(70).

Regla 32. *Dispositivos individuales de salvamento.*

7. El texto actual del párrafo 3 se sustituye por el siguiente:

«3. Trajes de inmersión:

3.1 El presente párrafo es aplicable a todos los buques de carga. No obstante, con respecto a los buques de carga construidos antes del 1 de julio de 2006 se cumplirá lo prescrito en los párrafos 3.2 a 3.5 a más tardar al efectuarse el primer reconocimiento del equipo de seguridad el 1 de julio de 2006 o posteriormente.

3.2 Se proveerá un traje de inmersión que cumpla las prescripciones de la sección 2.3 del Código a cada persona a bordo del buque. No obstante, en el caso de los buques que no sean graneleros, según la definición de la regla IX/1, no será necesario llevar tales trajes de inmersión cuando el buque esté destinado continuamente a efectuar viajes en zonas de clima cálido ** en las que, a juicio de la Administración, no sean necesarios los trajes de inmersión.

3.3 Si un buque tiene puestos de guardia o de operaciones que están situados en un lugar alejado de donde normalmente se estiban los trajes de inmersión, en dichos lugares se proveerán trajes de inmersión adicionales para el número de personas que habitualmente estén de guardia o trabajen allí en cualquier momento dado.

3.4 Los trajes de inmersión estarán ubicados de modo que sean fácilmente accesibles, y esa ubicación se indicará claramente.

3.5 Los trajes de inmersión prescritos en la presente regla podrán utilizarse para cumplir lo prescrito en la regla 7.3.»

CAPÍTULO IV

Radiocomunicaciones

Regla 15. *Prescripciones relativas a mantenimiento.*

8. El texto actual del párrafo 9 se sustituye por el siguiente:

«9. Las RLS por satélite:

.1 se someterán a prueba anualmente para verificar todos los aspectos relativos a su eficacia operacional, prestándose especialmente atención a la comprobación de la emisión en frecuencias operacionales, la codificación y el registro, en los plazos que se indican a continuación:

.1 en los buques de pasaje, dentro de los 3 meses anteriores a la fecha de expiración del Certificado de seguridad para buque de pasaje; y

.2 en los buques de carga, dentro de los 3 meses anteriores a la fecha de expiración, o dentro de los 3 meses anteriores o posteriores a la fecha de vencimiento anual, del Certificado de seguridad radioeléctrica para buque de carga.

La prueba se podrá efectuar a bordo del buque o en un centro aprobado de prueba; y

.2 serán objeto de mantenimiento a intervalos que no excedan de cinco años, en una instalación de mantenimiento en tierra aprobada.»

** Véanse las Directrices para evaluar la protección térmica (MSC/Circ.1046).

APÉNDICE

Certificados

Inventario del equipo adjunto al Certificado de seguridad del equipo para buque de carga (Modelo E)

9. En la sección 2, se suprime el apartado 9 y los apartados 10, 10.1 y 10.2 pasan a ser los apartados 9, 9.1 y 9.2, respectivamente.

Las presentes enmiendas entraron en vigor de forma general y para España el 1 de julio de 2006, de conformidad con lo establecido en el artículo VIII b) v VII) 2) del Convenio.

Lo que se hace público para conocimiento general.

Madrid, 19 de febrero de 2007.—El Secretario General Técnico del Ministerio de Asuntos Exteriores y de Cooperación, Francisco Fernández Fábregas.

MINISTERIO DE DEFENSA

4371 *ORDEN DEF/448/2007, de 27 de febrero, por la que se modifica el despliegue de la Fuerza del Ejército del Aire, que figura en el anexo III del Real Decreto 416/2006, de 11 de abril, por el que se establece la organización y el despliegue de la Fuerza del Ejército de Tierra, de la Armada y del Ejército del Aire, así como de la Unidad Militar de Emergencias.*

El Real Decreto 416/2006, de 11 de abril, por el que se establece la organización y el despliegue de la Fuerza del Ejército de Tierra, de la Armada y del Ejército del Aire, así como de la Unidad Militar de Emergencias, atribuye al Ministro de Defensa la competencia para establecer los planes de transición a las nuevas estructuras de la Fuerza de los Ejércitos, y le autoriza a modificar la estructura orgánica y despliegue que figuran en sus anexos.

La Orden Ministerial 114/2006, de 18 de septiembre, por la que se establecen las líneas generales del proceso de transición a la nueva estructura de la Fuerza del Ejército de Tierra, de la Armada y del Ejército del Aire y se dictan normas para su desarrollo y ejecución, establece que los Jefes de Estado Mayor del Ejército de Tierra, de la Armada y del Ejército del Aire presentarán sus propuestas de planes de transición a las nuevas estructuras de la Fuerza de su Ejército, para su aprobación por el Ministro de Defensa.

Durante el proceso de elaboración del Plan de Transición a la nueva estructura de la Fuerza del Ejército del Aire, surgió la necesidad de que la Base Aérea de Villanubla mantenga su condición de base aérea y no la de acuartelamiento aéreo, dado que en ella deberá continuar desplegada el Ala 37 y será preciso reubicar otra unidad dotada de aeronaves. Por otra parte, el previsible crecimiento de la Unidad Militar de Emergencias, ubicada en la Base Aérea de Torrejón, con el consiguiente incremento del número de instalaciones que necesitaría y de terrenos que precisarían, tanto para su expansión como para la realización de ejercicios de adiestramiento, unido a los problemas de saturación de tráfico aéreo existente en ese entorno, ha aconsejado ubicar el Ala 48 y el Centro Cartográfico y Fotográfico del Ejército del Aire en la Base Aérea de Getafe, y no en la de Torrejón como en

un principio estaba previsto. Por todo ello, procede adecuar el anexo III del Real Decreto 416/2006, de 11 de abril.

En su virtud, en uso de las facultades que me confiere la disposición final primera.2 del Real Decreto 416/2006, de 11 de abril, dispongo:

Apartado único. *Modificación del Real Decreto 416/2006, de 11 de abril, por el que se establece la organización y el despliegue de la Fuerza del Ejército de Tierra, de la Armada y del Ejército del Aire, así como de la Unidad Militar de Emergencias.*

El anexo III del Real Decreto 416/2006, de 11 de abril, relativo al despliegue de la Fuerza del Ejército del Aire, queda modificado como sigue:

Uno. La relación de Instalaciones aéreas del Mando Aéreo General de la Fuerza del Ejército del Aire queda como sigue:

«Instalaciones aéreas:

Jefatura, en Madrid.
Agrupación Base Aérea Torrejón de Ardoz (Madrid).
Agrupación Base Aérea Zaragoza.
Base Aérea Son San Juan, en Palma de Mallorca (Illes Balears).
Base Aérea de Villanubla, en Villanubla (Valladolid).
Agrupación Central del Ejército del Aire, en Madrid.
Agrupación Acuartelamiento Aéreo Tablada, en Sevilla.
Agrupación Acuartelamiento Aéreo El Prat, en Barcelona.
Aeródromo Militar Santiago, en Santiago de Compostela (A Coruña).
Centro de Sistemas Aeroespaciales de Observación, en Torrejón de Ardoz (Madrid).
Comandancia Militar Aérea del Aeropuerto de Melilla.»

Dos. La relación de Fuerzas Auxiliares de Contribución a la Acción del Estado del Mando Aéreo General de la Fuerza del Ejército del Aire queda como sigue:

«Fuerzas Auxiliares de Contribución a la Acción del Estado:

Jefatura, en Madrid.
Jefatura del Servicio de Búsqueda y Salvamento, en Torrejón de Ardoz (Madrid).
Centro de Coordinación de Salvamento Madrid, en Torrejón de Ardoz (Madrid).
Ala 48, en Getafe (Madrid).
Ala 37, en Villanubla (Valladolid).
43 Grupo, en Torrejón de Ardoz (Madrid).
45 Grupo, en Torrejón de Ardoz (Madrid).
801 Escuadrón, en Palma de Mallorca (Illes Balears).»

Tres. La relación de Fuerzas Auxiliares de Apoyo Operativo del Mando Aéreo General de la Fuerza del Ejército del Aire queda como sigue:

«Fuerzas Auxiliares de Apoyo Operativo:

Jefatura, en Madrid.
Centro Cartográfico y Fotográfico, en Getafe (Madrid).
Centro de Material de Apoyo, en Getafe (Madrid).
Grupo de Automóviles, en Getafe (Madrid).
Acuartelamiento Aéreo de Málaga.
Acuartelamiento Aéreo de Pollensa, en Pollensa-Mallorca (Illes Balears).
Acuartelamiento Aéreo Bobadilla (Málaga).
Polígono de Tiro Bardenas (Navarra).»

	<p>Tanques de pique de proa</p> <p>2.9 Para los tanques de pique de proa con una profundidad igual o superior a 6 m en el eje longitudinal del mamparo de colisión se proveerá un medio de acceso adecuado para la entrada en zonas críticas, tales como estructuras bajo cubierta, palmejares, mamparo de colisión y estructuras del forro del costado.</p> <p>2.9.1 Se considera que los palmejares de menos de 6 m de altura desde el techo de entrepuente o un palmejar situado inmediatamente por encima proporcionan un acceso adecuado en combinación con medios portátiles de acceso.</p> <p>2.9.2 En el caso de que la altura entre el techo de entrepuente y los palmejares, los palmejares o el palmejar inferior y el fondo del tanque sea igual o superior a 6 m, se proveerán de los medios alternativos de acceso que se definen en el párrafo 3.9 de las Disposiciones técnicas.</p>
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Las presentes Enmiendas entraron en vigor de forma general y para España el 1 de enero de 2006 de conformidad con lo establecido en el artículo VIII b) vii) 2) del Convenio SOLAS 1974.

Lo que se hace público para conocimiento general.

Madrid, 26 de enero de 2007.—El Secretario General Técnico del Ministerio de Asuntos Exteriores y de Cooperación, Francisco Fernández Fábregas

2657 *ENMIENDAS de 2004 al Convenio para la seguridad de la vida humana en el Mar, 1974 enmendado (Capítulos II-1, III, V, VII y XII) (publicado en el «Boletín Oficial del Estado» de 16, 17 y 18 de junio de 1980), adoptadas el 9 de diciembre de 2004, mediante Resolución MSC 170 (79).*

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, [RESOLUCIÓN MSC.170 (79)] (ADOPTADA EL 9 DE DICIEMBRE DE 2004)

Enmiendas al Convenio Internacional para la seguridad de la vida humana en el Mar, 1974, enmendado

El Comité de Seguridad Marítima,

Recordando el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

Recordando asimismo el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar (Convenio SOLAS), 1974, (en adelante denominado «el Convenio»), referente al procedimiento de enmienda del Anexo del Convenio, con excepción de su capítulo 1,

Habiendo examinado, en su 79º periodo de sesiones, las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en su artículo VIII b) i),

1. Adopta, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al mismo, cuyo texto figura en el anexo de la presente resolución;

2. Decide, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de enero de 2006, a menos que, antes de esa fecha, más de un tercio de los

Gobiernos Contratantes del Convenio o los Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50% del tonelaje bruto de la flota mercante mundial, hayan notificado sus objeciones a las enmiendas;

3. Invita a los Gobiernos Contratantes del Convenio SOLAS a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de julio de 2006, una vez aceptadas con arreglo a lo dispuesto en el párrafo 2 supra;

4. Pide al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo, a todos los Gobiernos Contratantes del Convenio;

5. Pide además al Secretario General que remita copias de la presente resolución y de su anexo, a los Miembros de la Organización que no sean Gobiernos Contratantes del Convenio.

ANEXO

Enmiendas al Convenio Internacional para la seguridad de la vida humana en el Mar, 1974, enmendado

CAPÍTULO II-1

Construcción—estructura, compartimentado y estabilidad, instalaciones de máquinas e instalaciones eléctricas

Regla 2. Definiciones.

1. A continuación del actual párrafo 13 se añade el nuevo párrafo 14:

«14. Granelero: un granelero según se define en la regla XII/1.1.»

Regla 18. Construcción y pruebas iniciales de puertas estancas, portillos, etc., en los buques de pasaje y en los buques de carga.

2. El párrafo 2 de la regla se sustituye por el siguiente:

«2. En los buques de pasaje y en los buques de carga las puertas estancas se probarán sometiéndolas a la presión correspondiente a una altura de

agua que llegue hasta la cubierta de cierre o la cubierta de francobordo, respectivamente. Cuando no puedan someterse a esa prueba determinadas puertas por la posibilidad de que se dañen los aislamientos o las piezas, la prueba de dichas puertas se sustituirá por una prueba de homologación de presión consistente en someter cada tipo de puerta de diferentes dimensiones a una presión de prueba que corresponda por lo menos a la carga hidrostática requerida para la ubicación prevista. La prueba de homologación se efectuará antes de instalar la puerta. El método de instalación y el procedimiento para instalar la puerta a bordo deberán corresponder a los de la prueba. Una vez instalada a bordo, se comprobará el asiento adecuado de cada puerta entre el mamparo, el marco y la puerta.»

Regla 45. *Precauciones contra descargas eléctricas, incendios de origen eléctrico y otros riesgos del mismo tipo.*

3. Después del encabezamiento se añade la frase siguiente:

«(Los párrafos 10 y 11 de la presente regla se aplican a los buques construidos el 1 de enero de 2007, o posteriormente).»

4. El actual párrafo 10 se sustituye por el siguiente:

«10. No se instalará equipo eléctrico alguno en ninguno de los espacios en que puedan acumularse mezclas inflamables, por ejemplo, en los compartimientos principalmente destinados a contener baterías de acumuladores, en pañoles de pintura, pañoles de acetileno y espacios análogos, a menos que, a juicio de la Administración, dicho equipo:

- .1 sea esencial para fines operacionales;
- .2 sea de un tipo que no pueda inflamar la mezcla de que se trate;
- .3 sea apropiado para el espacio de que se trate; y
- .4 esté adecuadamente homologado para su uso sin riesgos en atmósferas en las que sea probable que se acumulen polvo, vapores o gases.»

5. A continuación del párrafo 10 enmendado se añade el siguiente párrafo 11:

«11. En los buques tanque no se instalarán equipos, hilos ni cables eléctricos en emplazamientos potencialmente peligrosos, a menos que se ajusten a normas no inferiores a las aceptadas por la Organización. No obstante, en los emplazamientos no contemplados por dichas normas podrán instalarse, en los lugares potencialmente peligrosos, equipo, hilos y cables eléctricos que no se ajusten a ellas, si la Administración, tras evaluar los riesgos, estima que ofrecen un grado de seguridad equivalente.»

6. El actual párrafo 11 pasa a ser párrafo 12.

CAPITULO III

Dispositivos y medios de salvamento

Regla 31. *Embarcaciones de supervivencia y botes de rescate.*

7. A continuación del actual párrafo 1.7, se añade el siguiente nuevo párrafo 1.8:

«1.8 No obstante lo dispuesto en el párrafo 1.1, los graneleros, según se definen en la regla IX/1.6, construidos el 1 de julio de 2006 o posteriormente, cumplirán las prescripciones del párrafo 1.2.»

CAPÍTULO V

Seguridad de la navegación

Regla 19. *Prescripciones relativas a los sistemas y aparatos náuticos que se han de llevar a bordo.*

8. En el párrafo 2.5, se sustituye el texto del actual apartado .1 por el siguiente:

«1 un girocompás u otro medio para determinar y presentar visualmente su rumbo por medios no magnéticos que el timonel pueda leer claramente desde el puesto de gobierno principal. Dicho medio también transmitirá información sobre el rumbo para los aparatos a que se hace referencia en los párrafos 2.3.2, 2.4 y 2.5.5;»

Regla 20. *Registrador de datos de la travesía.*

9. Se añade el siguiente nuevo párrafo 2:

«2. A fin de facilitar las investigaciones de siniestros, en los buques de carga que efectúen viajes internacionales se instalará un registrador de datos de la travesía (RDT), que puede ser un registrador de datos de la travesía simplificado (RDT-S), según se indica a continuación:

.1 en el caso de los buques de carga de arqueo bruto igual o superior a 20.000, construidos antes del 1 de julio de 2002, en el primer reconocimiento en dique seco previsto después del 1 de julio de 2006 y en cualquier caso el 1 de enero de 2009 a más tardar;

.2 en el caso de los buques de carga de arqueo bruto igual o superior a 3.000 pero inferior a 20.000, construidos antes del 1 de julio de 2002, en el primer reconocimiento en dique seco previsto después del 1 de julio de 2007 y en cualquier caso el 1 de enero de 2010 a más tardar, y

.3 las Administraciones podrán eximir a los buques de carga de lo prescrito en los apartados .1 y .2 cuando tales buques vayan a ser retirados permanentemente del servicio en un plazo de 2 años contados a partir de la fecha de implantación indicada en los apartados .1 y .2 supra»

10 El actual párrafo 2 pasa a ser párrafo 3.

CAPÍTULO VII

Transporte de mercancías peligrosas

Regla 10. *Prescripciones relativas a los buques tanque quimiqueros.*

11. En el párrafo 1 de la regla se suprime la frase siguiente:

«A los efectos de la presente regla, las prescripciones del Código se considerarán obligatorias.»

CAPÍTULO XII

Medidas de seguridad adicionales aplicables a los graneleros

15. El texto actual del capítulo XII se sustituye por el siguiente:

«Regla 1. *Definiciones.*

A los efectos del presente capítulo regirán las siguientes definiciones:

1. Granelero: buque principalmente destinado a transportar carga seca a granel, incluidos los

buques mineraleros y los buques de carga combinada.

2. Granelero de forro sencillo en el costado: un granelero, según se define en el párrafo 1, en el que:

.1 una parte cualquiera de una bodega de carga limita con el forro exterior del costado; o

.2 en el que una o más bodegas de carga limitan con un doble forro en el costado cuya anchura es inferior a 760 mm en el caso de los graneleros construidos antes del 1 de enero de 2000 e inferior a 1.000 mm en el de los graneleros construidos el 1 de enero de 2000 o posteriormente, pero con anterioridad a 1 de julio de 2006, midiéndose esa distancia en sentido perpendicular al forro del costado.

Entre estos buques se incluyen los buques de carga combinada en los que una parte cualquiera de la bodega de carga está limitada por el forro exterior.

3. Granelero de doble forro en el costado: un granelero, según se define en el párrafo 1, en el que todas las bodegas de carga limitan con un doble forro en el costado distinto del que se define en el párrafo 2.2.

4. Doble forro en el costado: una configuración en la que cada costado del buque está constituido por el forro exterior del costado y un mamparo longitudinal que conecta el doble fondo y la cubierta. Cuando haya tanques laterales de pantoque y tanques laterales superiores, podrán formar parte integrante de la configuración del doble forro del costado.

5. Eslora de un granelero: la eslora, según se define en el Convenio internacional sobre líneas de carga vigente.

6. Carga sólida a granel: cualquier material, que no sea ni líquido ni gaseoso, constituido por una combinación de partículas, gránulos o trozos más grandes, generalmente de composición homogénea, que se embarca directamente en los espacios de carga del buque sin utilizar para ello ninguna forma intermedia de contención.

7. Normas relativas a la resistencia de los mamparos y del doble fondo de los graneleros: las "Normas para la evaluación de los escantillones del mamparo transversal estanco, acanalado verticalmente, situado entre las dos bodegas de carga más cercanas a proa y para evaluar la carga admisible de la bodega más cercana a proa", adoptadas el 27 de noviembre de 1977, mediante la resolución 4 de la Conferencia de Gobiernos Contratantes del Convenio internacional para la seguridad de la vida humana en el mar, 1974, como las enmienda la Organización, siempre que tales enmiendas se adopten, entren en vigor y se hagan efectivas de conformidad con las disposiciones del artículo VIII del presente Convenio relativas a los procedimientos de enmienda del Anexo, con excepción del capítulo 1.

8. Graneleros construidos: los graneleros cuya quilla haya sido colocada, o cuya construcción se halle en una fase similar.

9. Cuya construcción se halle en una fase similar: fase en la que:

.1 la construcción puede identificarse como propia de un buque concreto; y

.2 ha comenzado el montaje del buque y se han utilizado como mínimo 50 toneladas del total estimado de material estructural o un 1% de dicho total, si este segundo valor es inferior.

10. Manga (B): de un granelero es la manga según se define en el Convenio internacional sobre líneas de carga vigente.

Regla 2. *Ámbito de aplicación.*

Los graneleros cumplirán las prescripciones del presente capítulo, además de las prescripciones aplicables de los demás capítulos.

Regla 3. *Plan de implantación.*

Los graneleros construidos antes del 1 de julio de 1999 a los que se apliquen las reglas 4 ó 6 cumplirán lo dispuesto en dichas reglas acerca del programa mejorado de inspecciones prescrito en la regla XI-1/2, conforme al siguiente plan:

.1 los graneleros de edad igual o superior a 20 años el 1 de julio de 1999, en la fecha del primer reconocimiento intermedio o del primer reconocimiento periódico posterior al 1 de julio de 1999, si esta fecha es anterior;

.2 los graneleros de edad igual o superior a 15 años pero inferior a 20 años el 1 de julio de 1999, en la fecha del primer reconocimiento periódico posterior al 1 de julio de 1999, y a más tardar el 1 de julio de 2002; y

.3 los graneleros de edad inferior a 15 años el 1 de julio de 1999, en la fecha del primer reconocimiento periódico posterior a la fecha en la que el buque alcance los 15 años, y a más tardar en la fecha en la que el buque alcance los 17 años.

Regla 4. *Prescripciones sobre estabilidad con avería aplicables a los graneleros.*

1. Los graneleros de eslora igual o superior a 150 m y de forro sencillo en el costado, proyectados para transportar cargas sólidas a granel de densidad igual o superior a 1.000 kg/m³ construidos el 1 de julio de 1999 o posteriormente, cargados hasta la línea de carga de verano, podrán resistir la inundación de una cualquiera de sus bodegas de carga en todas las condiciones de carga y permanecer a flote en estado de equilibrio satisfactorio, según se especifica en el párrafo 4.

2. Los graneleros de eslora igual o superior a 150 m y de doble forro en el costado, en los que cualquier parte de los mamparos longitudinales, esté situada dentro de B/5 o de 11,5 m, si este último valor es inferior, medido desde el costado del buque hacia el interior en sentido perpendicular al eje longitudinal, con la línea de carga de verano asignada, proyectados para transportar cargas sólidas a granel de densidad igual o superior a 1.000 kg/m³, construidos el 1 de julio de 2006 o posteriormente y cargados hasta la línea de carga de verano, podrán resistir la inundación de una cualquiera de sus bodegas de carga en todas las condiciones de carga y permanecer a flote en estado de equilibrio satisfactorio, según se especifica en el párrafo 4.

3. Los graneleros de eslora igual o superior a 150 m y de forro sencillo en el costado, que transporten cargas sólidas a granel de densidad igual o superior a 1.780 kg/m³, construidos antes del 1 de julio de 1999, cargados hasta la línea de carga de verano, podrán resistir la inundación de la bodega de carga más cercana a proa en todas las condiciones de carga y permanecer a flote en estado de equilibrio satisfactorio, según se especifica en el párrafo 4. Esta prescripción se cumplirá conforme al plan de implantación establecido en la regla 3.

4. A reserva de lo dispuesto en el párrafo 7, el estado de equilibrio después de inundación satisfará lo estipulado sobre el estado de equilibrio en el anexo de la resolución A.320(IX), titulada "Regla equivalente a la regla 27 del Convenio internacional sobre líneas de carga, 1966" y enmendada mediante la resolución A.514(13). En la hipótesis de inunda-

ción, sólo será necesario tener en cuenta la inundación del espacio de la bodega de carga hasta el nivel del agua en el exterior del buque después de la inundación. Se supondrá que la permeabilidad de una bodega cargada es de 0,9 y la de una bodega vacía de 0,95, a menos que se suponga la permeabilidad correspondiente a una carga particular para el volumen de la bodega inundada ocupado por la carga y una permeabilidad de 0,95 para el volumen vacío de la bodega.

5. Se podrá considerar que los graneleros construidos antes del 1 de julio de 1999 a los que se haya asignado un francobordo reducido en cumplimiento de lo prescrito en la regla 27 7) del Convenio internacional sobre líneas de carga, 1966, adoptado el 5 de abril de 1966, cumplen lo prescrito en el párrafo 3.

6. Se podrá considerar que los graneleros a los que se haya asignado un francobordo reducido en cumplimiento de las disposiciones del párrafo 8) de la regla equivalente a la regla 27 del Convenio internacional sobre líneas de carga, 1966, adoptada mediante la resolución A.320(IX) y enmendada mediante la resolución A.514(13), cumplen lo prescrito en los párrafos 1 ó 2, según proceda.

7. El estado de equilibrio después de inundación de los graneleros a los que se haya asignado un francobordo reducido en cumplimiento de las disposiciones de la regla 27 8) del anexo B del Protocolo de 1988 relativo al Convenio internacional sobre líneas de carga, 1966, satisfará las disposiciones pertinentes de dicho Protocolo.

Regla 5. Resistencia estructural de los graneleros.

1. Los graneleros de eslora igual o superior a 150 m y de forro sencillo en el costado, construidos el 1 de julio de 1999 o posteriormente, proyectados para transportar cargas sólidas a granel de densidad igual o superior a 1.000 kg/m³, tendrán resistencia suficiente para soportar la inundación de una cualquiera de sus bodegas de carga hasta el nivel del agua en el exterior del buque después de la inundación, en todas las condiciones de carga y de lastre, teniendo también en cuenta los efectos dinámicos resultantes de la presencia de agua en la bodega, así como las recomendaciones adoptadas por la Organización.

2. Los graneleros de eslora igual o superior a 150 m y de doble forro en el costado, en los que cualquier parte de los mamparos longitudinales, esté situada dentro de B/5 o de 11,5 m, si este último valor es inferior, medidos desde el costado del buque hacia el interior, en sentido perpendicular al eje longitudinal, con la línea de carga de verano, asignada, proyectados para transportar cargas a granel de densidad igual o superior a 1.000 kg/m³ y construidos el 1 de julio de 2006 o posteriormente, cumplirán las disposiciones sobre resistencia estructural del párrafo 1.

Regla 6. Prescripciones estructurales y de otro tipo aplicables a los graneleros.

1. Los graneleros de eslora igual o superior a 150 m, de forro sencillo en el costado, construidos antes del 1 de julio de 1999, que transporten cargas sólidas a granel de densidad igual o superior a 1.780 kg/m³, cumplirán las siguientes prescripciones de conformidad con el plan de implantación establecido en la regla 3:

.1 El mamparo transversal estanco situado entre las dos bodegas de carga más cercanas a proa y el doble fondo de la bodega de carga más cercana

a proa tendrán una resistencia suficiente para soportar la inundación de la bodega de carga más cercana a proa, teniendo también en cuenta los efectos dinámicos resultantes de la presencia de agua en la bodega, en cumplimiento de las normas relativas a la resistencia del mamparo y del doble fondo de los graneleros. A los efectos de la presente regla, se considerará que las normas relativas a la resistencia del mamparo y del doble fondo de los graneleros tienen carácter obligatorio.

.2 Al considerar si, a fin de cumplir lo dispuesto en el párrafo 1.1, es necesario reforzar el mamparo transversal estanco o el doble fondo, y en qué medida, se podrán tener en cuenta:

.1 las restricciones aplicables a la distribución del peso total de la carga entre las bodegas de carga; y

.2 las restricciones aplicables al peso muerto máximo.

.3 En los graneleros a los que, con objeto de cumplir lo prescrito en el párrafo 1.1, se aplique una de las restricciones indicadas en los párrafos 1.2.1 y 1.2.2, o ambas, dichas restricciones se observarán siempre que se transporten cargas sólidas a granel de una densidad igual o superior a 1.780 kg/m³.

2. Los graneleros de eslora igual o superior a 150 m, construidos el 1 de julio de 2006 o posteriormente, cumplirán, en todas las zonas de doble forro en el costado, las siguientes disposiciones:

.1 Las estructuras primarias de refuerzo del doble forro en el costado no deberán estar dentro de la bodega de carga.

.2 A reserva de lo dispuesto infra, la distancia entre el forro exterior y el forro interior en cualquier sección transversal no será inferior a 1.000 mm, medidos en sentido perpendicular al forro del costado. El doble forro en el costado deberá estar construido de modo que permita el acceso para la inspección, con arreglo a lo prescrito en la regla II-1/3-6 y en las disposiciones técnicas conexas.

.1 En la zona de los tirantes, cartabones, extremos inferior y superior de las estructuras transversales, o cartabones de los extremos en el caso de las estructuras longitudinales, no será necesario respetar los espacios libres que se indican a continuación.

.2 La anchura mínima del paso libre a través del espacio del doble forro en el costado en las inmediaciones de obstrucciones tales como tuberías o escalas verticales no será inferior a 600 mm.

.3 Cuando los forros interior y/o exterior tengan una estructura transversal, el espacio libre mínimo entre las superficies interiores de las cuadernas no será inferior a 600 mm.

.4 Cuando los forros interior y exterior tengan una estructura longitudinal, el espacio libre mínimo entre las superficies interiores de las cuadernas no será inferior a 800 mm. Fuera de las partes paralelas a lo largo de las bodegas de carga, dicho espacio podrá reducirse cuando lo imponga la configuración estructural, pero en ningún caso será inferior a 600 mm.

.5 El espacio libre mínimo anteriormente mencionado será la distancia más corta medida entre las líneas hipotéticas que conectan las superficies internas de las cuadernas de los forros interior y exterior.

3. Los espacios de doble forro en el costado y los tanques destinados a lastre de agua de mar en los graneleros de eslora igual o superior a 150 m, construidos el 1 de julio de 2006 o posteriormente, deberán llevar un revestimiento que se ajuste a lo

prescrito en la regla II-1/3-2 teniendo en cuenta igualmente las Normas de rendimiento para los revestimientos que adoptará la Organización.

4. Los espacios del doble forro en el costado, exceptuando los tanques laterales superiores, cuando los haya, no se utilizarán para el transporte de carga.

5. En los graneleros de eslora igual o superior a 150 m que transporten cargas sólidas a granel de una densidad igual o superior a 1.000 kg/m³, construidos el 1 de julio de 2006 o posteriormente:

.1 la estructura de las bodegas de carga será tal que todas las cargas previsibles se puedan cargar y descargar mediante el equipo y los procedimientos normales de carga y descarga, sin ocasionar daños que puedan poner en peligro la seguridad de la estructura;

.2 se deberá asegurar la continuidad efectiva entre la estructura del forro del costado y el resto de la estructura del casco; y

.3 la estructura de las zonas de carga será tal que un solo fallo de cualquier elemento de refuerzo de dicha estructura no ocasione el fallo inmediato de otros miembros estructurales, provocando el colapso de todos los paneles reforzados.

Regla 7. Reconocimiento y mantenimiento de los graneleros.

1. Los graneleros de eslora igual o superior a 150 m, de forro sencillo en el costado, construidos antes del 1 de julio de 1999, y de 10 o más años de edad, no transportarán cargas sólidas a granel de densidad igual o superior a 1.780 kg/m³, a menos que hayan sido objeto, con resultados satisfactorios, de:

.1 un reconocimiento periódico, con arreglo al programa mejorado de inspecciones durante los reconocimientos, prescrito en la regla XI-1/2; o

.2 un reconocimiento de todas las bodegas de carga de alcance igual al exigido en los reconocimientos periódicos del programa mejorado de inspecciones durante los reconocimientos prescritos en la regla XI-1/2.

2. Los graneleros cumplirán las prescripciones de mantenimiento recogidas en la regla II-1/3-1 y las Normas para las inspecciones y el mantenimiento de las tapas de escotilla de graneleros por parte del propietario, adoptadas por la Organización mediante la resolución MSC.169(79), según la enmienda la Organización, a condición de que tales enmiendas sean adoptadas, entren en vigor y se hagan efectivas de conformidad con las disposiciones del artículo VIII del presente Convenio relativas a los procedimientos de enmienda del Anexo, exceptuado el capítulo 1.

Regla 8. Información sobre el cumplimiento de las prescripciones aplicables a los graneleros.

1. La Administración refrendará, o se refrendará en su nombre, el cuadernillo prescrito en la regla VI/7.2 de manera que indique que se cumplen las reglas 4, 5, 6 y 7, según proceda.

2. Toda restricción impuesta en lo que respecta al transporte de cargas sólidas a granel de densidad igual o superior a 1.780 kg/m³, de conformidad con lo prescrito en las reglas 6 y 14, se identificará y se consignará en el cuadernillo mencionado en el párrafo 1.

3. Los graneleros a los que se aplique lo dispuesto en el párrafo 2 llevarán permanentemente marcado en el forro exterior del costado, a media eslora, a babor y a estribor, un triángulo equilátero

lleno con los lados de 500 mm y el vértice a 300 mm por debajo de la línea de cubierta, pintado de un color que contraste con el del casco.

Regla 9. Prescripciones aplicables a los graneleros que no puedan cumplir lo dispuesto en la regla 4.3 debido a la configuración de proyecto de sus bodegas de carga.

En el caso de los graneleros construidos antes del 1 de julio de 1999 a los que se aplique la regla 4.3, con un número de mamparos transversales estancos insuficiente para cumplir lo dispuesto en ella, la Administración podrá permitir que se suspenda la aplicación de las reglas 4.3 y 6 a condición de que cumplan las siguientes prescripciones:

.1 en lo que se refiere a la bodega de carga más cercana a proa, las inspecciones exigidas para el reconocimiento anual en el programa mejorado de inspecciones durante los reconocimientos, prescrito en la regla XI-1/2, se sustituirán por las inspecciones preceptuadas en dicha regla para el reconocimiento intermedio de las bodegas de carga;

.2 estarán provistos de alarmas audibles y visibles en el puente de navegación, indicadoras de nivel alto de agua en los pozos de sentina de todas las bodegas de carga, o de los túneles transportadores de carga, según proceda, con arreglo a lo aprobado por la Administración o una organización reconocida por ella de conformidad con lo dispuesto en la regla XI-1/1; y

.3 contarán con información detallada acerca de hipótesis específicas de inundación de las bodegas de carga. Dicha información irá acompañada de instrucciones detalladas sobre los preparativos de evacuación, con arreglo a lo dispuesto en la sección 8 del Código Internacional de Gestión de la Seguridad (Código IGS), y se utilizará como base para la capacitación y los ejercicios de la tripulación.

Regla 10. Declaración de la densidad de la carga sólida a granel.

1. Antes de embarcar carga a granel en un granelero de eslora igual o superior a 150 m, el expedidor declarará la densidad de la carga además de facilitar la información al respecto que se prescribe en la regla VI/2.

2. En el caso de los graneleros a los que se aplica lo dispuesto en la regla 6, a menos que cumplan todas las prescripciones pertinentes del presente capítulo aplicables al transporte de cargas sólidas a granel de densidad igual o superior a 1.780 kg/m³, cuando se declare que la carga tiene una densidad comprendida entre 1.250 kg/m³ y 1.780 kg/m³, una organización acreditada para hacer las pruebas verificará dicha densidad.

Regla 11. Instrumento de carga.

(Salvo disposición expresa en otro sentido, la presente regla es aplicable a los graneleros independientemente de su fecha de construcción).

1. Los graneleros de eslora igual o superior a 150 m estarán provistos de un instrumento de carga capaz de proporcionar información sobre las fuerzas cortantes y los momentos flectores de la viga-casco, teniendo en cuenta la recomendación adoptada por la Organización

2. Los graneleros de eslora igual o superior a 150 m construidos antes del 1 de julio de 1999 cumplirán las prescripciones del párrafo 1 a más tardar en la fecha del primer reconocimiento intermedio o periódico del buque que haya que efectuar después del 1 de julio de 1999.

3. Los graneleros de eslora inferior a 150 m construidos el 1 de julio de 2006 o posteriormente estarán provistos de un instrumento de carga capaz de proporcionar información sobre la estabilidad del buque en condición sin avería. La Administración aprobará el programa informático mediante el que se efectuarán los cálculos de estabilidad, que incorporará las condiciones de prueba normalizadas relativas a la información sobre estabilidad aprobada.

Regla 12. *Alarmas para detectar la entrada de agua en bodegas, espacios de lastre y espacios secos.*

(La presente regla es aplicable a los graneleros independientemente de su fecha de construcción.)

1. Los graneleros estarán equipados con detectores del nivel del agua:

.1 en cada bodega de carga, provistos de alarmas audibles y visuales que se activen, la primera de ellas, cuando el nivel del agua por encima del doble fondo de cualquier bodega llegue a una altura de 0,5 m, y la segunda cuando llegue a una altura no inferior al 15% de la profundidad de la bodega de carga pero no superior a 2,0 m. En los graneleros a los que se aplique la regla 9.2 sólo es necesario instalar detectores con el segundo tipo de alarma. Los detectores del nivel del agua se instalarán en el extremo de popa de las bodegas de carga. En el caso de las bodegas de carga que se usen para lastre de agua se podrá instalar un dispositivo neutralizador de las alarmas. Las alarmas visuales permitirán distinguir claramente los dos diferentes niveles de agua detectados en cada bodega;

.2 en todo tanque de lastre situado a proa del mamparo de colisión prescrito en la regla II-1/11, provisto de una alarma audible y visual que se active cuando el líquido del tanque llegue a un nivel que no exceda del 10% de la capacidad del tanque. Se podrá instalar un dispositivo neutralizador de la alarma que se active cuando el tanque esté en uso; y

.3 en todo espacio seco o vacío que no sea la caja de cadenas y que tenga alguna parte situada a proa de la bodega de carga más cercana a la proa, provisto de una alarma audible y visual que se active cuando el nivel del agua llegue a una altura de 0,1 m por encima de la cubierta. No se requiere instalar tal alarma en espacios cerrados cuyo volumen no exceda del 0,1% del volumen de desplazamiento máximo del buque.

2. Las alarmas audibles y visuales especificadas en el párrafo 1 estarán situadas en el puente de navegación.

3. Los graneleros construidos antes del 1 de julio de 2004 cumplirán lo prescrito en la presente regla a más tardar en la fecha del primer reconocimiento anual, intermedio o de renovación del buque

que se lleve a cabo después del 1 de julio de 2004, y que sea el primero en tener lugar después de esa fecha.

Regla 13. *Disponibilidad de los sistemas de bombeo.*

(La presente regla es aplicable a los graneleros independientemente de su fecha de construcción).

1. En los graneleros, los medios de drenaje y bombeo de los tanques de lastre a proa del mamparo de colisión y de las sentinas de los espacios secos que tengan alguna parte situada a proa de la bodega de carga más cercana a proa se podrán poner en funcionamiento desde un espacio cerrado al que se acceda fácilmente desde el puente de navegación o desde el puesto de control de las máquinas de propulsión sin tener que atravesar la cubierta de francobordo expuesta o las cubiertas de las superestructuras. Cuando las tuberías de dichos tanques o sentinas atraviesen el mamparo de colisión se podrá aceptar el accionamiento de las válvulas mediante dispositivos de mando a distancia, como alternativa al medio de control de las válvulas prescrito en la regla II-1/11.4, siempre que la ubicación de los controles se ajuste a lo dispuesto en la presente regla.

2. Los graneleros construidos antes del 1 de julio de 2004 cumplirán lo prescrito en esta regla a más tardar en la fecha del primer reconocimiento intermedio o de renovación del buque que se lleve a cabo después del 1 de julio de 2004, pero en ningún caso después del 1 de julio de 2007.

Regla 14. *Restricciones relativas a la navegación con alguna bodega vacía.*

Los graneleros de forro sencillo en el costado y de eslora igual o superior a 150 m, que transporten cargas de una densidad igual o superior a 1.780 kg/m³ y que no cumplan las prescripciones para resistir la inundación de una cualquiera de las bodegas de carga, según se especifica en la regla 5.1 y en las Normas y criterios relativos a las estructuras laterales de los graneleros de forro sencillo en el costado, adoptadas por la Organización mediante la resolución MSC.168(79), como decida enmendarla la Organización, a condición de que tales enmiendas se adopten, entren en vigor y se hagan efectivas de conformidad con las disposiciones del artículo VIII del presente Convenio relativas a los procedimientos de enmienda del Anexo, exceptuando el capítulo 1, no deberán navegar con ninguna bodega que contenga menos del 10% de la carga máxima permitida en la condición de plena carga, después de haber cumplido 10 años de edad. La condición de plena carga aplicable en esta regla es una carga equivalente o superior al 90% del peso muerto del buque correspondiente al francobordo pertinente asignado.»

APÉNDICE
CERTIFICADOS

Modelo de Certificado de seguridad para buques de pasaje

13 Se introduce la siguiente nueva sección entre la que empieza por la frase "El presente certificado es válido hasta" y la que empieza por la expresión "Expedido en":

"Fecha de terminación del reconocimiento en el que se basa el presente certificado:
.....(dd/mm/aaaa)."

Modelo de Certificado de seguridad de construcción para buques de carga

14 Se introduce la siguiente nueva sección entre la que empieza por la frase "El presente certificado es válido hasta" y la que empieza por la expresión "Expedido en":

"Fecha de terminación del reconocimiento en el que se basa el presente certificado:
.....(dd/mm/aaaa)."

Modelo de Certificado de seguridad del equipo para buques de carga

15 Se introduce la siguiente nueva sección entre la que empieza por la frase "El presente certificado es válido hasta" y la que empieza por la expresión "Expedido en":

"Fecha de terminación del reconocimiento en el que se basa el presente certificado:
.....(dd/mm/aaaa)."

Inventario del equipo adjunto al Certificado de seguridad del equipo para buques de carga (Modelo E)

16 La sección 3 actual se sustituye por la siguiente:

"3 Pormenores de los sistemas y aparatos náuticos

Elemento	Disposiciones existentes
1.1 Compás magnético magistral*
1.2 Compás magnético de respeto*
1.3 Girocompás*
1.4 Repetidor del rumbo indicado por el girocompás*
1.5 Repetidor de la demora indicada por el girocompás*
1.6 Regulador del rumbo o de la derrota*
1.7 Taxímetro o dispositivo para leer las demoras*
1.8 Medios para corregir y obtener el rumbo y la demora
1.9 Dispositivo transmisor del rumbo (DTR) *
2.1 Cartas náuticas/Sistema de información y visualización de cartas electrónicas (SIVCE)**

Elemento		Disposiciones existentes
2.2	Medios auxiliares para los SIVCE	.....
2.3	Publicaciones náuticas	.....
2.4	Medios auxiliares para las publicaciones náuticas electrónicas	.....
3.1	Receptor para un sistema mundial de navegación por satélite/sistema de radionavegación terrenal* **	.....
3.2	Radar de 9 GHz*	.....
3.3	Segundo radar (3 GHz/9 GHz**)*	.....
3.4	Ayuda de punteo radar automática (APRA)*	.....
3.5	Ayuda de seguimiento automático*	.....
3.6	Segunda ayuda de seguimiento automático*	.....
3.7	Ayuda de punteo electrónica*	.....
4	Sistema de identificación automática (SIA)	.....
5.1	Registrador de datos de la travesía (RDT)**	.....
5.2	Registrador de datos de la travesía simplificado (RDT-S) **	.....
6.1	Dispositivo medidor de la velocidad y la distancia (en el agua)*	.....
6.2	Dispositivo medidor de la velocidad y la distancia (con respecto al fondo en dirección hacia proa y de través)*	.....
6.3	Ecosonda*	.....
7.1	Indicadores de la posición del timón, del sentido de giro, empuje y paso de la hélice, y de la modalidad de funcionamiento*	.....
7.2	Indicador de la velocidad de giro*	.....
8	Sistema de recepción de señales acústicas*	.....
9	Teléfono para comunicar con el puesto de gobierno de emergencia*	.....
10	Lámpara de señales diurnas*	.....
11	Reflector de radar*	.....
12	Código Internacional de Señales	.....
13	Manual IAMSAR, volumen III	.....

* En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.

** Táchese según proceda."

Modelo de Certificado de seguridad radioeléctrica para buques de carga

17 Se introduce la siguiente nueva sección entre la que empieza por la frase "El presente certificado es válido hasta" y la que empieza por la expresión "Expedido en":

"Fecha de terminación del reconocimiento en el que se basa el presente certificado:
..... (dd/mm/aaaa)."

Modelo de Certificado de seguridad para buques nucleares de pasaje

18 El modelo actual del certificado se sustituye por el siguiente.

"CERTIFICADO DE SEGURIDAD PARA BUQUE NUCLEAR DE PASAJE

El presente Certificado llevará como suplemento un Inventario del equipo (Modelo PUNC)

(Sello oficial)

(Estado)

para viaje internacional
viaje internacional corto¹

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN
EL MAR, 1974, en su forma modificada por el correspondiente Protocolo de 1988,

con la autoridad conferida por el Gobierno de

(nombre del Estado)

por

(persona u organización autorizada)

¹ Táchese según proceda.

Datos relativos al buque²

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Zonas marítimas en las que el buque está
autorizado a operar según su certificado (regla IV/2)

Número IMO

Fecha en la que se colocó la quilla del buque o en la que su construcción estaba en una fase
equivalente o, cuando proceda, fecha en la que comenzaron las obras de reforma o de
modificación de carácter importante**SE CERTIFICA:**

1 Que el buque ha sido objeto de reconocimiento, de conformidad con lo prescrito en la
regla VIII/9 del Convenio.

2 Que este buque, que se trata de un buque nuclear, cumple plenamente las prescripciones
del capítulo VIII del Convenio y se ajusta al expediente de seguridad aprobado para él, y que:

2.1 cumple las prescripciones del Convenio en lo que respecta a:

- .1 la estructura, las máquinas principales y auxiliares, las calderas y otros recipientes
a presión, incluidas la planta de propulsión nuclear y la estructura de protección
contra abordajes;
- .2 la disposición del compartimentado estanco y los detalles correspondientes;
- .3 las líneas de carga de compartimentado siguientes:

Líneas de carga de compartimentado asignadas y marcadas en el costado, en el centro del buque (regla II-1/13)	Francobordo	Utilícese cuando los espacios destinados a los pasajeros comprendan los siguientes espacios alternativos
C.1
C.2
C.3

2.2 cumple las prescripciones del Convenio en lo que respecta a la protección estructural
contra incendios, los sistemas y dispositivos de seguridad contra incendios y los planos de
lucha contra incendios;

² Los datos relativos al buque también podrán indicarse en casillas dispuestas horizontalmente.

- 2.3 cumple las prescripciones del Convenio en lo que respecta a los sistemas y al equipo de protección contra las radiaciones;
- 2.4 los dispositivos de salvamento y el equipo de los botes salvavidas, las balsas salvavidas y los botes de rescate, se han provisto de conformidad con las prescripciones del Convenio;
- 2.5 está provisto de un aparato lanzacabos y de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento, de conformidad con las prescripciones del Convenio;
- 2.6 cumple las prescripciones del Convenio, en lo que respecta a las instalaciones radioeléctricas;
- 2.7 el funcionamiento de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento cumple las prescripciones del Convenio;
- 2.8 cumple las prescripciones del Convenio en lo que respecta al equipo náutico de a bordo, los medios de embarco para prácticos y las publicaciones náuticas;
- 2.9 está provisto de luces, marcas, medios emisores de señales acústicas y de señales de socorro, de conformidad con las prescripciones del Convenio y del Reglamento internacional para prevenir los abordajes, en vigor;
- 2.10 en todos sus demás aspectos el buque se ajusta a las prescripciones pertinentes del Convenio.

El presente certificado es válido hasta

Fecha de terminación del reconocimiento en que se basa el presente Certificado

.....
(dd/mm/aaaa)

Expedido en
(Lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(sello o estampilla de la autoridad expedidora)"

19 Después del modelo de certificado de seguridad para buque nuclear de pasaje se inserta el siguiente inventario del equipo adjunto al certificado:

"INVENTARIO DEL EQUIPO ADJUNTO AL CERTIFICADO DE SEGURIDAD PARA BUQUE NUCLEAR DE PASAJE (MODELO PNUC)

El presente inventario se adjuntará permanentemente al Certificado de seguridad para buque nuclear de pasaje

INVENTARIO DEL EQUIPO PRESCRITO PARA CUMPLIR LO ESTIPULADO EN EL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, MODIFICADO POR EL CORRESPONDIENTE PROTOCOLO DE 1988

1 Datos relativos al buque

Nombre del buque

Número o letras distintivos

Número máximo de pasajeros que está autorizado a llevar

Número mínimo de personas con la competencia necesaria para manejar las instalaciones radioeléctricas

2 Pormenores de los dispositivos de salvamento

1	Número total de personas para las que se han provisto dispositivos de salvamento		
2	Número total de botes salvavidas	A babor	A estribor
2.1	Número total de personas a las que pueden dar cabida	.....	.....
2.2	Número de botes salvavidas parcialmente cerrados (regla III/21 y sección 4.5 del Código IDS)	.....	.....
2.3	Número de botes salvavidas totalmente cerrados (regla III/21 y sección 4.6 del Código IDS)	.....	.....
2.4	Otros botes salvavidas		
2.5.1	Número	.....	.....
2.5.2	Tipo	.....	.....
3	Número total de botes salvavidas a motor (incluidos en el total de botes salvavidas anteriormente indicado)		
3.1	Número de botes salvavidas provistos de proyectores	.....	.....
4	Número de botes de rescate	.....	.....
4.1	Número de botes incluidos en el total de botes salvavidas anteriormente indicados	.....	.....
5	Balsas salvavidas		
5.1	Balsas salvavidas para las que se necesitan dispositivos de puesta a flote aprobados	.....	.....
5.1.1	Número de balsas salvavidas	.....	.....

5.1.2	Número de personas a las que pueden dar cabida	.....
5.2	Balsas salvavidas para las que no se necesitan dispositivos de puesta a flote aprobados	
5.2.1	Número de balsas salvavidas	.....
5.2.2	Número de personas a las que pueden dar cabida	.....
6	Aparatos flotantes	
6.1	Número de aparatos	.....
6.2	Número de personas que los aparatos son capaces de sostener	.....
7	Número de aros salvavidas	.....
8	Número de chalecos salvavidas	
9	Trajes de inmersión	.....
9.1	Número total	.....
9.2	Número de trajes que cumplen las prescripciones aplicables a los chalecos salvavidas	.....
10	Número de ayudas térmicas ¹	.....
11	Instalaciones radioeléctricas utilizadas en los dispositivos de salvamento	.....
11.1	Número de respondedores de radar	.....
11.2	Número de aparatos radiotelefónicos bidireccionales de ondas métricas	.....

3 Pormenores de las instalaciones radioeléctricas

Elemento	Equipo existente a bordo	
1	Sistemas primarios	
1.1	Instalación radioeléctrica de ondas métricas	
1.1.1	Codificador de LSD	.....
1.1.2	Receptor de escucha de LSD	.....
1.1.3	Radiotelefonía	.....
1.2	Instalación radioeléctrica de ondas hectométricas	
1.2.1	Codificador de LSD	.....
1.2.2	Receptor de escucha de LSD	.....
1.2.3	Radiotelefonía	.....
1.3	Instalación radioeléctrica de ondas hectométricas/decamétricas	
1.3.1	Codificador de LSD	.....
1.3.2	Receptor de escucha de LSD	.....
1.3.3	Radiotelefonía	.....
1.3.4	Radiotelegrafía de impresión directa	.....
1.4	Estación terrena de buque de Inmarsat	.....
2	Medios secundarios para emitir alertas	.....
3	Instalaciones para la recepción de información sobre seguridad marítima	.....
3.1	Receptor NAVTEX	.....
3.2	Receptor de LIG	.....

¹ Excluidas las prescritas en los párrafos 4.1.5.1.24, 4.4.8.31 y 5.1.2.2.13 del Código IDS.

	Elemento	Equipo existente a bordo
3.3	Receptor radiotelegráfico de impresión directa de ondas decamétricas	.....
4	RLS satelitaria	.....
4.1	COSPAS-SARSAT	.....
4.2	Inmarsat	.....
5	RLS de ondas métricas	.....
6	Respondedor de radar del buque	.....

4 Métodos utilizados para el mantenimiento de las instalaciones radioeléctricas (reglas IV/15.6 y 15.7)

4.1 Duplicación del equipo

4.2 Mantenimiento en tierra

4.3 Capacidad de mantenimiento en el mar

5 Pormenores relativos a los sistemas y equipos náuticos

		Equipo existente a bordo
1.1	Compás magnético magistral ²	.....
1.2	Compás magnético de respeto ²	.....
1.3	Girocompás ²	.....
1.4	Repetidor del rumbo indicado por el girocompás ²	.....
1.5	Repetidor de las marcaciones indicadas por el girocompás ²	.....
1.6	Sistema de control del rumbo o de la derrota ²	.....
1.7	Taxímetro o dispositivo de marcación de compás ²	.....
1.8	Medios para corregir el rumbo y la demora	.....
1.9	Dispositivo transmisor del rumbo (DTR) ²	.....
2.1	Cartas náuticas/Sistema de información y visualización de cartas electrónicas (SIVCE) ³	.....
2.2	Medios auxiliares para los SIVCE	.....
2.3	Publicaciones náuticas	.....

² En virtud de la regla V19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.

³ Táchese según proceda.

		Equipo existente a bordo
2.4	Medios auxiliares para las publicaciones náuticas electrónicas	.....
3.1	Receptor para un sistema mundial de navegación por satélite/sistema de radionavegación terrena ^{2,3}	.....
3.2	Radar de 9 GHz ²	.....
3.3	Segundo radar (3 GHz/9 GHz) ²	.....
3.4	Ayuda de punteo radar automática (APRA) ²	.....
3.5	Ayuda de seguimiento automática ²	.....
3.6	Segunda ayuda de seguimiento automática ²	.....
3.7	Ayuda de punteo electrónica ²	.....
4	Sistema de identificación automática (SIA)	.....
5	Registrador de datos de la travesía (RDT)	.....
6.1	Dispositivo medidor de la velocidad y la distancia (en el agua) ²	.....
6.2	Dispositivo medidor de la velocidad y la distancia (con respecto al fondo en dirección de proa y de través) ²	.....
7	Ecosonda ²	.....
8.1	Indicadores de la posición del timón, del sentido de giro, empuje y paso de la hélice y de la modalidad de funcionamiento ²	.....
8.2	Indicador de la velocidad de giro ²	.....
9	Sistema de recepción de señales acústicas ²	.....
10	Teléfono para comunicar con el puesto de gobierno de emergencia ²	.....
11	Lámpara de señales diurnas ²	.....
12	Reflector de radar ²	.....
13	Código internacional de señales	.....
14	Manual IAMSAR, Volumen III	.....

SE CERTIFICA QUE este Inventario es correcto en su totalidad.

Expedido en
(lugar de expedición del inventario)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el inventario)

(sello o estampilla de la autoridad expedidora)"

Modelo de Certificado de seguridad para buques nucleares de carga

20 El actual modelo de certificado se sustituye por el siguiente:

"CERTIFICADO DE SEGURIDAD PARA BUQUE NUCLEAR DE CARGA

El presente Certificado llevará como suplemento un Inventario del equipo (Modelo CNUC)

(Sello oficial)

(Estado)

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL
MAR, 1974, modificado por el correspondiente Protocolo de 1988,

con la autoridad conferida por el Gobierno de

(nombre del Estado)

por

(persona u organización autorizada)

Datos relativos al buque¹

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Peso muerto del buque (toneladas métricas)².....

Eslora del buque (regla III/3.12).....

Zonas marítimas en las que el buque está
autorizado a operar según su certificado (regla IV/2)

Número IMO

¹ Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

² Únicamente si se trata de petroleros, buques tanque quimiqueros y buques gaseros.

Tipo de buque³

Granelero
 Petrolero
 Buque tanque quimiquero
 Buque gasero
 Buque de carga distinto de los anteriores

Fecha en que se colocó la quilla del buque o en que su construcción se hallaba en una fase equivalente o, cuando proceda, fecha en que comenzaron las obras de reforma o modificación de carácter importante

SE CERTIFICA:

- 1 Que el buque ha sido objeto de reconocimiento, de conformidad con lo prescrito en la regla VIII/9 del Convenio.
- 2 Que este buque, que se trata de un buque nuclear, cumple plenamente las prescripciones del capítulo VIII del Convenio y se ajusta al expediente de seguridad aprobado para él, y que:
 - 2.1 el estado de la estructura, las máquinas y el equipo, según las definiciones de la regla I/10 (cuando corresponda cumplir lo dispuesto en la regla VIII/9), incluidas la planta de propulsión nuclear y la estructura de protección contra abordajes, es satisfactorio, y que el buque cumple las prescripciones pertinentes de los capítulos II-1 y II-2 del Convenio (excluidas las relativas a sistemas y dispositivos de seguridad contra incendios y a planos de lucha contra incendios);
 - 2.2 cumple las prescripciones del Convenio en lo que se refiere a los sistemas y dispositivos de seguridad contra incendios y los planos de lucha contra incendios;
 - 2.3 los dispositivos de salvamento y el equipo para los botes salvavidas, las balsas salvavidas y los botes de rescate, se han provisto de conformidad con las prescripciones del Convenio;
 - 2.4 está provisto de un aparato lanzacabos y de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento, de conformidad con las prescripciones del Convenio;
 - 2.5 cumple las prescripciones del Convenio, en lo que respecta a las instalaciones radioeléctricas;
 - 2.6 el funcionamiento de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento cumple las prescripciones del Convenio;
 - 2.7 cumple las prescripciones del Convenio en lo que respecta al equipo náutico de a bordo, los medios de embarco para prácticos y las publicaciones náuticas;

³ Táchese según proceda.

- 2.8 está provisto de luces, marcas, medios emisores de señales acústicas y de señales de socorro, de conformidad con las prescripciones del Convenio y del Reglamento internacional para prevenir los abordajes, en vigor;
- 2.9 en todos sus demás aspectos el buque se ajusta a las prescripciones pertinentes de las reglas en la medida en que le son aplicables.

El presente certificado es válido hasta.....

Fecha de ultimación del reconocimiento en que se basa el presente Certificado.....
(dd/mm/aaaa)

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(sello o estampilla de la autoridad expedidora)"

21 Después del modelo de Certificado de seguridad para buque nuclear de carga se inserta el siguiente inventario del equipo adjunto al certificado:

**INVENTARIO DEL EQUIPO ADJUNTO AL CERTIFICADO DE SEGURIDAD
PARA BUQUE NUCLEAR DE CARGA (MODELO CNUC)**

El presente inventario se adjuntará permanentemente al Certificado de
seguridad para buque nuclear de carga

INVENTARIO DEL EQUIPO PRESCRITO PARA CUMPLIR LO ESTIPULADO EN EL
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN
EL MAR, 1974, MODIFICADO POR EL CORRESPONDIENTE
PROTOCOLO DE 1988

1 Datos relativos al buque

Nombre del buque

Número o letras distintivos

Número mínimo de personas con la competencia necesaria para manejar las instalaciones
radioeléctricas

2 Pormenores de los dispositivos de salvamento

1	Número total de personas para las que se han provisto dispositivos de salvamento	.....
		A babor	A estribor
2	Número total de botes salvavidas	.....	.....
2.1	Número total de personas a las que pueden dar cabida	.....	.....
2.2	Número de botes salvavidas totalmente cerrados (regla III/31 y sección 4.6 del Código IDS)	.....	.....
2.3	Número de botes salvavidas parcialmente cerrados autoadrizables (regla III/31 y sección 4.8 del Código IDS)	.....	.....
2.4	Número de botes salvavidas protegidos contra incendios (regla III/31 y sección 4.9 del Código IDS)	.....	.....
2.5	Otros botes salvavidas	.....	.....
2.5.1	Número	.....	.....
2.5.2	Tipo	.....	.....
2.6	Número de botes salvavidas de caída libre	.....	.....
2.6.1	Totalmente cerrados (regla III/31 y sección 4.7 del Código IDS)	.....	.....
2.6.2	Provistos de un sistema autónomo (regla III/31 y sección 4.8 del Código IDS)	.....	.....

2.6.3	Protegidos contra incendios (regla III/31 y sección 4.9 del Código IDS)	.....
3	Número total de botes salvavidas a motor, incluidos en el total de botes salvavidas anteriormente indicado	.....
3.1	Número de botes salvavidas provistos de proyectores	.....
4	Número de botes de rescate	.....
4.1	Número de botes incluidos en el total de botes salvavidas anteriormente indicado	.....
5	Balsas salvavidas	.....
5.1	Balsas salvavidas para las que se necesitan dispositivos de puesta a flote aprobados	.....
5.1.1	Número de balsas salvavidas	.....
5.1.2	Número de personas a las que pueden dar cabida	.....
5.2	Balsas salvavidas para las que no se necesitan dispositivos de puesta a flote aprobados	.....
5.2.1	Número de balsas salvavidas	.....
5.2.2	Número de personas a las que pueden dar cabida	.....
5.3	Número de balsas salvavidas prescritas en la regla III/31.1.4	.....
6	Número de aros salvavidas	.....
7	Número de chalecos salvavidas	.....
8	Trajes de inmersión	.....
8.1	Número total	.....
8.2	Número de trajes que cumplen las prescripciones aplicables a los chalecos salvavidas	.....
9	Número de ayudas térmicas ¹	.....
10	Instalaciones radioeléctricas utilizadas en los dispositivos de salvamento	.....
10.1	Número de respondedores de radar	.....
10.2	Número de aparatos radiotelefónicos bidireccionales de ondas métricas	.....

¹ Excluidas las prescritas en los párrafos 4.1.5.1.24, 4.4.8.31 y 5.1.2.2.13 del Código IDS.

3 Pormenores de las instalaciones radioeléctricas

Elemento	Equipo existente a bordo
1 Sistemas primarios	
1.1 Instalación radioeléctrica de ondas métricas	
1.1.1 Codificador de LSD
1.1.2 Receptor de escucha de LSD
1.1.3 Radiotelefonía
1.2 Instalación radioeléctrica de ondas hectométricas	
1.2.1 Codificador de LSD
1.2.2 Receptor de escucha de LSD
1.2.3 Radiotelefonía
1.3 Instalación radioeléctrica de ondas hectométricas/decamétricas	
1.3.1 Codificador de LSD
1.3.2 Receptor de escucha de LSD
1.3.3 Radiotelefonía
1.3.4 Radiotelegrafía de impresión directa
1.4 Estación terrena de buque de Inmarsat
2 Medios secundarios para emitir alertas
3 Instalaciones para la recepción de información sobre seguridad marítima	
3.1 Receptor NAVTEX
3.2 Receptor de LIG
3.3 Receptor radiotelegráfico de impresión directa de ondas decamétricas
4 RLS satelitaria	
4.1 COSPAS-SARSAT
4.2 Inmarsat
5 RLS de ondas métricas
6 Respondedor de radar del buque

4 Métodos utilizados para el mantenimiento de las instalaciones radioeléctricas (reglas IV/15.6 y 15.7)

- 4.1 Duplicación del equipo
- 4.2 Mantenimiento en tierra
- 4.3 Capacidad de mantenimiento en el mar

5 Pormenores relativos a los sistemas y equipos náuticos

Elemento	Equipo existente a bordo
1.1 Compás magnético magistral ²
1.2 Compás magnético de respeto ²
1.3 Girocompás ²
1.4 Repetidor del rumbo indicado por el girocompás ²
1.5 Repetidor de las marcaciones indicadas por el girocompás ²
1.6 Sistema de control del rumbo o de la derrota ²
1.7 Taxímetro o dispositivo de marcación de compás ²
1.8 Medios para corregir el rumbo y la demora
1.9 Dispositivo transmisor del rumbo (DTR) ²
2.1 Cartas náuticas/Sistema de información y visualización de cartas electrónicas (SIVCE) ³
2.2 Medios auxiliares para los SIVCE
2.3 Publicaciones náuticas
2.4 Medios auxiliares para las publicaciones náuticas electrónicas
3.1 Receptor para un sistema mundial de navegación por satélite/sistema de radionavegación terrena ^{2,3}
3.2 Radar de 9 GHz ²
3.3 Segundo radar (3 GHz/9 GHz) ²
3.4 Ayuda de punteo radar automática (APRA) ²
3.5 Ayuda de seguimiento automática ²
3.6 Segunda ayuda de seguimiento automática ²
3.7 Ayuda de punteo electrónica ²
4 Sistema de identificación automática (SIA)
5.1 Registrador de datos de la travesía (RDT) ³
5.2 Registrador de datos de la travesía simplificado (RDT-S) ³
6.1 Dispositivo medidor de la velocidad y la distancia (en el agua) ²

² En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.

³ Táchese según proceda.

Elemento	Equipo existente a bordo
6.2 Dispositivo medidor de la velocidad y la distancia (con respecto al fondo en dirección de proa y de través) ²
6.3 Ecosonda ²
7.1 Indicadores de la posición del timón, del sentido de giro, empuje y paso de la hélice y de la modalidad de funcionamiento ²
7.2 Indicador de la velocidad de giro ²
8 Sistema de recepción de señales acústicas ²
9 Teléfono para comunicar con el puesto de gobierno de emergencia ²
10 Lámpara de señales diurnas ²
11 Reflector de radar ²
12 Código internacional de señales
13 Manual IAMSAR, Volumen III

SE CERTIFICA QUE este Inventario es correcto en su totalidad.

Expedido en
(lugar de expedición del inventario)

.....
(fecha de expedición) (firma del funcionario autorizado para expedir el inventario)

(sello o estampilla de la autoridad expedidora)

² En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, éstos se especificarán.

Las presentes Enmiendas entraron en vigor de forma general y para España el 1 de julio de 2006 de conformidad con lo establecido en el artículo VIII b) VII) 2) del Convenio.

Lo que se hace público para conocimiento general.
Madrid, 26 de enero de 2007.-El Secretario General Técnico del Ministerio de Asuntos Exteriores y de Cooperación), Francisco Fernández Fábregas

RESOLUTION MSC.256(84)

(adopted on 16 May 2008)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

RESOLUTION MSC.256(84)
(adopted on 16 May 2008)

**ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR
THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as "the Convention"), concerning the amendment procedure applicable to the Annex to the Convention, other than to the provisions of chapter I thereof,

HAVING CONSIDERED, at its eighty-fourth session, amendments to the Convention, proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the Convention, the text of which is set out in the Annex to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the said amendments shall be deemed to have been accepted on 1 July 2009, unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;
3. INVITES SOLAS Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2010 upon their acceptance in accordance with paragraph 2 above;
4. RECOMMENDS the Contracting Governments concerned to issue certificates complying with the annexed amendments at the first renewal survey on or after 1 January 2010;
5. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;
6. FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its Annex to Members of the Organization, which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

CHAPTER II-1 CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

Regulation 3-4 – Emergency towing arrangements on tankers

1 The existing regulation 3-4 is replaced by the following:

“Regulation 3-4 Emergency towing arrangements and procedures

1 Emergency towing arrangements on tankers

1.1 Emergency towing arrangements shall be fitted at both ends on board every tanker of not less than 20,000 tonnes deadweight.

1.2 For tankers constructed on or after 1 July 2002:

- .1 the arrangements shall, at all times, be capable of rapid deployment in the absence of main power on the ship to be towed and easy connection to the towing ship. At least one of the emergency towing arrangements shall be pre-rigged ready for rapid deployment; and
- .2 emergency towing arrangements at both ends shall be of adequate strength taking into account the size and deadweight of the ship, and the expected forces during bad weather conditions. The design and construction and prototype testing of emergency towing arrangements shall be approved by the Administration, based on the Guidelines developed by the Organization.

1.3 For tankers constructed before 1 July 2002, the design and construction of emergency towing arrangements shall be approved by the Administration, based on the Guidelines developed by the Organization.

2 Emergency towing procedures on ships

2.1 This paragraph applies to:

- .1 all passenger ships, not later than 1 January 2010;
- .2 cargo ships constructed on or after 1 January 2010; and
- .3 cargo ships constructed before 1 January 2010, not later than 1 January 2012.

2.2 Ships shall be provided with a ship-specific emergency towing procedure. Such a procedure shall be carried aboard the ship for use in emergency situations and shall be based on existing arrangements and equipment available on board the ship.

2.3 The procedure shall include:

- .1 drawings of fore and aft deck showing possible emergency towing arrangements;
- .2 inventory of equipment on board that can be used for emergency towing;
- .3 means and methods of communication; and
- .4 sample procedures to facilitate the preparation for and conducting of emergency towing operations.”

2 The following new regulation 3-9 is added after the existing regulation 3-8:

“Regulation 3-9

Means of embarkation on and disembarkation from ships

1 Ships constructed on or after 1 January 2010 shall be provided with means of embarkation on and disembarkation from ships for use in port and in port-related operations, such as gangways and accommodation ladders, in accordance with paragraph 2, unless the Administration deems that compliance with a particular provision is unreasonable or impractical.

2 The means of embarkation and disembarkation required in paragraph 1 shall be constructed and installed based on the guidelines developed by the Organization.

3 For all ships the means of embarkation and disembarkation shall be inspected and maintained in suitable condition for their intended purpose, taking into account any restrictions related to safe loading. All wires used to support the means of embarkation and disembarkation shall be maintained as specified in regulation III/20.4.”

CHAPTER II-2

**CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND
FIRE EXTINCTION**

Regulation 10 – Fire fighting

3 The following new paragraph 4.1.5 is added after the existing paragraph 4.1.4:

“4.1.5 By the first scheduled dry-docking after 1 January 2010, fixed carbon dioxide fire-extinguishing systems for the protection of machinery spaces and cargo pump-rooms on ships constructed before 1 July 2002 shall comply with the provisions of paragraph 2.2.2 of chapter 5 of the Fire Safety Systems Code.”

Regulation 19 – Carriage of dangerous goods

4 In paragraph 4, the words “, as defined in regulation VII/2,” are deleted.

Regulation 20 – Protection of vehicle, special category and ro-ro spaces

5 The existing paragraph 6.1.4 is replaced by the following paragraph 6.1.4 and new paragraph 6.1.5 is added after paragraph 6.1.4 as follows:

“6.1.4 The requirement of this paragraph shall apply to ships constructed on or after 1 January 2010. Ships constructed on or after 1 July 2002 and before 1 January 2010 shall comply with the previously applicable requirements of paragraph 6.1.4, as amended by resolution MSC.99(73). When fixed pressure water spraying systems are fitted, in view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or decks during the operation of the fixed pressure water-spraying system, the following arrangements shall be provided:

- .1 in passenger ships:
 - .1.1 in the spaces above the bulkhead deck, scuppers shall be fitted so as to ensure that such water is rapidly discharged directly overboard, taking into account the guidelines developed by the Organization;
 - .1.2.1 in ro-ro passenger ships, discharge valves for scuppers, fitted with positive means of closing operable from a position above the bulkhead deck in accordance with the requirements of the International Convention on Load Lines in force, shall be kept open while the ships are at sea;
 - .1.2.2 any operation of valves referred to in paragraph 6.1.4.1.2.1 shall be recorded in the log-book;
 - .1.3 in the spaces below the bulkhead deck, the Administration may require pumping and drainage facilities to be provided additional to the requirements of regulation II-1/35-1. In such case, the drainage system shall be sized to remove no less than 125% of the combined capacity of both the water-spraying system pumps and the required number of fire hose nozzles, taking into account the guidelines developed by the Organization. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of not more than 40 m in each watertight compartment;
- .2 in cargo ships, the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. In such case, the drainage system shall be sized to remove no less than 125% of the combined capacity of both the water-spraying system pumps and the required number of fire hose nozzles, taking into account the guidelines developed by the Organization. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of not more than 40 m in each watertight compartment. If this is not possible, the adverse effect upon stability of the added weight and free surface of water

shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information. Such information shall be included in the stability information supplied to the master as required by regulation II-1/5-1.

6.1.5 On all ships, for closed vehicles and ro-ro spaces and special category spaces, where fixed pressure water-spraying systems are fitted, means shall be provided to prevent the blockage of drainage arrangements, taking into account the guidelines developed by the Organization. Ships constructed before 1 January 2010 shall comply with the requirements of this paragraph by the first survey after 1 January 2010.”

CHAPTER III LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Regulation 6 – Communications

6 The existing paragraph 2.2 is replaced by the following:

“2.2 Search and rescue locating devices

At least one search and rescue locating device shall be carried on each side of every passenger ship and of every cargo ship of 500 gross tonnage and upwards. At least one search and rescue locating device shall be carried on every cargo ship of 300 gross tonnage and upwards but less than 500 gross tonnage. Such search and rescue locating devices shall conform to the applicable performance standards not inferior to those adopted by the Organization. The search and rescue locating devices shall be stowed in such location that they can be rapidly placed in any survival craft other than the liferaft or liferafts required by regulation 31.1.4. Alternatively one search and rescue locating device shall be stowed in each survival craft other than those required by regulation 31.1.4. On ships carrying at least two search and rescue locating devices and equipped with free-fall lifeboats one of the search and rescue locating devices shall be stowed in a free-fall lifeboat and the other located in the immediate vicinity of the navigation bridge so that it can be utilized on board and ready for transfer to any of the other survival craft.”

Regulation 26 – Additional requirements for ro-ro passenger ships

7 The existing paragraph 2.5 is replaced by the following:

“2.5 Liferafts carried on ro-ro passenger ships shall be fitted with a search and rescue locating device in the ratio of one search and rescue locating device for every four liferafts. The search and rescue locating device shall be mounted inside the liferaft so its antenna is more than one metre above the sea level when the liferaft is deployed, except that for canopied reversible liferafts the search and rescue locating device shall be so arranged as to be readily accessed and erected by survivors. Each search and rescue locating device shall be arranged to be manually erected when the liferaft is deployed. Containers of liferafts fitted with search and rescue locating devices shall be clearly marked.”

CHAPTER IV RADIOCOMMUNICATIONS

Regulation 7 – Radio equipment: General

8 In paragraph 1, subparagraph .3 is replaced by the following:

“.3 a search and rescue locating device capable of operating either in the 9 GHz band or on frequencies dedicated for AIS, which:”

APPENDIX CERTIFICATES

Record of Equipment for Passenger Ship Safety Certificate (Form P)

9 In the Record of Equipment for Passenger Ship Safety Certificate (Form P), in section 2, the existing item 11.1 is replaced by the following:

“11.1 Number of search and rescue locating devices
11.1.1 Radar search and rescue transponders (SART)
11.1.2 AIS search and rescue transmitters (AIS-SART)”

and in section 3, the existing item 6 is replaced by the following:

“6 Ship’s search and rescue locating device
6.1 Radar search and rescue transponder (SART)
6.2 AIS search and rescue transmitter (AIS-SART)”

Record of Equipment for Cargo Ship Safety Equipment Certificate (Form E)

10 In the Record of Equipment for Cargo Ship Safety Equipment Certificate (Form E), in section 2, the existing item 9.1 is replaced by the following:

“9.1 Number of search and rescue locating devices
9.1.1 Radar search and rescue transponders (SART)
9.1.2 AIS search and rescue transmitters (AIS-SART)”

Record of Equipment for Cargo Ship Radio Certificate (Form R)

11 In the Record of Equipment for Cargo Ship Safety Radio Certificate (Form R), in section 2, the existing item 6 is replaced by the following:

“6 Ship’s search and rescue locating device
6.1 Radar search and rescue transponder (SART)
6.2 AIS search and rescue transmitter (AIS-SART)”

Record of Equipment for the Nuclear Passenger Ship Safety Certificate (Form PNUC)

12 In the Record of Equipment for Nuclear Passenger Ship Safety Certificate (Form PNUC), in section 2, the existing item 11.1 is replaced by the following:

- “11.1 Number of search and rescue locating devices
- 11.1.1 Radar search and rescue transponders (SART)
- 11.1.2 AIS search and rescue transmitters (AIS-SART)”,

and in section 3, the existing item 6 is replaced by the following:

- “6 Ship’s search and rescue locating device
- 6.1 Radar search and rescue transponder (SART)
- 6.2 AIS search and rescue transmitter (AIS-SART)”.

Record of Equipment for the Nuclear Cargo Ship Safety Certificate (Form CNUC)

13 In the Record of Equipment for Nuclear Cargo Ship Safety Certificate (Form CNUC), in section 2, item 9 is deleted and items 10, 10.1 and 10.2 are renumbered as items 9, 9.1 and 9.2 respectively; and the renumbered item 9.1 is replaced by the following:

- “9.1 Number of search and rescue locating devices
- 9.1.1 Radar search and rescue transponders (SART)
- 9.1.2 AIS search and rescue transmitters (AIS-SART)”,

and in section 3, the existing item 6 is replaced by the following:

- “6 Ship’s search and rescue locating device
- 6.1 Radar search and rescue transponder (SART)
- 6.2 AIS search and rescue transmitter (AIS-SART)”.

RESOLUTION MSC.256(84)

(adopted on 16 May 2008)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

ANEXO 1

**RESOLUCIÓN MSC.325(90)
(Adoptada el 24 de mayo de 2012)**

**ADOPCIÓN DE ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO ASIMISMO el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar (Convenio SOLAS), 1974 (en adelante denominado "el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, excepto las disposiciones de su capítulo I,

HABIENDO EXAMINADO, en su 90º periodo de sesiones, las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del mismo,

1. ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;
2. DECIDE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de julio de 2013 a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del arqueo bruto de la flota mercante mundial, hayan notificado que recusar las enmiendas;
3. INVITA a los Gobiernos Contratantes del Convenio SOLAS a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de enero de 2014, una vez aceptadas con arreglo a lo dispuesto en el párrafo 2 anterior;
4. PIDE al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;
5. PIDE ADEMÁS al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO II-1
Construcción – Estructura, compartimentado y estabilidad,
instalaciones de máquinas e instalaciones eléctricas

Parte B-1
Estabilidad

Regla 8-1

Capacidad de los sistemas de los buques de pasaje tras un siniestro por inundación

- 1 La regla existente II-1/8-1 se sustituye por la siguiente:

"Regla 8-1

Información operacional y capacidad de los sistemas de los buques de pasaje tras un siniestro por inundación

1 Ámbito de aplicación

Los buques de pasaje que tengan una eslora igual o superior a 120 m, según se define ésta en la regla II-1/2.5, o que tengan tres o más zonas verticales principales cumplirán las disposiciones de la presente regla.

2 Disponibilidad de los sistemas esenciales en caso de daños por inundación*

Todo buque de pasaje construido el 1 de julio de 2010 o posteriormente estará proyectado de modo que los sistemas estipulados en la regla II-2/21.4 permanezcan operacionales cuando el buque sufra inundación en un solo compartimento estanco.

3 Información operacional tras un siniestro por inundación

A los efectos de facilitar información operacional al capitán para el regreso a puerto en condiciones de seguridad tras un siniestro por inundación, los buques de pasaje construidos el 1 de enero de 2014 o posteriormente contarán con:

- .1 computador de estabilidad de a bordo; o
- .2 apoyo en tierra,

basándose en las directrices que elabore la Organización. **

* Véanse las Notas explicativas provisionales para la evaluación de la capacidad de los sistemas de los buques de pasaje tras un siniestro por incendio o por inundación (circular MSC.1/Circ.1369).

** Véanse las Directrices sobre la información operacional facilitada a los capitanes de buques de pasaje para el regreso a puerto del buque en condiciones de seguridad por su propia propulsión o mediante remolque (MSC.1/Circ.1400)."

CAPÍTULO III **Dispositivos y medios de salvamento**

Parte B

Prescripciones relativas a los buques y a los dispositivos de salvamento

Regla 20

Disponibilidad funcional, mantenimiento e inspección

2 En el párrafo 11.2, se añade el nuevo apartado .4 siguiente tras el apartado .3 existente:

- "4 independientemente de lo indicado en el apartado .3 anterior, la prueba de funcionamiento de los sistemas de suelta de los botes salvavidas de caída libre se realizará, ya sea mediante la puesta a flote por caída libre del bote salvavidas, que llevará a bordo únicamente la tripulación necesaria para su manejo, o mediante una puesta a flote simulada realizada de acuerdo con las directrices elaboradas por la Organización*."

* Véanse las Medidas para prevenir los accidentes causados por botes salvavidas (MSC.1/Circ.1206/Rev.1)."

CAPÍTULO V **Seguridad de la navegación**

Regla 14

Dotación de los buques

3 El párrafo 2 actual se sustituye por el nuevo párrafo siguiente:

- "2 Para todo buque al que se apliquen las disposiciones del capítulo I, la Administración:
- .1 establecerá la dotación mínima de seguridad adecuada mediante un procedimiento transparente teniendo en cuenta las orientaciones pertinentes adoptadas por la Organización^{*}; y
 - .2 expedirá el correspondiente documento relativo a la dotación mínima de seguridad, o equivalente, como prueba de que el buque lleva la dotación mínima de seguridad considerada necesaria para cumplir lo dispuesto en el párrafo 1.

* Véanse los Principios relativos a la dotación mínima de seguridad, adoptados mediante la resolución A.1047(27)."

CAPÍTULO VI **Transporte de cargas**

Parte A *Disposiciones generales*

- 4 Se añade la siguiente regla nueva 5-2 a continuación de la regla 5-1 existente:

"Regla 5-2

Prohibición de mezclar cargas líquidas a granel y de los procesos de producción durante la travesía en el mar

1 Está prohibida la mezcla física de cargas líquidas a granel durante la travesía en el mar. Por *mezcla física* se entiende el proceso mediante el cual se utilizan las bombas y tuberías de carga del buque para hacer circular internamente dos o más cargas distintas a fin de obtener una carga con una designación de producto diferente. La presente prohibición no impide que el capitán trasiegue carga si así lo requiriera la seguridad del buque o la protección del medio marino.

2 La prohibición establecida en el párrafo 1 no se aplica a la mezcla de los productos que se utilicen en la búsqueda y explotación de los recursos minerales de los fondos marinos a bordo de los buques empleados para facilitar dichas operaciones.

3 Está prohibido todo proceso de producción a bordo de los buques durante la travesía en el mar. Por *proceso de producción* se entiende toda operación voluntaria por la que se produzca una reacción química entre la carga de un buque y cualquier otra sustancia o carga.

4 La prohibición establecida en el párrafo 3 no se aplica a los procesos de producción de las cargas que se utilizan a bordo para la búsqueda y explotación de los recursos minerales de los fondos marinos con el fin de facilitar tales operaciones.*

* Véanse las Directrices para el transporte y manipulación en buques de apoyo mar adentro de cantidades limitadas de sustancias líquidas a granel potencialmente peligrosas o nocivas (resolución A.673(16), enmendada).

CAPÍTULO VII **Transporte de mercancías peligrosas**

Parte A *Transporte de mercancías peligrosas en bultos*

Regla 4

Documentos

- 5 El texto de la regla se sustituye por el siguiente:

"1 La información relativa al transporte de mercancías peligrosas en bultos y el certificado de arrumazón del contenedor/vehículo se ajustarán a las disposiciones pertinentes del Código IMDG y se facilitarán a la persona o a la organización que haya designado la autoridad del Estado rector del puerto.

2 Todo buque que transporte mercancías peligrosas en bultos llevará una lista especial, un manifiesto o un plan de estiba en los que, ajustándose a las disposiciones pertinentes del Código IMDG, se indiquen las mercancías peligrosas embarcadas y su emplazamiento a bordo. Antes de la partida, se entregará un ejemplar de uno de dichos documentos a la persona o la organización que haya designado la autoridad del Estado rector del puerto."

CAPÍTULO XI-1

Medidas especiales para incrementar la seguridad marítima

Regla 2

Reconocimientos mejorados

6 Se sustituye la expresión "las directrices aprobadas por la Asamblea de la Organización mediante la resolución A.744(18), tal como las enmiende" por "el Código internacional sobre el programa mejorado de inspecciones durante los reconocimientos de graneleros y petroleros, 2011 (Código ESP 2011), adoptado por la Asamblea de la Organización mediante la resolución A.1049(27), tal como lo enmiende".

ANEXO 2

RESOLUCIÓN MSC.338(91) (adoptada el 30 de noviembre de 2012)

ADOPCIÓN DE ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO TAMBIÉN el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar, 1974 (Convenio SOLAS) (en adelante denominado "el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, excepto las disposiciones de su capítulo I,

HABIENDO EXAMINADO, en su 91º periodo de sesiones, las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del Convenio,

1. ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;
2. DECIDE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de enero de 2014, a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del arqueo bruto de la flota mercante mundial hayan notificado que recusan las enmiendas;
3. INVITA a los Gobiernos Contratantes del Convenio SOLAS a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de julio de 2014, una vez aceptadas con arreglo a lo dispuesto en el párrafo 2 anterior;
4. PIDE al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;
5. PIDE TAMBIÉN al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no sean Gobiernos Contratantes del Convenio.

* * *

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO II-1
CONSTRUCCIÓN – ESTRUCTURA, COMPARTIMENTADO Y ESTABILIDAD,
INSTALACIONES DE MÁQUINAS E INSTALACIONES ELÉCTRICAS

Parte A-1
Estructura de los buques

- 1 Se añade la siguiente nueva regla 3-12 a continuación de la regla 3-11 existente:

"Regla 3-12

Protección contra el ruido

- 1 Esta regla será aplicable a los buques de arqueo bruto igual o superior a 1 600:
- .1 cuyo contrato de construcción se adjudique el 1 de julio de 2014 o posteriormente; o
 - .2 de no haberse formalizado un contrato de construcción, cuya quilla haya sido colocada o cuya construcción se halle en una fase equivalente el 1 de enero de 2015 o posteriormente; o
 - .3 cuya entrega tenga lugar el 1 de julio de 2018 o posteriormente,
- a menos que la Administración juzgue que el cumplimiento de una disposición particular no es razonable ni práctico.
- 2 En el caso de los buques entregados antes del 1 de julio de 2018 y:
- .1 cuyo contrato de construcción se firme antes del 1 de julio de 2014 y cuya quilla haya sido colocada o cuya construcción se halle en una fase equivalente el 1 de enero de 2009 o posteriormente pero antes del 1 de enero de 2015; o
 - .2 de no haberse formalizado un contrato de construcción, cuya quilla haya sido colocada o cuya construcción se halle en una fase equivalente el 1 de enero de 2009 o posteriormente pero antes del 1 de enero de 2015,

se adoptarán medidas* para reducir en los espacios de máquinas el ruido de éstas a los niveles admisibles que determine la Administración. Cuando no sea posible reducir en grado suficiente este ruido, la fuente que lo origine en exceso se insonorizará o aislará adecuadamente, o bien se habilitará un refugio a salvo del ruido si en el espacio de que se trate ha de haber dotación. El personal que haya de entrar en dichos espacios dispondrá de protectores de oídos, si es necesario.

3 Los buques se construirán de forma que se reduzca el ruido a bordo y se proteja al personal contra el ruido de conformidad con lo dispuesto en el Código sobre niveles de ruido a bordo de los buques, adoptado por el Comité de Seguridad Marítima mediante la resolución MSC.337(91), según sea enmendado por la Organización, a condición de que tales enmiendas se adopten, entren en vigor y se hagan efectivas de conformidad con lo dispuesto en el artículo VIII del presente convenio, relativo a los procedimientos de enmienda aplicables al anexo, con excepción del capítulo I. A los efectos de esta regla, si bien el Código sobre niveles de ruido a bordo de los buques es un instrumento de obligado cumplimiento, se entenderá que las partes recomendatorias especificadas en el capítulo I del mismo no son obligatorias, a condición de que las enmiendas a dichas partes recomendatorias sean adoptadas por el Comité de Seguridad Marítima de conformidad con su Reglamento interior.

4 No obstante lo dispuesto en el párrafo 1, esta regla no es aplicable a los tipos de buques enumerados en el párrafo 1.3.4 del Código sobre niveles de ruido a bordo de los buques.

* Véase el Código sobre niveles de ruido a bordo de los buques, adoptado por la Organización mediante la resolución A.468(XII)."

Parte C Instalaciones de máquinas

2 La actual regla 36 se suprime y se deja en blanco.

CAPÍTULO II-2 CONSTRUCCIÓN – PREVENCIÓN, DETECCIÓN Y EXTINCIÓN DE INCENDIOS

Parte A Generalidades

Regla 1

Ámbito de aplicación

3 Se añade la siguiente nota a pie de página en el título de la regla 1:

"* La fecha de aplicación del 1 de julio de 2012 se introdujo mediante la resolución MSC.308(88). No obstante, dicha resolución enmendó, en el capítulo II-2, el párrafo 23 de la regla 3 (definición de "Código de Procedimientos de Ensayo de Exposición al Fuego") y el párrafo 4.1 de la regla 7 (nuevo subpárrafo .3) únicamente, no enmendándose todas las demás reglas con la fecha original de aplicación del 1 de julio de 2002."

4 En el párrafo 2.4 existente, se añaden los apartados nuevos siguientes a continuación del apartado .6 existente:

".7 los buques de carga de arqueo bruto igual o superior a 500 y los buques de pasaje construidos el 1 de febrero de 1992 o posteriormente, pero antes del 1 de julio de 2002, no están obligados a cumplir lo dispuesto en la regla 19.3.3 siempre y cuando cumplan lo prescrito en la regla 54.2.3, adoptada mediante la resolución MSC.13(57); y

.8 los buques de carga de arqueo bruto igual o superior a 500 y los buques de pasaje construidos el 1 de septiembre de 1984 o posteriormente, pero antes del 1 de julio de 2002, no están obligados a cumplir lo dispuesto en las reglas 19.3.1, 19.3.5, 19.3.6 y 19.3.9, siempre y cuando cumplan lo prescrito en las reglas 54.2.1, 54.2.5, 54.2.6 y 54.2.9, adoptadas mediante la resolución MSC.1(XLV)."

5 Se añade el siguiente nuevo párrafo 2.5:

"2.5 Los buques construidos antes del 1 de julio de 2012, también cumplirán lo dispuesto en la regla 10.1.2, adoptada mediante la resolución MSC.338(91)."

Parte C **Control de incendios**

Regla 9

Contención del incendio

6 En la tabla 9.3, columna (11) (Espacios de categoría especial y espacios de carga rodada), fila (2) (Pasillos), se sustituye el símbolo "A-15" por el símbolo "A-30⁹".

7 En la tabla 9.3, columna (11) (Espacios de categoría especial y espacios de carga rodada), fila (4) (Escaleras), se sustituye el símbolo "A-15" por el símbolo "A-30⁹".

8 En la tabla 9.3, columna y fila (11) (Espacios de categoría especial y espacios de carga rodada), se sustituye el símbolo "A-0" por el símbolo "A-30⁹".

9 En la tabla 9.4, columna (11) (Espacios de categoría especial y de carga rodada), fila (1) (Puestos de control), se sustituye el símbolo "A-30" por el símbolo "A-60⁹".

10 En la tabla 9.4, columna (11) (Espacios de categoría especial y de carga rodada), fila (2) (Pasillos), se sustituye el símbolo "A-0" por el símbolo "A-30⁹".

11 En la tabla 9.4, columna (11) (Espacios de categoría especial y de carga rodada), fila (4) (Escaleras), se sustituye el símbolo "A-0" por el símbolo "A-30⁹".

12 En la tabla 9.4, columna y fila (11) (Espacios de categoría especial y de carga rodada), se sustituye el símbolo "A-0" por el símbolo "A-30⁹".

13 En la tabla 9.4, columna (2) (Pasillos), fila (11) (Espacios de categoría especial y de carga rodada), se sustituye el símbolo "A-15" por el símbolo "A-30⁹".

14 En la tabla 9.4, columna (4) (Escaleras), fila (11) (Espacios de categoría especial y de carga rodada), se sustituye el símbolo "A-15" por el símbolo "A-30⁹".

15 En la tabla 9.4, columna (6) (Espacios de categoría A para máquinas), fila (11) (Espacios de categoría especial y de carga rodada), se sustituye el símbolo "A-30" por el símbolo "A-60⁹".

16 En el cuadro 9.4, se añade la siguiente nueva nota:

⁹ Los buques construidos antes del 1 de julio de 2014 cumplirán, como mínimo, las prescripciones previas aplicables en el momento de construirse el buque, según se especifica en la regla 1.2."

17 En la tabla 9.5, columna y fila (11) (Espacios de carga rodada y espacios para vehículos), se sustituye el símbolo "h" por el símbolo "A-30".

18 En la tabla 9.6, columna (11) (Espacios de carga rodada y espacios para vehículos), fila (10) (Cubiertas expuestas), se sustituye el símbolo "h" por el símbolo "A-0".

19 En la tabla 9.6, columna y fila (11) (Espacios de carga rodada y espacios para vehículos), se sustituye el símbolo "h" por el símbolo "A-30".

20 En la tabla 9.6, columna (10) (Cubiertas expuestas), fila (11) (Espacios de carga rodada y espacios para vehículos), se sustituye el símbolo "h" por el símbolo "A-0".

21 En el cuadro 9.6, el texto actual de la nota "h" se sustituye por la palabra "suprimido".

22 En el cuadro 9.6, se añade la siguiente nueva nota:

^{ij} Los buques construidos antes del 1 de julio de 2014 cumplirán, como mínimo, las prescripciones previas aplicables en el momento de construirse el buque, según se especifica en la regla 1.2."

23 Se suprimen los párrafos 6.2 y 6.3 y la numeración de los párrafos siguientes se modifica en consecuencia.

Regla 10

Lucha contra incendios

24 En el párrafo 5.6.3, el apartado .1 existente se sustituye por el siguiente:

".1 las partes con riesgo de incendio de la maquinaria de combustión interna o, en el caso de los buques construidos antes del 1 de julio de 2014, las partes con riesgo de incendio de la maquinaria de combustión interna utilizadas para la propulsión principal del buque y la producción de energía;"

25 El actual párrafo 10.1 se sustituye por el siguiente:

"10.1 Tipos de equipo de bombero

.1 los equipos de bombero cumplirán lo prescrito en el Código de Sistemas de Seguridad contra Incendios; y

.2 el aparato respiratorio autónomo de aire comprimido de los equipos de bombero cumplirá lo dispuesto en el párrafo 2.1.2.2 del capítulo 3 del Código de Sistemas de Seguridad contra Incendios a más tardar el 1 de julio de 2019."

26 A continuación del párrafo 10.3 existente se añade el siguiente nuevo párrafo:

"10.4 Comunicaciones entre los bomberos

En el caso de los buques construidos el 1 de julio de 2014 o posteriormente, se llevarán a bordo como mínimo dos aparatos radiotelefónicos portátiles bidireccionales para cada cuadrilla de lucha contra incendios, para las comunicaciones entre los bomberos. Dichos aparatos radiotelefónicos portátiles bidireccionales serán de tipo antideflagrante o intrínsecamente seguros. Los buques construidos antes del 1 de julio de 2014 cumplirán lo dispuesto en este párrafo a más tardar en la fecha del primer reconocimiento que se efectúe después del 1 de julio de 2018."

**Parte E
Prescripciones operacionales**

Regla 15

Instrucciones, formación y ejercicios a bordo

27 A continuación del párrafo 2.2.5 existente se añade el siguiente nuevo párrafo:

"2.2.6 Se proveerán medios a bordo para recargar las botellas de los aparatos respiratorios utilizadas durante los ejercicios o se llevará a bordo un número adecuado de botellas de respeto para sustituir a las que se hayan utilizado."

**Parte G
Prescripciones especiales**

Regla 20

Protección de los espacios para vehículos, espacios de categoría especial y espacios de carga rodada

28 El actual párrafo 6.1, incluidos los subpárrafos 6.1.1 y 6.1.2, se sustituyen por los siguientes:

"6.1 Sistemas fijos de extinción de incendios

(Las prescripciones de los párrafos 6.1.1 y 6.1.2 serán aplicables a los buques construidos el 1 de julio de 2014 o posteriormente. Los buques construidos antes del 1 de julio de 2014 cumplirán las prescripciones de los párrafos 6.1.1 y 6.1.2 aplicables previamente.)

6.1.1 Los espacios para vehículos y los espacios de carga rodada, que no sean espacios de categoría especial y que puedan sellarse desde un lugar situado fuera de los espacios de carga, estarán equipados con uno de los siguientes sistemas fijos de extinción de incendios:

- .1 un sistema fijo de extinción de incendios por gas que cumpla lo dispuesto en el Código de Sistemas de Seguridad contra Incendios;
- .2 un sistema fijo de extinción de incendios de espuma de alta expansión que cumpla lo dispuesto en el Código de Sistemas de Seguridad contra Incendios; o

- .3 un sistema fijo de extinción de incendios a base de agua para espacios de carga rodada y espacios de categoría especial que cumpla lo dispuesto en el Código de Sistemas de Seguridad contra Incendios y en los párrafos 6.1.2.1 a 6.1.2.4.

6.1.2 Los espacios para vehículos y los espacios de carga rodada que no puedan sellarse y los espacios de categoría especial estarán equipados con un sistema fijo de extinción de incendios a base de agua para espacios de carga rodada y espacios de categoría especial que cumpla lo dispuesto en el Código de Sistemas de Seguridad contra Incendios que protegerá todas las partes de las cubiertas y la plataforma para vehículos de dichos espacios. Dicho sistema de extinción de incendios a base de agua contará con:

- .1 un manómetro en el cabezal de válvulas;
- .2 una clara indicación en cada válvula de los espacios que abarca;
- .3 instrucciones de mantenimiento y operación situadas en la sala de válvulas; y
- .4 un número suficiente de válvulas de desagüe para garantizar el drenaje completo del sistema."

CAPÍTULO III DISPOSITIVOS Y MEDIOS DE SALVAMENTO

Parte B

Prescripciones relativas a los buques y a los dispositivos de salvamento

29 A continuación de la regla 17 existente se añade la siguiente nueva regla 17-1:

"Regla 17-1

Rescate de personas del agua

1 Todos los buques tendrán planes y procedimientos específicos para el rescate de personas del agua, teniendo en cuenta las directrices elaboradas por la Organización.* En los planes y procedimientos se indicará el equipo previsto para utilizarse con fines del rescate y las medidas que deben adoptarse para reducir al mínimo los riesgos al personal de a bordo que participa en las operaciones de rescate. Los buques construidos antes del 1 de julio de 2014 cumplirán esta prescripción a más tardar cuando se efectúe el primer reconocimiento periódico o el primer reconocimiento de renovación del equipo de seguridad después del 1 de julio de 2014, si éste es anterior.

2 Se considerará que los buques de pasaje de transbordo rodado que se ajustan a lo dispuesto en la regla 26.4 cumplen la presente regla.

* Véanse las Directrices para la elaboración de planes y procedimientos para el rescate de personas del agua (MSC.1/Circ.1412)."

APÉNDICE CERTIFICADOS

30 Todos los modelos de certificados e inventarios de equipos se sustituyen por los siguientes:

MODELO DE CERTIFICADO DE SEGURIDAD PARA BUQUE DE PASAJE

CERTIFICADO DE SEGURIDAD PARA BUQUE DE PASAJE

El presente certificado llevará como suplemento un Inventario del equipo de seguridad para buque de pasaje (Modelo P)

(Sello oficial)

(Estado)

para viaje internacional/viaje internacional corto¹

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974,
enmendado,

con la autoridad conferida por el Gobierno de

_____ *(nombre del Estado)*

por

_____ *(persona u organización autorizada)*

Datos relativos al buque²

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Zonas marítimas en las que el buque está autorizado a operar
según su certificado (regla IV/2)

Número IMO³

Fecha de construcción:

Fecha del contrato de construcción

Fecha en que se colocó la quilla o en que la construcción
se hallaba en una fase equivalente

Fecha de entrega

Fecha en que comenzaron las obras de transformación,
reforma o modificación de carácter importante (cuando proceda)

Se deberán cumplimentar todas las fechas aplicables.

¹ Táchese según proceda.

² Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

³ De conformidad con el Sistema de asignación de un número de la OMI a los buques para su identificación, adoptado por la Organización mediante la resolución A.600(15).

SE CERTIFICA:

- 1 Que el buque ha sido objeto de reconocimiento de conformidad con lo prescrito en la regla I/7 del Convenio.
- 2 Que el reconocimiento ha puesto de manifiesto lo siguiente:
 - 2.1 que el buque cumple con las prescripciones del Convenio en lo que respecta a:
 - .1 la estructura, las máquinas principales y auxiliares, las calderas y otros recipientes de presión;
 - .2 la disposición del compartimentado estanco y los detalles correspondientes;
 - .3 las líneas de carga de compartimentado siguientes:

Líneas de carga de compartimentado asignadas y marcadas en el costado, en el centro del buque (regla II-1/18) ⁴	Francobordo	Utilícese cuando los espacios destinados a los pasajeros comprendan los siguientes espacios alternativos
P1
P2
P3

- 2.2 que el buque cumple con las prescripciones del Convenio en lo que respecta a la protección estructural contra incendios, los sistemas y dispositivos de seguridad contra incendios y los planos de lucha contra incendios;
- 2.3 que se han provisto los dispositivos de salvamento y el equipo de los botes salvavidas, las balsas salvavidas y los botes de rescate de conformidad con las prescripciones del Convenio;
- 2.4 que el buque va provisto de aparato lanzacabos y de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento de conformidad con las prescripciones del Convenio;
- 2.5 que el buque cumple con las prescripciones del Convenio en lo que respecta a las instalaciones radioeléctricas;
- 2.6 que el funcionamiento de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento cumple con las prescripciones del Convenio;
- 2.7 que el buque cumple con las prescripciones del Convenio en lo que respecta a los aparatos náuticos de a bordo, los medios de embarco para prácticos y las publicaciones náuticas;
- 2.8 que el buque está provisto de luces, marcas, medios emisores de señales acústicas y de señales de socorro, de conformidad con las prescripciones del Convenio y del Reglamento internacional para prevenir los abordajes en vigor;

⁴ Para los buques construidos antes del 1 de enero de 2009, se utilizará la notación de compartimentado "C.1, C.2 y C.3" aplicable.

2.9 que en todos los demás aspectos, el buque cumple con las prescripciones pertinentes del Convenio;

2.10 que el buque cuenta/no cuenta¹ con un proyecto y disposiciones alternativas en virtud de la(s) regla(s) II-1/55 / II-2/17 / III/38¹ del Convenio;

2.11 que se adjunta/no se adjunta¹ al presente certificado un Documento de aprobación de proyectos y disposiciones alternativas para las instalaciones eléctricas y de máquinas/la protección contra incendios/los dispositivos y medios de salvamento.¹

3 Que se ha/no se ha¹ expedido un Certificado de exención.

El presente certificado es válido hasta

Fecha de terminación del reconocimiento en el que se basa el presente certificado:
(dd/mm/aaaa)

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(Sello o estampilla de la autoridad expedidora, según proceda)

¹ Táchese según proceda.

INVENTARIO DEL EQUIPO DE SEGURIDAD PARA BUQUE DE PASAJE (MODELO P)

INVENTARIO DEL EQUIPO NECESARIO PARA CUMPLIR CON EL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

1 *Datos relativos al buque*

Nombre del buque

Número o letras distintivos

Número máximo de pasajeros que está autorizado a llevar

Número mínimo de personas con la competencia necesaria
 para manejar las instalaciones radioeléctricas

2 *Pormenores de los dispositivos de salvamento*

1	Número total de personas para las que se han provisto dispositivos de salvamento		
		A babor	A estribor
2	Número total de botes salvavidas	.....	.....
2.1	Número total de personas a las que se puede dar cabida	.....	.....
2.2	Número de botes salvavidas parcialmente cerrados (regla III/21 y sección 4.5 del Código IDS)	.....	.....
2.3	Número de botes salvavidas parcialmente cerrados autoadrizables (regla III/43) ¹	.....	.....
2.4	Número de botes salvavidas totalmente cerrados (regla III/21 y sección 4.6 del Código IDS)	.....	.....
2.5	Otros botes salvavidas	.....	.....
2.5.1	Número	.....	.....
2.5.2	Tipo	.....	.....
3	Número total de botes salvavidas a motor (comprendidos en el total de botes salvavidas que se acaba de indicar)	.....	.....
3.1	Número de botes salvavidas provistos de proyector	.....	.....
4	Número de botes de rescate	.....	.....
4.1	Número de botes comprendidos en el total de botes salvavidas que se acaba de indicar	.....	.....
4.2	Número de botes que son botes de rescate rápidos	.....	.....
5	Balsas salvavidas	.....	.....
5.1	Balsas salvavidas para las que se necesitan dispositivos aprobados de puesta a flote	.....	.....
5.1.1	Número de balsas salvavidas	.....	.....
5.1.2	Número de personas a las que se puede dar cabida	.....	.....
5.2	Balsas salvavidas para las que no se necesitan dispositivos aprobados de puesta a flote	.....	.....

¹ Véanse las enmiendas de 1983 al Convenio SOLAS (MSC.6(48)), aplicables a los buques construidos el 1 de julio de 1986, o posteriormente, pero antes del 1 de julio de 1998.

2 Pormenores de los dispositivos de salvamento (continuación)

5.2.1	Número de balsas salvavidas	.....
5.2.2	Número de personas a las que se puede dar cabida	.....
6	Número de sistemas marinos de evacuación (MES)	.....
6.1	Número de balsas salvavidas a las que prestan servicio	.....
6.2	Número de personas a las que se puede dar cabida	.....
7	Aparatos flotantes	.....
7.1	Número de aparatos	.....
7.2	Número de personas que los aparatos son capaces de sostener	.....
8	Número de aros salvavidas	.....
9	Número total de chalecos salvavidas	.....
9.1	Número de chalecos salvavidas para adultos	.....
9.2	Número de chalecos salvavidas para niños	.....
9.3	Número de chalecos salvavidas para bebés	.....
10	Trajes de inmersión	.....
10.1	Número total	.....
10.2	Número de trajes que cumplen con las prescripciones aplicables a los chalecos salvavidas	.....
11	Número de trajes de protección contra la intemperie	.....
12	Número de ayudas térmicas ²	.....
13	Instalaciones radioeléctricas utilizadas en los dispositivos de salvamento	.....
13.1	Número de dispositivos de localización de búsqueda y salvamento	.....
13.1.1	Número de respondedores de radar de búsqueda y salvamento (SART)	.....
13.1.2	Número de transmisores de búsqueda y salvamento del SIA (AIS-SART)	.....
13.2	Número de aparatos radiotelefónicos bidireccionales de ondas métricas	.....

3 Pormenores de las instalaciones radioeléctricas

Elemento		Disposiciones y equipos existentes a bordo
1	Sistemas primarios	.....
1.1	Instalación radioeléctrica de ondas métricas	.....
1.1.1	Codificador de LSD	.....
1.1.2	Receptor de escucha de LSD	.....
1.1.3	Radiotelefonía	.....
1.2	Instalación radioeléctrica de ondas hectométricas	.....
1.2.1	Codificador de LSD	.....
1.2.2	Receptor de escucha de LSD	.....

² Excluidas las prescritas en los párrafos 4.1.5.1.24, 4.4.8.31 y 5.1.2.2.13 del Código IDS.

3 Pormenores de las instalaciones radioeléctricas (continuación)

Elemento		Disposiciones y equipos existentes a bordo
1.2.3	Radiotelefonía	.....
1.3	Instalación radioeléctrica de ondas hectométricas/decamétricas	.....
1.3.1	Codificador de LSD	.....
1.3.2	Receptor de escucha de LSD	.....
1.3.3	Radiotelefonía	.....
1.3.4	Radiotelegrafía de impresión directa	.....
1.4	Estación terrena de buque de Inmarsat	.....
2	Medios secundarios para emitir alertas	.....
3	Instalaciones para la recepción de información sobre seguridad marítima	.....
3.1	Receptor NAVTEX	.....
3.2	Receptor de LIG	.....
3.3	Receptor radiotelegráfico de impresión directa de ondas decamétricas	.....
4	RLS satelitaria	.....
4.1	Cospas-Sarsat	.....
5	RLS de ondas métricas	.....
6	Número de dispositivos de localización de búsqueda y salvamento	.....
6.1	Número de respondedores de radar de búsqueda y salvamento (SART)	.....
6.2	Número de transmisores de búsqueda y salvamento del SIA (AIS-SART)	.....

4 Métodos utilizados para garantizar la disponibilidad de las instalaciones radioeléctricas (reglas IV/15.6 y 15.7)

4.1	Duplicación del equipo
4.2	Mantenimiento en tierra
4.3	Capacidad de mantenimiento en el mar

5 Pormenores de los sistemas y aparatos náuticos

Elemento		Disposiciones y equipos existentes a bordo
1.1	Compás magnético magistral ³	.....
1.2	Compás magnético de respeto ³	.....
1.3	Girocompás ³	.....
1.4	Repetidor del rumbo indicado por el girocompás ³	.....
1.5	Repetidor de las marcaciones indicadas por el girocompás ³	.....
1.6	Sistema de control del rumbo o de la derrota ³	.....
1.7	Taxímetro o dispositivo de marcación de compás ³	.....
1.8	Medios para corregir el rumbo y la demora	.....
1.9	Dispositivo transmisor del rumbo (DTR) ³	.....

³ En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.

5 Pormenores de los sistemas y aparatos náuticos (continuación)

Elemento		Disposiciones y equipos existentes a bordo
2.1	Cartas náuticas/Sistema de información y visualización de cartas electrónicas (SIVCE) ⁴	.....
2.2	Medios auxiliares para los SIVCE	.....
2.3	Publicaciones náuticas	.....
2.4	Medios auxiliares para las publicaciones náuticas electrónicas	.....
3.1	Receptor para un sistema mundial de navegación por satélite/sistema de radionavegación terrena ^{3,4}	.....
3.2	Radar de 9 GHz ³	.....
3.3	Segundo radar (3 GHz/9 GHz) ⁴ ³	.....
3.4	Ayuda de punteo radar automática (APRA) ³	.....
3.5	Ayuda de seguimiento automática ³	.....
3.6	Segunda ayuda de seguimiento automática ³	.....
3.7	Ayuda de punteo electrónica ³	.....
4.1	Sistema de identificación automática (SIA)	.....
4.2	Sistema de identificación y seguimiento de largo alcance	.....
5	Registrador de datos de la travesía (RDT)	.....
6.1	Dispositivo medidor de la velocidad y la distancia (en el agua) ³	.....
6.2	Dispositivo medidor de la velocidad y la distancia (con respecto al fondo en dirección de proa y de través) ³	.....
7	Ecosonda ³	.....
8.1	Indicadores de la posición del timón, del sentido de giro, empuje y paso de la hélice y de la modalidad de funcionamiento ³	.....
8.2	Indicador de la velocidad de giro ³	.....
9	Sistema de recepción de señales acústicas ³	.....
10	Teléfono para comunicar con el puesto de gobierno de emergencia ³	.....
11	Lámpara de señales diurnas ³	.....
12	Reflector de radar ³	.....
13	Código internacional de señales	.....
14	Manual IAMSAR, Volumen III	.....
15	Sistema de alarma para la guardia de navegación en el puente (BNWAS)	.....

SE CERTIFICA que este inventario es correcto en su totalidad.

Expedido en
(lugar de expedición del inventario)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el inventario)

(Sello o estampilla de la autoridad expedidora, según proceda)

³ En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.

⁴ Táchese según proceda.

**MODELO DE CERTIFICADO DE SEGURIDAD DE
CONSTRUCCIÓN PARA BUQUE DE CARGA**

CERTIFICADO DE SEGURIDAD DE CONSTRUCCIÓN PARA BUQUE DE CARGA

(Sello oficial)

(Estado)

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974,
enmendado,

con la autoridad conferida por el Gobierno de

_____ *(nombre del Estado)*

por

_____ *(persona u organización autorizada)*

Datos relativos al buque¹

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Peso muerto del buque (toneladas métricas)²

Número IMO³

Tipo de buque⁴

- Granelero
- Petrolero
- Buque tanque quimiquero
- Buque gasero
- Buque de carga distinto de los anteriores

Fecha de construcción:

Fecha del contrato de construcción

Fecha en que se colocó la quilla o en que la construcción
se hallaba en una fase equivalente

Fecha de entrega

Fecha en que comenzaron las obras de transformación,
reforma o modificación de carácter importante (cuando proceda)

Se deberán cumplimentar todas las fechas aplicables.

¹ Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

² Únicamente si se trata de petroleros, buques tanque quimiqueros y buques gaseros.

³ De conformidad con el Sistema de asignación de un número de la OMI a los buques para su identificación, adoptado por la Organización mediante la resolución A.600(15).

⁴ Táchese según proceda.

SE CERTIFICA:

- 1 Que el buque ha sido objeto de reconocimiento, de conformidad con lo prescrito en la regla I/10 del Convenio.
- 2 Que el reconocimiento ha puesto de manifiesto que el estado de la estructura, las máquinas y el equipo, según lo definido en la expresada regla, es satisfactorio, y que el buque cumple con las prescripciones pertinentes de los capítulos II-1 y II-2 del Convenio (sin que entren aquí las relativas a sistemas y dispositivos de seguridad contra incendios y planos de lucha contra incendios).
- 3 Que se ha/no se ha⁴ expedido un Certificado de exención.
- 4 Que el buque cuenta/no cuenta⁴ con un proyecto y disposiciones alternativas en virtud de la(s) regla(s) II-1/55 / II-2/17⁴ del Convenio.
- 5 Que se adjunta/no se adjunta⁴ al presente certificado un Documento de aprobación de proyectos y disposiciones alternativas para las instalaciones eléctricas y de máquinas/la protección contra incendios.⁴

El presente certificado es válido hasta

Fecha de terminación del reconocimiento en el que se basa el presente certificado:
(dd/mm/aaaa)

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(Sello o estampilla de la autoridad expedidora, según proceda)

⁴ Táchese según proceda.

MODELO DE CERTIFICADO DE SEGURIDAD DEL EQUIPO PARA BUQUE DE CARGA

CERTIFICADO DE SEGURIDAD DEL EQUIPO PARA BUQUE DE CARGA

El presente certificado llevará como suplemento un Inventario
del equipo de seguridad para buque de carga (Modelo E)

(Sello oficial)

(Estado)

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974,
enmendado

con la autoridad conferida por el Gobierno de

(nombre del Estado)

por

(persona u organización autorizada)

Datos relativos al buque¹

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Peso muerto del buque (toneladas métricas)²

Eslora del buque (regla III/3.12)

Número IMO³

Tipo de buque⁴

- Granelero
- Petrolero
- Buque tanque quimiquero
- Buque gasero
- Buque de carga distinto de los anteriores

Fecha en la que se colocó la quilla del buque o en la que su construcción se hallaba en una fase equivalente o, cuando proceda, fecha en la que comenzaron las obras de transformación, reforma o modificación de carácter importante:

¹ Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

² Únicamente si se trata de petroleros, buques tanque quimiqueros y buques gaseros.

³ De conformidad con el Sistema de asignación de un número de la OMI a los buques para su identificación, adoptado por la Organización mediante la resolución A.600(15).

⁴ Táchese según proceda.

SE CERTIFICA:

- 1 Que el buque ha sido objeto de reconocimiento, de conformidad con lo prescrito en la regla I/8 del Convenio.
- 2 Que el reconocimiento ha puesto de manifiesto lo siguiente:
 - 2.1 que el buque cumple con las prescripciones del Convenio en lo que respecta a los sistemas y dispositivos de seguridad contra incendios y los planos de lucha contra incendios;
 - 2.2 que se han provisto los dispositivos de salvamento y el equipo de los botes salvavidas, las balsas salvavidas y los botes de rescate, de conformidad con las prescripciones del Convenio;
 - 2.3 que el buque va provisto de aparato lanzacabos y de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento de conformidad con las prescripciones del Convenio;
 - 2.4 que el buque cumple con las prescripciones del Convenio en lo que respecta a los aparatos náuticos de a bordo, los medios de embarco para prácticos y las publicaciones náuticas;
 - 2.5 que el buque está provisto de luces, marcas, medios emisores de señales acústicas y de señales de socorro de conformidad con las prescripciones del Convenio y del Reglamento internacional para prevenir los abordajes en vigor;
 - 2.6 que en todos los demás aspectos, el buque cumple con las prescripciones pertinentes del Convenio;
 - 2.7 que el buque cuenta/no cuenta⁴ con un proyecto y disposiciones alternativos en virtud de la(s) regla(s) II-2/17 / III/38⁴ del Convenio;
 - 2.8 que se adjunta/no se adjunta⁴ al presente certificado un Documento de aprobación de proyectos y disposiciones alternativos de protección contra incendios/dispositivos y medios de salvamento.⁴
- 3 Que el buque opera, de conformidad con lo dispuesto en la regla III/26.1.1.1,⁵ dentro de los límites de la zona de tráfico
- 4 Que se ha/no se ha⁴ expedido un Certificado de exención.

El presente certificado es válido hasta

Fecha de terminación del reconocimiento en el que se basa el presente certificado:
(dd/mm/aaaa)

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(Sello o estampilla de la autoridad expedidora, según proceda)

⁴ Táchese según proceda.

⁵ Véanse las enmiendas de 1983 al Convenio SOLAS (MSC.6(48)), aplicables a los buques construidos el 1 de julio de 1986, o posteriormente, pero antes del 1 de julio de 1998 en el caso de los botes salvavidas parcialmente cerrados autoadrizables a bordo.

INVENTARIO DEL EQUIPO DE SEGURIDAD PARA BUQUE DE CARGA (MODELO E)

INVENTARIO DEL EQUIPO NECESARIO PARA CUMPLIR CON EL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

1 *Datos relativos al buque*

Nombre del buque

Número o letras distintivos

2 *Pormenores de los dispositivos de salvamento*

1	Número total de personas para las que se han provisto dispositivos de salvamento	A babor	A estribor
2	Número total de botes salvavidas	.....	.....
2.1	Número total de personas a las que se puede dar cabida	.....	.....
2.2	Número de botes salvavidas parcialmente cerrados autoadrizables (regla III/43) ¹	.....	.....
2.3	Número de botes salvavidas totalmente cerrados (regla III/31 y sección 4.6 del Código IDS)	.....	.....
2.4	Número de botes salvavidas provistos de un sistema autónomo de abastecimiento de aire (regla III/31 y sección 4.8 del Código IDS)	.....	.....
2.5	Número de botes salvavidas protegidos contra incendios (regla III/31 y sección 4.9 del Código IDS)	.....	.....
2.6	Otros botes salvavidas	.....	.....
2.6.1	Número	.....	.....
2.6.2	Tipo	.....	.....
2.7	Número de botes salvavidas de caída libre	.....	.....
2.7.1	Totalmente cerrados (regla III/31 y sección 4.7 del Código IDS)	.....	.....
2.7.2	Provistos de un sistema autónomo (regla III/31 y sección 4.8 del Código IDS)	.....	.....
2.7.3	Protegidos contra incendios (regla III/31 y sección 4.9 del Código IDS)	.....	.....
3	Número total de botes salvavidas a motor (comprendidos en el total de botes salvavidas que se acaba de indicar)	.....	.....
3.1	Número de botes salvavidas provistos de proyector	.....	.....
4	Número de botes de rescate	.....	.....
4.1	Número de botes comprendidos en el total de botes salvavidas que se acaba de indicar	.....	.....
5	Balsas salvavidas	.....	.....
5.1	Balsas salvavidas para las que se necesitan dispositivos aprobados de puesta a flote	.....	.....
5.1.1	Número de balsas salvavidas	.....	.....

¹ Véanse las enmiendas de 1983 al Convenio SOLAS (MSC.6(48)), aplicables a los buques construidos el 1 de julio de 1986, o posteriormente, pero antes del 1 de julio de 1998.

2 Pormenores de los dispositivos de salvamento (continuación)

5.1.2	Número de personas a las que se puede dar cabida	.....
5.2	Balsas salvavidas para las que no se necesitan dispositivos aprobados de puesta a flote	.....
5.2.1	Número de balsas salvavidas	.....
5.2.2	Número de personas a las que se puede dar cabida	.....
5.3	Número de balsas salvavidas prescritas en la regla III/31.1.4	.....
6	Número de aros salvavidas	.....
7	Número de chalecos salvavidas	.....
8	Trajes de inmersión	.....
8.1	Número total	.....
8.2	Número de trajes que cumplen con las prescripciones aplicables a los chalecos salvavidas	.....
9	Número de trajes de protección contra la intemperie	.....
10	Instalaciones radioeléctricas utilizadas en los dispositivos de salvamento	.....
10.1	Número de dispositivos de localización de búsqueda y salvamento	.....
10.1.1	Número de respondedores de radar de búsqueda y salvamento (SART)	.....
10.1.2	Número de transmisores de búsqueda y salvamento del SIA (AIS-SART)	.....
10.2	Número de aparatos radiotelefónicos bidireccionales de ondas métricas	.....

3 Pormenores de los sistemas y aparatos náuticos

Elemento		Disposiciones y equipos existentes a bordo
1.1	Compas magnético magistral ²	.....
1.2	Compas magnético de respeto ²	.....
1.3	Girocompás ²	.....
1.4	Repetidor del rumbo indicado por el girocompás ²	.....
1.5	Repetidor de las marcaciones indicadas por el girocompás ²	.....
1.6	Sistema de control del rumbo o de la derrota ²	.....
1.7	Taxímetro o dispositivo de marcación de compas ²	.....
1.8	Medios para corregir el rumbo y la demora	.....
1.9	Dispositivo transmisor del rumbo (DTR) ²	.....
2.1	Cartas náuticas/Sistema de información y visualización de cartas electrónicas (SIVCE) ³	.....
2.2	Medios auxiliares para los SIVCE	.....
2.3	Publicaciones náuticas	.....
2.4	Medios auxiliares para las publicaciones náuticas electrónicas	.....
3.1	Receptor para un sistema mundial de navegación por satélite/sistema de radionavegación terrenal ^{2,3}	.....

² En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.

³ Táchese según proceda.

3 Pormenores de los sistemas y aparatos náuticos (continuación)

Elemento		Disposiciones y equipos existentes a bordo
3.2	Radar de 9 GHz ²	.....
3.3	Segundo radar (3 GHz/9 GHz ³) ²	.....
3.4	Ayuda de punteo radar automática (APRA) ²	.....
3.5	Ayuda de seguimiento automática ²	.....
3.6	Segunda ayuda de seguimiento automática ²	.....
3.7	Ayuda de punteo electrónica ²	.....
4.1	Sistema de identificación automática (SIA)	.....
4.2	Sistema de identificación y seguimiento de largo alcance	.....
5.1	Registrador de datos de la travesía (RDT) ³	.....
5.2	Registrador de datos de la travesía simplificado (RDT-S) ³	.....
6.1	Dispositivo medidor de la velocidad y la distancia (en el agua) ²	.....
6.2	Dispositivo medidor de la velocidad y la distancia (con respecto al fondo en dirección de proa y de través) ²	.....
7	Ecosonda ²	.....
8.1	Indicadores de la posición del timón, del sentido de giro, empuje y paso de la hélice y de la modalidad de funcionamiento ²	.....
8.2	Indicador de la velocidad de giro ²	.....
9	Sistema de recepción de señales acústicas ²	.....
10	Teléfono para comunicar con el puesto de gobierno de emergencia ²	.....
11	Lámpara de señales diurnas ²	.....
12	Reflector de radar ²	.....
13	Código internacional de señales	.....
14	Manual IAMSAR, Volumen III	.....
15	Sistema de alarma para la guardia de navegación en el puente (BNWAS)	.....

SE CERTIFICA que este inventario es correcto en su totalidad.

Expedido en
 (lugar de expedición del inventario)

.....
 (fecha de expedición)

.....
 (firma del funcionario autorizado para expedir el inventario)

(Sello o estampilla de la autoridad expedidora, según proceda)

² En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.
³ Táchese según proceda.

**MODELO DE CERTIFICADO DE SEGURIDAD RADIOELÉCTRICA
PARA BUQUE DE CARGA**

CERTIFICADO DE SEGURIDAD RADIOELÉCTRICA PARA BUQUE DE CARGA

El presente certificado llevará como suplemento un Inventario del equipo de seguridad radioeléctrica para buque de carga (Modelo R)

(Sello oficial)

(Estado)

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974,
enmendado

con la autoridad conferida por el Gobierno de

_____ *(nombre del Estado)*

por

_____ *(persona u organización autorizada)*

Datos relativos al buque¹

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Zonas marítimas en las que el buque está autorizado a operar
según su certificado (regla IV/2)

Número IMO²

Fecha en la que se colocó la quilla del buque o en la que su construcción se hallaba en una fase equivalente o, cuando proceda, fecha en la que comenzaron las obras de transformación, reforma o modificación de carácter importante:

¹ Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

² De conformidad con el Sistema de asignación de un número de la OMI a los buques para su identificación, adoptado por la Organización mediante la resolución A.600(15).

SE CERTIFICA:

- 1 Que el buque ha sido objeto de reconocimiento, de conformidad con lo prescrito en la regla I/9 del Convenio.
- 2 Que el reconocimiento ha puesto de manifiesto lo siguiente:
 - 2.1 que el buque cumple con las prescripciones del Convenio en lo que respecta a las instalaciones radioeléctricas;
 - 2.2 que el funcionamiento de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento cumple con las prescripciones del Convenio.
- 3 Que se ha/no se ha³ expedido un Certificado de exención.

El presente certificado es válido hasta

Fecha de terminación del reconocimiento en el que se basa el presente certificado:
(dd/mm/aaaa)

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(Sello o estampilla de la autoridad expedidora, según proceda)

³ Táchese según proceda.

**INVENTARIO DEL EQUIPO DE SEGURIDAD RADIOELÉCTRICA
PARA BUQUE DE CARGA (MODELO R)**

INVENTARIO DEL EQUIPO NECESARIO PARA CUMPLIR CON EL
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA
HUMANA EN EL MAR, 1974, ENMENDADO

1 Datos relativos al buque

Nombre del buque

Número o letras distintivos

Número mínimo de personas con la competencia necesaria
para manejar las instalaciones radioeléctricas

2 Pormenores de las instalaciones radioeléctricas

Elemento		Disposiciones y equipos existentes a bordo
1	Sistemas primarios	.....
1.1	Instalación radioeléctrica de ondas métricas	.....
1.1.1	Codificador de LSD	.....
1.1.2	Receptor de escucha de LSD	.....
1.1.3	Radiotelefonía	.....
1.2	Instalación radioeléctrica de ondas hectométricas	.....
1.2.1	Codificador de LSD	.....
1.2.2	Receptor de escucha de LSD	.....
1.2.3	Radiotelefonía	.....
1.3	Instalación radioeléctrica de ondas hectométricas/decamétricas	.....
1.3.1	Codificador de LSD	.....
1.3.2	Receptor de escucha de LSD	.....
1.3.3	Radiotelefonía	.....
1.3.4	Telegrafía de impresión directa	.....
1.4	Estación terrena de buque de Inmarsat	.....
2	Medios secundarios para emitir el alerta	.....
3	Instalaciones para la recepción de información sobre seguridad marítima	.....
3.1	Receptor NAVTEX	.....
3.2	Receptor de LIG	.....
3.3	Receptor radiotelegráfico de impresión directa de ondas decamétricas	.....
4	RLS satelitaria	.....
4.1	Cospas-Sarsat	.....
5	RLS de ondas métricas	.....
6	Dispositivo de localización de búsqueda y salvamento de buque	.....
6.1	Respondedor de radar de búsqueda y salvamento (SART)	.....
6.2	Transmisor de búsqueda y salvamento del SIA (AIS-SART)	.....

3 Métodos utilizados para garantizar la disponibilidad de las instalaciones radioeléctricas (reglas IV/15.6 y 15.7)

3.1 Duplicación del equipo

3.2 Mantenimiento en tierra

3.3 Capacidad de mantenimiento en el mar

SE CERTIFICA que este inventario es correcto en su totalidad.

Expedido en
(lugar de expedición del inventario)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el inventario)

(Sello o estampilla de la autoridad expedidora, según proceda)

MODELO DE CERTIFICADO DE EXENCIÓN
CERTIFICADO DE EXENCIÓN

(Sello oficial)

(Estado)

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974,
enmendado,

con la autoridad conferida por el Gobierno de

_____ *(nombre del Estado)*

por

_____ *(persona u organización autorizada)*

Datos relativos al buque¹

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Número IMO²

SE CERTIFICA:

Que, por aplicación de lo prescrito en la regla
del Convenio, el buque queda exento de las prescripciones relativas a
..... del Convenio.

Condiciones, si las hubiere, en que se otorga el Certificado de exención:

.....
.....

Viajes, si los hubiere, para los que se otorga el Certificado de exención:

.....
.....

El presente certificado es válido hasta
a condición de que siga siendo válido el Certificado de
al que se adjunta el presente certificado.

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(Sello o estampilla de la autoridad expedidora, según proceda)

¹ Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

² De conformidad con el Sistema de asignación de un número de la OMI a los buques para su identificación, adoptado por la Organización mediante la resolución A.600(15).

**MODELO DE CERTIFICADO DE SEGURIDAD PARA BUQUE NUCLEAR DE PASAJE
CERTIFICADO DE SEGURIDAD PARA BUQUE NUCLEAR DE PASAJE**

El presente certificado llevará como suplemento un Inventario
del equipo de seguridad para buque de pasaje (Modelo P)

(Sello oficial)

(Estado)

para viaje internacional/viaje internacional corto¹

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974,
enmendado,

con la autoridad conferida por el Gobierno de

_____ *(nombre del Estado)*

por

_____ *(persona u organización autorizada)*

Datos relativos al buque²

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Zonas marítimas en las que el buque está autorizado a operar
según su certificado (regla IV/2)

Número IMO³

Fecha de construcción:

Fecha del contrato de construcción

Fecha en que se colocó la quilla o en que la construcción
se hallaba en una fase equivalente

Fecha de entrega

Fecha en que comenzaron las obras de transformación,
reforma o modificación de carácter importante (cuando proceda)

Se deberán cumplimentar todas las fechas aplicables.

¹ Táchese según proceda.

² Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

³ De conformidad con el Sistema de asignación de un número de la OMI a los buques para su identificación, adoptado por la Organización mediante la resolución A.600(15).

SE CERTIFICA:

- 1 Que el buque ha sido objeto de reconocimiento, de conformidad con lo prescrito en la regla VIII/9 del Convenio.
- 2 Que este buque, que se trata de un buque nuclear, cumple plenamente las prescripciones del capítulo VIII del Convenio y se ajusta al expediente de seguridad aprobado para él, y que:
 - 2.1 cumple las prescripciones del Convenio en lo que respecta a:
 - .1 la estructura, las máquinas principales y auxiliares, las calderas y otros recipientes a presión, incluidas la planta de propulsión nuclear y la estructura de protección contra abordajes;
 - .2 la disposición del compartimentado estanco y los detalles correspondientes;
 - .3 las líneas de carga de compartimentado siguientes:

Líneas de carga de compartimentado asignadas y marcadas en el costado, en el centro del buque (regla II-1/18) ⁴	Francobordo	Utilícese cuando los espacios destinados a los pasajeros comprendan los siguientes espacios alternativos
P1
P2
P3

- 2.2 cumple las prescripciones del Convenio en lo que respecta a la protección estructural contra incendios, los sistemas y dispositivos de seguridad contra incendios y los planos de lucha contra incendios;
- 2.3 cumple las prescripciones del Convenio en lo que respecta a los sistemas y al equipo de protección contra las radiaciones;
- 2.4 los dispositivos de salvamento y el equipo de los botes salvavidas, las balsas salvavidas y los botes de rescate se han provisto de conformidad con las prescripciones del Convenio;
- 2.5 está provisto de un aparato lanzacabos y de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento, de conformidad con las prescripciones del Convenio;
- 2.6 cumple las prescripciones del Convenio, en lo que respecta a las instalaciones radioeléctricas;
- 2.7 el funcionamiento de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento cumple las prescripciones del Convenio;
- 2.8 cumple las prescripciones del Convenio en lo que respecta al equipo náutico de a bordo, los medios de embarco para prácticos y las publicaciones náuticas;

⁴ Para los buques construidos antes del 1 de enero de 2009, se utilizará la notación de compartimentado "C.1, C.2 y C.3" aplicable.

- 2.9 está provisto de luces, marcas, medios emisores de señales acústicas y de señales de socorro, de conformidad con las prescripciones del Convenio y del Reglamento internacional para prevenir los abordajes en vigor;
- 2.10 en todos sus demás aspectos, el buque se ajusta a las prescripciones pertinentes del Convenio;
- 2.11 el buque cuenta/no cuenta¹ con un proyecto y disposiciones alternativos en virtud de la(s) regla(s) II-1/55 / II-2/17 / III/38¹ del Convenio; y
- 2.12 se adjunta/no se adjunta¹ al presente certificado un Documento de aprobación de proyectos y disposiciones alternativos para las instalaciones eléctricas y de máquinas/la protección contra incendios/los dispositivos y medios de salvamento.¹

El presente certificado es válido hasta

Fecha de terminación del reconocimiento en el que se basa el presente certificado:
(dd/mm/aaaa)

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(Sello o estampilla de la autoridad expedidora, según proceda)

¹ Táchese según proceda.

MODELO DE CERTIFICADO DE SEGURIDAD PARA BUQUE NUCLEAR DE CARGA

CERTIFICADO DE SEGURIDAD PARA BUQUE NUCLEAR DE CARGA

El presente certificado llevará como suplemento un Inventario
del equipo de seguridad para buque de carga (Modelo C)

(Sello oficial)

(Estado)

Expedido en virtud de las disposiciones del
CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974,
enmendado

con la autoridad conferida por el Gobierno de

_____ *(nombre del Estado)*

por

_____ *(persona u organización autorizada)*

Datos relativos al buque¹

Nombre del buque

Número o letras distintivos

Puerto de matrícula

Arqueo bruto

Peso muerto del buque (toneladas métricas)²

Eslora del buque (regla III/3.12)

Zonas marítimas en las que el buque está autorizado a operar
según su certificado (regla IV/2)

Número IMO³

Tipo de buque⁴

Granelero

Petrolero

Buque tanque quimiquero

Buque gasero

Buque de carga distinto de los anteriores

¹ Los datos relativos al buque podrán indicarse también en casillas dispuestas horizontalmente.

² Únicamente si se trata de petroleros, buques tanque quimiqueros y buques gaseros.

³ De conformidad con el Sistema de asignación de un número de la OMI a los buques para su identificación, adoptado por la Organización mediante la resolución A.600(15).

⁴ Táchese según proceda.

Fecha de construcción:

Fecha del contrato de construcción
Fecha en que se colocó la quilla o en que la construcción
se hallaba en una fase equivalente
Fecha de entrega
Fecha en que comenzaron las obras de transformación,
reforma o modificación de carácter importante (cuando proceda)

Se deberán cumplimentar todas las fechas aplicables.

SE CERTIFICA:

- 1 Que el buque ha sido objeto de reconocimiento, de conformidad con lo prescrito en la regla VIII/9 del Convenio.
- 2 Que este buque, que se trata de un buque nuclear, cumple plenamente las prescripciones del capítulo VIII del Convenio y se ajusta al expediente de seguridad aprobado para él, y que:
 - 2.1 el estado de la estructura, las máquinas y el equipo, según las definiciones de la regla I/10 (cuando corresponda cumplir lo dispuesto en la regla VIII/9), incluidas la planta de propulsión nuclear y la estructura de protección contra abordajes, es satisfactorio, y que el buque cumple las prescripciones pertinentes de los capítulos II-1 y II-2 del Convenio (excluidas las relativas a sistemas y dispositivos de seguridad contra incendios y a planos de lucha contra incendios);
 - 2.2 cumple las prescripciones del Convenio en lo que se refiere a los sistemas y dispositivos de seguridad contra incendios y los planos de lucha contra incendios;
 - 2.3 los dispositivos de salvamento y el equipo para los botes salvavidas, las balsas salvavidas y los botes de rescate se han provisto de conformidad con las prescripciones del Convenio;
 - 2.4 está provisto de un aparato lanzacabos y de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento, de conformidad con las prescripciones del Convenio;
 - 2.5 cumple las prescripciones del Convenio, en lo que respecta a las instalaciones radioeléctricas;
 - 2.6 el funcionamiento de las instalaciones radioeléctricas utilizadas en los dispositivos de salvamento cumple las prescripciones del Convenio;
 - 2.7 cumple las prescripciones del Convenio en lo que respecta al equipo náutico de a bordo, los medios de embarco para prácticos y las publicaciones náuticas;
 - 2.8 está provisto de luces, marcas, medios emisores de señales acústicas y de señales de socorro, de conformidad con las prescripciones del Convenio y del Reglamento internacional para prevenir los abordajes, en vigor;

- 2.9 en todos sus demás aspectos, el buque se ajusta a las prescripciones pertinentes de las reglas en la medida en que le son aplicables;
- 2.10 el buque cuenta/no cuenta³ con un proyecto y disposiciones alternativos en virtud de la(s) regla(s) II-1/55 / II-2/17 / III/38³ del Convenio; y
- 2.11 se adjunta/no se adjunta³ al presente certificado un Documento de aprobación de proyectos y disposiciones alternativos para las instalaciones eléctricas y de máquinas/la protección contra incendios/los dispositivos y medios de salvamento.³

El presente certificado es válido hasta

Fecha de ultimación del reconocimiento en el que se basa el presente certificado:
(dd/mm/aaaa)

Expedido en
(lugar de expedición del certificado)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el certificado)

(Sello o estampilla de la autoridad expedidora, según proceda)

³ Táchese según proceda.

**INVENTARIO DEL EQUIPO DE SEGURIDAD PARA BUQUE DE CARGA
 (MODELO C)**

INVENTARIO DEL EQUIPO NECESARIO PARA CUMPLIR CON EL
 CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA
 HUMANA EN EL MAR, 1974, ENMENDADO

1 Datos relativos al buque

Nombre del buque

Número o letras distintivos

Número mínimo de personas con la competencia necesaria
 para manejar las instalaciones radioeléctricas

2 Pormenores de los dispositivos de salvamento

1	Número total de personas para las que se han provisto dispositivos de salvamento		
		A babor	A estribor
2	Número total de botes salvavidas	.....	.....
2.1	Número total de personas a las que se puede dar cabida	.....	.....
2.2	Número de botes salvavidas parcialmente cerrados autoadrizables (regla III/43) ¹	.....	.....
2.3	Número de botes salvavidas totalmente cerrados (regla III/31 y sección 4.6 del Código IDS)	.....	.....
2.4	Número de botes salvavidas provistos de un sistema autónomo de abastecimiento de aire (regla III/31 y sección 4.8 del Código IDS)	.....	.....
2.5	Número de botes salvavidas protegidos contra incendios (regla III/31 y sección 4.9 del Código IDS)	.....	.....
2.6	Otros botes salvavidas	.....	.....
2.6.1	Número	.....	.....
2.6.2	Tipo	.....	.....
2.7	Número de botes salvavidas de caída libre	.....	.....
2.7.1	Totalmente cerrados (regla III/31 y sección 4.7 del Código IDS)	.....	.....
2.7.2	Provistos de un sistema autónomo (regla III/31 y sección 4.8 del Código IDS)	.....	.....
2.7.3	Protegidos contra incendios (regla III/31 y sección 4.9 del Código IDS)	.....	.....
3	Número total de botes salvavidas a motor (comprendidos en el total de botes salvavidas que se acaba de indicar)	.....	.....
3.1	Número de botes salvavidas provistos de proyector	.....	.....
4	Número de botes de rescate	.....	.....
4.1	Número de botes comprendidos en el total de botes salvavidas que se acaba de indicar	.....	.....

¹ Véanse las enmiendas de 1983 al Convenio SOLAS (MSC.6(48)), aplicables a los buques construidos el 1 de julio de 1986, o posteriormente, pero antes del 1 de julio de 1998.

2 Pormenores de los dispositivos de salvamento (continuación)

5	Balsas salvavidas	.....
5.1	Balsas salvavidas para las que se necesitan dispositivos aprobados de puesta a flote	.....
5.1.1	Número de balsas salvavidas	.....
5.1.2	Número de personas a las que se puede dar cabida	.....
5.2	Balsas salvavidas para las que no se necesitan dispositivos aprobados de puesta a flote	.....
5.2.1	Número de balsas salvavidas	.....
5.2.2	Número de personas a las que se puede dar cabida	.....
5.3	Número de balsas salvavidas prescritas en la regla III/31.1.4	.....
6	Número de aros salvavidas	.....
7	Número de chalecos salvavidas	.....
8	Trajes de inmersión	.....
8.1	Número total	.....
8.2	Número de trajes que cumplen con las prescripciones aplicables a los chalecos salvavidas	.....
9	Número de trajes de protección contra la intemperie	.....
10	Instalaciones radioeléctricas utilizadas en los dispositivos de salvamento	.....
10.1	Número de dispositivos de localización de búsqueda y salvamento	.....
10.1.1	Número de respondedores de radar de búsqueda y salvamento (SART)	.....
10.1.2	Número de transmisores de búsqueda y salvamento del SIA (AIS-SART)	.....
10.2	Número de aparatos radiotelefónicos bidireccionales de ondas métricas	.....

3 Pormenores de las instalaciones radioeléctricas

Elemento		Disposiciones y equipos existentes a bordo
1	Sistemas primarios	.....
1.1	Instalación radioeléctrica de ondas métricas	.....
1.1.1	Codificador de LSD	.....
1.1.2	Receptor de escucha de LSD	.....
1.1.3	Radiotelefonía	.....
1.2	Instalación radioeléctrica de ondas hectométricas	.....
1.2.1	Codificador de LSD	.....
1.2.2	Receptor de escucha de LSD	.....
1.2.3	Radiotelefonía	.....
1.3	Instalación radioeléctrica de ondas hectométricas/decamétricas	.....
1.3.1	Codificador de LSD	.....
1.3.2	Receptor de escucha de LSD	.....
1.3.3	Radiotelefonía	.....
1.3.4	Radiotelegrafía de impresión directa	.....

3 Pormenores de las instalaciones radioeléctricas (continuación)

Elemento		Disposiciones y equipos existentes a bordo
1.4	Estación terrena de buque de Inmarsat	.....
2	Medios secundarios para emitir alertas	.....
3	Instalaciones para la recepción de información sobre seguridad marítima	.....
3.1	Receptor NAVTEX	.....
3.2	Receptor de LIG	.....
3.3	Receptor radiotelegráfico de impresión directa de ondas decamétricas	.....
4	RLS satelitaria	.....
4.1	Cospas-Sarsat	.....
5	RLS de ondas métricas	.....
6	Dispositivo de localización de búsqueda y salvamento de buque	.....
6.1	Respondedor de radar de búsqueda y salvamento (SART)	.....
6.2	Transmisor de búsqueda y salvamento del SIA (AIS-SART)	.....

4 Métodos utilizados para garantizar la disponibilidad de las instalaciones radioeléctricas (reglas IV/15.6 y 15.7)

- 4.1 Duplicación del equipo
- 4.2 Mantenimiento en tierra
- 4.3 Capacidad de mantenimiento en el mar

5 Pormenores de los sistemas y aparatos náuticos

Elemento		Disposiciones y equipos existentes a bordo
1.1	Compás magnético magistral ²	.....
1.2	Compás magnético de respeto ²	.....
1.3	Girocompás ²	.....
1.4	Repetidor del rumbo indicado por el girocompás ²	.....
1.5	Repetidor de las marcaciones indicadas por el girocompás ²	.....
1.6	Sistema de control del rumbo o de la derrota ²	.....
1.7	Taxímetro o dispositivo de marcación de compás ²	.....
1.8	Medios para corregir el rumbo y la demora	.....
1.9	Dispositivo transmisor del rumbo (DTR) ²	.....
2.1	Cartas náuticas/Sistema de información y visualización de cartas electrónicas (SIVCE) ³	.....
2.2	Medios auxiliares para los SIVCE	.....

² En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.
³ Táchese según proceda.

5 Pormenores de los sistemas y aparatos náuticos (continuación)

Elemento		Disposiciones y equipos existentes a bordo
2.3	Publicaciones náuticas	.....
2.4	Medios auxiliares para las publicaciones náuticas electrónicas	.....
3.1	Receptor para un sistema mundial de navegación por satélite/sistema de radionavegación terrena ^{2,3}	.....
3.2	Radar de 9 GHz ²	.....
3.3	Segundo radar (3 GHz/9 GHz ³) ²	.....
3.4	Ayuda de punteo radar automática (APRA) ²	.....
3.5	Ayuda de seguimiento automática ²	.....
3.6	Segunda ayuda de seguimiento automática ²	.....
3.7	Ayuda de punteo electrónica ²	.....
4.1	Sistema de identificación automática (SIA)	.....
4.2	Sistema de identificación y seguimiento de largo alcance	.....
5.1	Registrador de datos de la travesía (RDT) ³	.....
5.2	Registrador de datos de la travesía simplificado (RDT-S) ³	.....
6.1	Dispositivo medidor de la velocidad y la distancia (en el agua) ²	.....
6.2	Dispositivo medidor de la velocidad y la distancia (con respecto al fondo en dirección de proa y de través) ²	.....
7	Ecosonda ²	.....
8.1	Indicadores de la posición del timón, del sentido de giro, empuje y paso de la hélice y de la modalidad de funcionamiento ²	.....
8.2	Indicador de la velocidad de giro ²	.....
9	Sistema de recepción de señales acústicas ²	.....
10	Teléfono para comunicar con el puesto de gobierno de emergencia ²	.....
11	Lámpara de señales diurnas ²	.....
12	Reflector de radar ²	.....
13	Código internacional de señales	.....
14	Manual IAMSAR, Volumen III	.....
15	Sistema de alarma para la guardia de navegación en el puente (BNWAS)	.....

SE CERTIFICA que este inventario es correcto en su totalidad.

Expedido en
(lugar de expedición del inventario)

.....
(fecha de expedición)

.....
(firma del funcionario autorizado para expedir el inventario)

(Sello o estampilla de la autoridad expedidora, según proceda)

² En virtud de la regla V/19 se permiten otros medios para cumplir esta prescripción. En caso de que se utilicen otros medios, deberán especificarse.
³ Táchese según proceda.

ANEXO 3

**RESOLUCIÓN MSC.404(96)
(adoptada el 19 de mayo de 2016)**

**ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO TAMBIÉN el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar, 1974 ("el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, con excepción de las disposiciones del capítulo I,

HABIENDO EXAMINADO, en su 96º periodo de sesiones, las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del Convenio,

1 ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;

2 DISPONE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de julio de 2019, a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del arqueo bruto de la flota mercante mundial hayan notificado al Secretario General que recusan las enmiendas;

3 INVITA a los Gobiernos Contratantes del Convenio a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de enero de 2020, una vez aceptadas de conformidad con lo dispuesto en el párrafo 2 *supra*;

4 PIDE al Secretario General que, a los efectos del artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;

5 PIDE TAMBIÉN al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

* * *

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO II-2
CONSTRUCCIÓN – PREVENCIÓN, DETECCIÓN Y EXTINCIÓN DE INCENDIOS

Parte A
Generalidades

Regla 3

Definiciones

1 Se añaden los dos nuevos párrafos siguientes a continuación del párrafo 56 existente:

"57 *Zona de aterrizaje para helicópteros*: zona del buque proyectada para el aterrizaje de helicópteros de manera ocasional o en situaciones de emergencia, pero no proyectada para las operaciones habituales de los helicópteros.

58 *Zona de carga y descarga con chigre*: zona de evacuación prevista para el transbordo en helicóptero de personal o suministros al buque, o desde éste, mientras el helicóptero vuela estacionariamente por encima de la cubierta."

Parte D
Evacuación

Regla 13

Medios de evacuación

1 Se suprime la nota a pie de página del título del párrafo 3.2.

2 Después del párrafo 3.2.6.2 actual se añaden los siguientes párrafos nuevos:

"3.2.7 *Análisis de la evacuación de los buques de pasaje**

3.2.7.1 Las vías de evacuación se evaluarán mediante un análisis de la evacuación en una fase temprana del proceso de proyecto. Este análisis se aplicará a:

- .1 los buques de pasaje de transbordo rodado construidos el 1 de julio de 1999 o posteriormente; y
- .2 otros buques de pasaje construidos el 1 de enero de 2020 o posteriormente que transporten más de 36 pasajeros.

3.2.7.2 El análisis servirá para determinar y eliminar, en la medida de lo posible, la congestión que puede producirse durante el abandono del buque debido a los desplazamientos normales de los pasajeros y la tripulación por las vías de evacuación, incluida la posibilidad de que los tripulantes tengan que desplazarse por esas vías en sentido contrario al de los pasajeros. Además, el análisis se utilizará para demostrar que los medios de evacuación son suficientemente flexibles para tener en cuenta la posibilidad de que determinadas vías de evacuación, puestos de reunión, puestos de embarco o embarcaciones de supervivencia no puedan utilizarse como resultado de un siniestro.

* Véanse las "Directrices revisadas para el análisis de la evacuación de los buques de pasaje nuevos y existentes" (MSC.1/Circ.1533), según pueda ser enmendada."

- 3 Se suprime el párrafo 7.4.

Parte G

Prescripciones especiales

Regla 18

Instalaciones para helicópteros

- 4 Se añade el siguiente párrafo 2.3 nuevo a continuación del párrafo 2.2 existente:

"2.3 No obstante lo prescrito en el anterior párrafo 2.2, los buques construidos el 1 de enero de 2020 o posteriormente que dispongan de una zona de aterrizaje para helicópteros estarán equipados con dispositivos de lucha contra incendios a base de espuma que cumplan las disposiciones pertinentes del capítulo 17 del Código internacional de sistemas de seguridad contra incendios.

y se modifica como corresponda la numeración de los párrafos restantes.

- 5 Se sustituye el párrafo 2.4 existente por el texto siguiente:

"2.4 No obstante lo prescrito en los párrafos 2.2 o 2.3 *supra*, los buques de pasaje de transbordo rodado que no dispongan de helicubiertas cumplirán la regla III/28."

- 6 Se añade el siguiente nuevo párrafo 5.1.6 a continuación del párrafo 5.1.5 existente:

"6 en lugar de las prescripciones de los párrafos 5.1.3 a 5.1.5, en los buques construidos el 1 de enero de 2020 o posteriormente y equipados con una helicubierta, dispositivos de lucha contra incendios a base de espuma que cumplan las disposiciones del Código internacional de sistemas de seguridad contra incendios;"

y se modifica como corresponda la numeración de los párrafos restantes.

ANEXO 3

**RESOLUCIÓN MSC.421(98)
(adoptada el 15 de junio de 2017)**

**ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO TAMBIÉN el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar, 1974 ("el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, con excepción de las disposiciones del capítulo I,

HABIENDO EXAMINADO, en su 98º periodo de sesiones, las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del Convenio,

1 ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;

2 DISPONE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de julio de 2019, a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del arqueo bruto de la flota mercante mundial hayan notificado al Secretario General que recusan las enmiendas;

3 INVITA a los Gobiernos Contratantes del Convenio a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de enero de 2020, una vez aceptadas de conformidad con lo dispuesto en el párrafo 2 *supra*;

4 PIDE al Secretario General que, a los efectos del artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;

5 PIDE TAMBIÉN al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

ANEXO

CAPÍTULO II-1

CONSTRUCCIÓN – ESTRUCTURA, COMPARTIMENTADO Y ESTABILIDAD, INSTALACIONES DE MÁQUINAS E INSTALACIONES ELÉCTRICAS

PARTE A GENERALIDADES

Regla 1 – Ámbito de aplicación

1 Se añaden los siguientes nuevos párrafos 1.1.1 y 1.1.2 a continuación del párrafo 1.1 actual:

"1.1.1 Salvo disposición expresa en otro sentido, las partes B, B-1, B-2 y B-4 del presente capítulo sólo se aplicarán a los buques:

- .1 cuyo contrato de construcción se adjudique el 1 de enero de 2020 o posteriormente; o
- .2 en ausencia de un contrato de construcción, cuya quilla se coloque o cuya construcción se halle en una fase equivalente el 1 de julio de 2020 o posteriormente; o
- .3 cuya entrega tenga lugar el 1 de enero de 2024 o posteriormente.

1.1.2 Salvo disposición expresa en otro sentido, la Administración se asegurará de que los buques que no estén regidos por lo dispuesto en el párrafo 1.1.1, pero que se hayan construido el 1 de enero de 2009 o posteriormente:

- .1 cumplen las prescripciones que figuran en las partes B, B-1, B-2 y B-4 que sean aplicables en virtud del capítulo II-1 del Convenio internacional para la seguridad de la vida humana en el mar, 1974, enmendado por las resoluciones MSC.216(82), MSC.269(85) y MSC.325(90); y
- .2 cumplen las prescripciones que figuran en la regla 19-1."

2 Se suprime el párrafo 1.3.4 actual y al final del actual párrafo 1.3.3, se sustituye ";" por ".".

3 El párrafo 2 actual se sustituye por el siguiente:

"2 Salvo disposición expresa en otro sentido, la Administración se asegurará de que los buques construidos antes del 1 de enero de 2009:

- .1 cumplen las prescripciones aplicables en virtud del capítulo II-1 del Convenio internacional para la seguridad de la vida humana en el mar, 1974, enmendado por las resoluciones MSC.1(XLV), MSC.6(48), MSC.11(55), MSC.12(56), MSC.13(57), MSC.19(58), MSC.26(60), MSC.27(61), la resolución 1 de la Conferencia SOLAS de 1995, MSC.47(66), MSC.57(67), MSC.65(68), MSC.69(69), MSC.99(73), MSC.134(76), MSC.151(78) y MSC.170(79); y
- .2 cumplen las prescripciones que figuran en la regla 19-1."

RESOLUTION MSC.1(XLV)
adopted on 20 November 1981

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.1(XLV)
adopted on 20 November 1981

**ADOPTION OF AMENDMENTS TO THE
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT
SEA, 1974**

THE MARITIME SAFETY COMMITTEE,

NOTING Article VIII(b) of the International Convention for the Safety of Life at Sea, 1974, hereafter referred to as "the Convention", concerning the procedure for amending the Annex to the Convention, other than the provisions of Chapter I thereof,

NOTING FURTHER the functions which the Convention confers upon the Maritime Safety Committee for the consideration and adoption of amendments to the Convention,

HAVING CONSIDERED at its forty-fifth session amendments to the Convention proposed and circulated in accordance with Article VIII(b)(i) thereof,

1 ADOPTS in accordance with Article VIII(b)(iv) of the Convention amendments to Chapters II-1, II-2, III, IV, V and VI of the Convention, the texts of which are given in the Annex to the present resolution;

2 DETERMINES in accordance with Article VIII(b)(vi)(2)(bb) of the Convention that all of the above-mentioned amendments shall be deemed to have been accepted unless, prior to 1 March 1984, more than one third of Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than fifty per cent of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3 INVITES Contracting Governments to note that in accordance with Article VIII(b)(vii)(2) of the Convention the amendments, upon their acceptance in accordance with paragraph 2 above, shall enter into force on 1 September 1984;

4 REQUESTS the Secretary-General in conformity with Article VIII(b)(v) of the Convention to transmit certified copies of the present resolution and the texts of the amendments contained in the Annex to all Contracting Governments to the International Convention for the Safety of Life at Sea, 1974;

5 FURTHER REQUESTS the Secretary-General to transmit copies of the resolution and its Annex to Members of the Organization which are not Contracting Governments to the Convention.

At its forty-fifth session held in November 1981, the Maritime Safety Committee adopted certain amendments to the International Convention for the Safety of Life at Sea, 1974 (SOLAS) in accordance with the procedure specified in Article VIII(b)(iv). Forty-one Contracting Governments to the 1974 SOLAS Convention were present at the session and the texts of the amendments to that Convention were all adopted unanimously.

ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR
THE SAFETY OF LIFE AT SEA, 1974

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CHAPTER II-1

CONSTRUCTION – SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

The existing text of Chapter II-1 is replaced by the following:

PART A – GENERAL

Regulation 1

Application

1.1 Unless expressly provided otherwise, this Chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 September 1984.

1.2 For the purpose of this Chapter, the term “a similar stage of construction” means the stage at which:

- .1 construction identifiable with a specific ship begins; and
- .2 assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is less.

1.3 For the purpose of this Chapter:

- .1 the expression “ships constructed” means “ships the keels of which are laid or which are at a similar stage of construction”;
- .2 the expression “all ships” means “ships constructed before, on or after 1 September 1984”;
- .3 a cargo ship, whenever built, which is converted to a passenger ship shall be treated as a passenger ship constructed on the date on which such a conversion commences.

2 Unless expressly provided otherwise:

- .1 for ships constructed before 1 September 1984, the Administration shall ensure that subject to the provisions of paragraph 2.2 the requirements which are applicable under Chapter II-1 of the International Convention for the Safety of Life at Sea, 1974*, to new or existing ships as defined in that Chapter are complied with;

* The text as adopted by the International Conference on Safety of Life at Sea, 1974.

- .2 for tankers constructed before 1 September 1984, the Administration shall ensure that the requirements which are applicable under Chapter II-1 of the Annex to the Protocol of 1978 relating to the International Convention for the Safety of Life at Sea, 1974, as amended in 1981 to new or existing ships as defined in that Chapter are complied with.

3 All ships which undergo repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to these ships. Such ships if constructed before 1 September 1984 shall, as a rule, comply with the requirements for ships constructed on or after that date to at least the same extent as they did before undergoing such repairs, alterations, modifications or outfitting. Repairs, alterations and modifications of a major character and outfitting related thereto shall meet the requirements for ships constructed on or after 1 September 1984 in so far as the Administration deems reasonable and practicable.

4 The Administration of a State may, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of this Chapter unreasonable or unnecessary, exempt from those requirements individual ships or classes of ships entitled to fly the flag of that State which, in the course of their voyage, do not proceed more than 20 miles from the nearest land.

5 Any passenger ship which is permitted under Regulation III/27(c) to carry a number of persons in excess of the lifeboat capacity provided, shall comply with the special standards of subdivision set out in Regulation 6.5, and the associated special provisions regarding permeability in Regulation 5.4, unless the Administration is satisfied that, having regard to the nature and conditions of the voyage, compliance with the other provisions of the Regulations of this Chapter and Chapter II-2 is sufficient.

6 In the case of passenger ships which are employed in special trades for the carriage of large numbers of special trade passengers, such as the pilgrim trade, the Administration of the State whose flag such ships are entitled to fly, if satisfied that it is impracticable to enforce compliance with the requirements of this Chapter, may exempt such ships from those requirements, provided that they comply fully with the provisions of:

- .1 the Rules annexed to the Special Trade Passenger Ships Agreement, 1971; and
- .2 the Rules annexed to the Protocol on Space Requirements for Special Trade Passenger Ships, 1973.

Regulation 2

Definitions

For the purpose of this Chapter, unless expressly provided otherwise:

1.1 "Subdivision load line" is a water-line used in determining the subdivision of the ship.

1.2 "Deepest subdivision load line" is the water-line which corresponds to the greatest draught permitted by the subdivision requirements which are applicable.

2 "Length of the ship" is the length measured between perpendiculars taken at the extremities of the deepest subdivision load line.

3 "Breadth of the ship" is the extreme width from outside of frame to outside of frame at or below the deepest subdivision load line.

4 "Draught" is the vertical distance from the moulded base line amidships to the subdivision load line in question.

5 "Bulkhead deck" is the uppermost deck up to which the transverse watertight bulkheads are carried.

6 "Margin line" is a line drawn at least 76 mm below the upper surface of the bulkhead deck at side.

7 "Permeability of a space" is the percentage of that space which can be occupied by water. The volume of a space which extends above the margin line shall be measured only to the height of that line.

8 "Machinery space" is to be taken as extending from the moulded base line to the margin line and between the extreme main transverse watertight bulkheads, bounding the spaces containing the main and auxiliary propulsion machinery, boilers serving the needs of propulsion, and all permanent coal bunkers. In the case of unusual arrangements, the Administration may define the limits of the machinery spaces.

9 "Passenger spaces" are those spaces which are provided for the accommodation and use of passengers, excluding baggage, store, provision and mail rooms. For the purposes of Regulations 5 and 6, spaces provided below the margin line for the accommodation and use of the crew shall be regarded as passenger spaces.

10 In all cases volumes and areas shall be calculated to moulded lines.

11 "Weathertight" means that in any sea conditions water will not penetrate into the ship.

Regulation 3

Definitions relating to Parts C, D and E

For the purpose of Parts C, D and E, unless expressly provided otherwise:

1 "Steering gear control system" is the equipment by which orders are transmitted from the navigating bridge to the steering gear power units. Steering gear control systems comprise transmitters, receivers, hydraulic control pumps and their associated motors, motor controllers, piping and cables.

2 “Main steering gear” is the machinery, rudder actuators, steering gear power units, if any, and ancillary equipment and the means of applying torque to the rudder stock (e.g. tiller or quadrant) necessary for effecting movement of the rudder for the purpose of steering the ship under normal service conditions.

3 “Steering gear power unit” is:

- .1 in the case of electric steering gear, an electric motor and its associated electrical equipment;
- .2 in the case of electrohydraulic steering gear, an electric motor and its associated electrical equipment and connected pump;
- .3 in the case of other hydraulic steering gear, a driving engine and connected pump.

4 “Auxiliary steering gear” is the equipment other than any part of the main steering gear necessary to steer the ship in the event of failure of the main steering gear but not including the tiller, quadrant or components serving the same purpose.

5 “Normal operational and habitable condition” is a condition under which the ship as a whole, the machinery, services, means and aids ensuring propulsion, ability to steer, safe navigation, fire and flooding safety, internal and external communications and signals, means of escape, and emergency boat winches, as well as the designed comfortable conditions of habitability are in working order and functioning normally.

6 “Emergency condition” is a condition under which any services needed for normal operational and habitable conditions are not in working order due to failure of the main source of electrical power.

7 “Main source of electrical power” is a source intended to supply electrical power to the main switchboard for distribution to all services necessary for maintaining the ship in normal operational and habitable conditions.

8 “Dead ship condition” is the condition under which the main propulsion plant, boilers and auxiliaries are not in operation due to the absence of power.

9 “Main generating station” is the space in which the main source of electrical power is situated.

10 “Main switchboard” is a switchboard which is directly supplied by the main source of electrical power and is intended to distribute electrical energy to the ship’s services.

11 “Emergency switchboard” is a switchboard which in the event of failure of the main electrical power supply system is directly supplied by the emergency source of electrical power or the transitional source of emergency power and is intended to distribute electrical energy to the emergency services.

12 "Emergency source of electrical power" is a source of electrical power, intended to supply the emergency switchboard in the event of failure of the supply from the main source of electrical power.

13 "Power actuating system" is the hydraulic equipment provided for supplying power to turn the rudder stock, comprising a steering gear power unit or units, together with the associated pipes and fittings, and a rudder actuator. The power actuating systems may share common mechanical components, i.e., tiller, quadrant and rudder stock, or components serving the same purpose.

14 "Maximum ahead service speed" is the greatest speed which the ship is designed to maintain in service at sea at the deepest sea-going draught.

15 "Maximum astern speed" is the speed which it is estimated the ship can attain at the designed maximum astern power at the deepest sea-going draught.

16 "Machinery spaces" are all machinery spaces of category A and all other spaces containing propelling machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces.

17 "Machinery spaces of category A" are those spaces and trunks to such spaces which contain:

- .1 internal combustion machinery used for main propulsion; or
- .2 internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW; or
- .3 any oil-fired boiler or oil fuel unit.

18 "Control stations" are those spaces in which the ship's radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralized.

19 "Chemical tanker" is a cargo ship constructed or adapted and used for the carriage in bulk of any liquid product listed in the summary of minimum requirements of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk to be adopted by the Maritime Safety Committee under the authority of the Assembly of the Organization conferred by resolution A.490(XII), hereinafter referred to as "Bulk Chemical Code", as may be amended by the Organization, or any liquid substance listed or provisionally assessed as category A, B or C in Appendix II to Annex II of the International Convention for the Prevention of Pollution from Ships in force.

20 "Gas carrier" is a cargo ship constructed or adapted and used for the carriage in bulk of any liquefied gas or other substance listed in Chapter XIX of the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Assembly of the Organization by resolution

A.328(IX), hereinafter referred to as "Gas Carrier Code" as has been or may be amended by the Organization.

21 "Deadweight" is the difference in tonnes between the displacement of a ship in water of a specific gravity of 1.025 at the load water-line corresponding to the assigned summer freeboard and the lightweight of the ship.

22 "Lightweight" is the displacement of a ship in tonnes without cargo, fuel, lubricating oil, ballast water, fresh water and feedwater in tanks, consumable stores, and passengers and crew and their effects.

PART B – SUBDIVISION AND STABILITY*

(Part B applies to passenger ships and to cargo ships, as indicated in the regulations)

Regulation 4

Floodable length in passenger ships

1 The floodable length at any point of the length of a ship shall be determined by a method of calculation which takes into consideration the form, draught and other characteristics of the ship in question.

2 In a ship with a continuous bulkhead deck, the floodable length at a given point is the maximum portion of the length of the ship, having its centre at the point in question, which can be flooded under the definite assumptions set forth in Regulation 5 without the ship being submerged beyond the margin line.

3.1 In the case of a ship not having a continuous bulkhead deck, the floodable length at any point may be determined to an assumed continuous margin line which at no point is less than 76 mm below the top of the deck (at side) to which the bulkheads concerned and the shell are carried watertight.

3.2 Where a portion of an assumed margin line is appreciably below the deck to which bulkheads are carried, the Administration may permit a limited relaxation in the watertightness of those portions of the bulkheads which are above the margin line and immediately under the higher deck.

* Instead of the requirements in this Part, the Regulations on Subdivision and Stability of Passenger Ships as an Equivalent to Part B of Chapter II of the International Convention for the Safety of Life at Sea, 1960, adopted by the Organization by resolution A.265(VIII), may be used, if applied in their entirety.

Regulation 5

Permeability in passenger ships

1.1 The definite assumptions referred to in Regulation 4 relate to the permeabilities of the spaces below the margin line.

1.2 In determining the floodable length, a uniform average permeability shall be used throughout the whole length of each of the following portions of the ship below the margin line:

- .1 the machinery space as defined in Regulation 2;
- .2 the portion forward of the machinery space; and
- .3 the portion abaft the machinery space.

2.1 The uniform average permeability throughout the machinery space shall be determined from the formula:

$$85 + 10 \left(\frac{a - c}{v} \right)$$

where:

a = the volume of the passenger spaces, as defined in Regulation 2, which are situated below the margin line within the limits of the machinery space;

c = the volume of between deck spaces below the margin line within the limits of the machinery space which are appropriated to cargo, coal or stores;

v = the whole volume of the machinery space below the margin line.

2.2 Where it is shown to the satisfaction of the Administration that the average permeability as determined by detailed calculation is less than that given by the formula, the detailed calculated value may be used. For the purpose of such calculation, the permeability of passenger spaces, as defined in Regulation 2, shall be taken as 95, that of all cargo, coal and store spaces as 60, and that of double bottom, oil fuel and other tanks at such value as may be approved in each case.

3 Except as provided in paragraph 4, the uniform average permeability throughout the portion of the ship forward of or abaft the machinery space shall be determined from the formula:

$$63 + 35 \frac{a}{v}$$

where:

a = the volume of the passenger spaces, as defined in Regulation 2, which are situated below the margin line, forward of or abaft the machinery space; and

v = the whole volume of the portion of the ship below the margin line forward of or abaft the machinery space.

4.1 In the case of a ship which is permitted under Regulation III/27(c) to carry a number of persons on board in excess of the lifeboat capacity provided, and is required under Regulation 1.5 to comply with special provisions, the uniform average permeability throughout the portion of the ship forward of or abaft the machinery space shall be determined from the formula:

$$95 - 35 \frac{b}{v}$$

where:

- b = the volume of the spaces below the margin line and above the tops of floors, inner bottom, or peak tanks, as the case may be, which are appropriated to and used as cargo spaces, coal or oil fuel bunkers, store-rooms, baggage and mail rooms, chain lockers and fresh water tanks, forward of or abaft the machinery space; and
- v = the whole volume of the portion of the ship below the margin line forward of or abaft the machinery space.

4.2 In the case of ships engaged on services where the cargo holds are not generally occupied by any substantial quantities of cargo, no part of the cargo spaces is to be included in calculating "b".

5 In the case of unusual arrangements the Administration may allow, or require, a detailed calculation of average permeability for the portions forward of or abaft the machinery space. For the purpose of such calculation, the permeability of passenger spaces as defined in Regulation 2 shall be taken as 95, that of spaces containing machinery as 85, that of all cargo, coal and store spaces as 60, and that of double bottom, oil fuel and other tanks at such value as may be approved in each case.

6 Where a between deck compartment between two watertight transverse bulkheads contains any passenger or crew space, the whole of that compartment, less any space completely enclosed within permanent steel bulkheads and appropriated to other purposes, shall be regarded as passenger space. Where, however, the passenger or crew space in question is completely enclosed within permanent steel bulkheads, only the space so enclosed need be considered as passenger space.

Regulation 6

Permissible length of compartments in passenger ships

1 Ships shall be as efficiently subdivided as is possible having regard to the nature of the service for which they are intended. The degree of subdivision shall vary with the length of the ship and with the service, in such manner that the highest degree of subdivision corresponds with the ships of greatest length, primarily engaged in the carriage of passengers.

2 Factor of subdivision

2.1 The maximum permissible length of a compartment having its centre at any point in the ship's length is obtained from the floodable length by multiplying the latter by an appropriate factor called the factor of subdivision.

2.2 The factor of subdivision shall depend on the length of the ship, and for a given length shall vary according to the nature of the seervice for which the ship is intended. It shall decrease in a regular and continuous manner:

- .1 as the length of the ship increases, and
- .2 from a factor A, applicable to ships primarily engaged in the carriage of cargo, to a factor B, applicable to ships primarily engaged in the carriage of passengers.

2.3 The variations of the factors A and B shall be expressed by the following formulae (1) and (2) where L is the length of the ship as defined in Regulation 2:

$$A = \frac{58.2}{L-60} + .18 \text{ (L = 131 m and upwards)} \dots\dots\dots (1)$$

$$B = \frac{30.3}{L-42} + .18 \text{ (L = 79 m and upwards)} \dots\dots\dots (2)$$

3. Criterion of service

3.1 For a ship of given length the appropriate factor of subdivision shall be determined by the criterion of service numeral (hereinafter called the criterion numeral) as given by the following formulae (3) and (4) where:

- C_s = the criterion numeral;
- L = the length of the ship (metres), as defined in Regulation 2;
- M = the volume of the machinery space (cubic metres), as defined in Regulation 2; with the addition thereto of the volume of any permanent oil fuel bunkers which may be situated above the inner bottom and forward of or abaft the machinery space;
- P = the whole volume of the passenger spaces below the margin line (cubic metres), as defined in Regulation 2;
- V = the whole volume of the ship below the margin line (cubic metres);
- P_1 = KN where:
 - N = the number of passengers for which the ship is to be certified, and
 - K = 0.056L

3.2 Where the value of KN is greater than the sum of P and the whole volume of the actual passenger spaces above the margin line, the figure to be taken as P_1 is that sum or two-thirds KN, whichever is the greater.

When P_1 is greater than P -

$$C_s = 72 \frac{M + 2P_1}{V + P_1 - P} \dots\dots\dots (3)$$

and in other cases -

$$C_s = 72 \frac{M + 2P}{V} \dots\dots\dots (4)$$

3.3 For ships not having a continuous bulkhead deck the volumes are to be taken up to the actual margin lines used in determining the floodable lengths.

4 *Rules for subdivision of ships other than those covered by paragraph 5*

4.1 The subdivision abaft the forepeak of ships of 131 m in length and upwards having a criterion numeral of 23 or less shall be governed by the factor A given by formula (1); of those having a criterion numeral of 123 or more by the factor B given by formula (2); and of those having a criterion numeral between 23 and 123 by the factor F obtained by linear interpolation between the factors A and B, using the formula:

$$F = A - \frac{(A - B)(C_s - 23)}{100} \dots\dots\dots (5)$$

Nevertheless, where the criterion numeral is equal to 45 or more and simultaneously the computed factor of subdivision as given by formula (5) is .65 or less, but more than .50, the subdivision abaft the forepeak shall be governed by the factor .50.

4.2 Where the factor F is less than .40 and it is shown to the satisfaction of the Administration to be impracticable to comply with the factor F in a machinery compartment of the ship, the subdivision of such compartment may be governed by an increased factor, which, however, shall not exceed .40.

4.3 The subdivision abaft the forepeak of ships of less than 131 m but not less than 79 m in length having a criterion numeral equal to S, where:

$$S = \frac{3,574 - 25L}{13}$$

shall be governed by the factor unity; of those having a criterion numeral of 123 or more by the factor B given by the formula (2); of those having a criterion numeral between S and 123 by the factor F obtained by linear interpolation between unity and the factor B using the formula:

$$F = 1 - \frac{(1 - B)(C_s - S)}{123 - S} \dots\dots\dots (6)$$

4.4 The subdivision abaft the forepeak of ships of less than 131 m but not less than 79 m in length and having a criterion numeral less than S, and of ships of less than 79 m in length shall be governed by the factor unity, unless, in either case, it is shown to the satisfaction of the Administration to be

impracticable to comply with this factor in any part of the ship, in which case the Administration may allow such relaxation as may appear to be justified, having regard to all the circumstances.

4.5 The provisions of paragraph 4.4 shall apply also to ships of whatever length, which are to be certified to carry a number of passengers exceeding 12 but not exceeding –

$$\frac{L^2}{650}, \text{ or } 50, \text{ whichever is the less.}$$

5 *Special standards of subdivision for ships which are permitted under Regulation III/27(c) to carry a number of persons on board in excess of the lifeboat capacity provided and are required under Regulation 1.5 to comply with special provisions*

5.1.1 In the case of ships primarily engaged in the carriage of passengers, the subdivision abaft the forepeak shall be governed by a factor of .50 or by the factor determined according to paragraphs 3 and 4, if less than .50.

5.1.2 In the case of such ships of less than 91.5 m in length, if the Administration is satisfied that compliance with such factor would be impracticable in a compartment, it may allow the length of that compartment to be governed by a higher factor provided the factor used is the lowest that is practicable and reasonable in the circumstances.

5.2 Where, in the case of any ship whether of less than 91.5 m or not, the necessity of carrying appreciable quantities of cargo makes it impracticable to require the subdivision abaft the forepeak to be governed by a factor not exceeding .50, the standard of subdivision to be applied shall be determined in accordance with the following sub-paragraphs .1 to .5, subject to the condition that where the Administration is satisfied that insistence on strict compliance in any respect would be unreasonable, it may allow such alternative arrangement of the watertight bulkheads as appears to be justified on merits and will not diminish the general effectiveness of the subdivision.

- .1 The provisions of paragraph 3 relating to the criterion numeral shall apply with the exception that in calculating the value of P_1 for berthed passengers K is to have the value defined in paragraph 3, or 3.5 m^3 , whichever is the greater, and for unberthed passengers K is to have the value 3.5 m^3 .
- .2 The factor B in paragraph 2 shall be replaced by the factor BB determined by the following formula:

$$BB = \frac{17.6}{L - 33} + .20 \text{ (} L = 55 \text{ m and upwards)}$$

- .3 The subdivision abaft the forepeak of ships of 131 m in length and upwards having a criterion numeral of 23 or less shall be governed by the factor A given by formula (1) in paragraph 2.3; of those having a criterion numeral of 123 or more by the factor BB given by the formula in paragraph 5.2.2; and of those having a criterion numeral between 23 and 123 by the factor F obtained by linear

interpolation between the factors A and BB, using the formula:

$$F = A - \frac{(A - BB)(C_s - 23)}{100}$$

except that if the factor F so obtained is less than .50 the factor to be used shall be either .50 or the factor calculated according to the provisions of paragraph 4.1, whichever is the smaller.

- .4 The subdivision abaft the forepeak of ships of less than 131 m but not less than 55 m in length having a criterion numeral equal to S_1 where -

$$S_1 = \frac{3,712 - 25L}{19}$$

shall be governed by the factor unity; of those having a criterion numeral of 123 or more by the factor BB given by the formula in paragraph 5.2.2; of those having a criterion numeral between S_1 and 123 by the factor F obtained by linear interpolation between unity and the factor BB using the formula:

$$F = 1 - \frac{(1 - BB)(C_s - S_1)}{123 - S_1}$$

except that in either of the two latter cases if the factor so obtained is less than .50 the subdivision may be governed by a factor not exceeding .50.

- .5 The subdivision abaft the forepeak of ships of less than 131 m but not less than 55 m in length and having a criterion numeral less than S_1 and of ships of less than 55 m in length shall be governed by the factor unity, unless it is shown to the satisfaction of the Administration to be impracticable to comply with this factor in particular compartments, in which event the Administration may allow such relaxations in respect of those compartments as appear to be justified, having regard to all the circumstances, provided that the aftermost compartment and as many as possible of the forward compartments (between the forepeak and the after end of the machinery space) shall be kept within the floodable length.

Regulation 7

Special requirements concerning passenger ship subdivision

1 Where in a portion or portions of a ship the watertight bulkheads are carried to a higher deck than in the remainder of the ship and it is desired to take advantage of this higher extension of the bulkheads in calculating the floodable length, separate margin lines may be used for each such portion of the ship provided that:

- .1 the sides of the ship are extended throughout the ship's length to the deck corresponding to the upper margin line and all openings in the

shell plating below this deck throughout the length of the ship are treated as being below a margin line, for the purposes of Regulation 17; and

- .2 the two compartments adjacent to the "step" in the bulkhead deck are each within the permissible length corresponding to their respective margin lines, and, in addition, their combined length does not exceed twice the permissible length based on the lower margin line.

2.1 A compartment may exceed the permissible length determined by the rules of Regulation 6 provided the combined length of each pair of adjacent compartments to which the compartment in question is common does not exceed either the floodable length or twice the permissible length, whichever is the less.

2.2 If one of the two adjacent compartments is situated inside the machinery space, and the second is situated outside the machinery space, and the average permeability of the portion of the ship in which the second is situated differs from that of the machinery space, the combined length of the two compartments shall be adjusted to the mean average permeability of the two portions of the ship in which the compartments are situated.

2.3 Where the two adjacent compartments have different factors of subdivision, the combined length of the two compartments shall be determined proportionately.

3 In ships of 100 m in length and upwards, one of the main transverse bulkheads abaft the forepeak shall be fitted at a distance from the forward perpendicular which is not greater than the permissible length.

4 A main transverse bulkhead may be recessed provided that all parts of the recess lie inboard of vertical surfaces on both sides of the ship, situated at a distance from the shell plating equal to one-fifth the breadth of the ship, as defined in Regulation 2, and measured at right angles to the centre line at the level of the deepest subdivision load line. Any part of a recess which lies outside these limits shall be dealt with as a step in accordance with paragraph 5.

5 A main transverse bulkhead may be stepped provided that it meets one of the following conditions:

- .1 the combined length of the two compartments, separated by the bulkhead in question, does not exceed either 90 per cent of the floodable length or twice the permissible length, except that, in ships having a factor of subdivision greater than .9, the combined length of the two compartments in question shall not exceed the permissible length;
- .2 additional subdivision is provided in way of the step to maintain the same measure of safety as that secured by a plane bulkhead;
- .3 the compartment over which the step extends does not exceed the permissible length corresponding to a margin line taken 76 mm below the step.

6 Where a main transverse bulkhead is recessed or stepped, an equivalent plane bulkhead shall be used in determining the subdivision.

7 If the distance between two adjacent main transverse bulkheads, or their equivalent plane bulkheads, or the distance between the transverse planes passing through the nearest stepped portions of the bulkheads, is less than 3.0 m plus 3 per cent of the length of the ship, or 11.0 m whichever is the less, only one of these bulkheads shall be regarded as forming part of the subdivision of the ship in accordance with the provisions of Regulation 6.

8 Where a main transverse watertight compartment contains local subdivision and it can be shown to the satisfaction of the Administration that, after any assumed side damage extending over a length of 3.0 m plus 3 per cent of the length of the ship, or 11.0 m whichever is the less, the whole volume of the main compartment will not be flooded, a proportionate allowance may be made in the permissible length otherwise required for such compartment. In such a case the volume of effective buoyancy assumed on the undamaged side shall not be greater than that assumed on the damaged side.

9 Where the required factor of subdivision is .50 or less, the combined length of any two adjacent compartments shall not exceed the floodable length.

Regulation 8

Stability of passenger ships in damaged condition

1.1 Sufficient intact stability shall be provided in all service conditions so as to enable the ship to withstand the final stage of flooding of any one main compartment which is required to be within the floodable length.

1.2 Where two adjacent main compartments are separated by a bulkhead which is stepped under the conditions of Regulation 7.5.1 the intact stability shall be adequate to withstand the flooding of those two adjacent main compartments.

1.3 Where the required factor of subdivision is .50 or less but more than .33 intact stability shall be adequate to withstand the flooding of any two adjacent main compartments.

1.4 Where the required factor of subdivision is .33 or less the intact stability shall be adequate to withstand the flooding of any three adjacent main compartments.

2.1 The requirements of paragraph 1 shall be determined by calculations which are in accordance with paragraphs 3, 4 and 6 and which take into consideration the proportions and design characteristics of the ship and the arrangement and configuration of the damaged compartments. In making these calculations the ship is to be assumed in the worst anticipated service condition as regards stability.

2.2 Where it is proposed to fit decks, inner skins or longitudinal bulkheads of sufficient tightness to seriously restrict the flow of water, the Administration shall be satisfied that proper consideration is given to such restrictions in the calculations.

2.3 In cases where the Administration considers the range of stability in the damaged condition to be doubtful, it may require investigation thereof.

3 For the purpose of making damage stability calculations the volume and surface permeabilities shall be in general as follows:

Spaces	Permeability
Appropriated to cargo, coal or stores	60
Occupied by accommodation	95
Occupied by machinery	85
Intended for liquids	0 or 95*

* Whichever results in the more severe requirements.

Higher surface permeabilities are to be assumed in respect of spaces which, in the vicinity of the damage waterplane, contain no substantial quantity of accommodation or machinery and spaces which are not generally occupied by any substantial quantity of cargo or stores.

4 Assumed extent of damage shall be as follows:

- .1 longitudinal extent: 3.0 m plus 3 per cent of the length of the ship, or 11.0 m whichever is the less. Where the required factor of subdivision is .33 or less the assumed longitudinal extent of damage shall be increased as necessary so as to include any two consecutive main transverse watertight bulkheads;
- .2 transverse extent (measured inboard from the ship's side, at right angles to the centre line at the level of the deepest subdivision load line): a distance of one-fifth of the breadth of the ship, as defined in Regulation 2; and
- .3 vertical extent: from the base line upwards without limit;
- .4 if any damage of lesser extent than that indicated in paragraphs 4.1, 4.2 and 4.3 would result in a more severe condition regarding heel or loss of metacentric height, such damage shall be assumed in the calculations.

5 Unsymmetrical flooding is to be kept to a minimum consistent with efficient arrangements. Where it is necessary to correct large angles of heel, the means adopted shall, where practicable, be self-acting, but in any case where controls to cross-flooding fittings are provided they shall be operable from above the bulkhead deck. These fittings together with their controls as well as the maximum heel before equalization shall be acceptable to the Administration. Where cross-flooding fittings are required the time for equalization shall not exceed 15 minutes. Suitable information concerning the use of cross-flooding fittings shall be supplied to the master of the ship.*

* Reference is made to the Recommendation on a Standard Method for Establishing Compliance with the Requirements for Cross-Flooding Arrangements in Passenger Ships, adopted by the Organization by resolution A.266(VIII).

6 The final conditions of the ship after damage and, in the case of unsymmetrical flooding, after equalization measures have been taken shall be as follows:

- .1 in the case of symmetrical flooding there shall be a positive residual metacentric height of at least 50 mm as calculated by the constant displacement method;
- .2 in the case of unsymmetrical flooding the total heel shall not exceed 7°, except that, in special cases, the Administration may allow additional heel due to the unsymmetrical moment, but in no case shall the final heel exceed 15°;
- .3 in no case shall the margin line be submerged in the final stage of flooding. If it is considered that the margin line may become submerged during an intermediate stage of flooding, the Administration may require such investigations and arrangements as it considers necessary for the safety of the ship.

7 The master of the ship shall be supplied with the data necessary to maintain sufficient intact stability under service conditions to enable the ship to withstand the critical damage. In the case of ships requiring cross-flooding the master of the ship shall be informed of the conditions of stability on which the calculations of heel are based and be warned that excessive heeling might result should the ship sustain damage when in a less favourable condition.

8.1 No relaxation from the requirements for damage stability may be considered by the Administration unless it is shown that the intact metacentric height in any service condition necessary to meet these requirements is excessive for the service intended.

8.2 Relaxations from the requirements for damage stability shall be permitted only in exceptional cases and subject to the condition that the Administration is to be satisfied that the proportions, arrangements and other characteristics of the ship are the most favourable to stability after damage which can practically and reasonably be adopted in the particular circumstances.

Regulation 9

Ballasting of passenger ships

1 Water ballast should not in general be carried in tanks intended for oil fuel. In ships in which it is not practicable to avoid putting water in oil fuel tanks, oily-water separating equipment to the satisfaction of the Administration shall be fitted, or other alternative means, such as discharge to shore facilities, acceptable to the Administration shall be provided for disposing of the oily-water ballast.

2 The provisions of this Regulation are without prejudice to the provisions of the International Convention for the Prevention of Pollution from Ships in force.

Regulation 10

Peak and machinery space bulkheads, shaft tunnels, etc. in passenger ships

1 A forepeak or collision bulkhead shall be fitted which shall be watertight up to the bulkhead deck. This bulkhead shall be located at a distance from the forward perpendicular of not less than 5 per cent of the length of the ship and not more than 3 m plus 5 per cent of the length of the ship.

2 Where any part of the ship below the water-line extends forward of the forward perpendicular, e.g. a bulbous bow, the distances stipulated in paragraph 1 shall be measured from a point either:

- .1 at the mid-length of such extension; or
- .2 at a distance 1.5 per cent of the length of the ship forward of the forward perpendicular; or
- .3 at a distance 3 m forward of the forward perpendicular;

whichever gives the smallest measurement.

3 Where a long forward superstructure is fitted, the forepeak or collision bulkhead shall be extended weathertight to the deck next above the bulkhead deck. The extension need not be fitted directly above the bulkhead below provided it is located within the limits specified in paragraph 1 or 2 with the exemption permitted by paragraph 4 and the part of the deck which forms the step is made effectively weathertight.

4 Where bow doors are fitted and a sloping loading ramp forms part of the extension of the collision bulkhead above the bulkhead deck the part of the ramp which is more than 2.3 m above the bulkhead deck may extend forward of the limit specified in paragraphs 1 and 2. The ramp shall be weathertight over its complete length.

5 An afterpeak bulkhead, and bulkheads dividing the machinery space, as defined in Regulation 2, from the cargo and passenger spaces forward and aft, shall also be fitted and made watertight up to the bulkhead deck. The afterpeak bulkhead may, however, be stepped below the bulkhead deck, provided the degree of safety of the ship as regards subdivision is not thereby diminished.

6 In all cases stern tubes shall be enclosed in watertight spaces of moderate volume. The stern gland shall be situated in a watertight shaft tunnel or other watertight space separate from the stern tube compartment and of such volume that, if flooded by leakage through the stern gland, the margin line will not be submerged.

Regulation 11

Collision bulkheads in cargo ships

1 For the purpose of this Regulation "freeboard deck", "length of ship" and "forward perpendicular" have the meanings as defined in the International Convention on Load Lines in force.

2 A collision bulkhead shall be fitted which shall be watertight up to the freeboard deck. This bulkhead shall be located at a distance from the forward perpendicular of not less than 5 per cent of the length of the ship or 10 m, whichever is the less, and, except as may be permitted by the Administration, not more than 8 per cent of the length of the ship.

3 Where any part of the ship below the water-line extends forward of the forward perpendicular, e.g. a bulbous bow, the distances stipulated in paragraph 2 shall be measured from a point either:

- .1 at the mid-length of such extension; or
- .2 at a distance 1.5 per cent of the length of the ship forward of the forward perpendicular; or
- .3 at a distance 3 m forward of the forward perpendicular;

whichever gives the smallest measurement.

4 The bulkhead may have steps or recesses provided they are within the limits prescribed in paragraph 2 or 3. Pipes piercing the collision bulkhead shall be fitted with suitable valves operable from above the freeboard deck and the valve chest shall be secured at the bulkhead inside the forepeak. The valves may be fitted on the after side of the collision bulkhead provided that the valves are readily accessible under all service conditions and the space in which they are located is not a cargo space. All valves shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable. No door, manhole, ventilation duct or any other opening shall be fitted in this bulkhead.

5 Where a long forward superstructure is fitted the collision bulkhead shall be extended weathertight to the deck next above the freeboard deck. The extension need not be fitted directly above the bulkhead below provided it is located within the limits prescribed in paragraph 2 or 3 with the exemption permitted by paragraph 6 and the part of the deck which forms the step is made effectively weathertight.

6 Where bow doors are fitted and a sloping loading ramp forms part of the extension of the collision bulkhead above the freeboard deck the part of the ramp which is more than 2.3 m above the freeboard deck may extend forward of the limit specified in paragraph 2 or 3. The ramp shall be weathertight over its complete length.

7 The number of openings in the extension of the collision bulkhead above the freeboard deck shall be restricted to the minimum compatible with the design and normal operation of the ship. All such openings shall be capable of being closed weathertight.

Regulation 12

Double bottoms in passenger ships

1 A double bottom shall be fitted extending from the forepeak bulkhead to the afterpeak bulkhead as far as this is practicable and compatible with the design and proper working of the ship.

- .1 In ships of 50 m and upwards but less than 61 m in length a double bottom shall be fitted at least from the machinery space to the forepeak bulkhead, or as near thereto as practicable.
- .2 In ships of 61 m and upwards but less than 76 m in length a double bottom shall be fitted at least outside the machinery space, and shall extend to the fore and after peak bulkheads, or as near thereto as practicable.
- .3 In ships of 76 m in length and upwards, a double bottom shall be fitted amidships, and shall extend to the fore and after peak bulkheads, or as near thereto as practicable.

2 Where a double bottom is required to be fitted its depth shall be to the satisfaction of the Administration and the inner bottom shall be continued out to the ship's sides in such a manner as to protect the bottom to the turn of the bilge. Such protection will be deemed satisfactory if the line of intersection of the outer edge of the margin plate with the bilge plating is not lower at any part than a horizontal plane passing through the point of intersection with the frame line amidships of a transverse diagonal line inclined at 25° to the base line and cutting it at a point one-half the ship's moulded breadth from the middle line.

3 Small wells constructed in the double bottom in connexion with drainage arrangements of holds, etc., shall not extend downwards more than necessary. The depth of the well shall in no case be more than the depth less 460 mm of the double bottom at the centre line, nor shall the well extend below the horizontal plane referred to in paragraph 2. A well extending to the outer bottom is, however, permitted at the after end of the shaft tunnel. Other wells (e.g., for lubricating oil under main engines) may be permitted by the Administration if satisfied that the arrangements give protection equivalent to that afforded by a double bottom complying with this Regulation.

4 A double bottom need not be fitted in way of watertight compartments of moderate size used exclusively for the carriage of liquids, provided the safety of the ship, in the event of bottom or side damage, is not, in the opinion of the Administration, thereby impaired.

5 In the case of ships to which the provisions of Regulation 1.5 apply and which are engaged on regular service within the limits of a short international voyage as defined in Regulation III/2, the Administration may permit a double bottom to be dispensed with in any part of the ship which is subdivided by a factor not exceeding .50, if satisfied that the fitting of a double bottom in that part would not be compatible with the design and proper working of the ship.

Regulation 13

Assigning, marking and recording of subdivision load lines for passenger ships

1 In order that the required degree of subdivision shall be maintained, a load line corresponding to the approved subdivision draught shall be assigned and marked on the ship's sides. A ship having spaces which are specially adapted for the accommodation of passengers and the carriage of cargo alternatively may, if the owners desire, have one or more additional load lines assigned and marked to correspond with the subdivision draughts which the Administration may approve for the alternative service conditions.

2 The subdivision load lines assigned and marked shall be recorded in the Passenger Ship Safety Certificate, and shall be distinguished by the notation C.1 for the principal passenger condition, and C.2, C.3, etc. for the alternative conditions.

3 The freeboard corresponding to each of these load lines shall be measured at the same position and from the same deck line as the freeboards determined in accordance with the International Convention on Load Lines in force.

4 The freeboard corresponding to each approved subdivision load line and the conditions of service for which it is approved, shall be clearly indicated on the Passenger Ship Safety Certificate.

5 In no case shall any subdivision load line mark be placed above the deepest load line in salt water as determined by the strength of the ship or the International Convention on Load Lines in force.

6 Whatever may be the position of the subdivision load line marks, a ship shall in no case be loaded so as to submerge the load line mark appropriate to the season and locality as determined in accordance with the International Convention on Load Lines in force.

7 A ship shall in no case be so loaded that when it is in salt water the subdivision load line mark appropriate to the particular voyage and condition of service is submerged.

Regulation 14

Construction and initial testing of watertight bulkheads, etc., in passenger ships and cargo ships

1 Each watertight subdivision bulkhead, whether transverse or longitudinal, shall be constructed in such a manner that it shall be capable of supporting, with a proper margin of resistance, the pressure due to the maximum head of water which it might have to sustain in the event of damage to the ship but at least the pressure due to a head of water up to the margin line. The construction of these bulkheads shall be to the satisfaction of the Administration.

2.1 Steps and recesses in bulkheads shall be watertight and as strong as the bulkhead at the place where each occurs.

2.2 Where frames or beams pass through a watertight deck or bulkhead, such deck or bulkhead shall be made structurally watertight without the use of wood or cement.

3 Testing main compartments by filling them with water is not compulsory. When testing by filling with water is not carried out, a hose test is compulsory; this test shall be carried out in the most advanced stage of the fitting out of the ship. In any case, a thorough inspection of the watertight bulkheads shall be carried out.

4 The forepeak, double bottoms (including duct keels) and inner skins shall be tested with water to a head corresponding to the requirements of paragraph 1.

5 Tanks which are intended to hold liquids, and which form part of the subdivision of the ship, shall be tested for tightness with water to a head up to the deepest subdivision load line or to a head corresponding to two-thirds of the depth from the top of keel to the margin line in way of the tanks, whichever is the greater; provided that in no case shall the test head be less than 0.9 m above the top of the tank.

6 The tests referred to in paragraphs 4 and 5 are for the purpose of ensuring that the subdivision structural arrangements are watertight and are not to be regarded as a test of the fitness of any compartment for the storage of oil fuel or for other special purposes for which a test of a superior character may be required depending on the height to which the liquid has access in the tank or its connexions.

Regulation 15

Openings in watertight bulkheads in passenger ships

1 The number of openings in watertight bulkheads shall be reduced to the minimum compatible with the design and proper working of the ship; satisfactory means shall be provided for closing these openings.

2.1 Where pipes, scuppers, electric cables, etc. are carried through watertight subdivision bulkheads, arrangements shall be made to ensure the watertight integrity of the bulkheads.

2.2 Valves not forming part of a piping system shall not be permitted in watertight subdivision bulkheads.

2.3 Lead or other heat sensitive materials shall not be used in systems which penetrate watertight subdivision bulkheads, where deterioration of such systems in the event of fire would impair the watertight integrity of the bulkheads.

- 3.1 No doors, manholes, or access openings are permitted:
- .1 in the collision bulkhead below the margin line;
 - .2 in watertight transverse bulkheads dividing a cargo space from an adjoining cargo space or from a permanent or reserve bunker, except as provided in paragraph 12 and in Regulation 16.

3.2 Except as provided in paragraph 3.3 the collision bulkhead may be pierced below the margin line by not more than one pipe for dealing with fluid in the forepeak tank, provided that the pipe is fitted with a screwdown valve capable of being operated from above the bulkhead deck, the valve chest being secured inside the forepeak to the collision bulkhead.

3.3 If the forepeak is divided to hold two different kinds of liquids the Administration may allow the collision bulkhead to be pierced below the margin line by two pipes, each of which is fitted as required by paragraph 3.2, provided the Administration is satisfied that there is no practical alternative to the fitting of such a second pipe and that, having regard to the additional subdivision provided in the forepeak, the safety of the ship is maintained.

4.1 Watertight doors fitted in bulkheads between permanent and reserve bunkers shall be always accessible, except as provided in paragraph 11.2 for between deck bunker doors.

4.2 Satisfactory arrangements shall be made by means of screens or otherwise to prevent the coal from interfering with the closing of watertight bunker doors.

5 Within spaces containing the main and auxiliary propulsion machinery including boilers serving the needs of propulsion and all permanent bunkers, not more than one door apart from the doors to bunkers and shaft tunnels may be fitted in each main transverse bulkhead. Where two or more shafts are fitted the tunnels shall be connected by an inter-communicating passage. There shall be only one door between the machinery space and the tunnel spaces where two shafts are fitted and only two doors where there are more than two shafts. All these doors shall be of the sliding type and shall be so located as to have their sills as high as practicable. The hand gear for operating these doors from above the bulkhead deck shall be situated outside the spaces containing the machinery if this is consistent with a satisfactory arrangement of the necessary gearing.

6.1 Watertight doors shall be sliding doors or hinged doors or doors of an equivalent type. Plate doors secured only by bolts and doors required to be closed by dropping or by the action of a dropping weight are not permitted.

- 6.2 Sliding doors may be either:
- Hand-operated only, or
 - power-operated as well as hand-operated.

6.3 Authorized watertight doors may therefore be divided into three classes:

Class 1 – hinged doors;

Class 2 – hand-operated sliding doors;

Class 3 – sliding doors which are power-operated as well as hand-operated.

6.4 The means of operation of any watertight door whether power-operated or not shall be capable of closing the door with the ship listed to 15° either way.

6.5 In all classes of watertight doors indicators shall be fitted which show, at all operating stations from which the doors are not visible, whether the doors are open or closed. If any of the watertight doors, of whatever class, is not fitted so as to enable it to be closed from a central control station, it shall be provided with a mechanical, electrical, telephonic, or any other suitable direct means of communication, enabling the officer of the watch promptly to contact the person who is responsible for closing the door in question, under previous orders.

7 Hinged doors (class 1) shall be fitted with quick action closing devices, such as catches, workable from each side of the bulkhead.

8 Hand-operated sliding doors (class 2) may have a horizontal or vertical motion. It shall be possible to operate the mechanism at the door itself from either side, and in addition, from an accessible position above the bulkhead deck, with an all round crank motion, or some other movement providing the same guarantee of safety and of an approved type. Departures from the requirement of operation on both sides may be allowed, if this requirement is impossible owing to the layout of the spaces. When operating a hand gear the time necessary for the complete closure of the door with the vessel upright, shall not exceed 90 seconds.

9.1 Power-operated sliding doors (class 3) may have a vertical or horizontal motion. If a door is required to be power-operated from a central control, the gearing shall be so arranged that the door can be operated by power also at the door itself from both sides. The arrangement shall be such that the door will close automatically if opened by local control after being closed from the central control, and also such that any door can be kept closed by local systems which will prevent the door from being opened from the upper control. Local control handles in connexion with the power gear shall be provided each side of the bulkhead and shall be so arranged as to enable persons passing through the doorway to hold both handles in the open position without being able to set the closing mechanism in operation accidentally. Power-operated sliding doors shall be provided with hand gear workable at the door itself on either side and from an accessible position above the bulkhead deck, with an all round crank motion or some other movement providing the same guarantee of safety and of an approved type. Provision shall be made to give warnings by sound signal that the door has begun to close and will continue to move until it is completely closed. The door shall take a sufficient time to close to ensure safety.

9.2 There shall be at least two independent power sources capable of opening and closing all the doors under control, each of them capable of operating all the doors simultaneously. The two power sources shall be controlled from the central station on the navigating bridge provided with all the necessary indicators for checking that each of the two power sources is capable of giving the required service satisfactorily.

9.3 In the case of hydraulic operation, each power source shall consist of a pump capable of closing all doors in not more than 60 seconds. In addition, there shall be for the whole installation hydraulic accumulators of sufficient capacity to operate all the doors at least three times, i.e., closed-open-closed. The fluid used shall be one which does not freeze at any of the temperatures liable to be encountered by the ship during its service.

10.1 Hinged watertight doors (class 1) in passenger, crew and working spaces are only permitted above a deck the underside of which, at its lowest point at side, is at least 2.0 m above the deepest subdivision load line.

10.2 Watertight doors, the sills of which are above the deepest load line and below the line specified in paragraph 10.1 shall be sliding doors and may be hand-operated (class 2), except in vessels engaged on short international voyages and required to have a factor of subdivision of .50 or less in which all such doors shall be power-operated. When trunkways in connexion with refrigerated cargo and ventilation or forced draught ducts are carried through more than one main watertight subdivision bulkhead, the doors at such openings shall be operated by power.

11.1 Watertight doors which may sometimes be opened at sea, and the sills of which are below the deepest subdivision load line shall be sliding doors. The following rules shall apply:

- .1 when the number of such doors (excluding doors at entrances to shaft tunnels) exceeds five, all of these doors and those at the entrance to shaft tunnels or ventilation or forced draught ducts, shall be power-operated (class 3) and shall be capable of being simultaneously closed from a central station situated on the navigating bridge;
- .2 when the number of such doors (excluding doors at entrances to shaft tunnels) is greater than one, but does not exceed five,
 - .2.1 where the ship has no passenger spaces below the bulkhead deck, all the above-mentioned doors may be hand-operated (class 2);
 - .2.2 where the ship has passenger spaces below the bulkhead deck all the above-mentioned doors shall be power-operated (class 3) and shall be capable of being simultaneously closed from a central station situated on the navigating bridge;
- .3 in any ship where there are only two such watertight doors and they are situated in the machinery space or in the bulkheads bounding such space, the Administration may allow these two doors to be hand-operated only (class 2).

11.2 If sliding watertight doors which have sometimes to be open at sea for the purpose of trimming coal are fitted between bunkers in the between decks below the bulkhead deck, these doors shall be operated by power. The opening and closing of these doors shall be recorded in such log book as may be prescribed by the Administration.

12.1 If the Administration is satisfied that such doors are essential, watertight doors of satisfactory construction may be fitted in watertight bulkheads dividing cargo between deck spaces. Such doors may be hinged, rolling or sliding doors but shall not be remotely controlled. They shall be fitted at the highest level and as far from the shell plating as practicable, but in no case shall the outboard vertical edges be situated at a distance from the shell plating which is less than one-fifth of the breadth of the ship, as defined in Regulation 2, such distance being measured at right angles to the centre line of the ship at the level of the deepest subdivision load line.

12.2 Such doors shall be closed before the voyage commences and shall be kept closed during navigation; the time of opening such doors in port and of closing them before the ship leaves port shall be entered in the log book. Should any of the doors be accessible during the voyage, they shall be fitted with a device which prevents unauthorized opening. When it is proposed to fit such doors, the number and arrangements shall receive the special consideration of the Administration.

13 Portable plates on bulkheads shall not be permitted except in machinery spaces. Such plates shall always be in place before the ship leaves port, and shall not be removed during navigation except in case of urgent necessity. The necessary precautions shall be taken in replacing them to ensure that the joints shall be watertight.

14 All watertight doors shall be kept closed during navigation except when necessarily opened for the working of the ship, in which case they shall always be ready to be immediately closed.

15.1 Where trunkways or tunnels for access from crew accommodation to the stokehold, for piping, or for any other purpose are carried through main transverse watertight bulkheads, they shall be watertight and in accordance with the requirements of Regulation 19. The access to at least one end of each such tunnel or trunkway, if used as a passage at sea, shall be through a trunk extending watertight to a height sufficient to permit access above the margin line. The access to the other end of the trunkway or tunnel may be through a watertight door of the type required by its location in the ship. Such trunkways or tunnels shall not extend through the first subdivision bulkhead abaft the collision bulkhead.

15.2 Where it is proposed to fit tunnels or trunkways for forced draught, piercing main transverse watertight bulkheads, these shall receive the special consideration of the Administration.

Regulation 16

Passenger ships carrying goods vehicles and accompanying personnel

1 This Regulation applies to passenger ships regardless of the date of construction designed or adapted for the carriage of goods vehicles and accompanying personnel where the total number of persons on board, other than those specified in Regulation 1/2(e)(i) and (ii), exceeds 12.

2 If in such a ship the total number of passengers which include personnel accompanying vehicles does not exceed $N = 12 + \sqrt{A/25}$, where A = total deck area (square metres) of spaces available for the stowage of goods vehicles and where the clear height at the stowage position and at the entrance to such spaces is not less than 4 m, the provisions of Regulation 15.12 in respect of watertight doors apply except that the doors may be fitted at any level in watertight bulkheads dividing cargo spaces. Additionally, indicators are required on the navigating bridge to show automatically when each door is closed and all door fastenings are secured.

3 When applying the provisions of this Chapter to such a ship, N shall be taken as the maximum number of passengers for which the ship may be certified in accordance with this Regulation.

4 In applying Regulation 8 for the worst operating conditions, the permeability for cargo spaces intended for the stowage of goods vehicles and containers shall be derived by calculation in which the goods vehicles and containers shall be assumed to be non-watertight and their permeability taken as 65. For ships engaged in dedicated services the actual value of permeability for goods vehicles or containers may be applied. In no case shall the permeability of the cargo spaces in which the goods vehicles and containers are carried be taken as less than 60.

Regulation 17

Openings in the shell plating of passenger ships below the margin line

1 The number of openings in the shell plating shall be reduced to the minimum compatible with the design and proper working of the ship.

2 The arrangement and efficiency of the means for closing any opening in the shell plating shall be consistent with its intended purpose and the position in which it is fitted and generally to the satisfaction of the Administration.

3.1 Subject to the requirements of the International Convention on Load Lines in force, no sidescuttle shall be fitted in such a position that its sill is below a line drawn parallel to the bulkhead deck at side and having its lowest point 2.5 per cent of the breadth of the ship above the deepest subdivision load line, or 500 mm, whichever is the greater.

3.2 All sidescuttles the sills of which are below the margin line, as permitted by paragraph 3.1 shall be of such construction as will effectively prevent any person opening them without the consent of the master of the ship.

3.3.1 Where in a between decks, the sills of any of the sidescuttles referred to in paragraph 3.2 are below a line drawn parallel to the bulkhead deck at side and having its lowest point 1.4 m plus 2.5 per cent of the breadth of the ship above the water when the ship departs from any port, all the sidescuttles in that between decks shall be closed watertight and locked before the ship leaves port, and they shall not be opened before the ship arrives at the next port. In the application of this paragraph the appropriate allowance for fresh water may be made when applicable.

3.3.2 The time of opening such sidescuttles in port and of closing and locking them before the ship leaves port shall be entered in such log book as may be prescribed by the Administration.

3.3.3 For any ship that has one or more sidescuttles so placed that the requirements of paragraph 3.3.1 would apply when it was floating at its deepest subdivision load line, the Administration may indicate the limiting mean draught at which these sidescuttles will have their sills above the line drawn parallel to the bulkhead deck at side, and having its lowest point 1.4 m plus 2.5 per cent of the breadth of the ship above the water-line corresponding to the limiting mean draught, and at which it will therefore be permissible to depart from port without previously closing and locking them and to open them at sea on the responsibility of the master during the voyage to the next port. In tropical zones as defined in the International Convention on Load Lines in force, this limiting draught may be increased by 0.3 m.

4 Efficient hinged inside deadlights so arranged that they can be easily and effectively closed and secured watertight, shall be fitted to all sidescuttles except that abaft one-eighth of the ship's length from the forward perpendicular and above a line drawn parallel to the bulkhead deck at side and having its lowest point at a height of 3.7 m plus 2.5 per cent of the breadth of the ship above the deepest subdivision load line, the deadlights may be portable in passenger accommodation other than that for steerage passengers, unless the deadlights are required by the International Convention on Load Lines in force to be permanently attached in their proper positions. Such portable deadlights shall be stowed adjacent to the sidescuttles they serve.

5 Sidescuttles and their deadlights which will not be accessible during navigation shall be closed and secured before the ship leaves port.

6.1 No sidescuttles shall be fitted in any spaces which are appropriated exclusively to the carriage of cargo or coal.

6.2 Sidescuttles may, however, be fitted in spaces appropriated alternatively to the carriage of cargo or passengers, but they shall be of such construction as will effectively prevent any person opening them or their deadlights without the consent of the master.

6.3 If cargo is carried in such spaces, the sidescuttles and their deadlights shall be closed watertight and locked before the cargo is shipped and such closing and locking shall be recorded in such log book as may be prescribed by the Administration.

7 Automatic ventilating sidescuttles shall not be fitted in the shell plating below the margin line without the special sanction of the Administration.

8 The number of scuppers, sanitary discharges and other similar openings in the shell plating shall be reduced to the minimum either by making each discharge serve for as many as possible of the sanitary and other pipes, or in any other satisfactory manner.

9.1 All inlets and discharges in the shell plating shall be fitted with efficient and accessible arrangements for preventing the accidental admission of water into the ship.

9.2.1 Subject to the requirements of the International Convention on Load Lines in force, and except as provided in paragraph 9.3, each separate discharge led through the shell plating from spaces below the margin line shall be provided with either one automatic non-return valve fitted with a positive means of closing it from above the bulkhead deck or with two automatic non-return valves without positive means of closing, provided that the inboard valve is situated above the deepest subdivision load line and is always accessible for examination under service conditions. Where a valve with positive means of closing is fitted, the operating position above the bulkhead deck shall always be readily accessible and means shall be provided for indicating whether the valve is open or closed.

9.2.2 The requirements of the International Convention on Load Lines in force shall apply to discharges led through the shell plating from spaces above the margin line.

9.3 Machinery space main and auxiliary sea inlets and discharges in connexion with the operation of machinery shall be fitted with readily accessible valves between the pipes and the shell plating or between the pipes and fabricated boxes attached to the shell plating. The valves may be controlled locally and shall be provided with indicators showing whether they are open or closed.

9.4 All shell fittings and valves required by this Regulation shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable. All pipes to which this Regulation refers shall be of steel or other equivalent material to the satisfaction of the Administration.

10.1 Gangway, cargo and coaling ports fitted below the margin line shall be of sufficient strength. They shall be effectively closed and secured watertight before the ship leaves port, and shall be kept closed during navigation.

10.2 Such ports shall in no case be so fitted as to have their lowest point below the deepest subdivision load line.

11.1 The inboard opening of each ash-shoot, rubbish-shoot, etc. shall be fitted with an efficient cover.

11.2 If the inboard opening is situated below the margin line, the cover shall be watertight, and in addition an automatic non-return valve shall be fitted in

the shoot in an easily accessible position above the deepest subdivision load line. When the shoot is not in use both the cover and the valve shall be kept closed and secured.

Regulation 18

Construction and initial tests of watertight doors, sidescuttles, etc., in passenger ships and cargo ships

- 1 In passenger ships:
 - .1 the design, materials and construction of all watertight doors, sidescuttles, gangway, cargo and coaling ports, valves, pipes, ash-shoots and rubbish-shoots referred to in these Regulations shall be to the satisfaction of the Administration;
 - .2 the frames of vertical watertight doors shall have no groove at the bottom in which dirt might lodge and prevent the door closing properly.
- 2 In passenger ships and cargo ships each watertight door shall be tested by water pressure to a head up to the bulkhead deck or freeboard deck respectively. The test shall be made before the ship is put into service, either before or after the door is fitted.

Regulation 19

Construction and initial tests of watertight decks, trunks, etc. in passenger ships and cargo ships

- 1 Watertight decks, trunks, tunnels, duct keels and ventilators shall be of the same strength as watertight bulkheads at corresponding levels. The means used for making them watertight, and the arrangements adopted for closing openings in them, shall be to the satisfaction of the Administration. Watertight ventilators and trunks shall be carried at least up to the bulkhead deck in passenger ships and up to the freeboard deck in cargo ships.
- 2 After completion, a hose or flooding test shall be applied to watertight decks and a hose test to watertight trunks, tunnels and ventilators.

Regulation 20

Watertight integrity of passenger ships above the margin line

- 1 The Administration may require that all reasonable and practicable measures shall be taken to limit the entry and spread of water above the bulkhead deck. Such measures may include partial bulkheads or webs. When partial watertight bulkheads and webs are fitted on the bulkhead deck, above or in the immediate vicinity of main subdivision bulkheads, they shall have

watertight shell and bulkhead deck connexions so as to restrict the flow of water along the deck when the ship is in a heeled damaged condition. Where the partial watertight bulkhead does not line up with the bulkhead below, the bulkhead deck between shall be made effectively watertight.

2 The bulkhead deck or a deck above it shall be weathertight. All openings in the exposed weather deck shall have coamings of ample height and strength and shall be provided with efficient means for expeditiously closing them weathertight. Freeing ports, open rails and scuppers shall be fitted as necessary for rapidly clearing the weather deck of water under all weather conditions.

3 Sidescuttles, gangway, cargo and coaling ports and other means for closing openings in the shell plating above the margin line shall be of efficient design and construction and of sufficient strength having regard to the spaces in which they are fitted and their positions relative to the deepest subdivision load line.

4 Efficient inside deadlights, so arranged that they can be easily and effectively closed and secured watertight, shall be provided for all sidescuttles to spaces below the first deck above the bulkhead deck.

Regulation 21

Bilge pumping arrangements

1 *Passenger ships and cargo ships*

1.1 An efficient bilge pumping system shall be provided, capable of pumping from and draining any watertight compartment other than a space permanently appropriated for the carriage of fresh water, water ballast, oil fuel or liquid cargo and for which other efficient means of pumping are provided, under all practical conditions. Efficient means shall be provided for draining water from insulated holds.

1.2 Sanitary, ballast and general service pumps may be accepted as independent power bilge pumps if fitted with the necessary connexions to the bilge pumping system.

1.3 All bilge pipes used in or under coal bunkers or fuel storage tanks or in boiler or machinery spaces, including spaces in which oil-settling tanks or oil fuel pumping units are situated, shall be of steel or other suitable material.

1.4 The arrangement of the bilge and ballast pumping system shall be such as to prevent the possibility of water passing from the sea and from water ballast spaces into the cargo and machinery spaces, or from one compartment to another. Provision shall be made to prevent any deep tank having bilge and ballast connexions being inadvertently flooded from the sea when containing cargo, or being discharged through a bilge pipe when containing water ballast.

1.5 All distribution boxes and manually operated valves in connexion with the bilge pumping arrangements shall be in positions which are accessible under ordinary circumstances.

2 *Passenger ships*

2.1 The bilge pumping system required by paragraph 1.1 shall be capable of operation under all practicable conditions after a casualty whether the ship is upright or listed. For this purpose wing suction shall generally be fitted except in narrow compartments at the end of the ship where one suction may be sufficient. In compartments of unusual form, additional suction may be required. Arrangements shall be made whereby water in the compartment may find its way to the suction pipes. Where, for particular compartments, the Administration is satisfied that the provision of drainage may be undesirable, it may allow such provision to be dispensed with if calculations made in accordance with the conditions laid down in Regulation 8.2.1 to 8.2.3 show that the survival capability of the ship will not be impaired.

2.2 At least three power pumps shall be fitted connected to the bilge main, one of which may be driven by the propulsion machinery. Where the criterion numeral is 30 or more, one additional independent power pump shall be provided.

2.3 Where practicable, the power bilge pumps shall be placed in separate watertight compartments and so arranged or situated that these compartments will not be flooded by the same damage. If the main propulsion machinery, auxiliary machinery and boilers are in two or more watertight compartments, the pumps available for bilge service shall be distributed as far as is possible throughout these compartments.

2.4 On a ship of 91.5 m in length and upwards or having a criterion numeral of 30 or more, the arrangements shall be such that at least one power bilge pump shall be available for use in all flooding conditions which the ship is required to withstand, as follows:

- .1 one of the required bilge pumps shall be an emergency pump of a reliable submersible type having a source of power situated above the bulkhead deck; or
- .2 the bilge pumps and their sources of power shall be so distributed throughout the length of the ship that at least one pump in an undamaged compartment will be available.

2.5 With the exception of additional pumps which may be provided for peak compartments only, each required bilge pump shall be so arranged as to draw water from any space required to be drained by paragraph 1.1.

2.6 Each power bilge pump shall be capable of pumping water through the required main bilge pipe at a speed of not less than 2 m/sec. Independent power bilge pumps situated in machinery spaces shall have direct suction from these spaces, except that not more than two such suction shall be required in any one space. Where two or more such suction are provided there shall be at least one on each side of the ship. The Administration may require independent power bilge pumps situated in other spaces to have

separate direct suction. Direct suction shall be suitably arranged and those in a machinery space shall be of a diameter not less than that required for the bilge main.

2.7.1 In addition to the direct bilge suction or suction required by paragraph 2.6 a direct suction from the main circulating pump leading to the drainage level of the machinery space and fitted with a non-return valve shall be provided in the machinery space. The diameter of this direct suction pipe shall be at least two-thirds of the diameter of the pump inlet in the case of steamships, and of the same diameter as the pump inlet in the case of motorships.

2.7.2 Where in the opinion of the Administration the main circulating pump is not suitable for this purpose, a direct emergency bilge suction shall be led from the largest available independent power driven pump to the drainage level of the machinery space; the suction shall be of the same diameter as the main inlet of the pump used. The capacity of the pump so connected shall exceed that of a required bilge pump by an amount deemed satisfactory by the Administration.

2.7.3 The spindles of the sea inlet and direct suction valves shall extend well above the engine room platform.

2.8 All bilge suction piping up to the connexion to the pumps shall be independent of other piping.

2.9 The diameter d of the bilge main shall be calculated according to the following formula. However, the actual internal diameter of the bilge main may be rounded off to the nearest standard size acceptable to the Administration:

$$d = 25 + 1.68 \sqrt{L(B + D)}$$

where d is the internal diameter of the bilge main (millimetres);

L and B are the length and the breadth of the ship (metres) as defined in Regulation 2; and

D is the moulded depth of the ship to bulkhead deck (metres).

The diameter of the bilge branch pipes shall meet the requirements of the Administration.

2.10 Provision shall be made to prevent the compartment served by any bilge suction pipe being flooded in the event of the pipe being severed or otherwise damaged by collision or grounding in any other compartment. For this purpose, where the pipe is at any part situated nearer the side of the ship than one-fifth of the breadth of the ship (as defined in Regulation 2 and measured at right angles to the centreline at the level of the deepest subdivision load line), or is in a duct keel, a non-return valve shall be fitted to the pipe in the compartment containing the open end.

2.11 Distribution boxes, cocks and valves in connexion with the bilge pumping system shall be so arranged that, in the event of flooding, one of the bilge pumps may be operative on any compartment; in addition, damage to a pump or its pipe connecting to the bilge main outboard of a line drawn at

one-fifth of the breadth of the ship shall not put the bilge system out of action. If there is only one system of pipes common to all the pumps, the necessary valves for controlling the bilge suction must be capable of being operated from above the bulkhead deck. Where in addition to the main bilge pumping system an emergency bilge pumping system is provided, it shall be independent of the main system and so arranged that a pump is capable of operating on any compartment under flooding condition as specified in paragraph 2.1; in that case only the valves necessary for the operation of the emergency system need be capable of being operated from above the bulkhead deck.

2.12 All cocks and valves referred to in paragraph 2.11 which can be operated from above the bulkhead deck shall have their controls at their place of operation clearly marked and shall be provided with means to indicate whether they are open or closed.

3 *Cargo ships*

At least two power pumps connected to the main bilge system shall be provided, one of which may be driven by the propulsion machinery. If the Administration is satisfied that the safety of the ship is not impaired, bilge pumping arrangements may be dispensed with in particular compartments.

Regulation 22

*Stability information for passenger ships and cargo ships**

1 Every passenger ship regardless of size and every cargo ship having a length, as defined in the International Convention on Load Lines in force, of 24 m and upwards, shall be inclined upon its completion and the elements of its stability determined. The master shall be supplied with such information satisfactory to the Administration as is necessary to enable him by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service. A copy of the stability information shall be furnished to the Administration.

2 Where any alterations are made to a ship so as to materially affect the stability information supplied to the master, amended stability information shall be provided. If necessary the ship shall be re-inclined.

3 The Administration may allow the inclining test of an individual ship to be dispensed with provided basic stability data are available from the inclining test of a sister ship and it is shown to the satisfaction of the Administration that reliable stability information for the exempted ship can be obtained from such basic data.

* Reference is made to the Recommendation on Intact Stability for Passenger and Cargo Ships under 100 metres in length, adopted by the Organization by resolution A.167(ES. IV) and Amendments to this Recommendation, adopted by the Organization by resolution A.206(VII).

4 The Administration may also allow the inclining test of an individual ship or class of ships especially designed for the carriage of liquids or ore in bulk to be dispensed with when reference to existing data for similar ships clearly indicates that due to the ship's proportions and arrangements more than sufficient metacentric height will be available in all probable loading conditions.

Regulation 23

Damage control plans in passenger ships

There shall be permanently exhibited, for the guidance of the officer in charge of the ship, plans showing clearly for each deck and hold the boundaries of the watertight compartments, the openings therein with the means of closure and position of any controls thereof, and the arrangements for the correction of any list due to flooding. In addition, booklets containing the aforementioned information shall be made available to the officers of the ship.

Regulation 24

Marking, periodical operation and inspection of watertight doors, etc. in passenger ships

1 This Regulation applies to all ships.

2.1 Drills for the operating of watertight doors, sidescuttles, valves and closing mechanisms of scuppers, ash-shoots and rubbish-shoots shall take place weekly. In ships in which the voyage exceeds one week in duration a complete drill shall be held before leaving port, and others thereafter at least once a week during the voyage.

2.2 All watertight doors, both hinged and power operated, in main transverse bulkheads, in use at sea, shall be operated daily.

3.1 The watertight doors and all mechanisms and indicators connected therewith, all valves, the closing of which is necessary to make a compartment watertight, and all valves the operation of which is necessary for damage control cross connexions shall be periodically inspected at sea at least once a week.

3.2 Such valves, doors and mechanisms shall be suitably marked to ensure that they may be properly used to provide maximum safety.

Regulation 25

Entries in log of passenger ships

1 This Regulation applies to all ships.

2 Hinged doors, portable plates, sidescuttles, gangway, cargo and coaling ports and other openings, which are required by these Regulations to be kept closed during navigation, shall be closed before the ship leaves port. The time of closing and the time of opening (if permissible under these Regulations) shall be recorded in such log book as may be prescribed by the Administration.

3 A record of all drills and inspections required by Regulation 24 shall be entered in the log book with an explicit record of any defects which may be disclosed.

PART C – MACHINERY INSTALLATIONS

(Except where expressly provided otherwise Part C applies to passenger ships and cargo ships)

Regulation 26

General

1 The machinery, boilers and other pressure vessels, associated piping systems and fittings shall be of a design and construction adequate for the service for which they are intended and shall be so installed and protected as to reduce to a minimum any danger to persons on board, due regard being paid to moving parts, hot surfaces and other hazards. The design shall have regard to materials used in construction, the purpose for which the equipment is intended, the working conditions to which it will be subjected and the environmental conditions on board.

2 The Administration shall give special consideration to the reliability of single essential propulsion components and may require a separate source of propulsion power sufficient to give the ship a navigable speed, especially in the case of unconventional arrangements.

3 Means shall be provided whereby normal operation of propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative. Special consideration shall be given to the malfunctioning of:

- .1 a generating set which serves as a main source of electrical power;
- .2 the sources of steam supply;
- .3 the boiler feed water systems;
- .4 the fuel oil supply systems for boilers or engines;
- .5 the sources of lubricating oil pressure;
- .6 the sources of water pressure;

- .7 a condensate pump and the arrangements to maintain vacuum in condensers;
- .8 the mechanical air supply for boilers;
- .9 an air compressor and receiver for starting or control purposes;
- .10 the hydraulic, pneumatic or electrical means for control in main propulsion machinery including controllable pitch propellers.

However, the Administration, having regard to overall safety considerations, may accept a partial reduction in propulsion capability from normal operation.

4 Means shall be provided to ensure that the machinery can be brought into operation from the dead ship condition without external aid.

5 All boilers, all parts of machinery, all steam, hydraulic, pneumatic and other systems and their associated fittings which are under internal pressure shall be subjected to appropriate tests including a pressure test before being put into service for the first time.

6 Main propulsion machinery and all auxiliary machinery essential to the propulsion and the safety of the ship shall, as fitted in the ship, be designed to operate when the ship is upright and when inclined at any angle of list up to and including 15° either way under static conditions and 22.5° under dynamic conditions (rolling) either way and simultaneously inclined dynamically (pitching) 7.5° by bow or stern. The Administration may permit deviation from these angles, taking into consideration the type, size and service conditions of the ship.

7 Provision shall be made to facilitate cleaning, inspection and maintenance of main propulsion and auxiliary machinery including boilers and pressure vessels.

8 Special consideration shall be given to the design, construction and installation of propulsion machinery systems so that any mode of their vibrations shall not cause undue stresses in this machinery in the normal operating ranges.

Regulation 27

Machinery

1 Where risk from overspeeding of machinery exists, means shall be provided to ensure that the safe speed is not exceeded.

2 Where main or auxiliary machinery including pressure vessels or any parts of such machinery are subject to internal pressure and may be subject to dangerous overpressure, means shall be provided where practicable to protect against such excessive pressure.

3 All gearing and every shaft and coupling used for transmission of power to machinery essential for the propulsion and safety of the ship or for the safety of persons on board shall be so designed and constructed that they will withstand the maximum working stresses to which they may be subjected in all service conditions, and due consideration shall be given to the type of engines by which they are driven or of which they form part.

4 Internal combustion engines of a cylinder diameter of 200 mm or a crankcase volume of 0.6 m³ and above shall be provided with crankcase explosion relief valves of a suitable type with sufficient relief area. The relief valves shall be arranged or provided with means to ensure that discharge from them is so directed as to minimize the possibility of injury to personnel.

5 Main turbine propulsion machinery and, where applicable, main internal combustion propulsion machinery and auxiliary machinery shall be provided with automatic shut-off arrangements in the case of failures such as lubricating oil supply failure which could lead rapidly to complete breakdown, serious damage or explosion. The Administration may permit provisions for overriding automatic shut-off devices.

Regulation 28

Means of going astern

1 Sufficient power for going astern shall be provided to secure proper control of the ship in all normal circumstances.

2 The ability of the machinery to reverse the direction of thrust of the propeller in sufficient time, and so to bring the ship to rest within a reasonable distance from maximum ahead service speed, shall be demonstrated and recorded.*

3 The stopping times, ship headings and distances recorded on trials, together with the results of trials to determine the ability of ships having multiple propellers to navigate and manoeuvre with one or more propellers inoperative, shall be available on board for the use of the master or designated personnel.*

4 Where the ship is provided with supplementary means for manoeuvring or stopping, the effectiveness of such means shall be demonstrated and recorded as referred to in paragraphs 2 and 3.

* Reference is made to the Recommendation on Information to be Included in the Manoeuvring Booklets adopted by the Organization by resolution A.209(VII).

Regulation 29

Steering gear

1 Unless expressly provided otherwise, every ship shall be provided with a main steering gear and an auxiliary steering gear to the satisfaction of the Administration. The main steering gear and the auxiliary steering gear shall be so arranged that the failure of one of them will not render the other one inoperative.

2.1 All the steering gear components and the rudder stock shall be of sound and reliable construction to the satisfaction of the Administration. Special consideration shall be given to the suitability of any essential component which is not duplicated. Any such essential component shall, where appropriate, utilize anti-friction bearings such as ball bearings, roller bearings or sleeve bearings which shall be permanently lubricated or provided with lubrication fittings.

2.2 The design pressure for calculations to determine the scantlings of piping and other steering gear components subjected to internal hydraulic pressure shall be at least 1.25 times the maximum working pressure to be expected under the operational conditions specified in paragraph 3.2, taking into account any pressure which may exist in the low pressure side of the system. At the discretion of the Administration, fatigue criteria shall be applied for the design of piping and components, taking into account pulsating pressures due to dynamic loads.

2.3 Relief valves shall be fitted to any part of the hydraulic system which can be isolated and in which pressure can be generated from the power source or from external forces. The setting of the relief valves shall not exceed the design pressure. The valves shall be of adequate size and so arranged as to avoid an undue rise in pressure above the design pressure.

3 The main steering gear and rudder stock shall be:

- .1 of adequate strength and capable of steering the ship at maximum ahead service speed which shall be demonstrated;
- .2 capable of putting the rudder over from 35° on one side to 35° on the other side with the ship at its deepest seagoing draught and running ahead at maximum ahead service speed and, under the same conditions, from 35° on either side to 30° on the other side in not more than 28 seconds;
- .3 operated by power where necessary to meet the requirements of paragraph 3.2 and in any case when the Administration requires a rudder stock of over 120 mm diameter in way of the tiller, excluding strengthening for navigation in ice; and
- .4 so designed that they will not be damaged at maximum astern speed; however, this design requirement need not be proved by trials at maximum astern speed and maximum rudder angle.

- 4 The auxiliary steering gear shall be:
 - .1 of adequate strength and capable of steering the ship at navigable speed and of being brought speedily into action in an emergency;
 - .2 capable of putting the rudder over from 15° on one side to 15° on the other side in not more than 60 seconds with the ship at its deepest seagoing draught and running ahead at one half of the maximum ahead service speed or 7 knots, whichever is the greater; and
 - .3 operated by power where necessary to meet the requirements of paragraph 4.2 and in any case when the Administration requires a rudder stock of over 230 mm diameter in way of the tiller, excluding strengthening for navigation in ice.
- 5 Main and auxiliary steering gear power units shall be:
 - .1 arranged to re-start automatically when power is restored after a power failure; and
 - .2 capable of being brought into operation from a position on the navigating bridge. In the event of a power failure to any one of the steering gear power units, an audible and visual alarm shall be given on the navigating bridge.
- 6.1 Where the main steering gear comprises two or more identical power units, an auxiliary steering gear need not be fitted, provided that:
 - .1 in a passenger ship, the main steering gear is capable of operating the rudder as required by paragraph 3.2 while any one of the power units is out of operation;
 - .2 in a cargo ship, the main steering gear is capable of operating the rudder as required by paragraph 3.2 while operating with all power units;
 - .3 the main steering gear is so arranged that after a single failure in its piping system or in one of the power units the defect can be isolated so that steering capability can be maintained or speedily regained.
- 6.2 The Administration may, until 1 September 1986, accept the fitting of a steering gear which has a proven record of reliability but does not comply with the requirements of paragraph 6.1.3 for a hydraulic system.
- 6.3 Steering gears, other than of the hydraulic type, shall achieve standards equivalent to the requirements of this paragraph to the satisfaction of the Administration.
- 7 Steering gear control shall be provided:
 - .1 for the main steering gear, both on the navigating bridge and in the steering gear compartment;
 - .2 where the main steering gear is arranged in accordance with paragraph 6, by two independent control systems, both operable from the navigating bridge. This does not require duplication of the

steering wheel or steering lever. Where the control system consists of an hydraulic telemotor, a second independent system need not be fitted, except in a tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards;

- .3 for the auxiliary steering gear, in the steering gear compartment and, if power operated, it shall also be operable from the navigating bridge and shall be independent of the control system for the main steering gear.

8 Any main and auxiliary steering gear control system operable from the navigating bridge shall comply with the following:

- .1 if electric, it shall be served by its own separate circuit supplied from a steering gear power circuit from a point within the steering gear compartment, or directly from switchboard busbars supplying that steering gear power circuit at a point on the switchboard adjacent to the supply to the steering gear power circuit;
- .2 means shall be provided in the steering gear compartment for disconnecting any control system operable from the navigating bridge from the steering gear it serves;
- .3 the system shall be capable of being brought into operation from a position on the navigating bridge;
- .4 in the event of a failure of electrical power supply to the control system, an audible and visual alarm shall be given on the navigating bridge; and
- .5 short circuit protection only shall be provided for steering gear control supply circuits.

9 The electric power circuits and the steering gear control systems with their associated components, cables and pipes required by this Regulation and by Regulation 30 shall be separated as far as is practicable throughout their length.

10 A means of communication shall be provided between the navigating bridge and the steering gear compartment.

11 The angular position of the rudder shall:

- .1 if the main steering gear is power operated, be indicated on the navigating bridge. The rudder angle indication shall be independent of the steering gear control system;
- .2 be recognizable in the steering gear compartment.

12 Hydraulic power-operated steering gear shall be provided with the following:

- .1 arrangements to maintain the cleanliness of the hydraulic fluid taking into consideration the type and design of the hydraulic system;

- .2 a low level alarm for each hydraulic fluid reservoir to give the earliest practicable indication of hydraulic fluid leakage. Audible and visual alarms shall be given on the navigating bridge and in the machinery space where they can be readily observed; and
- .3 a fixed storage tank having sufficient capacity to recharge at least one power actuating system including the reservoir, where the main steering gear is required to be power operated. The storage tank shall be permanently connected by piping in such a manner that the hydraulic systems can be readily recharged from a position within the steering gear compartment and shall be provided with a contents gauge.

13 The steering gear compartment shall be:

- .1 readily accessible and, as far as practicable, separated from machinery spaces; and
- .2 provided with suitable arrangements to ensure working access to steering gear machinery and controls. These arrangements shall include handrails and gratings or other non-slip surfaces to ensure suitable working conditions in the event of hydraulic fluid leakage.

14 Where the rudder stock is required to be over 230 mm diameter in way of the tiller, excluding strengthening for navigation in ice, an alternative power supply, sufficient at least to supply the steering gear power unit which complies with the requirements of paragraph 4.2 and also its associated control system and the rudder angle indicator, shall be provided automatically, within 45 seconds, either from the emergency source of electrical power or from an independent source of power located in the steering gear compartment. This independent source of power shall be used only for this purpose. In every ship of 10,000 tons gross tonnage and upwards, the alternative power supply shall have a capacity for at least 30 minutes of continuous operation and in any other ship for at least 10 minutes.

15 In every tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards and in every other ship of 70,000 tons gross tonnage and upwards, the main steering gear shall comprise two or more identical power units complying with the provisions of paragraph 6.

16 Every tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards shall, subject to paragraph 17, comply with the following:

- .1 the main steering gear shall be so arranged that in the event of loss of steering capability due to a single failure in any part of one of the power actuating systems of the main steering gear, excluding the tiller, quadrant or components serving the same purpose, or seizure of the rudder actuators, steering capability shall be regained in not more than 45 seconds after the loss of one power actuating system;
- .2 the main steering gear shall comprise either:
 - .2.1 two independent and separate power actuating systems, each capable of meeting the requirements of paragraph 3.2; or

- .2.2 at least two identical power actuating systems which, acting simultaneously in normal operation, shall be capable of meeting the requirements of paragraph 3.2. Where necessary to comply with this requirement, inter-connexion of hydraulic power actuating systems shall be provided. Loss of hydraulic fluid from one system shall be capable of being detected and the defective system automatically isolated so that the other actuating system or systems shall remain fully operational;
- .3 steering gears other than of the hydraulic type shall achieve equivalent standards.

17 For tankers, chemical tankers or gas carriers of 10,000 tons gross tonnage and upwards, but of less than 100,000 tonnes deadweight, solutions other than those set out in paragraph 16, which need not apply the single failure criterion to the rudder actuator or actuators, may be permitted provided that an equivalent safety standard is achieved and that:

- .1 following loss of steering capability due to a single failure of any part of the piping system or in one of the power units, steering capability shall be regained within 45 seconds; and
- .2 where the steering gear includes only a single rudder actuator, special consideration is given to stress analysis for the design including fatigue analysis and fracture mechanics analysis, as appropriate, to the material used, to the installation of sealing arrangements and to testing and inspection and to the provision of effective maintenance. In consideration of the foregoing, the Administration shall adopt regulations which include the provisions of the Guidelines for Acceptance of Non-Duplicated Rudder Actuators for Tankers, Chemical Tankers and Gas Carriers of 10,000 Tons Gross Tonnage and Above but Less than 100,000 Tonnes Deadweight, adopted by the Organization.*

18 For a tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards, but less than 70,000 tonnes deadweight, the Administration may, until 1 September 1986, accept a steering gear system with a proven record of reliability which does not comply with the single failure criterion required for a hydraulic system in paragraph 16.

19 Every tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards, constructed before 1 September 1984, shall comply, not later than 1 September 1986, with the following:

- .1 the requirements of paragraphs 7.1, 8.2, 8.4, 10, 11, 12.2, 12.3 and 13.2;
- .2 two independent steering gear control systems shall be provided each of which can be operated from the navigating bridge. This does not require duplication of the steering wheel or steering lever;

* Reference is made to the Guidelines for Acceptance of Non-Duplicated Rudder Actuators for Tankers, Chemical Tankers and Gas Carriers of 10,000 Tons Gross Tonnage and Above but Less than 100,000 Tonnes Deadweight, adopted by the Organization by resolution A.467(XII).

- .3 if the steering gear control system in operation fails, the second system shall be capable of being brought into immediate operation from the navigating bridge; and
- .4 each steering gear control system, if electric, shall be served by its own separate circuit supplied from the steering gear power circuit or directly from switchboard busbars supplying that steering gear power circuit at a point on the switchboard adjacent to the supply to the steering gear power circuit.

20 In addition to the requirements of paragraph 19, in every tanker, chemical tanker or gas carrier of 40,000 tons gross tonnage and upwards, constructed before 1 September 1984, the steering gear shall, not later than 1 September 1988, be so arranged that, in the event of a single failure of the piping or of one of the power units, steering capability can be maintained or the rudder movement can be limited so that steering capability can be speedily regained. This shall be achieved by:

- .1 an independent means of restraining the rudder; or
- .2 fast acting valves which may be manually operated to isolate the actuator or actuators from the external hydraulic piping together with a means of directly refilling the actuators by a fixed independent power-operated pump and piping system; or
- .3 an arrangement such that, where hydraulic power systems are interconnected, loss of hydraulic fluid from one system shall be detected and the defective system isolated either automatically or from the navigating bridge so that the other system remains fully operational.

Regulation 30

Additional requirements for electric and electrohydraulic steering gear

1 Means for indicating that the motors of electric and electrohydraulic steering gear are running shall be installed on the navigating bridge and at a suitable main machinery control position.

2 Each electric or electrohydraulic steering gear comprising one or more power units shall be served by at least two exclusive circuits fed directly from the main switchboard; however, one of the circuits may be supplied through the emergency switchboard. An auxiliary electric or electrohydraulic steering gear associated with a main electric or electrohydraulic steering gear may be connected to one of the circuits supplying this main steering gear. The circuits supplying an electric or electrohydraulic steering gear shall have adequate rating for supplying all motors which can be simultaneously connected to them and may be required to operate simultaneously.

3 Short circuit protection and an overload alarm shall be provided for such circuits and motors. Protection against excess current, including starting current, if provided, shall be for not less than twice the full load current of the motor or circuit so protected, and shall be arranged to permit the passage of

the appropriate starting currents. Where a three-phase supply is used an alarm shall be provided that will indicate failure of any one of the supply phases. The alarms required in this paragraph shall be both audible and visual and shall be situated in a conspicuous position in the main machinery space or control room from which the main machinery is normally controlled and as may be required by Regulation 51.

4 When in a ship of less than 1,600 tons gross tonnage an auxiliary steering gear which is required by Regulation 29.4.3 to be operated by power is not electrically powered or is powered by an electric motor primarily intended for other services, the main steering gear may be fed by one circuit from the main switchboard. Where such an electric motor primarily intended for other services is arranged to power such an auxiliary steering gear, the requirement of paragraph 3 may be waived by the Administration if satisfied with the protection arrangement together with the requirements of Regulation 29.5.1 and .2 and 29.7.3 applicable to auxiliary steering gear.

Regulation 31

Machinery controls

1 Main and auxiliary machinery essential for the propulsion and safety of the ship shall be provided with effective means for its operation and control.

2 Where remote control of propulsion machinery from the navigating bridge is provided and the machinery spaces are intended to be manned, the following shall apply:

- .1 the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the navigating bridge under all sailing conditions, including manoeuvring;
- .2 the remote control shall be performed, for each independent propeller, by a control device so designed and constructed that its operation does not require particular attention to the operational details of the machinery. Where multiple propellers are designed to operate simultaneously, they may be controlled by one control device;
- .3 the main propulsion machinery shall be provided with an emergency stopping device on the navigating bridge which shall be independent of the navigating bridge control system;
- .4 propulsion machinery orders from the navigating bridge shall be indicated in the main machinery control room or at the manoeuvring platform as appropriate;
- .5 remote control of the propulsion machinery shall be possible only from one location at a time; at such locations interconnected control positions are permitted. At each location there shall be an indicator showing which location is in control of the propulsion machinery. The transfer of control between the navigating bridge and machinery spaces shall be possible only in the main machinery space or the

main machinery control room. This system shall include means to prevent the propelling thrust from altering significantly when transferring control from one location to another;

- .6 it shall be possible to control the propulsion machinery locally, even in the case of failure in any part of the remote control system;
- .7 the design of the remote control system shall be such that in case of its failure an alarm will be given. Unless the Administration considers it impracticable the preset speed and direction of thrust of the propeller shall be maintained until local control is in operation;
- .8 indicators shall be fitted on the navigating bridge for:
 - .8.1 propeller speed and direction of rotation in the case of fixed pitch propellers;
 - .8.2 propeller speed and pitch position in the case of controllable pitch propellers;
- .9 an alarm shall be provided on the navigating bridge and in the machinery space to indicate low starting air pressure which shall be set at a level to permit further main engine starting operations. If the remote control system of the propulsion machinery is designed for automatic starting, the number of automatic consecutive attempts which fail to produce a start shall be limited in order to safeguard sufficient starting air pressure for starting locally.

3 Where the main propulsion and associated machinery, including sources of main electrical supply, are provided with various degrees of automatic or remote control and are under continuous manual supervision from a control room the arrangements and controls shall be so designed, equipped and installed that the machinery operation will be as safe and effective as if it were under direct supervision; for this purpose Regulations 46 to 50 shall apply as appropriate. Particular consideration shall be given to protect such spaces against fire and flooding.

4 In general, automatic starting, operational and control systems shall include provisions for manually overriding the automatic controls. Failure of any part of such systems shall not prevent the use of the manual override.

Regulation 32

Steam boilers and boiler feed systems

1 Every steam boiler and every unfired steam generator shall be provided with not less than two safety valves of adequate capacity. However, having regard to the output or any other features of any boiler or unfired steam generator, the Administration may permit only one safety valve to be fitted if it is satisfied that adequate protection against overpressure is thereby provided.

2 Each oil-fired boiler which is intended to operate without manual supervision shall have safety arrangements which shut off the fuel supply and give an alarm in the case of low water level, air supply failure or flame failure.

3 Water tube boilers serving turbine propulsion machinery shall be fitted with a high-water-level alarm.

4 Every steam generating system which provides services essential for the safety of the ship, or which could be rendered dangerous by the failure of its feed water supply, shall be provided with not less than two separate feed water systems from and including the feed pumps, noting that a single penetration of the steam drum is acceptable. Unless overpressure is prevented by the pump characteristics means shall be provided which will prevent overpressure in any part of the systems.

5 Boilers shall be provided with means to supervise and control the quality of the feed water. Suitable arrangements shall be provided to preclude, as far as practicable, the entry of oil or other contaminants which may adversely affect the boiler.

6 Every boiler essential for the safety of the ship and designed to contain water at a specified level shall be provided with at least two means for indicating its water level, at least one of which shall be a direct reading gauge glass.

Regulation 33

Steam pipe systems

1 Every steam pipe and every fitting connected thereto through which steam may pass shall be so designed, constructed and installed as to withstand the maximum working stresses to which it may be subjected.

2 Means shall be provided for draining every steam pipe in which dangerous water hammer action might otherwise occur.

3 If a steam pipe or fitting may receive steam from any source at a higher pressure than that for which it is designed a suitable reducing valve, relief valve and pressure gauge shall be fitted.

Regulation 34

Air pressure systems

1 In every ship means shall be provided to prevent overpressure in any part of compressed air systems and wherever water jackets or casings of air compressors and coolers might be subjected to dangerous overpressure due to leakage into them from air pressure parts. Suitable pressure relief arrangements shall be provided for all systems.

2 The main starting air arrangements for main propulsion internal combustion engines shall be adequately protected against the effects of backfiring and internal explosion in the starting air pipes.

3 All discharge pipes from starting air compressors shall lead directly to the starting air receivers, and all starting pipes from the air receivers to main or auxiliary engines shall be entirely separate from the compressor discharge pipe system.

4 Provision shall be made to reduce to a minimum the entry of oil into the air pressure systems and to drain these systems.

Regulation 35

Ventilating systems in machinery spaces

Machinery spaces of category A shall be adequately ventilated so as to ensure that when machinery or boilers therein are operating at full power in all weather conditions including heavy weather, an adequate supply of air is maintained to the spaces for the safety and comfort of personnel and the operation of the machinery. Any other machinery space shall be adequately ventilated appropriate for the purpose of that machinery space.

Regulation 36

*Protection against noise**

Measures shall be taken to reduce machinery noise in machinery spaces to acceptable levels as determined by the Administration. If this noise cannot be sufficiently reduced the source of excessive noise shall be suitably insulated or isolated or a refuge from noise shall be provided if the space is required to be manned. Ear protectors shall be provided for personnel required to enter such spaces, if necessary.

Regulation 37

Communication between navigating bridge and machinery space

At least two independent means shall be provided for communicating orders from the navigating bridge to the position in the machinery space or in the control room from which the engines are normally controlled: one of these shall be an engine room telegraph which provides visual indication of the orders and responses both in the machinery space and on the navigating bridge. Appropriate means of communication shall be provided to any other positions from which the engines may be controlled.

* Reference is made to the Code on Noise Levels on Board Ships, adopted by the Organization by resolution A.468(XII).

Regulation 38

Engineers' alarm

An engineers' alarm shall be provided to be operated from the engine control room or at the manoeuvring platform as appropriate, and shall be clearly audible in the engineers' accommodation.

Regulation 39

Location of emergency installations in passenger ships

Emergency sources of electrical power, fire pumps, bilge pumps except those specifically serving the spaces forward of the collision bulkhead, any fixed fire-extinguishing system required by Chapter II-2 and other emergency installations which are essential for the safety of the ship, except anchor windlasses, shall not be installed forward of the collision bulkhead.

PART D – ELECTRICAL INSTALLATIONS

(Except where expressly provided otherwise Part D applies to passenger ships and cargo ships)

Regulation 40

General

- 1 Electrical installations shall be such that:
 - .1 all electrical auxiliary services necessary for maintaining the ship in normal operational and habitable conditions will be ensured without recourse to the emergency source of electrical power;
 - .2 electrical services essential for safety will be ensured under various emergency conditions; and
 - .3 the safety of passengers, crew and ship from electrical hazards will be ensured.
- 2 The Administration shall take appropriate steps to ensure uniformity in the implementation and application of the provisions of this Part in respect of electrical installations*.

* Reference is made to the Recommendations published by the International Electrotechnical Commission and, in particular, Publication 92 – Electrical Installations in Ships.

Regulation 41

Main source of electrical power and lighting systems

1.1 A main source of electrical power of sufficient capacity to supply all those services mentioned in Regulation 40.1.1 shall be provided. This main source of electrical power shall consist of at least two generating sets.

1.2 The capacity of these generating sets shall be such that in the event of any one generating set being stopped it will still be possible to supply those services necessary to provide normal operational conditions of propulsion and safety. Minimum comfortable conditions of habitability shall also be ensured which include at least adequate services for cooking, heating, domestic refrigeration, mechanical ventilation, sanitary and fresh water.

1.3 The arrangements of the ship's main source of electrical power shall be such that the services referred to in Regulation 40.1.1 can be maintained regardless of the speed and direction of the propulsion machinery or shafting.

1.4 In addition, the generating sets shall be such as to ensure that with any one generator or its primary source of power out of operation, the remaining generating sets shall be capable of providing the electrical services necessary to start the main propulsion plant from a dead ship condition. The emergency source of electrical power may be used for the purpose of starting from a dead ship condition if its capability either alone or combined with that of any other source of electrical power is sufficient to provide at the same time those services required to be supplied by Regulations 42.2.1 to 42.2.3 or 43.2.1 to 43.2.4.

1.5 Where transformers constitute an essential part of the electrical supply system required by this paragraph, the system shall be so arranged as to ensure the same continuity of the supply as is stated in this paragraph.

2.1 A main electric lighting system which shall provide illumination throughout those parts of the ship normally accessible to and used by passengers or crew shall be supplied from the main source of electrical power.

2.2 The arrangement of the main electric lighting system shall be such that a fire or other casualty in spaces containing the main source of electrical power, associated transforming equipment, if any, the main switchboard and the main lighting switchboard, will not render the emergency electric lighting system required by Regulations 42.2.1 and 42.2.2 or 43.2.1, 43.2.2 and 43.2.3 inoperative.

2.3 The arrangement of the emergency electric lighting system shall be such that a fire or other casualty in spaces containing the emergency source of electrical power, associated transforming equipment, if any, the emergency switchboard and the emergency lighting switchboard will not render the main electric lighting system required by this Regulation inoperative.

3 The main switchboard shall be so placed relative to one main generating station that, as far as is practicable, the integrity of the normal electrical supply may be affected only by a fire or other casualty in one space. An

environmental enclosure for the main switchboard, such as may be provided by a machinery control room situated within the main boundaries of the space, is not to be considered as separating the switchboards from the generators.

4 Where the total installed electrical power of the main generating sets is in excess of 3 MW, the main busbars shall be subdivided into at least two parts which shall normally be connected by removable links or other approved means; so far as is practicable, the connexion of generating sets and any other duplicated equipment shall be equally divided between the parts. Equivalent arrangements may be permitted to the satisfaction of the Administration.

Regulation 42

Emergency source of electrical power in passenger ships

1.1 A self-contained emergency source of electrical power shall be provided.

1.2 The emergency source of electrical power, associated transforming equipment, if any, transitional source of emergency power, emergency switchboard and emergency lighting switchboard shall be located above the uppermost continuous deck and shall be readily accessible from the open deck. They shall not be located forward of the collision bulkhead.

1.3 The location of the emergency source of electrical power and associated transforming equipment, if any, the transitional source of emergency power, the emergency switchboard and the emergency electric lighting switchboards in relation to the main source of electrical power, associated transforming equipment, if any, and the main switchboard shall be such as to ensure to the satisfaction of the Administration that a fire or other casualty in spaces containing the main source of electrical power, associated transforming equipment, if any, and the main switchboard or in any machinery space of category A will not interfere with the supply, control and distribution of emergency electrical power. As far as practicable, the space containing the emergency source of electrical power, associated transforming equipment, if any, the transitional source of emergency electrical power and the emergency switchboard shall not be contiguous to the boundaries of machinery spaces of category A or those spaces containing the main source of electrical power, associated transforming equipment, if any, or the main switchboard.

1.4 Provided that suitable measures are taken for safeguarding independent emergency operation under all circumstances, the emergency generator may be used exceptionally, and for short periods, to supply non-emergency circuits.

2 The electrical power available shall be sufficient to supply all those services that are essential for safety in an emergency, due regard being paid to such services as may have to be operated simultaneously. The emergency source of electrical power shall be capable, having regard to starting currents and the transitory nature of certain loads, of supplying simultaneously at least the following services for the periods specified hereinafter, if they depend upon an electrical source for their operation:

- 2.1 For a period of 36 hours, emergency lighting:
- .1 at every embarkation station on deck and over sides as required by Regulations III/19 and III/30;
 - .2 in all service and accommodation alleyways, stairways and exits, personnel lift cars;
 - .3 in the machinery spaces and main generating stations including their control positions;
 - .4 in all control stations, machinery control rooms, and at each main and emergency switchboard;
 - .5 at all stowage positions for firemen's outfits;
 - .6 at the steering gear; and
 - .7 at the fire pump, the sprinkler pump and the emergency bilge pump referred to in paragraph 2.4 and at the starting position of their motors.

2.2 For a period of 36 hours, the navigation lights and other lights required by the International Regulations for Preventing Collisions at Sea in force.

- 2.3 For a period of 36 hours:
- .1 all internal communication equipment required in an emergency;
 - .2 the navigational aids as required by Regulation V/12; where such provision is unreasonable or impracticable the Administration may waive this requirement for ships of less than 5,000 tons gross tonnage;
 - .3 the fire detection and fire alarm system, and the fire door holding and release system; and
 - .4 for intermittent operation of the daylight signalling lamp, the ship's whistle, the manual fire alarms and all internal signals that are required in an emergency;

unless such services have an independent supply for the period of 36 hours from an accumulator battery suitably located for use in an emergency.

- 2.4 For a period of 36 hours:
- .1 one of the fire pumps required by Regulation II-2/4.3.1 and 4.3.3;
 - .2 the automatic sprinkler pump, if any; and
 - .3 the emergency bilge pump and all the equipment essential for the operation of electrically powered remote controlled bilge valves.

2.5 For the period of time required by Regulation 29.14 the steering gear if required to be so supplied by that Regulation.

2.6 For a period of half an hour:

- .1 any watertight doors required by Regulation 15 to be power operated together with their indicators and warning signals. Provided the requirements of Regulation 15.9.2 are complied with, sequential operation of the doors may be permitted providing all doors can be closed in 60 seconds;
- .2 the emergency arrangements to bring the lift cars to deck level for the escape of persons. The passenger lift cars may be brought to deck level sequentially in an emergency.

2.7 In a ship engaged regularly on voyages of short duration, the Administration if satisfied that an adequate standard of safety would be attained may accept a lesser period than the 36 hour period specified in paragraphs 2.1 to 2.5 but not less than 12 hours.

3 The emergency source of electrical power may be either a generator or an accumulator battery, which shall comply with the following:

3.1 Where the emergency source of electrical power is a generator, it shall be:

- .1 driven by a suitable prime-mover with an independent supply of fuel having a flashpoint (closed cup test) of not less than 43°C;
- .2 started automatically upon failure of the electrical supply from the main source of electrical power and shall be automatically connected to the emergency switchboard; those services referred to in paragraph 4 shall then be transferred automatically to the emergency generating set. The automatic starting system and the characteristic of the prime-mover shall be such as to permit the emergency generator to carry its full rated load as quickly as is safe and practicable, subject to a maximum of 45 seconds; unless a second independent means of starting the emergency generating set is provided, the single source of stored energy shall be protected to preclude its complete depletion by the automatic starting system; and
- .3 provided with a transitional source of emergency electrical power according to paragraph 4.

3.2 Where the emergency source of electrical power is an accumulator battery, it shall be capable of:

- .1 carrying the emergency electrical load without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage;
- .2 automatically connecting to the emergency switchboard in the event of failure of the main source of electrical power; and
- .3 immediately supplying at least those services specified in paragraph 4.

4 The transitional source of emergency electrical power required by paragraph 3.1.3 shall consist of an accumulator battery suitably located for use in an emergency which shall operate without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage and be of sufficient capacity and so arranged as to supply automatically in the event of failure of either the main or emergency source of electrical power at least the following services, if they depend upon an electrical source for their operation:

4.1 For half an hour:

- .1 the lighting required by paragraphs 2.1 and 2.2;
- .2 all services required by paragraphs 2.3.1, 2.3.3 and 2.3.4 unless such services have an independent supply for the period specified from an accumulator battery suitably located for use in an emergency.

4.2 Power to close the watertight doors but not necessarily all of them simultaneously, together with their indicators and warning signals as required by paragraph 2.6.1.

5.1 The emergency switchboard shall be installed as near as is practicable to the emergency source of electrical power.

5.2 Where the emergency source of electrical power is a generator, the emergency switchboard shall be located in the same space unless the operation of the emergency switchboard would thereby be impaired.

5.3 No accumulator battery fitted in accordance with this Regulation shall be installed in the same space as the emergency switchboard. An indicator shall be mounted in a suitable place on the main switchboard or in the machinery control room to indicate when the batteries constituting either the emergency source of electrical power or the transitional source of emergency electrical power referred to in paragraph 3.1.3 or 4 are being discharged.

5.4 The emergency switchboard shall be supplied during normal operation from the main switchboard by an interconnector feeder which is to be adequately protected at the main switchboard against overload and short circuit and which is to be disconnected automatically at the emergency switchboard upon failure of the main source of electrical power. Where the system is arranged for feedback operation, the interconnector feeder is also to be protected at the emergency switchboard at least against short circuit.

5.5 In order to ensure ready availability of the emergency source of electrical power, arrangements shall be made where necessary to disconnect automatically non-emergency circuits from the emergency switchboard to ensure that power shall be available to the emergency circuits.

6 The emergency generator and its prime-mover and any emergency accumulator battery shall be so designed and arranged as to ensure that they will function at full rated power when the ship is upright and when inclined at any angle of list up to 22.5° or when inclined up to 10° either in the fore or aft direction, or is in any combination of angles within those limits.

7 Provision shall be made for the periodic testing of the complete emergency system and shall include the testing of automatic starting arrangements.

Regulation 43

Emergency source of electrical power in cargo ships

1.1 A self-contained emergency source of electrical power shall be provided.

1.2 The emergency source of electrical power, associated transforming equipment, if any, transitional source of emergency power, emergency switchboard and emergency lighting switchboard shall be located above the uppermost continuous deck and shall be readily accessible from the open deck. They shall not be located forward of the collision bulkhead, except where permitted by the Administration in exceptional circumstances.

1.3 The location of the emergency source of electrical power, associated transforming equipment, if any, the transitional source of emergency power, the emergency switchboard and the emergency lighting switchboard in relation to the main source of electrical power, associated transforming equipment, if any, and the main switchboard shall be such as to ensure to the satisfaction of the Administration that a fire or other casualty in the space containing the main source of electrical power, associated transforming equipment, if any, and the main switchboard, or in any machinery space of category A will not interfere with the supply, control and distribution of emergency electrical power. As far as practicable the space containing the emergency source of electrical power, associated transforming equipment, if any, the transitional source of emergency electrical power and the emergency switchboard shall not be contiguous to the boundaries of machinery spaces of category A or those spaces containing the main source of electrical power, associated transforming equipment, if any, and the main switchboard.

1.4 Provided that suitable measures are taken for safeguarding independent emergency operation under all circumstances, the emergency generator may be used, exceptionally, and for short periods, to supply non-emergency circuits.

2 The electrical power available shall be sufficient to supply all those services that are essential for safety in an emergency, due regard being paid to such services as may have to be operated simultaneously. The emergency source of electrical power shall be capable, having regard to starting currents and the transitory nature of certain loads, of supplying simultaneously at least the following services for the periods specified hereinafter, if they depend upon an electrical source for their operation:

2.1 For a period of 3 hours, emergency lighting at every embarkation station on deck and over sides as required by Regulations III/19 and III/38.

- 2.2 For a period of 18 hours, emergency lighting:
- .1 in all service and accommodation alleyways, stairways and exits, personnel lift cars and personnel lift trunks;
 - .2 in the machinery spaces and main generating stations including their control positions;
 - .3 in all control stations, machinery control rooms, and at each main and emergency switchboard;
 - .4 at all stowage positions for firemen's outfits;
 - .5 at the steering gear; and
 - .6 at the fire pump referred to in paragraph 2.5, at the sprinkler pump, if any, and at the emergency bilge pump, if any, and at the starting positions of their motors.

2.3 For a period of 18 hours, the navigation lights and other lights required by the International Regulations for Preventing Collisions at Sea in force.

2.4 For a period of 18 hours:

- .1 all internal communication equipment as required in an emergency;
- .2 the navigational aids as required by Regulation V/12; where such provision is unreasonable or impracticable the Administration may waive this requirement for ships of less than 5,000 tons gross tonnage;
- .3 the fire detection and fire alarm system; and
- .4 intermittent operation of the daylight signalling lamp, the ship's whistle, the manual fire alarms, and all internal signals that are required in an emergency;

unless such services have an independent supply for the period of 18 hours from an accumulator battery suitably located for use in an emergency.

2.5 For a period of 18 hours one of the fire pumps required by Regulation II-2/4.3.1 and 4.3.3 if dependent upon the emergency generator for its source of power.

2.6.1 For the period of time required by Regulation 29.14 the steering gear where it is required to be so supplied by that Regulation.

2.6.2 In a ship engaged regularly in voyages of short duration, the Administration if satisfied that an adequate standard of safety would be attained may accept a lesser period than the 18 hour period specified in paragraphs 2.2 to 2.5 but not less than 12 hours.

3 The emergency source of electrical power may be either a generator or an accumulator battery, which shall comply with the following:

3.1 Where the emergency source of electrical power is a generator, it shall be:

- .1 driven by a suitable prime-mover with an independent supply of fuel, having a flashpoint (closed cup test) of not less than 43°C;
- .2 started automatically upon failure of the main source of electrical power supply unless a transitional source of emergency electrical power in accordance with paragraph 3.1.3 is provided; where the emergency generator is automatically started, it shall be automatically connected to the emergency switchboard; those services referred to in paragraph 4 shall then be connected automatically to the emergency generator; and unless a second independent means of starting the emergency generator is provided the single source of stored energy shall be protected to preclude its complete depletion by the automatic starting system; and
- .3 provided with a transitional source of emergency electrical power as specified in paragraph 4 unless an emergency generator is provided capable both of supplying the services mentioned in that paragraph and of being automatically started and supplying the required load as quickly as is safe and practicable subject to a maximum of 45 seconds.

3.2 Where the emergency source of electrical power is an accumulator battery it shall be capable of:

- .1 carrying the emergency electrical load without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage;
- .2 automatically connecting to the emergency switchboard in the event of failure of the main source of electrical power; and
- .3 immediately supplying at least those services specified in paragraph 4.

4 The transitional source of emergency electrical power where required by paragraph 3.1.3 shall consist of an accumulator battery suitably located for use in an emergency which shall operate without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage and be of sufficient capacity and shall be so arranged as to supply automatically in the event of failure of either the main or the emergency source of electrical power for half an hour at least the following services if they depend upon an electrical source for their operation:

- .1 the lighting required by paragraphs 2.1, 2.2 and 2.3. For this transitional phase, the required emergency electric lighting, in respect of the machinery space and accommodation and service spaces may be provided by permanently fixed, individual, automatically charged, relay operated accumulator lamps; and
- .2 all services required by paragraphs 2.4.1, 2.4.3 and 2.4.4 unless such services have an independent supply for the period specified from an accumulator battery suitably located for use in an emergency.

5.1 The emergency switchboard shall be installed as near as is practicable to the emergency source of electrical power.

5.2 Where the emergency source of electrical power is a generator, the emergency switchboard shall be located in the same space unless the operation of the emergency switchboard would thereby be impaired.

5.3 No accumulator battery fitted in accordance with this Regulation shall be installed in the same space as the emergency switchboard. An indicator shall be mounted in a suitable place on the main switchboard or in the machinery control room to indicate when the batteries constituting either the emergency source of electrical power or the transitional source of electrical power referred to in paragraph 3.2 or 4 are being discharged.

5.4 The emergency switchboard shall be supplied during normal operation from the main switchboard by an interconnector feeder which is to be adequately protected at the main switchboard against overload and short circuit and which is to be disconnected automatically at the emergency switchboard upon failure of the main source of electrical power. Where the system is arranged for feedback operation, the interconnector feeder is also to be protected at the emergency switchboard at least against short circuit.

5.5 In order to ensure ready availability of the emergency source of electrical power, arrangements shall be made where necessary to disconnect automatically non-emergency circuits from the emergency switchboard to ensure that electrical power shall be available automatically to the emergency circuits.

6 The emergency generator and its prime-mover and any emergency accumulator battery shall be so designed and arranged as to ensure that they will function at full rated power when the ship is upright and when inclined at any angle of list up to 22.5° or when inclined up to 10° either in the fore or aft direction, or is in any combination of angles within those limits.

7 Provision shall be made for the periodic testing of the complete emergency system and shall include the testing of automatic starting arrangements.

Regulation 44

Starting arrangements for emergency generating sets

1 Emergency generating sets shall be capable of being readily started in their cold condition at a temperature of 0°C. If this is impracticable, or if lower temperatures are likely to be encountered, provision acceptable to the Administration shall be made for the maintenance of heating arrangements, to ensure ready starting of the generating sets.

2 Each emergency generating set arranged to be automatically started shall be equipped with starting devices approved by the Administration with a stored energy capability of at least three consecutive starts. A second source of energy shall be provided for an additional three starts within 30 minutes unless manual starting can be demonstrated to be effective.

- 3 The stored energy shall be maintained at all times, as follows:
- .1 electrical and hydraulic starting systems shall be maintained from the emergency switchboard;
 - .2 compressed air starting systems may be maintained by the main or auxiliary compressed air receivers through a suitable non-return valve or by an emergency air compressor which, if electrically driven, is supplied from the emergency switchboard;
 - .3 all of these starting, charging and energy storing devices shall be located in the emergency generator space; these devices are not to be used for any purpose other than the operation of the emergency generating set. This does not preclude the supply to the air receiver of the emergency generating set from the main or auxiliary compressed air system through the non-return valve fitted in the emergency generator space.
- 4.1 Where automatic starting is not required, manual starting is permissible, such as manual cranking, inertia starters, manually charged hydraulic accumulators, or powder charge cartridges, where they can be demonstrated as being effective.
- 4.2 When manual starting is not practicable, the requirements of paragraphs 2 and 3 shall be complied with except that starting may be manually initiated.

Regulation 45

Precautions against shock, fire and other hazards of electrical origin

- 1.1 Exposed metal parts of electrical machines or equipment which are not intended to be live but which are liable under fault conditions to become live shall be earthed unless the machines or equipment are:
- .1 supplied at a voltage not exceeding 55 V direct current or 55 V, root mean square between conductors; auto-transformers shall not be used for the purpose of achieving this voltage; or
 - .2 supplied at a voltage not exceeding 250 V by safety isolating transformers supplying only one consuming device; or
 - .3 constructed in accordance with the principle of double insulation.
- 1.2 The Administration may require additional precautions for portable electrical equipment for use in confined or exceptionally damp spaces where particular risks due to conductivity may exist.
- 1.3 All electrical apparatus shall be so constructed and so installed as not to cause injury when handled or touched in the normal manner.
- 2 Main and emergency switchboards shall be so arranged as to give easy access as may be needed to apparatus and equipment, without danger to personnel. The sides and the rear and, where necessary, the front of

switchboards shall be suitably guarded. Exposed live parts having voltages to earth exceeding a voltage to be specified by the Administration shall not be installed on the front of such switchboards. Where necessary, non-conducting mats or gratings shall be provided at the front and rear of the switchboard.

3.1 The hull return system of distribution shall not be used for any purpose in a tanker, or for power, heating, or lighting in any other ship of 1,600 tons gross tonnage and upwards.

3.2 The requirement of paragraph 3.1 does not preclude under conditions approved by the Administration the use of:

- .1 impressed current cathodic protective systems;
- .2 limited and locally earthed systems; or
- .3 insulation level monitoring devices provided the circulation current does not exceed 30 mA under the most unfavourable conditions.

3.3 Where the hull return system is used, all final subcircuits, i.e. all circuits fitted after the last protective device, shall be two-wire and special precautions shall be taken to the satisfaction of the Administration.

4.1 Earthed distribution systems shall not be used in a tanker. The Administration may exceptionally permit in a tanker the earthing of the neutral for alternating current power networks of 3,000 V (line to line) and over, provided that any possible resulting current does not flow directly through any of the dangerous spaces.

4.2 When a distribution system, whether primary or secondary, for power, heating or lighting, with no connexion to earth is used, a device capable of continuously monitoring the insulation level to earth and of giving an audible or visual indication of abnormally low insulation values shall be provided.

5.1 Except as permitted by the Administration in exceptional circumstances, all metal sheaths and armour of cables shall be electrically continuous and shall be earthed.

5.2 All electric cables and wiring external to equipment shall be at least of a flame retardant type and shall be so installed as not to impair their original flame retarding properties. Where necessary for particular applications the Administration may permit the use of special types of cables such as radio frequency cables, which do not comply with the foregoing.

5.3 Cables and wiring serving essential or emergency power, lighting, internal communications or signals shall so far as practicable be routed clear of galleys, laundries, machinery spaces of category A and their casings and other high fire risk areas. Cables connecting fire pumps to the emergency switchboard shall be of a fire resistant type where they pass through high fire risk areas. Where practicable all such cables should be run in such a manner as to preclude their being rendered unserviceable by heating of the bulkheads that may be caused by a fire in an adjacent space.

5.4 Where cables which are installed in hazardous areas introduce the risk of fire or explosion in the event of an electrical fault in such areas, special

precautions against such risks shall be taken to the satisfaction of the Administration.

5.5 Cables and wiring shall be installed and supported in such a manner as to avoid chafing or other damage.

5.6 Terminations and joints in all conductors shall be so made as to retain the original electrical, mechanical, flame retarding and, where necessary, fire resisting properties of the cable.

6.1 Each separate circuit shall be protected against short circuit and against overload, except as permitted in Regulations 29 and 30 or where the Administration may exceptionally otherwise permit.

6.2 The rating or appropriate setting of the overload protective device for each circuit shall be permanently indicated at the location of the protective device.

7 Lighting fittings shall be so arranged as to prevent temperature rises which could damage the cables and wiring, and to prevent surrounding material from becoming excessively hot.

8 All lighting and power circuits terminating in a bunker or cargo space shall be provided with a multiple pole switch outside the space for disconnecting such circuits.

9.1 Accumulator batteries shall be suitably housed, and compartments used primarily for their accommodation shall be properly constructed and efficiently ventilated.

9.2 Electrical or other equipment which may constitute a source of ignition of flammable vapours shall not be permitted in these compartments except as permitted in paragraph 10.

9.3 Accumulator batteries shall not be located in sleeping quarters except where hermetically sealed to the satisfaction of the Administration.

10 No electrical equipment shall be installed in any space where flammable mixtures are liable to collect including those on board tankers or in compartments assigned principally to accumulator batteries, in paint lockers, acetylene stores or similar spaces, unless the Administration is satisfied that such equipment is:

- .1 essential for operational purposes;
- .2 of a type which will not ignite the mixture concerned;
- .3 appropriate to the space concerned; and
- .4 appropriately certified for safe usage in the dusts, vapours or gases likely to be encountered.

11 In a passenger ship, distribution systems shall be so arranged that fire in any main vertical zone as is defined in Regulation II-2/3.9 will not interfere with services essential for safety in any other such zone. This requirement will

be met if main and emergency feeders passing through any such zone are separated both vertically and horizontally as widely as is practicable.

PART E - ADDITIONAL REQUIREMENTS FOR PERIODICALLY UNATTENDED MACHINERY SPACES

(Part E applies to cargo ships except that Regulation 54
refers to passenger ships)

Regulation 46

General

- 1 The arrangements provided shall be such as to ensure that the safety of the ship in all sailing conditions, including manoeuvring, is equivalent to that of a ship having the machinery spaces manned.
- 2 Measures shall be taken to the satisfaction of the Administration to ensure that the equipment is functioning in a reliable manner and that satisfactory arrangements are made for regular inspections and routine tests to ensure continuous reliable operation.
- 3 Every ship shall be provided with documentary evidence, to the satisfaction of the Administration, of its fitness to operate with periodically unattended machinery spaces.

Regulation 47

Fire precautions

- 1 Means shall be provided to detect and give alarms at an early stage in case of fires:
 - .1 in boiler air supply casings and exhausts (uptakes); and
 - .2 in scavenging air belts of propulsion machinery,unless the Administration considers this to be unnecessary in a particular case.
- 2 Internal combustion engines of 2250 kW and above or having cylinders of more than 300 mm bore shall be provided with crankcase oil mist detectors or engine bearing temperature monitors or equivalent devices.

Regulation 48

Protection against flooding

1 Bilge wells in periodically unattended machinery spaces shall be located and monitored in such a way that the accumulation of liquids is detected at normal angles of trim and heel, and shall be large enough to accommodate easily the normal drainage during the unattended period.

2 Where the bilge pumps are capable of being started automatically, means shall be provided to indicate when the influx of liquid is greater than the pump capacity or when the pump is operating more frequently than would normally be expected. In these cases, smaller bilge wells to cover a reasonable period of time may be permitted. Where automatically controlled bilge pumps are provided, special attention shall be given to oil pollution prevention requirements.

3 The location of the controls of any valve serving a sea inlet, a discharge below the water-line or a bilge injection system shall be so sited as to allow adequate time for operation in case of influx of water to the space, having regard to the time likely to be required in order to reach and operate such controls. If the level to which the space could become flooded with the ship in the fully loaded condition so requires, arrangements shall be made to operate the controls from a position above such level.

Regulation 49

Control of propulsion machinery from the navigating bridge

1 Under all sailing conditions, including manoeuvring, the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the navigating bridge.

1.1 Such remote control shall be performed by a single control device for each independent propeller, with automatic performance of all associated services, including, where necessary, means of preventing overload of the propulsion machinery.

1.2 The main propulsion machinery shall be provided with an emergency stopping device on the navigating bridge which shall be independent of the navigating bridge control system.

2 Propulsion machinery orders from the navigating bridge shall be indicated in the main machinery control room or at the propulsion machinery control position as appropriate.

3 Remote control of the propulsion machinery shall be possible only from one location at a time; at such locations interconnected control positions are permitted. At each location there shall be an indicator showing which location is in control of the propulsion machinery. The transfer of control between the navigating bridge and machinery spaces shall be possible only in

the machinery space or in the machinery control room. The system shall include means to prevent the propelling thrust from altering significantly when transferring control from one location to another.

4 It shall be possible for all machinery essential for the safe operation of the ship to be controlled from a local position, even in the case of failure in any part of the automatic or remote control systems.

5 The design of the remote automatic control system shall be such that in case of its failure an alarm will be given. Unless the Administration considers it impracticable, the preset speed and direction of thrust shall be maintained until local control is in operation.

6 Indicators shall be fitted on the navigating bridge for:

- .1 propeller speed and direction of rotation in case of fixed pitch propellers; or
- .2 propeller speed and pitch position in case of controllable pitch propellers.

7 The number of consecutive automatic attempts which fail to produce a start shall be limited to safeguard sufficient starting air pressure. An alarm shall be provided to indicate low starting air pressure set at a level which still permits starting operations of the propulsion machinery.

Regulation 50

Communication

A reliable means of vocal communication shall be provided between the main machinery control room or the propulsion machinery control position as appropriate, the navigating bridge and the engineer officers' accommodation.

Regulation 51

Alarm system

1 An alarm system shall be provided indicating any fault requiring attention and shall:

- .1 be capable of sounding an audible alarm in the main machinery control room or at the propulsion machinery control position, and indicate visually each separate alarm function at a suitable position;
- .2 have a connexion to the engineers' public rooms and to each of the engineers' cabins through a selector switch, to ensure connexion to at least one of those cabins. Administrations may permit equivalent arrangements;
- .3 activate an audible and visual alarm on the navigating bridge for any situation which requires action by or attention of the officer on watch;

- .4 as far as is practicable be designed on the fail-to-safety principle; and
- .5 activate the engineers' alarm required by Regulation 38 if an alarm function has not received attention locally within a limited time.

2.1 The alarm system shall be continuously powered and shall have an automatic change-over to a stand-by power supply in case of loss of normal power supply.

2.2 Failure of the normal power supply of the alarm system shall be indicated by an alarm.

3.1 The alarm system shall be able to indicate at the same time more than one fault and the acceptance of any alarm shall not inhibit another alarm.

3.2 Acceptance at the position referred to in paragraph 1 of any alarm condition shall be indicated at the positions where it was shown. Alarms shall be maintained until they are accepted and the visual indications of individual alarms shall remain until the fault has been corrected, when the alarm system shall automatically reset to the normal operating condition.

Regulation 52

Safety systems

A safety system shall be provided to ensure that serious malfunction in machinery or boiler operations, which presents an immediate danger, shall initiate the automatic shut-down of that part of the plant and that an alarm shall be given. Shut-down of the propulsion system shall not be automatically activated except in cases which could lead to serious damage, complete breakdown, or explosion. Where arrangements for overriding the shut-down of the main propelling machinery are fitted, these shall be such as to preclude inadvertent operation. Visual means shall be provided to indicate when the override has been activated.

Regulation 53

Special requirements for machinery, boiler and electrical installations

1 The special requirements for the machinery, boiler and electrical installations shall be to the satisfaction of the Administration and shall include at least the requirements of this Regulation.

2 The main source of electrical power shall comply with the following:

2.1 Where the electrical power can normally be supplied by one generator, suitable load shedding arrangements shall be provided to ensure the integrity of supplies to services required for propulsion and steering as well as the safety of the ship. In the case of loss of the generator in operation, adequate provision shall be made for automatic starting and connecting to the main

switchboard of a stand-by generator of sufficient capacity to permit propulsion and steering and to ensure the safety of the ship with automatic re-starting of the essential auxiliaries including, where necessary, sequential operations. The Administration may dispense with this requirement for a ship of less than 1,600 tons gross tonnage, if it is considered impracticable.

2.2 If the electrical power is normally supplied by more than one generator simultaneously in parallel operation, provision shall be made, for instance by load shedding, to ensure that, in case of loss of one of these generating sets, the remaining ones are kept in operation without overload to permit propulsion and steering, and to ensure the safety of the ship.

3 Where stand-by machines are required for other auxiliary machinery essential to propulsion, automatic change-over devices shall be provided.

4 *Automatic control and alarm system*

4.1 The control system shall be such that the services needed for the operation of the main propulsion machinery and its auxiliaries are ensured through the necessary automatic arrangements.

4.2 An alarm shall be given on the automatic change-over.

4.3 An alarm system complying with Regulation 51 shall be provided for all important pressures, temperatures and fluid levels and other essential parameters.

4.4 A centralized control position shall be arranged with the necessary alarm panels and instrumentation indicating any alarm.

5 Means shall be provided to keep the starting air pressure at the required level where internal combustion engines are used for main propulsion.

Regulation 54

Special consideration in respect of passenger ships

Passenger ships shall be specially considered by the Administration as to whether or not their machinery spaces may be periodically unattended and if so whether additional requirements to those stipulated in these Regulations are necessary to achieve equivalent safety to that of normally attended machinery spaces.

CHAPTER II-2

CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

The existing text of Chapter II-2 is replaced by the following:

PART A – GENERAL

Regulation 1

Application

1.1 Unless expressly provided otherwise, this Chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 September 1984.

1.2 For the purpose of this Chapter the term “a similar stage of construction” means the stage at which:

- .1 construction identifiable with a specific ship begins; and
- .2 assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is less.

1.3 For the purpose of this Chapter:

- .1 the expression “ships constructed” means “ships the keels of which are laid or which are at a similar stage of construction”;
- .2 the expression “all ships” means “ships constructed before, on or after 1 September 1984”;
- .3 a cargo ship, whenever built, which is converted to a passenger ship shall be treated as a passenger ship constructed on the date on which such a conversion commences.

2 Unless expressly provided otherwise:

- .1 for ships constructed before 1 September 1984, the Administration shall ensure that, subject to the provisions of paragraph 2.2, the requirements which are applicable under Chapter II-2 of the International Convention for the Safety of Life at Sea, 1974* to new or existing ships as defined in that Chapter are complied with;
- .2 for tankers constructed before 1 September 1984, the Administration shall ensure that the requirements which are applicable under

* The text as adopted by the International Conference on Safety of Life at Sea, 1974.

Chapter II-2 of the Annex to the Protocol of 1978 relating to the International Convention for the Safety of Life at Sea, 1974, to new or existing ships as defined in that Chapter are complied with.

3 All ships which undergo repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to these ships. Such ships, if constructed before 1 September 1984 shall, as a rule, comply with the requirements for ships constructed on or after that date to at least the same extent as they did before undergoing such repairs, alterations, modifications or outfitting. Repairs, alterations and modifications of a major character and outfitting related thereto shall meet the requirements for ships constructed on or after 1 September 1984 in so far as the Administration deems reasonable and practicable.

4.1 The Administration of a State may, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of this Chapter unreasonable or unnecessary, exempt from those requirements individual ships or classes of ships entitled to fly the flag of that State which, in the course of their voyage, do not proceed more than 20 miles from the nearest land.

4.2 In the case of passenger ships which are employed in special trades for the carriage of large numbers of special trade passengers, such as the pilgrim trade, the Administration of the State whose flag such ships are entitled to fly, if satisfied that it is impracticable to enforce compliance with the requirements of this Chapter, may exempt such ships from those requirements, provided that they comply fully with provisions of:

- .1 the Rules annexed to the Special Trade Passenger Ships Agreement, 1971; and
- .2 the Rules annexed to the Protocol on Space Requirements for Special Trade Passenger Ships, 1973.

Regulation 2

Basic principles

1 The purpose of this Chapter is to require the fullest practicable degree of fire protection, fire detection and fire extinction in ships.

2 The following basic principles underlie the Regulations in this Chapter and are embodied in the Regulations as appropriate, having regard to the type of ships and the potential fire hazard involved:

- .1 division of ship into main vertical zones by thermal and structural boundaries;
- .2 separation of accommodation spaces from the remainder of the ship by thermal and structural boundaries;

- .3 restricted use of combustible materials;
- .4 detection of any fire in the zone of origin;
- .5 containment and extinction of any fire in the space of origin;
- .6 protection of means of escape or access for fire fighting;
- .7 ready availability of fire-extinguishing appliances;
- .8 minimization of possibility of ignition of flammable cargo vapour.

Regulation 3

Definitions

For the purpose of this Chapter, unless expressly provided otherwise:

1 "Non-combustible material" is a material which neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750°C, this being determined to the satisfaction of the Administration by an established test procedure.* Any other material is a combustible material.

2 "A standard fire test" is one in which specimens of the relevant bulkheads or decks are exposed in a test furnace to temperatures corresponding approximately to the standard time-temperature curve. The specimen shall have an exposed surface of not less than 4.65 m² and height (or length of deck) of 2.44 m, resembling as closely as possible the intended construction and including where appropriate at least one joint. The standard time-temperature curve is defined by a smooth curve drawn through the following temperature points measured above the initial furnace temperature:

at the end of the first	5 minutes	556°C
" " " " " "	10 minutes	659°C
" " " " " "	15 minutes	718°C
" " " " " "	30 minutes	821°C
" " " " " "	60 minutes	925°C

3 "'A' class divisions" are those divisions formed by bulkheads and decks which comply with the following:

- .1 they shall be constructed of steel or other equivalent material;
- .2 they shall be suitably stiffened;
- .3 they shall be so constructed as to be capable of preventing the passage of smoke and flame to the end of the one-hour standard fire test;

* Reference is made to Improved Recommendation on Test Method for Qualifying Marine Construction Materials as Non-Combustible, adopted by the Organization by resolution A.472(XII)

- .4 they shall be insulated with approved non-combustible materials such that the average temperature of the unexposed side will not rise more than 139°C above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180°C above the original temperature, within the time listed below:

class "A-60"	60 minutes
class "A-30"	30 minutes
class "A-15"	15 minutes
class "A-0"	0 minutes

- .5 the Administration may require a test of a prototype bulkhead or deck to ensure that it meets the above requirements for integrity and temperature rise.*

4 "B" class divisions" are those divisions formed by bulkheads, decks, ceilings or linings which comply with the following:

- .1 they shall be so constructed as to be capable of preventing the passage of flame to the end of the first half hour of the standard fire test;
- .2 they shall have an insulation value such that the average temperature of the unexposed side will not rise more than 139°C above the original temperature, nor will the temperature at any one point, including any joint, rise more than 225°C above the original temperature, within the time listed below:

class "B-15"	15 minutes
class "B-0"	0 minutes

- .3 they shall be constructed of approved non-combustible materials and all materials entering into the construction and erection of "B" class divisions shall be non-combustible, with the exception that combustible veneers may be permitted provided they meet other requirements of this Chapter;
- .4 the Administration may require a test of a prototype division to ensure that it meets the above requirements for integrity and temperature rise.*

5 "C" class divisions" are divisions constructed of approved non-combustible materials. They need meet neither requirements relative to the passage of smoke and flame nor limitations relative to the temperature rise. Combustible veneers are permitted provided they meet other requirements of this Chapter.

6 "Continuous 'B' class ceilings or linings" are those "B" class ceilings or linings which terminate only at an "A" or "B" class division.

7 "Steel or other equivalent material". Where the words "steel or other equivalent material" occur, "equivalent material" means any non-

* Reference is made to Recommendation for Fire Test Procedures for "A" and "B" Class Divisions, adopted by the Organization by resolutions A.163(ES.IV) and A.215(VII).

combustible material which, by itself or due to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable exposure to the standard fire test (e.g. aluminium alloy with appropriate insulation).

8 "Low flame spread" means that the surface thus described will adequately restrict the spread of flame, this being determined to the satisfaction of the Administration by an established test procedure.

9 "Main vertical zones" are those sections into which the hull, superstructure, and deckhouses are divided by "A" class divisions, the mean length of which on any deck does not in general exceed 40 m.

10 "Accommodation spaces" are those spaces used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, games and hobbies rooms, barber shops, pantries containing no cooking appliances and similar spaces.

11 "Public spaces" are those portions of the accommodation which are used for halls, dining rooms, lounges and similar permanently enclosed spaces.

12 "Service spaces" are those spaces used for galleys, pantries containing cooking appliances, lockers, main and specie rooms, store-rooms, workshops other than those forming part of the machinery spaces, and similar spaces and trunks to such spaces.

13 "Cargo spaces" are all spaces used for cargo (including cargo oil tanks) and trunks to such spaces.

14 "Ro/ro cargo spaces" are spaces not normally subdivided in any way and extending to either a substantial length or the entire length of the ship in which goods (packaged or in bulk, in or on rail or road cars, vehicles (including road or rail tankers), trailers, containers, pallets, demountable tanks or in or on similar stowage units or other receptacles) can be loaded and unloaded normally in a horizontal direction.

15 "Open ro/ro cargo spaces" are ro/ro cargo spaces either open at both ends, or open at one end and provided with adequate natural ventilation effective over their entire length through permanent openings in the side plating or deckhead to the satisfaction of the Administration.

16 "Closed ro/ro cargo spaces" are ro/ro cargo spaces which are neither open ro/ro cargo spaces nor weather decks.

17 "Weather deck" is a deck which is completely exposed to the weather from above and from at least two sides.

18 "Special category spaces" are those enclosed spaces above or below the bulkhead deck intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion, into and from which such vehicles can be driven and to which passengers have access.

19 "Machinery spaces of category A" are those spaces and trunks to such

spaces which contain.

- .1 internal combustion machinery used for main propulsion; or
- .2 internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW; or
- .3 any oil-fired boiler or oil fuel unit.

20 "Machinery spaces" are all machinery spaces of category A and all other spaces containing propulsion machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces.

21 "Oil fuel unit" is the equipment used for the preparation of oil fuel for delivery to an oil-fired boiler, or equipment used for the preparation for delivery of heated oil to an internal combustion engine, and includes any oil pressure pumps, filters and heaters dealing with oil at a pressure of more than 0.18 N/mm².

22 "Control stations" are those spaces in which the ship's radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralized.

23 "Rooms containing furniture and furnishings of restricted fire risk" are, for the purpose of Regulation 26, those rooms containing furniture and furnishings of restricted fire risk (whether cabins, public spaces, offices or other types of accommodation) in which:

- .1 all case furniture such as desks, wardrobes, dressing tables, bureaux, dressers, is constructed entirely of approved non-combustible materials, except that a combustible veneer not exceeding 2 mm may be used on the working surface of such articles;
- .2 all free-standing furniture such as chairs, sofas, tables, is constructed with frames of non-combustible materials;
- .3 all draperies, curtains and other suspended textile materials have, to the satisfaction of the Administration, qualities of resistance to the propagation of flame not inferior to those of wool of mass 0.8 kg/m²;
- .4 all floor coverings have, to the satisfaction of the Administration, qualities of resistance to the propagation of flame not inferior to those of an equivalent woollen material used for the same purpose;
- .5 all exposed surfaces of bulkheads, linings and ceilings have low flame-spread characteristics; and

* Reference is made to Recommendation on Test Method for Determining the Resistance to Flame of Vertically Supported Textiles and Films, adopted by the Organization by resolution A.471(XII).

.6 all upholstered furniture has qualities of resistance to the ignition and propagation of flame to the satisfaction of the Administration.

24 "Bulkhead deck" is the uppermost deck up to which the transverse watertight bulkheads are carried.

25 "Deadweight" is the difference in tonnes between the displacement of a ship in water of a specific gravity of 1.025 at the load water-line corresponding to the assigned summer freeboard and the lightweight of the ship.

26 "Lightweight" is the displacement of a ship in tonnes without cargo, fuel, lubricating oil, ballast water, fresh water and feedwater in tanks, consumable stores, and passengers and crew and their effects.

27 "Combination carrier" is a tanker designed to carry oil or alternatively solid cargoes in bulk.

28 "Crude oil" is any oil occurring naturally in the earth whether or not treated to render it suitable for transportation and includes:

- .1 crude oil from which certain distillate fractions may have been removed; and
- .2 crude oil to which certain distillate fractions may have been added.

29 "Dangerous goods" are those goods referred to in Regulation VII/2.

30 "Chemical tanker" is a tanker constructed or adapted and used for the carriage in bulk of any liquid product of a flammable nature listed in the summary of minimum requirements of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk to be adopted by the Maritime Safety Committee under the authority of the Assembly of the Organization conferred by resolution A.490(XII), hereinafter referred to as "Bulk Chemical Code", as may be amended by the Organization.

31 "Gas carrier" is a tanker constructed or adapted and used for the carriage in bulk of any liquefied gas or certain other substances of a flammable nature listed in Chapter XIX of the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Organization by resolution A.328(IX), hereinafter referred to as "Gas Carrier Code", as has been or may be amended by the Organization.

Regulation 4

Fire pumps, fire mains, hydrants and hoses

1 Every ship shall be provided with fire pumps, fire mains, hydrants and hoses complying as applicable with the requirements of this Regulation.

2 *Capacity of fire pumps*

2.1 The required fire pumps shall be capable of delivering for fire-fighting

purposes a quantity of water, at the pressure specified in paragraph 4, as follows:

- .1 pumps in passenger ships, not less than two-thirds of the quantity required to be dealt with by the bilge pumps when employed for bilge pumping; and
- .2 pumps in cargo ships, other than any emergency pump, not less than four-thirds of the quantity required under Regulation II-1/21 to be dealt with by each of the independent bilge pumps in a passenger ship of the same dimension when employed in bilge pumping, provided that in no cargo ship need the total required capacity of the fire pumps exceed 180 m³/hour.

2.2 Each of the required fire pumps (other than any emergency pump required in paragraph 3.3.2 for cargo ships) shall have a capacity not less than 80 per cent of the total required capacity divided by the minimum number of required fire pumps but in any case not less than 25 m³/hour and each such pump shall in any event be capable of delivering at least the two required jets of water. These fire pumps shall be capable of supplying the fire main system under the required conditions. Where more pumps than the minimum of required pumps are installed the capacity of such additional pumps shall be to the satisfaction of the Administration.

3 *Arrangements of fire pumps and of fire mains*

3.1 Ships shall be provided with independently driven fire pumps as follows:

- .1 Passenger ships of 4,000 tons gross tonnage and upwards at least three
- .2 Passenger ships of less than 4,000 tons gross tonnage and cargo ships of 1,000 tons gross tonnage and upwards at least two
- .3 Cargo ships of less than 1,000 tons gross tonnage to the satisfaction of the Administration

3.2 Sanitary, ballast, bilge or general service pumps may be accepted as fire pumps, provided that they are not normally used for pumping oil and that if they are subject to occasional duty for the transfer or pumping of oil fuel, suitable change-over arrangements are fitted.

3.3 The arrangement of sea connexions, fire pumps and their sources of power shall be such as to ensure that:

- .1 In passenger ships of 1,000 tons gross tonnage and upwards, in the event of a fire in any one compartment all the fire pumps will not be put out of action.
- .2 In cargo ships of 2,000 tons gross tonnage and upwards if a fire in any one compartment could put all the pumps out of action there shall be an alternative means consisting of a fixed independently driven emergency pump which shall be capable of supplying two jets

of water to the satisfaction of the Administration. The pump and its location shall comply with the following requirements:

- .2.1 The capacity of the pump shall not be less than 40 per cent of the total capacity of the fire pumps required by this Regulation and in any case not less than 25 m³/hour.
- .2.2 When the pump is delivering the quantity of water required by paragraph 3.3.2.1 the pressure at any hydrant shall be not less than the minimum pressures given in paragraph 4.2.
- .2.3 Any diesel driven power source for the pump shall be capable of being readily started in its cold condition down to a temperature of 0°C by hand (manual) cranking. If this is impracticable, or if lower temperatures are likely to be encountered, consideration is to be given to the provision and maintenance of heating arrangements, acceptable to the Administration, so that ready starting will be assured. If hand (manual) starting is impracticable the Administration may permit other means of starting. These means shall be such as to enable the diesel driven power source to be started at least 6 times within a period of 30 minutes, and at least twice within the first 10 minutes.
- .2.4 Any service fuel tank shall contain sufficient fuel to enable the pump to run on full load for at least three hours and sufficient reserves of fuel shall be available outside the main machinery space to enable the pump to be run on full load for an additional 15 hours.
- .2.5 The total suction head of the pump shall not exceed 4.5 m under all conditions of list and trim likely to be encountered in service and the suction piping shall be designed to minimize suction losses.
- .2.6 The boundaries of the space containing the fire pump shall be insulated to a standard of structural fire protection equivalent to that required for a control room in Regulation 44.
- .2.7 No direct access shall be permitted between the machinery space and the space containing the emergency fire pump and its source of power. When this is impracticable an Administration may accept an arrangement where the access is by means of an airlock, each of the two doors being self-closing, or through a watertight door capable of being operated from a space remote from the machinery space and the space containing the emergency fire pump and unlikely to be cut off in the event of fire in those spaces. In such cases a second means of access to the space containing the emergency fire pump and its source of power shall be provided.
- .2.8 Ventilation arrangements to the space containing the independent source of power for the emergency fire pump shall be such as to preclude, as far as practicable, the possibility of smoke from a machinery space fire entering or being drawn into that space.
- .3 In passenger ships of less than 1,000 tons gross tonnage and cargo

ships of less than 2,000 tons gross tonnage, if a fire in any one compartment could put all the pumps out of action the alternative means of providing water for fire-fighting purposes are to the satisfaction of the Administration.

- .4 In addition, in cargo ships where other pumps, such as general service, bilge and ballast, etc., are fitted in a machinery space, arrangements shall be made to ensure that at least one of these pumps, having the capacity and pressure required by paragraphs 2.2 and 4.2, is capable of providing water to the fire main.

3.4 The arrangements for the ready availability of water supply shall be:

- .1 in passenger ships of 1,000 tons gross tonnage and upwards such that at least one effective jet of water is immediately available from any hydrant in an interior location and so as to ensure the continuation of the output of water by the automatic starting of a required fire pump;
- .2 in passenger ships of less than 1,000 tons gross tonnage and in cargo ships to the satisfaction of the Administration;
- .3 in cargo ships with a periodically unattended machinery space or when only one person is required on watch there shall be immediate water delivery from the fire main system at a suitable pressure, either by remote starting of one of the main fire pumps with remote starting from the navigating bridge and fire control station, if any, or permanent pressurization of the fire main system by one of the main fire pumps, except that the Administration may waive this requirement for cargo ships of less than 1,600 tons gross tonnage if the arrangement of the machinery space access makes it unnecessary;
- .4 in passenger ships, if fitted with periodically unattended machinery spaces in accordance with Regulation II-1/54, the Administration shall determine provisions for fixed water fire-extinguishing arrangement for such spaces equivalent to those required for normally attended machinery spaces.

3.5 Relief valves shall be provided in conjunction with all fire pumps if the pumps are capable of developing a pressure exceeding the design pressure of the water service pipes, hydrants and hoses. These valves shall be so placed and adjusted as to prevent excessive pressure in any part of the fire main system.

3.6 In tankers isolation valves shall be fitted in the fire main at poop front in a protected position and on the tank deck at intervals of not more than 40 m to preserve the integrity of the fire main system in case of fire or explosion.

4 *Diameter of and pressure in the fire mains*

4.1 The diameter of the fire main and water service pipes shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously, except that in the case of cargo ships the diameter need only be sufficient for the discharge of 140 m³/hour.

4.2 With the two pumps simultaneously delivering through nozzles specified in paragraph 8 the quantity of water specified in paragraph 4.1, through any adjacent hydrants, the following minimum pressures shall be maintained at all hydrants:

Passenger ships:

4,000 tons gross tonnage and upwards	0.31 N/mm ²
1,000 tons gross tonnage and upwards but under 4,000 tons gross tonnage	0.27 N/mm ²
Under 1,000 tons gross tonnage	To the satisfaction of the Administration

Cargo ships:

6,000 tons gross tonnage and upwards	0.27 N/mm ²
1,000 tons gross tonnage and upwards but under 6,000 tons gross tonnage	0.25 N/mm ²
Under 1,000 tons gross tonnage	To the satisfaction of the Administration

4.3 The maximum pressure at any hydrant shall not exceed that at which the effective control of a fire hose can be demonstrated.

5 *Number and position of hydrants*

5.1 The number and position of hydrants shall be such that at least two jets of water not emanating from the same hydrant, one of which shall be from a single length of hose, may reach any part of the ship normally accessible to the passengers or crew while the ship is being navigated and any part of any cargo space when empty, any ro/ro cargo space or any special category space in which latter case the two jets shall reach any part of such space, each from a single length of hose. Furthermore, such hydrants shall be positioned near the accesses to the protected spaces.

5.2 In the accommodation, service and machinery spaces of passenger ships the number and position of hydrants shall be such that the requirements of paragraph 5.1 may be complied with when all watertight doors and all doors in main vertical zone bulkheads are closed.

5.3 Where, in a passenger ship, access is provided to a machinery space of category A at a low level from an adjacent shaft tunnel, two hydrants shall be provided external to, but near the entrance to that machinery space. Where such access is provided from other spaces, in one of those spaces two hydrants shall be provided near the entrance to the machinery space of category A. Such provision need not be made where the tunnel or adjacent spaces are not part of the escape route.

6 *Pipes and hydrants*

6.1 Materials readily rendered ineffective by heat shall not be used for fire

mains and hydrants unless adequately protected. The pipes and hydrants shall be so placed that the fire hoses may be easily coupled to them. The arrangement of pipes and hydrants shall be such as to avoid the possibility of freezing. In ships where deck cargo may be carried, the positions of the hydrants shall be such that they are always readily accessible and the pipes shall be arranged as far as practicable to avoid risk of damage by such cargo. Unless one hose and nozzle is provided for each hydrant in the ship, there shall be complete interchangeability of hose couplings and nozzles.

6.2 A valve shall be fitted to serve each fire hose so that any fire hose may be removed while the fire pumps are at work.

6.3 Isolating valves to separate the section of the fire main within the machinery space containing the main fire pump or pumps from the rest of the fire main shall be fitted in an easily accessible and tenable position outside the machinery spaces. The fire main shall be so arranged that when the isolating valves are shut all the hydrants on the ship, except those in the machinery space referred to above, can be supplied with water by a fire pump not located in this machinery space through pipes which do not enter this space. Exceptionally, the Administration may permit short lengths of the emergency fire pump suction and discharge piping to penetrate the machinery space if it is impracticable to route it externally provided that the integrity of the fire main is maintained by the enclosure of the piping in a substantial steel casing.

7 Fire hoses

7.1 Fire hoses shall be of material approved by the Administration and shall be sufficient in length to project a jet of water to any of the spaces in which they may be required to be used. Their maximum length shall be to the satisfaction of the Administration. Each hose shall be provided with a nozzle and the necessary couplings. Hoses specified in this Chapter as "fire hoses" shall together with any necessary fittings and tools be kept ready for use in conspicuous positions near the water service hydrants or connexions. Additionally in interior locations in passenger ships carrying more than 36 passengers fire hoses shall be connected to the hydrants at all times.

7.2 Ships shall be provided with fire hoses the number and diameter of which shall be to the satisfaction of the Administration.

7.3 In passenger ships there shall be at least one fire hose for each of the hydrants required by paragraph 5 and these hoses shall be used only for the purposes of extinguishing fires or testing the fire-extinguishing apparatus at fire drills and surveys.

7.4.1 In cargo ships of 1,000 tons gross tonnage and upwards the number of fire hoses to be provided shall be one for each 30 m length of the ship and one spare but in no case less than five in all. This number does not include any hoses required in any engine or boiler room. The Administration may increase the number of hoses required so as to ensure that hoses in sufficient number are available and accessible at all times, having regard to the type of ship and the nature of trade in which the ship is employed.

7.4.2 In cargo ships of less than 1,000 tons gross tonnage the number of fire hoses to be provided shall be to the satisfaction of the Administration.

8 *Nozzles*

8.1 For the purposes of this Chapter, standard nozzle sizes shall be 12 mm, 16 mm and 19 mm or as near thereto as possible. Larger diameter nozzles may be permitted at the discretion of the Administration.

8.2 For accommodation and service spaces, a nozzle size greater than 12 mm need not be used.

8.3 For machinery spaces and exterior locations, the nozzle size shall be such as to obtain the maximum discharge possible from two jets at the pressure mentioned in paragraph 4 from the smallest pump, provided that a nozzle size greater than 19 mm need not be used.

8.4 All nozzles shall be of an approved dual purpose type (i.e. spray/jet type) incorporating a shut-off.

9 *Location and arrangement of water pumps, etc., for other fire-extinguishing systems*

Pumps required for the provision of water for other fire-extinguishing systems required by this Chapter, their sources of power and their controls shall be installed outside the space or spaces protected by such systems and shall be so arranged that a fire in the space or spaces protected will not put any such system out of action.

Regulation 5

Fixed gas fire-extinguishing systems

1 *General*

1.1 The use of a fire-extinguishing medium which, in the opinion of the Administration, either by itself or under expected conditions of use gives off toxic gases in such quantities as to endanger persons shall not be permitted.

1.2 The necessary pipes for conveying fire-extinguishing medium into protected spaces shall be provided with control valves so marked as to indicate clearly the spaces to which the pipes are led. Suitable provision shall be made to prevent inadvertent admission of the medium to any space. Where a cargo space fitted with a gas fire-extinguishing system is used as a passenger space the gas connexion shall be blanked during such use.

1.3 The piping for the distribution of fire-extinguishing medium shall be arranged and discharge nozzles so positioned that a uniform distribution of medium is obtained.

1.4 Means shall be provided to close all openings which may admit air to or allow gas to escape from a protected space.

1.5 Where the volume of free air contained in air receivers in any space is such that, if released in such space in the event of fire, such release of air

within that space would seriously affect the efficiency of the fixed fire-extinguishing system, the Administration shall require the provision of an additional quantity of fire-extinguishing medium.

1.6 Means shall be provided for automatically giving audible warning of the release of fire-extinguishing medium into any space in which personnel normally work or to which they have access. The alarm shall operate for a suitable period before the medium is released.

1.7 The means of control of any fixed gas fire-extinguishing system shall be readily accessible and simple to operate and shall be grouped together in as few locations as possible at positions not likely to be cut off by a fire in a protected space. At each location there shall be clear instructions relating to the operation of the system having regard to the safety of personnel.

1.8 Automatic release of fire-extinguishing medium shall not be permitted, except as permitted by paragraph 3.3.5 and in respect of local automatically operated units referred to in paragraphs 3.4 and 3.5.

1.9 Where the quantity of extinguishing medium is required to protect more than one space, the quantity of medium available need not be more than the largest quantity required for any one space so protected.

1.10 Except as otherwise permitted by paragraphs 3.3, 3.4 or 3.5 pressure containers required for the storage of fire-extinguishing medium, other than steam, shall be located outside protected spaces in accordance with paragraph 1.13.

1.11 Means shall be provided for the crew to safely check the quantity of medium in the containers.

1.12 Containers for the storage of fire-extinguishing medium and associated pressure components shall be designed to pressure codes of practice to the satisfaction of the Administration having regard to their locations and maximum ambient temperatures expected in service.

1.13 When the fire-extinguishing medium is stored outside a protected space, it shall be stored in a room which shall be situated in a safe and readily accessible position and shall be effectively ventilated to the satisfaction of the Administration. Any entrance to such a storage room shall preferably be from the open deck and in any case shall be independent of the protected space. Access doors shall open outwards, and bulkheads and decks including doors and other means of closing any opening therein, which form the boundaries between such rooms and adjoining enclosed spaces shall be gastight. For the purpose of the application of the integrity tables in Regulations 26, 27, 44 and 58, such storage rooms shall be treated as control stations.

1.14 Spare parts for the system shall be stored on board and be to the satisfaction of the Administration.

2 *Carbon dioxide systems*

2.1 For cargo spaces the quantity of carbon dioxide available shall, unless

otherwise provided, be sufficient to give a minimum volume of free gas equal to 30 per cent of the gross volume of the largest cargo space so protected in the ship.

2.2 For machinery spaces the quantity of carbon dioxide carried shall be sufficient to give a minimum quantity of free gas equal to the larger of the following quantities, either:

- .1 40 per cent of the gross volume of the largest machinery space so protected, the volume to exclude that part of the casing above the level at which the horizontal area of the casing is 40 per cent or less of the horizontal area of the space concerned taken midway between the tank top and the lowest part of the casing; or
- .2 35 per cent of the gross volume of the largest machinery space protected, including the casing;

provided that the above-mentioned percentages may be reduced to 35 per cent and 30 per cent respectively for cargo ships of less than 2,000 tons gross tonnage; provided also that if two or more machinery spaces are not entirely separate they shall be considered as forming one space.

2.3 For the purpose of this paragraph the volume of free carbon dioxide shall be calculated at 0.56 m³/kg.

2.4 For machinery spaces the fixed piping system shall be such that 85 per cent of the gas can be discharged into the space within 2 minutes.

3 *Halogenated hydrocarbon systems*

3.1 The use of halogenated hydrocarbons as fire-extinguishing media is only permitted in machinery spaces, pumprooms and in cargo spaces intended solely for the carriage of vehicles which are not carrying any cargo.

3.2 When halogenated hydrocarbons are used as the fire-extinguishing media in total flooding systems:

- .1 The system shall be arranged for manual initiation of power release only.
- .2 If the charge of halogenated hydrocarbon is required to supply more than one space, the arrangements for its storage and release shall be such that compliance with paragraphs 3.2.9 or 3.2.10 respectively, is obtained.
- .3 Means shall be provided for automatically stopping all ventilation fans serving the protected space before the medium is released.
- .4 Means shall be provided to manually close all dampers in the ventilation system serving a protected space.
- .5 The discharge arrangements shall be so designed that the minimum quantity of medium required for cargo spaces or machinery spaces in paragraphs 3.2.9 or 3.2.10 respectively can be substantially discharged in a nominal 20 seconds or less based on the discharge of

the liquid phase.

- .6 The system shall be designed to operate within a temperature range to the satisfaction of the Administration.
- .7 The discharge shall not endanger personnel engaged on maintenance of equipment or using the normal access ladders and escapes serving the space.
- .8 Means shall be provided for the crew to safely check the pressure within containers.
- .9 The quantity of extinguishing medium for cargo spaces intended solely for the carriage of vehicles which are not carrying any cargo shall be calculated in accordance with table 5.1. This quantity shall be based on the gross volume of the protected space. In respect of Halon 1301 and 1211, the quantity shall be calculated on a volumetric ratio basis, and in respect of Halon 2402 on a mass per unit volume basis.

TABLE 5.1

Halon	Minimum	Maximum
1301	5 per cent	7 per cent
1211	5 per cent	5.5 per cent
2402	0.23 kg/m ³	0.30 kg/m ³

- .10 The quantity of extinguishing media for machinery spaces shall be calculated in accordance with table 5.2. This quantity shall be based on the gross volume of the space in respect of the minimum concentration and the net volume of the space in respect of the maximum concentration, including the casing. In respect of Halon 1301 and 1211, the quantity shall be calculated on a volumetric ratio basis, and in respect of Halon 2402 on a mass per unit volume basis.

TABLE 5.2

Halon	Minimum	Maximum
1301	4.25 per cent	7 per cent
1211	4.25 per cent	5.5 per cent
2402	0.20 kg/m ³	0.30 kg/m ³

- .11 For the purpose of paragraphs 3.2.9 and 3.2.10, the volume of Halon 1301 shall be calculated at 0.16 m³/kg and the volume of Halon 1211 shall be calculated at 0.14 m³/kg.

3.3 Only Halon 1301 may be stored within a protected machinery space. Containers shall be individually distributed throughout that space and the following requirements shall be complied with:

- .1 A manually initiated power release, located outside the protected space, shall be provided. Duplicate sources of power shall be provided for this release and shall be located outside the protected space and be immediately available except that for machinery spaces, one of the sources of power may be located inside the protected space.
- .2 Electric power circuits connecting the containers shall be monitored for fault conditions and loss of power. Visual and audible alarms shall be provided to indicate this.
- .3 Pneumatic or hydraulic power circuits connecting the containers shall be duplicated. The sources of pneumatic or hydraulic pressure shall be monitored for loss of pressure. Visual and audible alarms shall be provided to indicate this.
- .4 Within the protected space, electrical circuits essential for the release of the system shall be heat resistant e.g. mineral insulated cable or equivalent. Piping systems essential for the release of systems designed to be operated hydraulically or pneumatically shall be of steel or other equivalent heat-resisting material to the satisfaction of the Administration.
- .5 Each pressure container shall be fitted with an automatic over-pressure release device which, in the event of the container being exposed to the effects of fire and the system not being operated, will safely vent the contents of the container into the protected space.
- .6 The arrangement of containers and the electrical circuits and piping essential for the release of any system shall be such that in the event of damage to any one power release line through fire or explosion in a protected space, i.e. a single fault concept, at least two-thirds of the fire-extinguishing charge required by paragraphs 3.2.9 or 3.2.10 for that space can still be discharged having regard to the requirement for uniform distribution of medium throughout the space. The arrangements in respect of systems for spaces requiring only one or two containers shall be to the satisfaction of the Administration.
- .7 Not more than two discharge nozzles shall be fitted to any pressure container and the maximum quantity of agent in each container shall be to the satisfaction of the Administration having regard to the requirement for uniform distribution of medium throughout the space.
- .8 The containers shall be monitored for decrease in pressure due to leakage and discharge. Visual and audible alarms in the protected area and on the navigating bridge or in the space where the fire control equipment is centralized shall be provided to indicate this condition, except that for cargo spaces, alarms are only required on the navigating bridge or the space where the fire control equipment is centralized.

3.4 Local automatically operated fixed fire-extinguishing units containing Halon 1301 or 1211, fitted in enclosed areas of high fire risk within machinery

spaces, in addition to, and independent of, any required fixed fire-extinguishing system may be accepted subject to compliance with the following:

- .1 The space in which such additional local protection is provided shall preferably be on one working level and on the same level as the access. At the discretion of the Administration more than one working level may be permitted subject to an access being provided on each level.
- .2 The size of the space and arrangements of accesses thereto and machinery therein, shall be such that escape from anywhere in the space can be effected in not more than 10 seconds.
- .3 The operation of any unit shall be signalled both visually and audibly outside each access to the machinery space and at the navigating bridge or in the space where the fire control equipment is centralized.
- .4 A notice indicating that the space contains one or more automatically operated fire-extinguishing units and stating which medium is used, shall be displayed outside each access thereto.
- .5 Discharge nozzles shall be so positioned that the discharge does not endanger personnel using the normal access ladders and escapes serving the compartment. Provision shall also be made to protect personnel engaged in maintenance of machinery from inadvertent discharge of the medium.
- .6 The fire-extinguishing units shall be designed to operate within a temperature range to the satisfaction of the Administration.
- .7 Means shall be provided for the crew to safely check the pressure within the containers.
- .8 The total quantity of extinguishing medium provided in the local automatically operated units shall be such that a concentration of 7 per cent in respect of Halon 1301 and 5.5 per cent in respect of Halon 1211 at 20°C based on the net volume of the enclosed space is not exceeded. This requirement applies when either a local automatically operated unit or a fixed system fitted in compliance with paragraph 3.2 has operated, but not when both have operated. The volume of Halon 1301 shall be calculated at 0.16 m³/kg and the volume of Halon 1211 shall be calculated at 0.14 m³/kg.
- .9 The time of discharge of a unit, based on the discharge of the liquid phase, shall be 10 seconds or less.
- .10 The arrangement of local automatically operated fire-extinguishing units shall be such that their release does not result in loss of electrical power or reduction of the manoeuvrability of the ship.

3.5 Automatically operated fire-extinguishing units, as described in paragraph 3.4, fitted in machinery spaces over equipment having a high fire risk, in addition to and independent of any required fixed fire-extinguishing system, may be accepted subject to compliance with paragraphs 3.4.3 to

3.4.6, 3.4.9 and 3.4.10 and with the following:

- 1 The quantity of medium provided in local automatically operated units shall be such that a vapour in air concentration not greater than 1.25 per cent at 20°C based on the gross volume of the machinery space is obtained in the event of their simultaneous operation.
- 2 The volume of Halon 1301 shall be calculated at 0.16 m³/kg and the volume of Halon 1211 shall be calculated at 0.14 m³/kg.

4 *Steam systems*

In general, the Administration shall not permit the use of steam as a fire-extinguishing medium in fixed fire-extinguishing systems. Where the use of steam is permitted by the Administration it shall be used only in restricted areas as an addition to the required fire-extinguishing medium and with the proviso that the boiler or boilers available for supplying steam shall have an evaporation of at least 1.0 kg of steam per hour for each 0.75 m³ of the gross volume of the largest space so protected. In addition to complying with the foregoing requirements the systems in all respects shall be as determined by, and to the satisfaction of, the Administration.

5 *Other gas systems*

5.1 Where gas other than carbon dioxide or halogenated hydrocarbons, or steam as permitted by paragraph 4 is produced on the ship and is used as a fire-extinguishing medium, it shall be a gaseous product of fuel combustion in which the oxygen content, the carbon monoxide content, the corrosive elements and any solid combustible elements have been reduced to a permissible minimum.

5.2 Where such gas is used as the fire-extinguishing medium in a fixed fire-extinguishing system for the protection of machinery spaces it shall afford protection equivalent to that provided by a fixed system using carbon dioxide as the medium.

5.3 Where such gas is used as a fire-extinguishing medium in a fixed fire-extinguishing system for the protection of cargo spaces, a sufficient quantity of such gas shall be available to supply hourly a volume of free gas at least equal to 25 per cent of the gross volume of the largest space protected in this way for a period of 72 hours.

Regulation 6

Fire extinguishers

1 All fire extinguishers shall be of approved types and designs.

1.1 The capacity of required portable fluid extinguishers shall be not more than 13.5 ℓ and not less than 9 ℓ. Other extinguishers shall be at least as portable as the 13.5 ℓ fluid extinguisher and shall have a fire-extinguishing capability at least equivalent to that of a 9 ℓ fluid extinguisher.

1.2 The Administration shall determine the equivalents of fire extinguishers.

2 Spare charges shall be provided in accordance with requirements to be specified by the Administration.

3 Fire extinguishers containing an extinguishing medium which, in the opinion of the Administration, either by itself or under expected conditions of use gives off toxic gases in such quantities as to endanger persons shall not be permitted.

4 A portable foam applicator unit shall consist of an air-foam nozzle of an inductor type capable of being connected to the fire main by a fire hose, together with a portable tank containing at least 20 ℓ of foam-making liquid and one spare tank. The nozzle shall be capable of producing effective foam suitable for extinguishing an oil fire, at the rate of at least 1.5 m³/minute.

5 Fire extinguishers shall be periodically examined and subjected to such tests as the Administration may require.

6 One of the portable fire extinguishers intended for use in any space shall be stowed near the entrance to that space.

7 Accommodation spaces, service spaces and control stations shall be provided with portable fire extinguishers of appropriate types and in sufficient number to the satisfaction of the Administration. Ships of 1,000 tons gross tonnage and upwards shall carry at least five portable fire extinguishers.

Regulation 7

Fire-extinguishing arrangements in machinery spaces

1 Spaces containing oil-fired boilers or oil fuel units

1.1 Machinery spaces of category A containing oil-fired boilers or oil fuel units shall be provided with any one of the following fixed fire-extinguishing systems:

- .1 a gas system complying with the provisions of Regulation 5;
- .2 a high expansion foam system complying with the provisions of Regulation 9;
- .3 a pressure water-spraying system complying with the provisions of Regulation 10.

In each case if the engine and boiler rooms are not entirely separate, or if fuel oil can drain from the boiler room into the engine room, the combined engine and boiler rooms shall be considered as one compartment.

1.2 There shall be in each boiler room at least one set of portable air-foam equipment complying with the provisions of Regulation 6.4.

1.3 There shall be at least two portable foam extinguishers or equivalent in each firing space in each boiler room and in each space in which a part of the oil fuel installation is situated. There shall be not less than one approved foam-type extinguisher of at least 135 ℓ capacity or equivalent in each boiler room. These extinguishers shall be provided with hoses on reels suitable for reaching any part of the boiler room. In the case of domestic boilers of less than 175 kW in cargo ships the Administration may consider relaxing the requirements of this paragraph.

1.4 In each firing space there shall be a receptacle containing sand, sawdust impregnated with soda, or other approved dry material in such quantity as may be required by the Administration. An approved portable extinguisher may be substituted as an alternative.

2 *Spaces containing internal combustion machinery*

Machinery spaces of category A containing internal combustion machinery shall be provided with:

- .1 One of the fire-extinguishing systems required by paragraph 1.1.
- .2 At least one set of portable air-foam equipment complying with the provisions of Regulation 6.4.
- .3 In each such space approved foam type fire extinguishers, each of at least 45 ℓ capacity or equivalent, sufficient in number to enable foam or its equivalent to be directed on to any part of the fuel and lubricating oil pressure systems, gearing and other fire hazards. In addition, there shall be provided a sufficient number of portable foam extinguishers or equivalent which shall be so located that no point in the space is more than 10 m walking distance from an extinguisher and that there are at least two such extinguishers in each such space. For smaller spaces of cargo ships the Administration may consider relaxing this requirement.

3 *Spaces containing steam turbines or enclosed steam engines*

In spaces containing steam turbines or enclosed steam engines used either for main propulsion or for other purposes when such machinery has in the aggregate a total power output of not less than 375 kW there shall be provided:

- .1 Approved foam fire extinguishers each of at least 45 ℓ capacity or equivalent sufficient in number to enable foam or its equivalent to be directed on to any part of the pressure lubrication system, on to any part of the casings enclosing pressure lubricated parts of the turbines, engines or associated gearing, and any other fire hazards. However, such extinguishers shall not be required if protection at least equivalent to that required by this sub-paragraph is provided in such spaces by a fixed fire-extinguishing system fitted in compliance with paragraph 1.1.
- .2 A sufficient number of portable foam extinguishers or equivalent which shall be so located that no point in the space is more than 10 m walking distance from an extinguisher and that there are at

least two such extinguishers in each such space, except that such extinguishers shall not be required in addition to any provided in compliance with paragraph 1.3.

- .3 One of the fire-extinguishing systems required by paragraph 1.1, where such spaces are periodically unattended.

4 *Fire-extinguishing appliances in other machinery spaces*

Where, in the opinion of the Administration, a fire hazard exists in any machinery space for which no specific provisions for fire-extinguishing appliances are prescribed in paragraphs 1, 2 and 3, there shall be provided in, or adjacent to, that space such a number of approved portable fire extinguishers or other means of fire extinction as the Administration may deem sufficient.

5 *Fixed fire-extinguishing systems not required by this Chapter*

Where a fixed fire-extinguishing system not required by this Chapter is installed, such a system shall be to the satisfaction of the Administration.

6 *Machinery spaces of category A in passenger ships*

In passenger ships carrying more than 36 passengers each machinery space of category A shall be provided with at least two suitable water fog applicators.*

Regulation 8

Fixed low-expansion foam fire-extinguishing systems in machinery spaces

1 Where in any machinery space a fixed low-expansion foam fire-extinguishing system is fitted in addition to the requirements of Regulation 7, such system shall be capable of discharging through fixed discharge outlets in not more than five minutes a quantity of foam sufficient to cover to a depth of 150 mm the largest single area over which oil fuel is liable to spread. The system shall be capable of generating foam suitable for extinguishing oil fires. Means shall be provided for effective distribution of the foam through a permanent system of piping and control valves or cocks to suitable discharge outlets, and for the foam to be effectively directed by fixed sprayers on other main fire hazards in the protected space. The expansion ratio of the foam shall not exceed 12 to 1.

2 The means of control of any such systems shall be readily accessible and simple to operate and shall be grouped together in as few locations as possible at positions not likely to be cut off by a fire in the protected space.

* A water fog applicator might consist of a metal "L"-shaped pipe, the long limb being about 2 m in length capable of being fitted to a fire hose and the short limb being about 250 mm in length fitted with a fixed water fog nozzle or capable of being fitted with a water spray nozzle.

Regulation 9

Fixed high-expansion foam fire-extinguishing systems in machinery spaces

1.1 Any required fixed high-expansion foam system in machinery spaces shall be capable of rapidly discharging through fixed discharge outlets a quantity of foam sufficient to fill the greatest space to be protected at a rate of at least 1 m in depth per minute. The quantity of foam-forming liquid available shall be sufficient to produce a volume of foam equal to five times the volume of the largest space to be protected. The expansion ratio of the foam shall not exceed 1,000 to 1.

1.2 The Administration may permit alternative arrangements and discharge rates provided that it is satisfied that equivalent protection is achieved.

2 Supply ducts for delivering foam, air intakes to the foam generator and the number of foam-producing units shall in the opinion of the Administration be such as will provide effective foam production and distribution.

3 The arrangement of the foam generator delivery ducting shall be such that a fire in the protected space will not affect the foam generating equipment.

4 The foam generator, its sources of power supply, foam-forming liquid and means of controlling the system shall be readily accessible and simple to operate and shall be grouped in as few locations as possible at positions not likely to be cut off by a fire in the protected space.

Regulation 10

Fixed pressure water-spraying fire-extinguishing systems in machinery spaces

1 Any required fixed pressure water-spraying fire-extinguishing system in machinery spaces shall be provided with spraying nozzles of an approved type.

2 The number and arrangement of the nozzles shall be to the satisfaction of the Administration and shall be such as to ensure an effective average distribution of water of at least 5 ℓ/m² per minute in the spaces to be protected. Where increased application rates are considered necessary, these shall be to the satisfaction of the Administration. Nozzles shall be fitted above bilges, tank tops and other areas over which oil fuel is liable to spread and also above other specific fire hazards in the machinery spaces.

3 The system may be divided into sections, the distribution valves of which shall be operated from easily accessible positions outside the spaces to be protected and will not be readily cut off by a fire in the protected space.

4 The system shall be kept charged at the necessary pressure and the pump supplying the water for the system shall be put automatically into action

by a pressure drop in the system.

5 The pump shall be capable of simultaneously supplying at the necessary pressure all sections of the system in any one compartment to be protected. The pump and its controls shall be installed outside the space or spaces to be protected. It shall not be possible for a fire in the space or spaces protected by the water-spraying system to put the system out of action.

6 The pump may be driven by independent internal combustion machinery but, if it is dependent upon power being supplied from the emergency generator fitted in compliance with the provisions of Regulation II-1/44 or Regulation II-1/45, as appropriate, that generator shall be so arranged as to start automatically in case of main power failure so that power for the pump required by paragraph 5 is immediately available. When the pump is driven by independent internal combustion machinery it shall be so situated that a fire in the protected space will not affect the air supply to the machinery.

7 Precautions shall be taken to prevent the nozzles from becoming clogged by impurities in the water or corrosion of piping, nozzles, valves and pump.

Regulation 11

Special arrangements in machinery spaces

1 The provisions of this Regulation shall apply to machinery spaces of category A and, where the Administration considers it desirable, to other machinery spaces.

2.1 The number of skylights, doors, ventilators, openings in funnels to permit exhaust ventilation and other openings to machinery spaces shall be reduced to a minimum consistent with the needs of ventilation and the proper and safe working of the ship.

2.2 Skylights shall be of steel and shall not contain glass panels. Suitable arrangements shall be made to permit the release of smoke in the event of fire, from the space to be protected.

2.3 In passenger ships, doors other than power-operated watertight doors, shall be so arranged that positive closure is assured in case of fire in the space, by power-operated closing arrangements or by the provision of self-closing doors capable of closing against an inclination of 3.5° opposing closure and having a fail-safe hook-back facility, provided with a remotely operated release device.

3 Windows shall not be fitted in machinery space boundaries. This does not preclude the use of glass in control rooms within the machinery spaces.

4 Means of control shall be provided for:

- .1 opening and closure of skylights, closure of openings in funnels which normally allow exhaust ventilation, and closure of ventilator dampers;

- .2 permitting the release of smoke;
- .3 closing power-operated doors or actuating release mechanism on doors other than power-operated watertight doors;
- .4 stopping ventilating fans; and
- .5 stopping forced and induced draught fans, oil fuel transfer pumps, oil fuel unit pumps and other similar fuel pumps.

5 The controls required in paragraph 4 and in Regulation 15.2.5 shall be located outside the space concerned, where they will not be cut off in the event of fire in the space they serve. In passenger ships such controls and the controls for any required fire-extinguishing system shall be situated at one control position or grouped in as few positions as possible to the satisfaction of the Administration. Such positions shall have a safe access from the open deck.

6 When access to any machinery space of category A is provided at a low level from an adjacent shaft tunnel, there shall be provided in the shaft tunnel, near the watertight door, a light steel fire-screen door operable from each side.

7 For periodically unattended machinery spaces in cargo ships, the Administration shall give special consideration to maintaining fire integrity of the machinery spaces, the location and centralization of the fire-extinguishing system controls, the required shut-down arrangements (e.g. ventilation, fuel pumps, etc.) and may require additional fire-extinguishing appliances and other fire-fighting equipment and breathing apparatus. In passenger ships these requirements shall be at least equivalent to those of machinery spaces normally attended.

8 An approved automatic fire detection and alarm system complying with the provisions of Regulation 14 shall be fitted in any machinery space:

- .1 where the installation of automatic and remote control systems and equipment has been approved in lieu of continuous manning of the space; and
- .2 where the main propulsion and associated machinery including sources of main electrical supply are provided with various degrees of automatic or remote control and are under continuous manned supervision from a control room.

Regulation 12

Automatic sprinkler, fire detection and fire alarm systems

1.1 Any required automatic sprinkler, fire detection and fire alarm system shall be capable of immediate operation at all times and no action by the crew shall be necessary to set it in operation. It shall be of the wet pipe type but small exposed sections may be of the dry pipe type where in the opinion of the Administration this is a necessary precaution. Any parts of the system which

may be subjected to freezing temperatures in service shall be suitably protected against freezing. It shall be kept charged at the necessary pressure and shall have provision for a continuous supply of water as required in this Regulation.

1.2 Each section of sprinklers shall include means for giving a visual and audible alarm signal automatically at one or more indicating units whenever any sprinkler comes into operation. Such alarm systems shall be such as to indicate if any fault occurs in the system.

1.2.1 In passenger ships such units shall give an indication of any fire and its location in any space served by the system and shall be centralized on the navigating bridge or in the main fire control station, which shall be so manned or equipped as to ensure that any alarm from the system is immediately received by a responsible member of the crew.

1.2.2 In cargo ships such units shall indicate in which section served by the system fire has occurred and shall be centralized on the navigating bridge and in addition, visible and audible alarms from the unit shall be placed in a position other than on the navigating bridge, so as to ensure that the indication of fire is immediately received by the crew.

2.1 Sprinklers shall be grouped into separate sections, each of which shall contain not more than 200 sprinklers. In passenger ships any section of sprinklers shall not serve more than two decks and shall not be situated in more than one main vertical zone. However, the Administration may permit such a section of sprinklers to serve more than two decks or be situated in more than one main vertical zone, if it is satisfied that the protection of the ship against fire will not thereby be reduced.

2.2 Each section of sprinklers shall be capable of being isolated by one stop valve only. The stop valve in each section shall be readily accessible and its location shall be clearly and permanently indicated. Means shall be provided to prevent the operation of the stop valves by any unauthorized person.

2.3 A gauge indicating the pressure in the system shall be provided at each section stop valve and at a central station.

2.4 The sprinklers shall be resistant to corrosion by marine atmosphere. In accommodation and service spaces the sprinklers shall come into operation within the temperature range from 68° to 79°C, except that in locations such as drying rooms, where high ambient temperatures might be expected, the operating temperature may be increased by not more than 30°C above the maximum deckhead temperature.

2.5 A list or plan shall be displayed at each indicating unit showing the spaces covered and the location of the zone in respect of each section. Suitable instructions for testing and maintenance shall be available.

3 Sprinklers shall be placed in an overhead position and spaced in a suitable pattern to maintain an average application rate of not less than 5 ℓ/m² per minute over the nominal area covered by the sprinklers. However, the Administration may permit the use of sprinklers providing such an alternative amount of water suitably distributed as has been shown to the satisfaction of

the Administration to be not less effective.

4.1 A pressure tank having a volume equal to at least twice that of the charge of water specified in this sub-paragraph shall be provided. The tank shall contain a standing charge of fresh water, equivalent to the amount of water which would be discharged in one minute by the pump referred to in paragraph 5.2, and the arrangements shall provide for maintaining an air pressure in the tank such as to ensure that where the standing charge of fresh water in the tank has been used the pressure will be not less than the working pressure of the sprinkler, plus the pressure exerted by a head of water measured from the bottom of the tank to the highest sprinkler in the system. Suitable means of replenishing the air under pressure and of replenishing the fresh water charge in the tank shall be provided. A glass gauge shall be provided to indicate the correct level of the water in the tank.

4.2 Means shall be provided to prevent the passage of sea-water into the tank.

5.1 An independent power pump shall be provided solely for the purpose of continuing automatically the discharge of water from the sprinklers. The pump shall be brought into action automatically by the pressure drop in the system before the standing fresh water charge in the pressure tank is completely exhausted.

5.2 The pump and the piping system shall be capable of maintaining the necessary pressure at the level of the highest sprinkler to ensure a continuous output of water sufficient for the simultaneous coverage of a minimum area of 280 m² at the application rate specified in paragraph 3.

5.3 The pump shall have fitted on the delivery side a test valve with a short open-ended discharge pipe. The effective area through the valve and pipe shall be adequate to permit the release of the required pump output while maintaining the pressure in the system specified in paragraph 4.1.

5.4 The sea inlet to the pump shall wherever possible be in the space containing the pump and shall be so arranged that when the ship is afloat it will not be necessary to shut off the supply of sea-water to the pump for any purpose other than the inspection or repair of the pump.

6 The sprinkler pump and tank shall be situated in a position reasonably remote from any machinery space of category A and shall not be situated in any space required to be protected by the sprinkler system.

7.1 In passenger ships there shall be not less than two sources of power supply for the sea-water pump and automatic alarm and detection system. Where the sources of power for the pump are electrical, these shall be a main generator and an emergency source of power. One supply for the pump shall be taken from the main switchboard, and one from the emergency switchboard by separate feeders reserved solely for that purpose. The feeders shall be so arranged as to avoid galleys, machinery spaces and other enclosed spaces of high fire risk except in so far as it is necessary to reach the appropriate switchboards, and shall be run to an automatic change-over switch situated near the sprinkler pump. This switch shall permit the supply of power from the main switchboard so long as a supply is available therefrom,

and be so designed that upon failure of that supply it will automatically change over to the supply from the emergency switchboard. The switches on the main switchboard and the emergency switchboard shall be clearly labelled and normally kept closed. No other switch shall be permitted in the feeders concerned. One of the sources of power supply for the alarm and detection system shall be an emergency source. Where one of the sources of power for the pump is an internal combustion engine it shall, in addition to complying with the provisions of paragraph 6, be so situated that a fire in any protected space will not affect the air supply to the machinery.

7.2 In cargo ships there shall not be less than two sources of power supply for the sea-water pump and automatic alarm and detection system. If the pump is electrically driven it shall be connected to the main source of electrical power, which shall be capable of being supplied by at least two generators. The feeders shall be so arranged as to avoid galleys, machinery spaces and other enclosed spaces of high fire risk except in so far as it is necessary to reach the appropriate switchboards. One of the sources of power supply for the alarm and detection system shall be an emergency source. Where one of the sources of power for the pump is an internal combustion engine it shall, in addition to complying with the provisions of paragraph 6, be so situated that a fire in any protected space will not affect the air supply to the machinery.

8 The sprinkler system shall have a connexion from the ship's fire main by way of a lockable screw-down non-return valve at the connexion which will prevent a backflow from the sprinkler system to the fire main.

9.1 A test valve shall be provided for testing the automatic alarm for each section of sprinklers by a discharge of water equivalent to the operation of one sprinkler. The test valve for each section shall be situated near the stop valve for that section.

9.2 Means shall be provided for testing the automatic operation of the pump on reduction of pressure in the system.

9.3 Switches shall be provided at one of the indicating positions referred to in paragraph 1.2 which will enable the alarm and the indicators for each section of sprinklers to be tested.

10 Spare sprinkler heads shall be provided for each section of sprinklers to the satisfaction of the Administration.

Regulation 13

Fixed fire detection and fire alarm systems

1 General requirements

1.1 Any required fixed fire detection and fire alarm system with manually operated call points shall be capable of immediate operation at all times.

1.2 Power supplies and electric circuits necessary for the operation of the system shall be monitored for loss of power or fault conditions as appropriate.

Occurrence of a fault condition shall initiate a visual and audible fault signal at the control panel which shall be distinct from a fire signal.

1.3 There shall be not less than two sources of power supply for the electrical equipment used in the operation of the fire detection and fire alarm system, one of which shall be an emergency source. The supply shall be provided by separate feeders reserved solely for that purpose. Such feeders shall run to an automatic change-over switch situated in or adjacent to the control panel for the fire detection system.

1.4 Detectors and manually operated call points shall be grouped into sections. The activation of any detector or manually operated call point shall initiate a visual and audible fire signal at the control panel and indicating units. If the signals have not received attention within two minutes an audible alarm shall be automatically sounded throughout the crew accommodation and service spaces, control stations and machinery spaces of category A. This alarm sounder system need not be an integral part of the detection system.

1.5 The control panel shall be located on the navigating bridge or in the main fire control station.

1.6 Indicating units shall denote the section in which a detector or manually operated call point has operated. At least one unit shall be so located that it is easily accessible to responsible members of the crew at all times, when at sea or in port except when the ship is out of service. One indicating unit shall be located on the navigating bridge if the control panel is located in the main fire control station.

1.7 Clear information shall be displayed on or adjacent to each indicating unit about the spaces covered and the location of the sections.

1.8 No section covering more than one deck within accommodation, service and control stations shall normally be permitted except a section which covers an enclosed stairway. In order to avoid delay in identifying the source of fire, the number of enclosed spaces included in each section shall be limited as determined by the Administration. In no case shall more than fifty enclosed spaces be permitted in any section.

1.9 In passenger ships a section of detectors shall not serve spaces on both sides of the ship nor on more than one deck and neither shall it be situated in more than one main vertical zone except that the Administration, if it is satisfied that the protection of the ship against fire will not thereby be reduced, may permit such a section of detectors to serve both sides of the ship and more than one deck.

1.10 A section of fire detectors which covers a control station, a service space or an accommodation space shall not include a machinery space of category A.

1.11 Detectors shall be operated by heat, smoke or other products of combustion, flame, or any combination of these factors. Detectors operated by other factors indicative of incipient fires may be considered by the Administration provided that they are no less sensitive than such detectors. Flame detectors shall only be used in addition to smoke or heat detectors.

1.12 Suitable instructions and components spares for testing and maintenance shall be provided.

1.13 The function of the detection system shall be periodically tested to the satisfaction of the Administration by means of equipment producing hot air at the appropriate temperature, or smoke or aerosol particles having the appropriate range of density or particle size, or other phenomena associated with incipient fires to which the detector is designed to respond. All detectors shall be of a type such that they can be tested for correct operation and restored to normal surveillance without the renewal of any component.

1.14 The fire detection system shall not be used for any other purpose, except that closing of fire doors and similar functions may be permitted at the control panel.

2 *Installation requirements*

2.1 Manual call points shall be installed throughout the accommodation spaces, service spaces and control stations. One manual call point shall be located at each exit. Manual call points shall be readily accessible in the corridors of each deck such that no part of the corridor is more than 20 m from a manual call point.

2.2 Smoke detectors shall be installed in all stairways, corridors and escape routes within accommodation spaces. Consideration shall be given to the installation of special purpose smoke detectors within ventilation ducting.

2.3 Where a fixed fire detection and fire alarm system is required for the protection of spaces other than those specified in paragraph 2.2, at least one detector complying with paragraph 1.11 shall be installed in each such space.

2.4 Detectors shall be located for optimum performance. Positions near beams and ventilation ducts or other positions where patterns of air flow could adversely affect performance and positions where impact or physical damage is likely shall be avoided. In general, detectors which are located on the overhead shall be a minimum distance of 0.5 m away from bulkheads.

2.5 The maximum spacing of detectors shall be in accordance with the table below:

Type of detector	Maximum floor area per detector	Maximum distance apart between centres	Maximum distance away from bulkheads
Heat	37 m ²	9 m	4.5 m
Smoke	74 m ²	11 m	5.5 m

The Administration may require or permit other spacings based upon test data which demonstrate the characteristics of the detectors.

2.6 Electrical wiring which forms part of the system shall be so arranged as to avoid galleys, machinery spaces of category A, and other enclosed spaces of high fire risk except where it is necessary to provide for fire detection or

fire alarm in such spaces or to connect to the appropriate power supply.

3 *Design requirements*

3.1 The system and equipment shall be suitably designed to withstand supply voltage variation and transients, ambient temperature changes, vibration, humidity, shock, impact and corrosion normally encountered in ships.

3.2 Smoke detectors required by paragraph 2.2 shall be certified to operate before the smoke density exceeds 12.5 per cent obscuration per metre, but not until the smoke density exceeds 2 per cent obscuration per metre. Smoke detectors to be installed in other spaces shall operate within sensitivity limits to the satisfaction of the Administration having regard to the avoidance of detector insensitivity or oversensitivity.

3.3 Heat detectors shall be certified to operate before the temperature exceeds 78°C but not until the temperature exceeds 54°C, when the temperature is raised to those limits at a rate less than 1°C per minute. At higher rates of temperature rise, the heat detector shall operate within temperature limits to the satisfaction of the Administration having regard to the avoidance of detector insensitivity or oversensitivity.

3.4 At the discretion of the Administration, the permissible temperature of operation of heat detectors may be increased to 30°C above the maximum deckhead temperature in drying rooms and similar spaces of a normal high ambient temperature.

Regulation 14

Fixed fire detection and fire alarm systems for periodically unattended machinery spaces

1 A fixed fire detection and fire alarm system in accordance with the relevant provisions of Regulation 13 shall be installed in periodically unattended machinery spaces.

2 This fire detection system shall be so designed and the detectors so positioned as to detect rapidly the onset of fire in any part of those spaces and under any normal conditions of operation of the machinery and variations of ventilation as required by the possible range of ambient temperatures. Except in spaces of restricted height and where their use is specially appropriate, detection systems using only thermal detectors shall not be permitted. The detection system shall initiate audible and visual alarms distinct in both respects from the alarms of any other system not indicating fire, in sufficient places to ensure that the alarms are heard and observed on the navigating bridge and by a responsible engineer officer. When the navigating bridge is unmanned the alarm shall sound in a place where a responsible member of the crew is on duty.

3 After installation the system shall be tested under varying conditions of engine operation and ventilation.

Regulation 15

Arrangements for oil fuel, lubricating oil and other flammable oils

1 *Limitations in the use of oil as fuel*

The following limitations shall apply to the use of oil as fuel:

- .1 Except as otherwise permitted by this paragraph, no oil fuel with a flashpoint of less than 60°C shall be used.
- .2 In emergency generators oil fuel with a flashpoint of not less than 43°C may be used.
- .3 Subject to such additional precautions as it may consider necessary and on condition that the ambient temperature of the space in which such oil fuel is stored or used shall not be allowed to rise to within 10°C below the flashpoint of the oil fuel, the Administration may permit the general use of oil fuel having a flashpoint of less than 60°C but not less than 43°C.
- .4 In cargo ships the use of fuel having a lower flashpoint than otherwise specified in this paragraph, for example crude oil, may be permitted provided that such fuel is not stored in any machinery space and subject to the approval by the Administration of the complete installation.

The flashpoint of oils shall be determined by an approved closed cup method.

2 *Oil fuel arrangements*

In a ship in which oil fuel is used, the arrangements for the storage, distribution and utilization of the oil fuel shall be such as to ensure the safety of the ship and persons on board and shall at least comply with the following provisions:

- .1 As far as practicable, parts of the oil fuel system containing heated oil under pressure exceeding 0.18 N/mm² shall not be placed in a concealed position such that defects and leakage cannot readily be observed. The machinery spaces in way of such parts of the oil fuel system shall be adequately illuminated.
- .2 The ventilation of machinery spaces shall be sufficient under all normal conditions to prevent accumulation of oil vapour.
- .3 As far as practicable, oil fuel tanks shall be part of the ship's structure and shall be located outside machinery spaces of category A. Where oil fuel tanks, other than double bottom tanks, are necessarily located adjacent to or within machinery spaces of category A, at least one of their vertical sides shall be contiguous to the machinery space boundaries, and shall preferably have a common boundary with the double bottom tanks, and the area of the tank boundary common with the machinery spaces shall be kept to a minimum. Where such tanks are situated within the boundaries of machinery spaces of category A they shall not contain oil fuel

having a flashpoint of less than 60°C. In general the use of free standing oil fuel tanks shall be avoided. When such tanks are employed their use shall be prohibited in category A machinery spaces on passenger ships. Where permitted, they shall be placed in an oil-tight spill tray of ample size having a suitable drain pipe leading to a suitably sized spill oil tank.

- .4 No oil fuel tank shall be situated where spillage or leakage therefrom can constitute a hazard by falling on heated surfaces. Precautions shall be taken to prevent any oil that may escape under pressure from any pump, filter or heater from coming into contact with heated surfaces.
- .5 Every oil fuel pipe, which, if damaged, would allow oil to escape from a storage, settling or daily service tank situated above the double bottom shall be fitted with a cock or valve directly on the tank capable of being closed from a safe position outside the space concerned in the event of a fire occurring in the space in which such tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel or similar space, valves on the tank shall be fitted but control in the event of fire may be effected by means of an additional valve on the pipe or pipes outside the tunnel or similar space. If such additional valve is fitted in the machinery space it shall be operated from a position outside this space.
- .6 Safe and efficient means of ascertaining the amount of oil fuel contained in any oil fuel tank shall be provided. Sounding pipes shall not terminate in any space where the risk of ignition of spillage from the sounding pipe might arise. In particular, they shall not terminate in passenger or crew spaces. Other means of ascertaining the amount of oil fuel contained in any oil fuel tank may be permitted:
 - 6.1 in passenger ships, if such means do not require penetration below the top of the tank, and providing their failure or over-filling of the tanks will not permit release of fuel;
 - 6.2 in cargo ships, providing the failure of such means or over-filling of the tanks will not permit release of fuel. The use of cylindrical gauge glasses is prohibited. The Administration may permit the use of oil level gauges with flat glasses and self-closing valves between the gauges and oil tanks.

Such other means shall be acceptable to the Administration and shall be maintained in the proper condition to ensure their continued accurate functioning in service.

- .7 Provision shall be made to prevent overpressure in any oil tank or in any part of the oil fuel system, including the filling pipes. Any relief valves and air or overflow pipes shall discharge to a position which, in the opinion of the Administration, is safe.
- .8 Oil fuel pipes and their valves and fittings shall be of steel or other approved material, except that restricted use of flexible pipes shall be permissible in positions where the Administration is satisfied that

they are necessary. Such flexible pipes and end attachments shall be of approved fire-resisting materials of adequate strength and shall be constructed to the satisfaction of the Administration.

3 *Lubricating oil arrangements*

The arrangements for the storage, distribution and utilization of oil used in pressure lubrication systems shall be such as to ensure the safety of the ship and persons on board, and such arrangements in machinery spaces of category A and whenever practicable in other machinery spaces shall at least comply with the provisions of paragraphs 2.1, 2.4, 2.5, 2.6, 2.7 and 2.8, except that this does not preclude the use of sight flow glasses in lubricating systems provided that they are shown by test to have a suitable degree of fire resistance.

4 *Arrangements for other flammable oils*

The arrangements for the storage, distribution and utilization of other flammable oils employed under pressure in power transmission systems, control and activating systems and heating systems shall be such as to ensure the safety of the ship and persons on board. In locations where means of ignition are present, such arrangements shall at least comply with the provisions of paragraphs 2.4 and 2.6, and with the provisions of paragraphs 2.7 and 2.8 in respect of strength and construction.

5 *Periodically unattended machinery spaces*

In addition to the requirements of paragraphs 1 to 4, the oil fuel and lubricating oil systems shall comply with the following:

- .1 Where necessary, oil fuel and lubricating oil pipelines shall be screened or otherwise suitably protected to avoid as far as practicable oil spray or oil leakages on to hot surfaces or into machinery air intakes. The number of joints in such piping systems shall be kept to a minimum and, where practicable, leakages from high pressure oil fuel pipes shall be collected and arrangements provided for an alarm to be given.
- .2 Where daily service oil fuel tanks are filled automatically, or by remote control, means shall be provided to prevent overflow spillages. Other equipment which treats flammable liquids automatically, e.g. oil fuel purifiers, which, whenever practicable, shall be installed in a special space reserved for purifiers and their heaters, shall have arrangements to prevent overflow spillages.
- .3 Where daily service oil fuel tanks or settling tanks are fitted with heating arrangements, a high temperature alarm shall be provided if the flashpoint of the oil fuel can be exceeded.

Regulation 16

Ventilation systems in ships other than passenger ships carrying more than 36 passengers

1 Ventilation ducts shall be of non-combustible material. Short ducts, however, not generally exceeding 2 m in length and with a cross-section not exceeding 0.02 m² need not be non-combustible, subject to the following conditions:

- .1 these ducts shall be of a material which, in the opinion of the Administration, has a low fire risk;
- .2 they may only be used at the end of the ventilation device;
- .3 they shall not be situated less than 600 mm, measured along the duct, from an opening in an "A" or "B" class division including continuous "B" class ceilings.

2 Where the ventilation ducts with a free-sectional area exceeding 0.02 m² pass through class "A" bulkheads or decks, the opening shall be lined with a steel sheet sleeve unless the ducts passing through the bulkheads or decks are of steel in the vicinity of passage through the deck or bulkhead and the ducts and sleeves shall comply in this part with the following:

- .1 The sleeves shall have a thickness of at least 3 mm and a length of at least 900 mm. When passing through bulkheads, this length shall be divided preferably into 450 mm on each side of the bulkhead. These ducts, or sleeves lining such ducts, shall be provided with fire insulation. The insulation shall have at least the same fire integrity as the bulkhead or deck through which the duct passes. Equivalent penetration protection may be provided to the satisfaction of the Administration.
- .2 Ducts with a free cross-sectional area exceeding 0.075 m² shall be fitted with fire dampers in addition to the requirements of paragraph 2.1. The fire damper shall operate automatically but shall also be capable of being closed manually from both sides of the bulkhead or deck. The damper shall be provided with an indicator which shows whether the damper is open or closed. Fire dampers are not required, however, where ducts pass through spaces surrounded by "A" class divisions, without serving those spaces, provided those ducts have the same fire integrity as the divisions which they pierce.

3 Ducts provided for the ventilation of machinery spaces of category A, galleys, car deck spaces, ro/ro cargo spaces or special category spaces shall not pass through accommodation spaces, service spaces or control stations unless the ducts are either:

- .1.1 constructed of steel having a thickness of at least 3 mm and 5 mm for ducts the widths or diameters of which are up to and including 300 mm and 760 mm and over respectively and, in the case of such ducts, the widths or diameters of which are between 300 mm and 760 mm having a thickness to be obtained by interpolation;

- .1.2 suitably supported and stiffened;
- .1.3 fitted with automatic fire dampers close to the boundaries penetrated; and
- .1.4 insulated to "A-60" standard from the machinery spaces, galleys, car deck spaces, ro/ro cargo spaces or special category spaces to a point at least 5 m beyond each fire damper;

or

- .2.1 constructed of steel in accordance with paragraphs 3.1.1 and 3.1.2; and
- .2.2 insulated to "A-60" standard throughout the accommodation spaces, service spaces or control stations;

except that penetrations of main zone divisions shall also comply with the requirements of paragraph 8.

4 Ducts provided for ventilation to accommodation spaces, service spaces or control stations shall not pass through machinery spaces of category A, galleys, car deck spaces, ro/ro cargo spaces or special category spaces unless either:

- .1.1 the ducts where they pass through a machinery space of category A, galley, car deck space, ro/ro cargo space or special category space are constructed of steel in accordance with paragraphs 3.1.1 and 3.1.2;
- .1.2 automatic fire dampers are fitted close to the boundaries penetrated; and
- .1.3 the integrity of the machinery space, galley, car deck space, ro/ro cargo space or special category space boundaries is maintained at the penetrations;

or

- .2.1 the ducts where they pass through a machinery space of category A, galley, car deck space, ro/ro cargo space or special category space are constructed of steel in accordance with paragraphs 3.1.1 and 3.1.2; and
- .2.2 are insulated to "A-60" standard within the machinery space, galley, car deck space, ro/ro cargo space or special category space;

except that penetrations of main zone divisions shall also comply with the requirements of paragraph 8.

5 Ventilation ducts with a free cross-sectional area exceeding 0.02 m² passing through "B" class bulkheads shall be lined with steel sheet sleeves of 900 mm in length divided preferably into 450 mm on each side of the bulkheads unless the duct is of steel for this length.

6 Such measures as are practicable shall be taken in respect of control

stations outside machinery spaces in order to ensure that ventilation, visibility and freedom from smoke are maintained, so that in the event of fire the machinery and equipment contained therein may be supervised and continue to function effectively. Alternative and separate means of air supply shall be provided; air inlets of the two sources of supply shall be so disposed that the risk of both inlets drawing in smoke simultaneously is minimized. At the discretion of the Administration, such requirements need not apply to control stations situated on, and opening on to, an open deck, or where local closing arrangements would be equally effective.

7 Where they pass through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be constructed of "A" class divisions. Each exhaust duct shall be fitted with:

- .1 a grease trap readily removable for cleaning;
- .2 a fire damper located in the lower end of the duct;
- .3 arrangements, operable from within the galley, for shutting off the exhaust fans; and
- .4 fixed means for extinguishing a fire within the duct.

8 Where in a passenger ship it is necessary that a ventilation duct passes through a main vertical zone division, a fail-safe automatic closing fire damper shall be fitted adjacent to the division. The damper shall also be capable of being manually closed from each side of the division. The operating position shall be readily accessible and be marked in red light-reflecting colour. The duct between the division and the damper shall be of steel or other equivalent material and, if necessary, insulated to comply with the requirements of Regulation 18.1.1. The damper shall be fitted on at least one side of the division with a visible indicator showing whether the damper is in the open position.

9 The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated.

10 Power ventilation of accommodation spaces, service spaces, cargo spaces, control stations and machinery spaces shall be capable of being stopped from an easily accessible position outside the space being served. This position should not be readily cut off in the event of a fire in the spaces served. The means provided for stopping the power ventilation of the machinery spaces shall be entirely separate from the means provided for stopping ventilation of other spaces.

Regulation 17

Fireman's outfit

- 1 A fireman's outfit shall consist of:
 - 1.1 Personal equipment comprising:
 - .1 Protective clothing of material to protect the skin from the heat

radiating from the fire and from burns and scalding by steam. The outer surface shall be water-resistant.

- .2 Boots and gloves of rubber or other electrically non-conducting material.
 - .3 A rigid helmet providing effective protection against impact.
 - .4 An electric safety lamp (hand lantern) of an approved type with a minimum burning period of three hours.
 - .5 An axe to the satisfaction of the Administration.
- 1.2 A breathing apparatus of an approved type which may be either:
- .1 a smoke helmet or smoke mask which shall be provided with a suitable air pump and a length of air hose sufficient to reach from the open deck, well clear of hatch or doorway, to any part of the holds or machinery spaces. If, in order to comply with this sub-paragraph, an air hose exceeding 36 m in length would be necessary, a self-contained breathing apparatus shall be substituted or provided in addition as determined by the Administration; or
 - .2 a self-contained compressed air-operated breathing apparatus, the volume of air contained in the cylinders of which shall be at least 1,200 ℓ, or other self-contained breathing apparatus which shall be capable of functioning for at least 30 minutes. A number of spare charges, suitable for use with the apparatus provided, shall be available on board to the satisfaction of the Administration.
- 2 For each breathing apparatus a fireproof lifeline of sufficient length and strength shall be provided capable of being attached by means of a snaphook to the harness of the apparatus or to a separate belt in order to prevent the breathing apparatus becoming detached when the lifeline is operated.
- 3 All ships shall carry at least two fireman's outfits complying with the requirements of paragraph 1.
- 3.1 In addition, there shall be provided:
- .1 in passenger ships for every 80 m, or part thereof, of the aggregate of the lengths of all passenger spaces and service spaces on the deck which carries such spaces or, if there is more than one such deck, on the deck which has the largest aggregate of such lengths, two fireman's outfits and two sets of personal equipment, each set comprising the items stipulated in paragraphs 1.1.1, 1.1.2 and 1.1.3;
 - .2 in tankers, two fireman's outfits.
- 3.2 In passenger ships carrying more than 36 passengers for each pair of breathing apparatus there shall be provided one water fog applicator which shall be stored adjacent to such apparatus.
- 3.3 The Administration may require additional sets of personal equipment and breathing apparatus, having due regard to the size and type of the ship.

4 The fireman's outfits or sets of personal equipment shall be so stored as to be easily accessible and ready for use and, where more than one fireman's outfit or more than one set of personal equipment is carried, they shall be stored in widely separated positions. In passenger ships at least two fireman's outfits and one set of personal equipment shall be available at any one position.

Regulation 18

Miscellaneous items

1.1 Where "A" class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts, etc., or for girders, beams or other structural members, arrangements shall be made to ensure that the fire resistance is not impaired, subject to the provisions of Regulation 30.5.

1.2 Where "B" class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts, etc., or for the fitting of ventilation terminals, lighting fixtures and similar devices, arrangements shall be made to ensure that the fire resistance is not impaired.

2.1 Pipes penetrating "A" or "B" class divisions shall be of materials approved by the Administration having regard to the temperature such divisions are required to withstand.

2.2 Where the Administration may permit the conveying of oil and combustible liquids through accommodation and service spaces, the pipes conveying oil or combustible liquids shall be of a material approved by the Administration having regard to the fire risk.

2.3 Materials readily rendered ineffective by heat shall not be used for overboard scuppers, sanitary discharges, and other outlets which are close to the water-line and where the failure of the material in the event of fire would give rise to danger of flooding.

3 Electric radiators, if used, shall be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiators shall be fitted with an element so exposed that clothing, curtains, or other similar materials can be scorched or set on fire by heat from the element.

4 Cellulose-nitrate based films shall not be used for cinematograph installations.

5 All waste-receptacles shall be constructed of non-combustible materials with no openings in the sides or bottom.

6 In spaces where penetration of oil products is possible, the surface of insulation shall be impervious to oil or oil vapours.

Regulation 19

*International shore connexion**

1 Ships of 500 tons gross tonnage and upwards shall be provided with at least one international shore connexion, complying with provisions of paragraph 3.

2 Facilities shall be available enabling such a connexion to be used on either side of the ship.

3 Standard dimensions of flanges for the international shore connexion shall be in accordance with the following table:

Description	Dimension
Outside diameter	178 mm
Inside diameter	64 mm
Bolt circle diameter	132 mm
Slots in flange	4 holes 19 mm in diameter spaced equidistantly on a bolt circle of the above diameter, slotted to the flange periphery
Flange thickness	14.5 mm minimum
Bolts and nuts	4, each of 16 mm diameter, 50 mm in length

4 The connexion shall be of steel or other suitable material and shall be designed for 1.0 N/mm² services. The flange shall have a flat face on one side and on the other shall be permanently attached to a coupling that will fit the ship's hydrant and hose. The connexion shall be kept aboard the ship together with a gasket of any material suitable for 1.0 N/mm² services, together with four 16 mm bolts, 50 mm in length and eight washers.

Regulation 20

Fire control plans

1 In all ships general arrangement plans shall be permanently exhibited for the guidance of the ship's officers, showing clearly for each deck the control stations, the various fire sections enclosed by "A" class divisions, the sections enclosed by "B" class divisions together with particulars of the fire detection and fire alarm systems, the sprinkler installation, the fire-extinguishing appliances, means of access to different compartments, decks, etc. and the ventilating system including particulars of the fan control positions, the position of dampers and identification numbers of the

* Reference is made to the recommendation contained in resolution A.470(XII) adopted by the Organization entitled "International Shore Connexion (shore side)".

ventilating fans serving each section. Alternatively, at the discretion of the Administration, the aforementioned details may be set out in a booklet, a copy of which shall be supplied to each officer, and one copy shall at all times be available on board in an accessible position. Plans and booklets shall be kept up to date, any alterations being recorded thereon as soon as practicable. Description in such plans and booklets shall be in the national language. If the language is neither English nor French, a translation into one of those languages shall be included. In addition, instructions concerning the maintenance and operation of all the equipment and installations on board for the fighting and containment of fire shall be kept under one cover, readily available in an accessible position.

2 In all ships a duplicate set of fire control plans or a booklet containing such plans shall be permanently stored in a prominently marked weathertight enclosure outside the deckhouse for the assistance of shoreside fire-fighting personnel.

Regulation 21

Ready availability of fire-extinguishing appliances

In all ships, fire-extinguishing appliances shall be kept in good order and available for immediate use at all times during the voyage.

Regulation 22

Acceptance of substitutes

1 This Regulation applies to all ships.

2 Where in this Chapter any special type of appliance, apparatus, extinguishing medium or arrangement is specified in any ship, any other type of appliance etc., may be allowed, provided the Administration is satisfied that it is not less effective.

PART B – FIRE SAFETY MEASURES FOR PASSENGER SHIPS

Regulation 23

Structure

1 The hull, superstructure, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material. For the purpose of applying the definition of steel or other equivalent material as given in Regulation 3.7 the “applicable fire exposure” shall be according to the integrity and insulation standards given in the tables of Regulations 26 and 27. For example where divisions such as decks or sides and ends of deckhouses

are permitted to have "B-0" fire integrity, the "applicable fire exposure" shall be half an hour.

2 However, in cases where any part of the structure is of aluminium alloy, the following shall apply:

- .1 The insulation of aluminium alloy components of "A" or "B" class divisions, except structure which, in the opinion of the Administration, is non-load-bearing, shall be such that the temperature of the structural core does not rise more than 200°C above the ambient temperature at any time during the applicable fire exposure to the standard fire test.
- .2 Special attention shall be given to the insulation of aluminium alloy components of columns, stanchions and other structural members required to support lifeboat and liferaft stowage, launching and embarkation areas, and "A" and "B" class divisions to ensure:
 - .2.1 that for such members supporting lifeboat and liferaft areas and "A" class divisions, the temperature rise limitation specified in paragraph 2.1 shall apply at the end of one hour; and
 - .2.2 that for such members required to support "B" class divisions, the temperature rise limitation specified in paragraph 2.1 shall apply at the end of half an hour.

3 Crowns and casings of machinery spaces of category A shall be of steel construction adequately insulated and openings therein, if any, shall be suitably arranged and protected to prevent the spread of fire.

Regulation 24

Main vertical zones and horizontal zones

1.1 For ships carrying more than 36 passengers, the hull, superstructure and deckhouses shall be subdivided into main vertical zones by "A" class divisions. Steps and recesses shall be kept to a minimum, but where they are necessary they shall also be "A" class divisions. These divisions shall have insulation values in accordance with tables in Regulation 26.

1.2 For ships carrying not more than 36 passengers, the hull, superstructure and deckhouses in way of accommodation and service spaces shall be subdivided into main vertical zones by "A" class divisions. These divisions shall have insulation values in accordance with tables in Regulation 27.

2 As far as practicable, the bulkheads forming the boundaries of the main vertical zones above the bulkhead deck shall be in line with watertight subdivision bulkheads situated immediately below the bulkhead deck.

3 Such bulkheads shall extend from deck to deck and to the shell or other boundaries.

4 Where a main vertical zone is subdivided by horizontal "A" class

divisions into horizontal zones for the purpose of providing an appropriate barrier between sprinklered and non-sprinklered zones of the ship, the divisions shall extend between adjacent main vertical zone bulkheads and to the shell or exterior boundaries of the ship and shall be insulated in accordance with the fire insulation and integrity values given in table 26.3 or in table 27.2.

5.1 On ships designed for special purposes, such as automobile or railroad car ferries, where the provision of main vertical zone bulkheads would defeat the purpose for which the ship is intended, equivalent means for controlling and limiting a fire shall be substituted and specifically approved by the Administration.

5.2 However, in a ship with special category spaces, any such space shall comply with the applicable provisions of Regulation 37 and in so far as such compliance would be inconsistent with compliance with other requirements of this Part, the requirements of Regulation 37 shall prevail.

Regulation 25

Bulkheads within a main vertical zone

1.1 For ships carrying more than 36 passengers all bulkheads which are not required to be "A" class divisions shall be at least "B" class or "C" class divisions as prescribed in the tables in Regulation 26.

1.2 For ships carrying not more than 36 passengers all bulkheads within accommodation and service spaces which are not required to be "A" class divisions shall be at least "B" class or "C" class divisions as prescribed in the tables in Regulation 27.

1.3 All such divisions may be faced with combustible materials in accordance with the provisions of Regulation 34.

2 All corridor bulkheads where not required to be "A" class shall be "B" class divisions which shall extend from deck to deck except:

- .1 when continuous "B" class ceilings or linings are fitted on both sides of the bulkhead, the portion of the bulkhead behind the continuous ceiling or lining shall be of material which, in thickness and composition, is acceptable in the construction of "B" class divisions but which shall be required to meet "B" class integrity standards only in so far as is reasonable and practicable in the opinion of the Administration;
- .2 in the case of a ship protected by an automatic sprinkler system complying with the provisions of Regulation 12 the corridor bulkheads of "B" class materials may terminate at a ceiling in the corridor provided such a ceiling is of material which, in thickness and composition, is acceptable in the construction of "B" class divisions. Notwithstanding the requirements of Regulations 26 and 27 such bulkheads and ceilings shall be required to meet "B" class integrity standards only in so far as is reasonable and practicable in

the opinion of the Administration. All doors and frames in such bulkheads shall be of non-combustible materials and shall be so constructed and erected as to provide substantial fire resistance to the satisfaction of the Administration.

3 All bulkheads required to be "B" class divisions, except corridor bulkheads, shall extend from deck to deck and to the shell or other boundaries unless continuous "B" class ceilings or linings are fitted on both sides of the bulkhead, in which case the bulkhead may terminate at the continuous ceiling or lining.

Regulation 26

Fire integrity of bulkheads and decks in ships carrying more than 36 passengers

1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this Part, the minimum fire integrity of all bulkheads and decks shall be as prescribed in tables 26.1 to 26.4. Where, due to any particular structural arrangements in the ship, difficulty is experienced in determining from the tables the minimum fire integrity value of any divisions, such values shall be determined to the satisfaction of the Administration.

2 The following requirements shall govern application of the tables:

.1 Table 26.1 shall apply to bulkheads bounding main vertical zones or horizontal zones.

Table 26.2 shall apply to bulkheads not bounding either main vertical zones or horizontal zones.

Table 26.3 shall apply to decks forming steps in main vertical zones or bounding horizontal zones.

Table 26.4 shall apply to decks not forming steps in main vertical zones nor bounding horizontal zones.

.2 for the purpose of determining the appropriate fire integrity standards to be applied to boundaries between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (14) below. Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this Regulation, it shall be treated as a space within the relevant category having the most stringent boundary requirements. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row number in the tables.

(1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.

Spaces containing the ship's radio equipment.

Fire-extinguishing rooms, fire control and recording stations.
Control room for propulsion machinery when located outside the propulsion machinery space.
Spaces containing centralized fire alarm equipment.
Spaces containing centralized emergency public address system stations and equipment.

(2) *Stairways*

Interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) for passengers and crew and enclosures thereto.

In this connexion a stairway which is enclosed at only one level shall be regarded as part of the space from which it is not separated by a fire door.

(3) *Corridors*

Passenger and crew corridors and lobbies.

(4) *Lifeboat and liferaft handling and embarkation stations*

Open deck spaces and enclosed promenades forming lifeboat and liferaft embarkation and lowering stations.

(5) *Open deck spaces*

Open deck spaces and enclosed promenades clear of lifeboat and liferaft embarkation and lowering stations.

Air space (the space outside superstructures and deckhouses).

(6) *Accommodation spaces of minor fire risk*

Cabins containing furniture and furnishings of restricted fire risk.

Offices and dispensaries containing furniture and furnishings of restricted fire risk.

Public spaces containing furniture and furnishings of restricted fire risk and having a deck area of less than 50 m².

(7) *Accommodation spaces of moderate fire risk*

Spaces as in category (6) above but containing furniture and furnishings of other than restricted fire risk.

Public spaces containing furniture and furnishings of restricted fire risk and having a deck area of 50 m² or more.

Isolated lockers and small store-rooms in accommodation spaces.

Sale shops.

Motion picture projection and film stowage rooms.

Diet kitchens (containing no open flame).

Cleaning gear lockers (in which flammable liquids are not stowed).

- Laboratories (in which flammable liquids are not stowed).
Pharmacies.
Small drying rooms (having a deck area of 4 m² or less).
Specie rooms.
- (8) *Accommodation spaces of greater fire risk*
Public spaces containing furniture and furnishings of other than restricted fire risk and having a deck area of 50 m² or more.
Barber shops and beauty parlours.
- (9) *Sanitary and similar spaces*
Communal sanitary facilities, showers, baths, water closets, etc.
Small laundry rooms.
Indoor swimming, pool area.
Operating rooms.
Isolated pantries containing no cooking appliances in accommodation spaces.
Private sanitary facilities shall be considered a portion of the space in which they are located.
- (10) *Tanks, voids and auxiliary machinery spaces having little or no fire risk*
Water tanks forming part of the ship's structure.
Voids and cofferdams.
Auxiliary machinery spaces which do not contain machinery having a pressure lubrication system and where storage of combustibles is prohibited, such as:
ventilation and air-conditioning rooms; windlass room; steering gear room; stabilizer equipment room; electrical propulsion motor room; rooms containing section switchboards and purely electrical equipment other than oil-filled electrical transformers (above 10 kVA); shaft alleys and pipe tunnels; spaces for pumps and refrigeration machinery (not handling or using flammable liquids).
Closed trunks serving the spaces listed above.
Other closed trunks such as pipe and cable trunks.
- (11) *Auxiliary machinery spaces, cargo spaces, special category spaces, cargo and other oil tanks and other similar spaces of moderate fire risk*
Cargo oil tanks.
Cargo holds, trunkways and hatchways.
Refrigerated chambers.
Oil fuel tanks (where installed in a separate space with no machinery).

Shaft alleys and pipe tunnels allowing storage of combustibles.

Auxiliary machinery spaces as in category (10) which contain machinery having a pressure lubrication system or where storage of combustibles is permitted.

Oil fuel filling stations.

Spaces containing oil-filled electrical transformers (above 10 kVA).

Spaces containing turbine and reciprocating steam engine driven auxiliary generators and small internal combustion engines of power output up to 110 kW driving emergency generators, sprinkler, drencher or fire pumps, bilge pumps, etc.

Special category spaces (tables 26.1 and 26.3 only apply).

Closed trunks serving the spaces listed above.

(12) *Machinery spaces and main galleys*

Main propulsion machinery rooms (other than electric propulsion motor rooms) and boiler rooms.

Auxiliary machinery spaces other than those in categories (10) and (11) which contain internal combustion machinery or other oil-burning, heating or pumping units.

Main galleys and annexes.

Trunks and casings to the spaces listed above.

(13) *Store-rooms, workshops, pantries, etc.*

Main pantries not annexed to galleys.

Main laundry.

Large drying rooms (having a deck area of more than 4 m²).

Miscellaneous stores.

Mail and baggage rooms.

Garbage rooms.

Workshops (not part of machinery spaces, galleys, etc.)

(14) *Other spaces in which flammable liquids are stowed*

Lamp rooms.

Paint rooms.

Store-rooms containing flammable liquids (including dyes, medicines, etc.).

Laboratories (in which flammable liquids are stowed).

.3 Where a single value is shown for the fire integrity of a boundary between two spaces, that value shall apply in all cases.

.4 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is not protected by an automatic sprinkler system complying

TABLE 26.1 – BULKHEADS BOUNDING MAIN VERTICAL ZONES OR HORIZONTAL ZONES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations (1)	A-60	A-30	A-30	A-0	A-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60
Stairways (2)		A-0	A-0	A-0	A-0	A-15 A-0	A-30 A-0	A-60 A-15	A-0	A-0	A-30	A-60	A-15 A-0	A-60
Corridors (3)			A-0	A-0	A-0	A-0	A-30 A-0	A-30 A-0	A-0	A-0	A-30	A-60	A-15 A-0	A-60
Lifeboat and liferaft handling and embarkation stations (4)				-	-	A-0	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-60
Open deck spaces (5)					-	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of minor fire risk (6)						A-15 A-0	A-30 A-0	A-30 A-0	A-0	A-0	A-15 A-0	A-30	A-15 A-0	A-30
Accommodation spaces of moderate fire risk (7)							A-30 A-0	A-60 A-15	A-0	A-0	A-30 A-0	A-60	A-30 A-0	A-60
Accommodation spaces of greater fire risk (8)								A-60 A-15	A-0	A-0	A-60 A-15	A-60	A-30 A-0	A-60
Sanitary and similar spaces (9)									A-0	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk (10)										A-0	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, special category spaces, cargo and other oil tanks and other similar spaces of moderate fire risk (11)											A-0	A-60	A-0	A-60
Machinery spaces and main galleys (12)												A-60	A-30 ^{b/} A-15	A-60
Store-rooms, workshops, pantries etc. (13)													A-0	A-30
Other spaces in which flammable liquids are stowed (14)														A-60

See notes under table 26.4

TABLE 26.2 – BULKHEADS NOT BOUNDING EITHER MAIN VERTICAL ZONES OR HORIZONTAL ZONES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations (1)	B-0 ^{a/}	A-0	A-0	A-0	A-0 B-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60
Stairways (2)		A-0 ^{a/}	A-0	A-0	A-0	A-0	A-15 A-0	A-30 A-0	A-0	A-0	A-15	A-30	A-15 A-0	A-30
Corridors (3)			C	A-0	A-0 B-0	B-0	B-15 B-0	B-15 B-0	B-0	A-0	A-15	A-30	A-0	A-30 A-0
Lifeboat and liferaft handling and embarkation stations (4)				–	–	A-0	A-0	A-0	A-0	A-0	A-0	A-15	A-0	A-15 A-0
Open deck space (5)					–	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-0	A-0 B-0	A-0 B-0
Accommodation spaces of minor fire risk (6)						B-0 C	B-15 C	B-15 C	B-0 C	A-0	A-15 A-0	A-30	A-0	A-30 A-0
Accommodation spaces of moderate fire risk (7)							B-15 C	B-15 C	B-0 C	A-0	A-15 A-0	A-60	A-15 A-0	A-60 A-15
Accommodation spaces of greater fire risk (8)								B-15 C	B-0 C	A-0	A-30 A-0	A-60	A-15 A-0	A-60 A-15
Sanitary and similar spaces (9)									C	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk (10)										A-0 ^{a/}	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk (11)											A-0 ^{a/}	A-0	A-0	A-30 ^{b/} A-15
Machinery spaces and main galleys (12)												A-0 ^{a/}	A-0	A-60
Store-rooms, workshops, pantries, etc (13)													A-0 ^{a/}	A-0
Other spaces in which flammable liquids are stowed (14)														A-30 ^{b/} A-15

See notes under table 26.4

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TABLE 26.3 – DECKS FORMING STEPS IN MAIN VERTICAL ZONES OR BOUNDING HORIZONTAL ZONES

Space below ↓	Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations	(1)	A-60	A-60	A-30	A-0	A-0	A-15	A-30	A-60	A-0	A-0	A-30	A-60	A-15	A-60
Stairways	(2)	A-15	A-0	A-0	A-0	A-0	A-0	A-15 A-0	A-15 A-0	A-0	A-0	A-0	A-60	A-0	A-60
Corridors	(3)	A-30	A-0	A-0	A-0	A-0	A-0	A-15 A-0	A-15 A-0	A-0	A-0	A-0	A-60	A-0	A-60
Lifeboat and liferaft handling and embarkation stations	(4)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Open deck spaces	(5)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of minor fire risk	(6)	A-60	A-30 A-0	A-15 A-0	A-0	A-0	A-0	A-15 A-0	A-30 A-0	A-0	A-0	A-15 A-0	A-15	A-0	A-15
Accommodation spaces of moderate fire risk	(7)	A-60	A-60 A-15	A-30 A-0	A-15 A-0	A-0	A-15 A-0	A-30 A-0	A-60 A-15	A-0	A-0	A-30 A-0	A-30	A-0	A-30
Accommodation spaces of greater fire risk	(8)	A-60	A-60 A-15	A-60 A-15	A-60 A-15	A-0	A-30 A-0	A-60 A-15	A-60 A-15	A-0	A-0	A-30 A-0	A-60	A-15 A-0	A-60
Sanitary and similar spaces	(9)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk	(10)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, special category spaces, cargo and other oil tanks and other similar spaces of moderate fire risk	(11)	A-60	A-60	A-60	A-60	A-0	A-30 A-0	A-60 A-15	A-60 A-15	A-0	A-0	A-0	A-30	A-30 ^{b/} A-0	A-30
Machinery spaces and main galleys	(12)	A-60	A-60	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60
Store-rooms, workshops, pantries, etc.	(13)	A-60	A-60 A-15	A-30 A-0	A-15	A-0	A-15 A-0	A-30 A-0	A-60 A-15	A-0	A-0	A-0	A-30	A-0	A-30
Other spaces in which flammable liquids are stowed	(14)	A-60	A-60	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60

See notes under table 26.4

TABLE 26.4 – DECKS NOT FORMING STEPS IN MAIN VERTICAL ZONES NOR BOUNDING HORIZONTAL ZONES

Space below ↙	Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations	(1)	A-30 A-0	A-30 A-0	A-15 A-0	A-0	A-0 B-0	A-0	A-15 A-0	A-30 A-0	A-0	A-0	A-0	A-60	A-0	A-60 A-15
Stairways	(2)	A-0	A-0	A-0	A-0	A-0 B-0	A-0	A-0	A-0	A-0	A-0	A-0	A-30	A-0	A-30 A-0
Corridors	(3)	A-15 A-0	A-0	A-0 ^{a/} B-0 ^{b/}	A-0	A-0 B-0	A-0 B-0	A-15 B-0	A-15 B-0	A-0 B-0	A-0	A-0	A-30	A-0	A-30 A-0
Lifeboat and liferaft handling and embarkation stations	(4)	A-0	A-0	A-0	A-0	–	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-0	A-0	A-0
Open deck spaces	(5)	A-0	A-0	A-0 B-0	A-0	–	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-0	A-0 B-0	A-0
Accommodation spaces of minor fire risk	(6)	A-60	A-15 A-0	A-0	A-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-15 A-0	A-0	A-15 A-0
Accommodation spaces of moderate fire risk	(7)	A-60	A-30 A-0	A-15 A-0	A-15 A-0	A-0 B-0	A-0 B-0	A-15 B-0	A-30 B-0	A-0 B-0	A-0	A-15 A-0	A-30 A-0	A-0	A-30 A-0
Accommodation spaces of greater fire risk	(8)	A-60	A-60 A-15	A-60 A-0	A-30 A-0	A-0 B-0	A-15 B-0	A-30 B-0	A-60 B-0	A-0 B-0	A-0	A-30 A-0	A-30 A-0	A-0	A-30 A-0
Sanitary spaces and similar spaces	(9)	A-0	A-0	A-0 B-0	A-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0 B-0	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk	(10)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0 ^{a/}	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk	(11)	A-60	A-60 A-15	A-60 A-15	A-30 A-0	A-0	A-0	A-15 A-0	A-30 A-0	A-0	A-0	A-0 ^{a/}	A-0	A-0	A-30 ^{b/} A-15
Machinery spaces and main galleys	(12)	A-60	A-60	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0	A-30	A-30 ^{a/}	A-0	A-60
Store-rooms, workshops, pantries, etc.	(13)	A-60	A-30 A-0	A-15 A-0	A-15 A-0	A-0 B-0	A-15 A-0	A-30 A-0	A-30 A-0	A-0 B-0	A-0	A-0	A-0	A-0	A-15 ^{b/} A-0
Other spaces in which flammable liquids are stowed	(14)	A-60	A-60 A-30	A-60 A-30	A-60	A-0	A-30 A-0	A-60 A-15	A-60 A-15	A-0	A-0	A-30 ^{b/} A-0	A-30 ^{b/} A-0	A-0	A-30 ^{b/} A-0

Notes. To be applied to tables 26.1 to 26.4, as appropriate.

a/ Where adjacent spaces are in the same numerical category and superscript ^{a/} appears, a bulkhead or deck between such spaces need not be fitted if deemed unnecessary by the Administration. For example, in category (12) a bulkhead need not be required between a galley and its annexed pantries provided the pantry bulkheads and decks maintain the integrity of the galley boundaries. A bulkhead is, however, required between a galley and a machinery space even though both spaces are in category (12).

b/ Where superscript ^{b/} appears the lesser insulation value may be permitted only if at least one of the adjoining spaces is protected by an automatic sprinkler system complying with the provisions of Regulation 12.

with the provisions of Regulation 12 or between such zones neither of which is so protected, the higher of the two values given in the tables shall apply.

- .5 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is protected by an automatic sprinkler system complying with the provisions of Regulation 12 or between such zones both of which are so protected, the lesser of the two values given in the tables shall apply. Where a sprinklered zone and a non-sprinklered zone meet within accommodation and service spaces, the higher of the two values given in the tables shall apply to the division between the zones.
- .6 Notwithstanding the provisions of Regulation 35 there are no special requirements for material or integrity of boundaries where only a dash appears in the tables.
- .7 The Administration shall determine in respect of category (5) spaces whether the insulation values in table 26.1 or 26.2 shall apply to ends of deckhouses and superstructures, and whether the insulation values in table 26.3 or 26.4 shall apply to weather decks. In no case shall the requirements of category (5) of tables 26.1 to 26.4 necessitate enclosure of spaces which in the opinion of the Administration need not be enclosed.

3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing wholly or in part, to the required insulation and integrity of a division.

4 In approving structural fire protection details, the Administration shall have regard to the risk of heat transmission at intersections and terminal points of required thermal barriers.

Regulation 27

Fire integrity of bulkheads and decks in ships carrying not more than 36 passengers

- 1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this Part, the minimum fire integrity of bulkheads and decks shall be as prescribed in table 27.1 and table 27.2.
- 2 The following requirements shall govern application of the tables:
 - .1 Tables 27.1 and 27.2 shall apply respectively to the bulkheads and decks separating adjacent spaces.
 - .2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) below. The title of each category is intended to be typical

rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

(1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.

Spaces containing the ship's radio equipment.

Fire-extinguishing rooms, fire control stations and fire-recording stations.

Control room for propulsion machinery when located outside the machinery space.

Spaces containing centralized fire alarm equipment.

(2) *Corridors*

Passenger and crew corridors and lobbies.

(3) *Accommodation spaces*

Spaces as defined in Regulation 3.10 excluding corridors.

(4) *Stairways*

Interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connexion, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(5) *Service spaces (low risk)*

Lockers and store-rooms having areas of less than 2 m², drying rooms and laundries.

(6) *Machinery spaces of category A*

Spaces as defined in Regulation 3.19.

(7) *Other machinery spaces*

Spaces as defined in Regulation 3.20 excluding machinery spaces of category A.

(8) *Cargo spaces*

All spaces used for cargo (including cargo oil tanks) and trunkways and hatchways to such spaces, other than special category spaces.

(9) *Service spaces (high risk)*

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 2 m² or more and workshops other than those forming part of the machinery spaces.

TABLE 27.1 – FIRE INTEGRITY OF BULKHEADS SEPARATING ADJACENT SPACES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0 ^{c/}	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*	A-60
Corridors (2)		C ^{e/}	B-0 ^{e/}	B-0 ^{e/} A-0 ^{a/}	B-0 ^{e/}	A-60	A-0	A-0	A-15 A-0 ^{d/}	*	A-15
Accommodation spaces (3)			C ^{e/}	B-0 ^{e/} A-0 ^{a/}	B-0 ^{e/}	A-60	A-0	A-0	A-15 A-0 ^{d/}	*	A-30 A-0 ^{d/}
Stairways (4)				B-0 ^{e/} A-0 ^{a/}	B-0 ^{e/} A-0 ^{a/}	A-60	A-0	A-0	A-15 A-0 ^{d/}	*	A-15
Service spaces (low risk) (5)					C ^{e/}	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces (6) of category A						*	A-0	A-0	A-60	*	A-60
Other machinery spaces (7)							A-0 ^{b/}	A-0	A-0	*	A-0
Cargo spaces (8)								*	A-0	*	A-0
Service spaces (high risk) (9)									A-0 ^{b/}	*	A-30
Open decks (10)										--	A-0
Special category (11) spaces											A-0

Notes: To be applied to both tables 27.1 and 27.2, as appropriate.

- a/ For clarification as to which applies see Regulations 25 and 29.
- b/ Where spaces are of the same numerical category and superscript b appears, a bulkhead or deck of the ratings shown in the tables is only required when the adjacent spaces are for a different purpose, e.g. in category (9). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.
- c/ Bulkheads separating the wheelhouse and chartroom from each other may be "B-0" rating.
- d/ See 2.3 and 2.4 of this Regulation.
- e/ For the application of Regulation 24.1.2, "B-0" and "C", where appearing in table 27.1, shall be read as "A-0".
- f/ Fire insulation need not be fitted if the machinery space of category (7), in the opinion of the Administration, has little or no fire risk.
- * Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material but is not required to be of "A" class standard. For the application of Regulation 24.1.2 an asterisk, where appearing in table 27.2, except for categories (8) and (10), shall be read as "A-0".

TABLE 27.2 – FIRE INTEGRITY OF DECKS SEPARATING ADJACENT SPACES

Space below ↓	Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations	(1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*	A-30
Corridors	(2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Accommodation spaces	(3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30 A-0d/
Stairways	(4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*	A-0
Service spaces (low risk)	(5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A	(6)	A-60	A-60	A-60	A-60	A-60	*	A-60 f/	A-30	A-60	*	A-60
Other machinery spaces	(7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*	A-0
Cargo spaces	(8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*	A-0
Service spaces (high risk)	(9)	A-60	A-30 A-0d/	A-30 A-0d/	A-30 A-0d/	A-0	A-60	A-0	A-0	A-0	*	A-30
Open decks	(10)	*	*	*	*	*	*	*	*	*	--	A-0
Special category spaces	(11)	A-60	A-15	A-30 A-0d/	A-15	A-0	A-30	A-0	A-0	A-30	A-0	A-0

(10) *Open decks*

Open deck spaces and enclosed promenades having no fire risk. Air spaces (the space outside superstructures and deck-houses).

(11) *Special category spaces*

Spaces as defined in Regulation 3.18.

- 3 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is not protected by an automatic sprinkler system complying with the provisions of Regulation 12 or between such zones neither of which is so protected, the higher of the two values given in the tables shall apply.
- 4 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone

which is protected by an automatic sprinkler system complying with the provisions of Regulation 12 or between such zones both of which are so protected, the lesser of the two values given in the tables shall apply. Where a sprinklered zone and a non-sprinklered zone meet within accommodation and service spaces, the higher of the two values given in the tables shall apply to the division between the zones.

3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

4 External boundaries which are required in Regulation 23.1 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries to have "A" class integrity elsewhere in this Chapter. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be of materials to the satisfaction of the Administration.

Regulation 28

Means of escape

1 Stairways and ladders shall be arranged to provide ready means of escape to the lifeboat and liferaft embarkation deck from all passenger and crew spaces and from spaces in which the crew is normally employed, other than machinery spaces. In particular, the following provisions shall be complied with:

- .1 Below the bulkhead deck two means of escape, at least one of which shall be independent of watertight doors, shall be provided from each watertight compartment or similarly restricted space or group of spaces. Exceptionally, the Administration may dispense with one of the means of escape, due regard being paid to the nature and location of spaces and to the number of persons who might normally be accommodated or employed there.
- .2 Above the bulkhead deck there shall be at least two means of escape from each main vertical zone or similarly restricted space or group of spaces at least one of which shall give access to a stairway forming a vertical escape.
- .3 If a radiotelegraph station has no direct access to the open deck, two means of escape from or access to such station shall be provided, one of which may be a porthole or window of sufficient size or another means to the satisfaction of the Administration.
- .4 A corridor or part of a corridor from which there is only one route of escape shall not exceed:
 - 13 m in length for ships carrying more than 36 passengers, and
 - 7 m in length for ships carrying not more than 36 passengers.
- .5 At least one of the means of escape required by paragraphs 1.1 and

1.2 shall consist of a readily accessible enclosed stairway, which shall provide continuous fire shelter from the level of its origin to the appropriate lifeboat and liferaft embarkation decks or the highest level served by the stairway, whichever level is the highest. However, where the Administration has granted dispensation under the provisions of paragraph 1.1 the sole means of escape shall provide safe escape to the satisfaction of the Administration. The width, number and continuity of the stairways shall be to the satisfaction of the Administration.

- .6 Protection of access from the stairway enclosures to the lifeboat and liferaft embarkation areas shall be to the satisfaction of the Administration.
- .7 Stairways serving only a space and a balcony in that space shall not be considered as forming one of the required means of escape.

2.1 In special category spaces the number and disposition of the means of escape both below and above the bulkhead deck shall be to the satisfaction of the Administration and in general the safety of access to the embarkation deck shall be at least equivalent to that provided for under paragraphs 1.1, 1.2, 1.5 and 1.6.

2.2 One of the escape routes from the machinery spaces where the crew is normally employed shall avoid direct access to any special category space.

3.1 Two means of escape shall be provided from each machinery space. In particular, the following provisions shall be complied with:

- .1 Where the space is below the bulkhead deck the two means of escape shall consist of either:
 - .1.1 two sets of steel ladders as widely separated as possible, leading to doors in the upper part of the space similarly separated and from which access is provided to the appropriate lifeboat and liferaft embarkation decks. One of these ladders shall provide continuous fire shelter from the lower part of the space to a safe position outside the space; or
 - .1.2 one steel ladder leading to a door in the upper part of the space from which access is provided to the embarkation deck and additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the embarkation deck.
- .2 Where the space is above the bulkhead deck, the two means of escape shall be as widely separated as possible and the doors leading from such means of escape shall be in a position from which access is provided to the appropriate lifeboat and liferaft embarkation decks. Where such means of escape require the use of ladders, these shall be of steel.

3.2 In a ship of less than 1,000 tons gross tonnage, the Administration may

dispense with one of the means of escape, due regard being paid to the width and disposition of the upper part of the space; and in a ship of 1,000 tons gross tonnage and above, the Administration may dispense with one means of escape from any such space so long as either a door or a steel ladder provides a safe escape route to the embarkation deck, due regard being paid to the nature and location of the space and whether persons are normally employed in that space.

4 In no case shall lifts be considered as forming one of the required means of escape.

Regulation 29

Protection of stairways and lifts in accommodation and service spaces

1 All stairways shall be of steel frame construction except where the Administration sanctions the use of other equivalent material, and shall be within enclosures formed of "A" class divisions, with positive means of closure at all openings, except that:

- .1 a stairway connecting only two decks need not be enclosed, provided the integrity of the deck is maintained by proper bulkheads or doors in one 'tweendeck space. When a stairway is closed in one 'tweendeck space, the stairway enclosure shall be protected in accordance with the tables for decks in Regulations 26 or 27;
- .2 stairways may be fitted in the open in a public space, provided they lie wholly within such public space.

2 Stairway enclosures shall have direct communication with the corridors and be of sufficient area to prevent congestion, having in view the number of persons likely to use them in an emergency. In so far as is practicable, stairway enclosures shall not give direct access to cabins, service lockers, or other enclosed spaces containing combustibles in which a fire is likely to originate.

3 Lift trunks shall be so fitted as to prevent the passage of smoke and flame from one 'tweendeck to another and shall be provided with means of closing so as to permit the control of draught and smoke.

Regulation 30

Openings in "A" class divisions

1 Except for hatches between cargo, special category, store, and baggage spaces, and between such spaces and the weather decks, all openings shall be provided with permanently attached means of closing which shall be at least as effective for resisting fires as the divisions in which they are fitted.

2 The construction of all doors and door frames in "A" class divisions,

with the means of securing them when closed, shall provide resistance to fire as well as to the passage of smoke and flame, as far as practicable, equivalent to that of the bulkheads in which the doors are situated. Such doors and door frames shall be constructed of steel or other equivalent material. Watertight doors need not be insulated.

3 It shall be possible for each door to be opened and closed from each side of the bulkhead by one person only.

4 Fire doors in main vertical zone bulkheads and stairway enclosures, other than power-operated watertight doors and those which are normally locked, shall be of the self-closing type capable of closing against an inclination of 3.5° opposing closure. The speed of door closure shall, if necessary, be controlled so as to prevent undue danger to persons. All such doors, except those that are normally closed, shall be capable of release from a control station, either simultaneously or in groups, and also individually from a position at the door. The release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system; however, approved power-operated watertight doors will be considered acceptable for this purpose. Hold-back hooks not subject to control station release will not be permitted. When double swing doors are permitted, they shall have a latch arrangement which is automatically engaged by the operation of the door release system.

5 Where a space is protected by an automatic sprinkler system complying with the provisions of Regulation 12 or fitted with a continuous "B" class ceiling, openings in decks not forming steps in main vertical zones nor bounding horizontal zones shall be closed reasonably tight and such decks shall meet the "A" class integrity requirements in so far as is reasonable and practicable in the opinion of the Administration.

6 The requirements for "A" class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles. Similarly, the requirements for "A" class integrity shall not apply to exterior doors in superstructures and deckhouses.

Regulation 31

Openings in "B" class divisions

1 Doors and door frames in "B" class divisions and means of securing them shall provide a method of closure which shall have resistance to fire as far as practicable equivalent to that of the divisions except that ventilation openings may be permitted in the lower portion of such doors. Where such opening is in or under a door the total net area of any such opening or openings shall not exceed 0.05 m². When such opening is cut in a door it shall be fitted with a grill made of non-combustible material. Doors shall be non-combustible.

2 The requirements for "B" class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles. Similarly, the requirements for "B" class integrity shall not apply to exterior doors in

superstructures and deckhouses. For ships carrying not more than 36 passengers, the Administration may permit the use of combustible materials in doors separating cabins from the individual interior sanitary spaces such as showers.

3 Where an automatic sprinkler system complying with the provisions of Regulation 12 is fitted:

- .1 openings in decks not forming steps in main vertical zones nor bounding horizontal zones shall be closed reasonably tight and such decks shall meet the "B" class integrity requirements in so far as is reasonable and practicable in the opinion of the Administration; and
- .2 openings in corridor bulkheads of "B" class materials shall be protected in accordance with the provisions of Regulation 25.

Regulation 32

Ventilation systems

1 *Passenger ships carrying more than 36 passengers*

1.1 The ventilation system of a passenger ship carrying more than 36 passengers shall, in addition to this part of this Regulation, also be in compliance with the requirements of Regulation 16.2 to 16.9.

1.2 In general, the ventilation fans shall be so disposed that the ducts reaching the various spaces remain within the main vertical zone.

1.3 Where ventilation systems penetrate decks, precautions shall be taken, in addition to those relating to the fire integrity of the deck required by Regulations 18.1.1 and 30.5, to reduce the likelihood of smoke and hot gases passing from one 'tweendeck space to another through the system. In addition to insulation requirements contained in this Regulation, vertical ducts shall, if necessary, be insulated as required by the appropriate tables in Regulation 26.

1.4 Except in cargo spaces, ventilation ducts shall be constructed of the following materials:

- .1 ducts not less than 0.075 m² in sectional area and all vertical ducts serving more than a single 'tweendeck space shall be constructed of steel or other equivalent material;
- .2 ducts less than 0.075 m² in sectional area other than the vertical ducts referred to in paragraph 1.4.1, shall be constructed of non-combustible materials. Where such ducts penetrate "A" or "B" class divisions due regard shall be given to ensuring the fire integrity of the division;
- .3 short lengths of duct, not in general exceeding 0.02 m² in sectional area nor 2 m in length, need not be non-combustible provided that

all of the following conditions are met:

- .3.1 the duct is constructed of a material of restricted fire risk to the satisfaction of the Administration;
- .3.2 the duct is used only at the terminal end of the ventilation system; and
- .3.3 the duct is not located closer than 600 mm measured along its length to a penetration of an "A" or "B" class division, including continuous "B" class ceilings.

1.5 Where a stairway enclosure is ventilated, the duct or ducts shall be taken from the fan room independently of other ducts in the ventilation system and shall not serve any other space.

1.6 All power ventilation, except machinery space and cargo space ventilation and any alternative system which may be required under Regulation 16.6, shall be fitted with controls so grouped that all fans may be stopped from either of two separate positions which shall be situated as far apart as practicable. Controls provided for the power ventilation serving machinery spaces shall also be grouped so as to be operable from two positions, one of which shall be outside such spaces. Fans serving power ventilation systems to cargo spaces shall be capable of being stopped from a safe position outside such spaces.

2 *Passenger ships carrying not more than 36 passengers*

2.1 The ventilation system of passenger ships carrying not more than 36 passengers shall be in compliance with Regulation 16.

Regulation 33

Windows and sidescuttles

1 All windows and sidescuttles in bulkheads within accommodation and service spaces and control stations other than those to which the provisions of Regulation 30.6 and of Regulation 31.2 apply, shall be so constructed as to preserve the integrity requirements of the type of bulkheads in which they are fitted.

2 Notwithstanding the requirements of the tables in Regulations 26 and 27:

- .1 all windows and sidescuttles in bulkheads separating accommodation and service spaces and control stations from weather shall be constructed with frames of steel or other suitable material. The glass shall be retained by a metal glazing bead or angle;
- .2 special attention shall be given to the fire integrity of windows facing open or enclosed lifeboat and liferaft embarkation areas and to the fire integrity of windows situated below such areas in such a position that their failure during a fire would impede the launching of, or embarkation into, lifeboats or liferafts.

Regulation 34

Restricted use of combustible materials

1 Except in cargo spaces, mail rooms, baggage rooms, or refrigerated compartments of service spaces, all linings, grounds, ceilings and insulations shall be of non-combustible materials. Partial bulkheads or decks used to subdivide a space for utility or artistic treatment shall also be of non-combustible material.

2 Vapour barriers and adhesives used in conjunction with insulation, as well as insulation of pipe fittings, for cold service systems need not be non-combustible, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have qualities of resistance to the propagation of flame to the satisfaction of the Administration.

3 The following surfaces shall have low flame-spread characteristics:*

- .1 exposed surfaces in corridors and stairway enclosures, and of bulkheads, wall and ceiling linings in all accommodation and service spaces and control stations;
- .2 concealed or inaccessible spaces in accommodation, service spaces and control stations.

4 The total volume of combustible facings, mouldings, decorations and veneers in any accommodation and service space shall not exceed a volume equivalent to 2.5 mm veneer on the combined area of the walls and ceilings. In the case of ships fitted with an automatic sprinkler system complying with the provisions of Regulation 12, the above volume may include some combustible material used for erection of "C" class divisions.

5 Veneers used on surfaces and linings covered by the requirements of paragraph 3 shall have a calorific value not exceeding 45 MJ/m² of the area for the thickness used.

6 Furniture in the corridors and stairway enclosures shall be kept to a minimum.

7 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke and toxic products.

8 Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of approved material which will not readily ignite, or give rise to toxic or explosive hazards at elevated temperatures.**

* Reference is made to Guidelines on the Evaluation of Fire Hazard Properties of Materials, adopted by the Organization by resolution A.166(ES.IV).

** Reference is made to Improved Provisional Guidelines on Test Procedures for Primary Deck Coverings, adopted by the Organization by resolution A.214(VII).

Regulation 35

Details of construction

- 1 In accommodation and service spaces, control stations, corridors and stairways:
 - .1 air spaces enclosed behind ceilings, panelling or linings shall be suitably divided by close-fitting draught stops not more than 14 m apart;
 - .2 in the vertical direction, such enclosed air spaces, including those behind linings of stairways, trunks, etc. shall be closed at each deck.
- 2 The construction of ceiling and bulkheading shall be such that it will be possible, without impairing the efficiency of the fire protection, for the fire patrols to detect any smoke originating in concealed and inaccessible places, except where in the opinion of the Administration there is no risk of fire originating in such places.

Regulation 36

Automatic sprinkler, fire detection and fire alarm systems or automatic fire detection and fire alarm systems

- 1 In any ship to which this Part applies there shall be installed throughout each separate zone, whether vertical or horizontal, in all accommodation and service spaces and, where it is considered necessary by the Administration, in control stations, except spaces which afford no substantial fire risk (such as void spaces, sanitary spaces, etc.) either:
 - .1 an automatic sprinkler, fire detection and fire alarm system of an approved type, complying with the provisions of Regulation 12 and so installed and arranged as to protect such spaces; or
 - .2 a fixed fire detection and fire alarm system of an approved type, complying with the provisions of Regulation 13 and so installed and arranged as to detect the presence of fire in such spaces, except that the smoke detectors required by Regulation 13.2.2 need not be provided.

Regulation 37

Protection of special category spaces

- 1 *Provisions applicable to special category spaces whether above or below the bulkhead deck*
 - 1.1 General
 - 1.1.1 The basic principle underlying the provisions of this Regulation is that as normal main vertical zoning may not be practicable in special category

spaces, equivalent protection must be obtained in such spaces on the basis of a horizontal zone concept and by the provision of an efficient fixed fire-extinguishing system. Under this concept a horizontal zone for the purpose of this Regulation may include special category spaces on more than one deck provided that the total overall clear height for vehicles does not exceed 10 m.

1.1.2 The requirements of Regulations 16, 18, 30 and 32 for maintaining the integrity of vertical zones shall be applied equally to decks and bulkheads forming the boundaries separating horizontal zones from each other and from the remainder of the ship.

1.2 Structural protection

1.2.1 Boundary bulkheads of special category spaces shall be insulated as required for category (11) spaces in table 26.1 or in table 27.1 and the horizontal boundaries as required for category (11) spaces in table 26.3 or in table 27.2.

1.2.2 Indicators shall be provided on the navigating bridge which shall indicate when any fire door leading to or from the special category spaces is closed.

1.3 Fixed fire-extinguishing system*

Each special category space shall be fitted with an approved fixed pressure water-spraying system for manual operation which shall protect all parts of any deck and vehicle platform in such space, provided that the Administration may permit the use of any other fixed fire-extinguishing system that has been shown by full-scale test in conditions simulating a flowing petrol fire in a special category space to be not less effective in controlling fires likely to occur in such a space.

1.4 Patrols and detection

1.4.1 An efficient patrol system shall be maintained in special category spaces. In any such space in which the patrol is not maintained by a continuous fire watch at all times during the voyage there shall be provided an automatic fire detection system of an approved type.

1.4.2 Manually operated call points shall be provided as necessary throughout the special category spaces and one shall be placed close to each exit from such spaces.

1.5 Fire-extinguishing equipment

There shall be provided in each special category space:

- .1 at least three water fog applicators;
- .2 one portable foam applicator unit complying with the provisions of Regulation 6.4, provided that at least two such units are available in

* Reference is made to Recommendation on Fixed Fire-Extinguishing Systems for Special Category Spaces, adopted by the Organization by resolution A.123(V).

the ship for use in such spaces; and

- .3 such number of portable fire extinguishers as the Administration may deem sufficient, provided that at least one portable extinguisher is located at each access to such spaces.

1.6 Ventilation system

1.6.1 There shall be provided an effective power ventilation system for the special category spaces sufficient to give at least 10 air changes per hour. The system for such spaces shall be entirely separated from other ventilation systems and shall be operating at all times when vehicles are in such spaces. The Administration may require an increased number of air changes when vehicles are being loaded and unloaded. Ventilation ducts serving special category spaces capable of being effectively sealed shall be separated for each such space. The system shall be capable of being controlled from a position outside such spaces.

1.6.2 The ventilation shall be such as to prevent air stratification and the formation of air pockets.

1.6.3 Means shall be provided to indicate on the navigating bridge any loss or reduction of the required ventilating capacity.

1.6.4 Arrangements shall be provided to permit a rapid shut-down and effective closure of the ventilation system in case of fire, taking into account the weather and sea conditions.

1.6.5 Ventilation ducts, including dampers, shall be made of steel and their arrangement shall be to the satisfaction of the Administration.

2 *Additional provisions applicable only to special category spaces above the bulkhead deck*

2.1 Scuppers

In view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or decks consequent on the operation of the fixed pressure water-spraying system, scuppers shall be fitted so as to ensure that such water is rapidly discharged directly overboard.

2.2 Precautions against ignition of flammable vapours

2.2.1 On any deck on which vehicles are carried and on which explosive vapours might be expected to accumulate, equipment which may constitute a source of ignition of flammable vapours and, in particular, electrical equipment and wiring, shall be installed at least 450 mm above the deck. Electrical equipment installed at more than 450 mm above the deck shall be of a type so enclosed and protected as to prevent the escape of sparks. However, if the Administration is satisfied that the installation of electrical equipment and wiring at less than 450 mm above the deck is necessary for the safe operation of the ship, such electrical equipment and wiring may be installed provided that it is of a type approved for use in an explosive petrol and air mixture.

2.2.2 Electrical equipment and wiring, if installed in an exhaust ventilation duct, shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

3 *Additional provisions applicable only to special category spaces below the bulkhead deck*

3.1 Bilge pumping and drainage

In view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or tank top consequent on the operation of the fixed pressure water-spraying system, the Administration may require pumping and drainage facilities to be provided additional to the requirements of Regulation II-1/21.

3.2 Precautions against ignition of flammable vapours

3.2.1 Electrical equipment and wiring, if fitted, shall be of a type suitable for use in explosive petrol and air mixtures. Other equipment which may constitute a source of ignition of flammable vapours shall not be permitted.

3.2.2 Electrical equipment and wiring, if installed in an exhaust ventilation duct, shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

Regulation 38

*Protection of cargo spaces, other than special category spaces,
intended for the carriage of motor vehicles with
fuel in their tanks for their own propulsion*

In any cargo space (other than special category spaces) containing motor vehicles with fuel in their tanks for their own propulsion, the following provisions shall be complied with.

1 *Fire detection*

There shall be provided an approved automatic fire detection and fire alarm system. The design and arrangements of this system shall be considered in conjunction with the ventilation requirements referred to in paragraph 3.

2 *Fire-extinguishing arrangements*

2.1 There shall be fitted a fixed fire-extinguishing system which shall comply with the provisions of Regulation 5, except that, if a carbon dioxide system is fitted, the quantity of gas available shall be at least sufficient to give a minimum volume of free gas equal to 45 per cent of the gross volume of the largest such cargo space which is capable of being sealed, and the arrangements shall be such as to ensure that at least two thirds of the gas required for the relevant space shall be introduced during 10 minutes. Any

other fixed gas fire-extinguishing system or fixed high expansion foam fire-extinguishing system may be fitted provided it gives equivalent protection. Furthermore, any cargo space designated only for vehicles which are not carrying any cargo may be fitted with fixed halogenated hydrocarbon fire-extinguishing systems which shall comply with the provisions of Regulation 5.

2.2 As an alternative, a system meeting the requirements of Regulation 37.1.3 may be fitted, provided that Regulation 37.2.1 or 37.3.1, as appropriate, is also complied with.

2.3 There shall be provided for use in any such space such number of portable fire extinguishers as the Administration may deem sufficient. At least one portable extinguisher shall be located at each access to such spaces.

3 *Ventilation system*

3.1 There shall be provided an effective power ventilation system sufficient to give at least 10 air changes per hour for ships carrying more than 36 passengers, and 6 air changes per hour for ships carrying not more than 36 passengers. The system for such cargo spaces shall be entirely separate from other ventilation systems and shall be operating at all times when vehicles are in such spaces. Ventilation ducts serving such cargo spaces capable of being effectively sealed shall be separated for each such space. The system shall be capable of being controlled from a position outside such spaces.

3.2 The ventilation shall be such as to prevent air stratification and the formation of air pockets.

3.3 Means shall be provided to indicate on the navigating bridge any loss or reduction of the required ventilating capacity.

3.4 Arrangements shall be provided to permit a rapid shut-down and effective closure of the ventilation system in case of fire, taking into account the weather and sea conditions.

3.5 Ventilation ducts, including dampers, shall be made of steel and their arrangement shall be to the satisfaction of the Administration.

4 *Precautions against ignition of flammable vapours*

4.1 Electrical equipment and wiring, if fitted, shall be of a type suitable for use in explosive petrol and air mixtures. Other equipment which may constitute a source of ignition of flammable vapours shall not be permitted.

4.2 Electrical equipment and wiring, if installed in an exhaust ventilation duct, shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

4.3 Scuppers shall not be led to machinery or other spaces where sources of ignition may be present.

Regulation 39

Fixed fire-extinguishing arrangements in cargo spaces

1 Except as provided for in paragraph 3, the cargo spaces of ships of 1,000 tons gross tonnage and upwards shall be protected by a fixed gas fire-extinguishing system complying with the provisions of Regulation 5, or by a fixed high expansion foam fire-extinguishing system which gives equivalent protection.

2 Where it is shown to the satisfaction of the Administration that a ship is engaged on voyages of such short duration that it would be unreasonable to apply the requirements of paragraph 1 and also in ships of less than 1,000 tons gross tonnage, the arrangements in cargo spaces shall be to the satisfaction of the Administration.

3 A ship engaged in the carriage of dangerous goods shall be provided in any cargo spaces with a fixed gas fire-extinguishing system complying with the provisions of Regulation 5 or with a fire-extinguishing system which in the opinion of the Administration gives equivalent protection for the cargoes carried.

Regulation 40

Fire patrols, detection, alarms and public address systems

1 Manual alarms shall be fitted throughout the accommodation and service spaces to transmit an alarm immediately to the navigating bridge or main fire control station.

2 An approved fire detection or fire alarm system shall be provided which will automatically indicate at one or more suitable points or stations the presence or indication of fire and its location in any cargo space which, in the opinion of the Administration, is not accessible except where it is shown to the satisfaction of the Administration that the ship is engaged on voyages of such short duration that it would be unreasonable to apply this requirement.

3 All ships shall at all times when at sea, or in port (except when out of service), be so manned or equipped as to ensure that any initial fire alarm is immediately received by a responsible member of the crew.

4 A special alarm, operated from the navigating bridge or fire control station, shall be fitted to summon the crew. This alarm may be part of the ship's general alarm system but it shall be capable of being sounded independently of the alarm to the passenger spaces.

5 A public address system or other effective means of communication shall be available throughout the accommodation and service spaces and control stations.

6 For ships carrying more than 36 passengers an efficient patrol system shall be maintained so that an outbreak of fire may be promptly detected. Each member of the fire patrol shall be trained to be familiar with the

arrangements of the ship as well as the location and operation of any equipment he may be called upon to use.

Regulation 41

Special requirements for ships carrying dangerous goods

The requirements of Regulation 54 shall apply, as appropriate, to passenger ships carrying dangerous goods.

PART C – FIRE SAFETY MEASURES FOR CARGO SHIPS

(Regulation 54 of this Part also applies to passenger ships as appropriate).

Regulation 42

Structure

1 Subject to the provisions of paragraph 4, the hull, superstructure, structural bulkheads, deck and deckhouses shall be constructed of steel or other equivalent material.

2 The insulation of aluminium alloy components of "A" or "B" class divisions, except structure which in the opinion of the Administration is non-load-bearing, shall be such that the temperature of the structural core does not rise more than 200°C above the ambient temperature at any time during the applicable exposure to the standard fire test.

3 Special attention shall be given to the insulation of aluminium alloy components of columns, stanchions and other structural members required to support lifeboat and liferaft stowage, launching and embarkation areas, and "A" and "B" class divisions, to ensure:

- .1 that for such members supporting lifeboat and liferaft areas and "A" class divisions, the temperature rise limitation specified in paragraph 2 shall apply at the end of one hour;
and
- .2 that for such members required to support "B" class divisions, the temperature rise limitation specified in paragraph 2 shall apply at the end of half an hour.

4 Crowns and casings of machinery spaces of category A shall be of steel construction adequately insulated and openings therein, if any, shall be suitably arranged and protected to prevent the spread of fire.

5 One of the following methods of protection shall be adopted in accommodation and service areas:

- .1 *Method IC* – The construction of all internal divisional bulkheading of non-combustible “B” or “C” class divisions generally without the installation of an automatic sprinkler, fire detection and fire alarm system in the accommodation and service spaces, except as required by Regulation 52.1; or
- .2 *Method IIC* – The fitting of an automatic sprinkler, fire detection and fire alarm system as required by Regulation 52.2 for the detection and extinction of fire in all spaces in which fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheading; or
- .3 *Method IIIC* – The fitting of a fixed fire detection and fire alarm system, as required by Regulation 52.3, in all spaces in which a fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheading, except that in no case must the area of any accommodation space or spaces bounded by an “A” or “B” class division exceed 50 m². Consideration may be given by the Administration to increasing this area for public spaces.

6 The requirements for the use of non-combustible materials in construction and insulation of the boundary bulkheads of machinery spaces, control stations, service spaces, etc., and the protection of stairway enclosures and corridors will be common to all three methods outlined in paragraph 5.

Regulation 43

Bulkheads within the accommodation and service spaces

1 All bulkheads required to be “B” class divisions shall extend from deck to deck and to the shell or other boundaries, unless continuous “B” class ceilings or linings are fitted on both sides of the bulkhead in which case the bulkhead may terminate at the continuous ceiling or lining.

2 *Method IC* – All bulkheads not required by this or other Regulations of this Part to be “A” or “B” class divisions, shall be of at least “C” class construction.

3 *Method IIC* – There shall be no restriction on the construction of bulkheads not required by this or other regulations of this Part to be “A” or “B” class divisions except in individual cases where “C” class bulkheads are required in accordance with table 44.1.

4 *Method IIIC* – There shall be no restriction on the construction of bulkheads not required by this Part to be “A” or “B” class divisions except that the area of any accommodation space or spaces bounded by a continuous “A” or “B” class division must in no case exceed 50 m² except in individual cases where “C” class bulkheads are required in accordance with table 44.1. Consideration may be given by the Administration to increasing this area for public space.

Regulation 44

Fire integrity of bulkheads and decks

1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this Part, the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 44.1 and 44.2.

2 The following requirements shall govern application of the tables:

.1 Tables 44.1 and 44.2 shall apply respectively to the bulkheads and decks separating adjacent spaces.

.2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) below. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

(1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.

Spaces containing the ship's radio equipment.

Fire-extinguishing rooms, fire control rooms and fire-recording stations.

Control room for propulsion machinery when located outside the machinery space.

Spaces containing centralized fire alarm equipment.

(2) *Corridors*

Corridors and lobbies.

(3) *Accommodation spaces*

Spaces as defined in Regulation 3.10, excluding corridors.

(4) *Stairways*

Interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connexion, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(5) *Service spaces (low risk)*

Lockers and store-rooms having an area of less than 2 m², drying rooms and laundries.

(6) *Machinery spaces of category A*

Spaces as defined in Regulation 3.19.

TABLE 44.1 – FIRE INTEGRITY OF BULKHEADS SEPARATING ADJACENT SPACES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0 ^{e/}	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*	A-60
Corridors (2)		C	B-0	B-0 A-0 ^{c/}	B-0	A-60	A-0	A-0	A-0	*	A-30
Accommodation spaces (3)			Ca,b/	B-0 A-0 ^{c/}	B-0	A-60	A-0	A-0	A-0	*	A-30
Stairways (4)				B-0 A-0 ^{c/}	B-0 A-0 ^{c/}	A-60	A-0	A-0	A-0	*	A-30
Service spaces (low risk) (5)					C	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces (6) of category A						*	A-0	A-0 ^{d/}	A-60	*	A-60 ^{f/}
Other machinery spaces (7)							A-0 ^{d/}	A-0	A-0	*	A-0
Cargo spaces (8)								*	A-0	*	A-0
Service spaces (high risk) (9)								A-0 ^{d/}		*	A-30
Open decks (10)										-	A-0
Ro/ro cargo spaces (11)											*h/

Notes: To be applied to tables 44.1 and 44.2, as appropriate.

- a/ No special requirements are imposed upon bulkheads in methods IIC and IIIC fire protection.
- b/ In case of method IIIC "B" class bulkheads of "B-0" rating shall be provided between spaces or groups of spaces of 50 m² and over in area.
- c/ For clarification as to which applies, see Regulations 43 and 46.
- d/ Where spaces are of the same numerical category and superscript d appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose, e.g. in category (3). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.
- e/ Bulkheads separating the wheelhouse, chartroom and radio room from each other may be "B-0" rating.
- f/ A-0 rating may be used if no dangerous goods are intended to be carried or if such goods are stowed not less than 3 m horizontally from such bulkhead.
- g/ For cargo spaces in which dangerous goods are intended to be carried, Regulation 54.2.8 applies.
- h/ Bulkheads and decks separating ro/ro cargo spaces shall be capable of being closed reasonably gastight and such divisions shall have "A" class integrity in so far as is reasonable and practicable in the opinion of the Administration.
- i/ Fire insulation need not be fitted if the machinery space in category (7), in the opinion of the Administration, has little or no fire risk.
- * Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material but is not required to be of "A" class standard.

TABLE 44.2 – FIRE INTEGRITY OF DECKS SEPARATING ADJACENT SPACES

Space below ↓ Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*	A-60
Corridors (2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30
Accommodation spaces (3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30
Stairways (4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*	A-30
Service spaces (low risk) (5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A (6)	A-60	A-60	A-60	A-60	A-60	*	A-60 i/	A-30	A-60	*	A-60
Other machinery spaces (7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*	A-0
Cargo spaces (8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*	A-0
Service spaces (high risk) (9)	A-60	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0 ^{d/}	*	A-30
Open decks (10)	*	*	*	*	*	*	*	*	*	—	*
Ro/ro cargo spaces (11)	A-60	A-30	A-30	A-30	A-0	A-60	A-0	A-0	A-30	*	* ^{h/}

- (7) *Other machinery spaces*
Spaces as defined in Regulation 3.20 excluding machinery spaces of category A.
- (8) *Cargo spaces*
All spaces used for cargo (including cargo oil tanks) and trunkways and hatchways to such spaces.
- (9) *Service spaces (high risk)*
Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having an area of 2 m² or more, workshops other than those forming part of the machinery spaces.
- (10) *Open decks*
Open deck spaces and enclosed promenades having no fire risk. Air spaces (the space outside superstructures and deck-houses).
- (11) *Ro/ro cargo spaces*
Spaces as defined in Regulation 3.14. Cargo spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion.

3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

4 External boundaries which are required in Regulation 42.1 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries to have "A" class integrity elsewhere in this Part. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be of materials to the satisfaction of the Administration.

Regulation 45

Means of escape

1 Stairways and ladders shall be so arranged as to provide, from all accommodation spaces and from spaces in which the crew is normally employed, other than machinery spaces, ready means of escape to the open deck and thence to the lifeboats and liferafts. In particular the following general provisions shall be complied with:

- .1 At all levels of accommodation there shall be provided at least two widely separated means of escape from each restricted space or group of spaces.
- .2.1 Below the lowest open deck the main means of escape shall be a stairway and the second escape may be a trunk or a stairway.

- .2.2 Above the lowest open deck the means of escape shall be stairways or doors to an open deck or a combination thereof.
 - .3 Exceptionally the Administration may dispense with one of the means of escape, due regard being paid to the nature and location of spaces and to the numbers of persons who normally might be quartered or employed there.
 - .4 No dead-end corridors having a length of more than 7 m shall be accepted. A dead-end corridor is a corridor or part of a corridor from which there is only one escape route.
 - .5 The width and continuity of the means of escape shall be to the satisfaction of the Administration.
 - .6 If a radiotelegraph station has no direct access to the open deck, two means of access to or egress from such station shall be provided, one of which may be a porthole or window of sufficient size or other means to the satisfaction of the Administration, to provide an emergency escape.
- 2 In all ro/ro cargo spaces where the crew is normally employed the number and locations of escape routes to the open deck shall be to the satisfaction of the Administration, but shall in no case be less than two and shall be widely separated.
- 3 Except as provided in paragraph 4, two means of escape shall be provided from each machinery space of category A. In particular, one of the following provisions shall be complied with:
- .1 two sets of steel ladders as widely separated as possible leading to doors in the upper part of the space similarly separated and from which access is provided to the open deck. In general, one of these ladders shall provide continuous fire shelter from the lower part of the space to a safe position outside the space. However, the Administration may not require the shelter if, due to the special arrangement or dimensions of the machinery space, a safe escape route from the lower part of this space is provided. This shelter shall be of steel, insulated, where necessary, to the satisfaction of the Administration and be provided with a self-closing steel door at the lower end; or
 - .2 one steel ladder leading to a door in the upper part of the space from which access is provided to the open deck and additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the open deck.
- 4 In a ship of less than 1,000 tons gross tonnage, the Administration may dispense with one of the means of escape required under paragraph 3, due regard being paid to the dimension and disposition of the upper part of the space.
- 5 From machinery spaces other than those of category A, escape routes

shall be provided to the satisfaction of the Administration having regard to the nature and location of the space and whether persons are normally employed in that space.

6 Lifts shall not be considered as forming one of the required means of escape as required by this Regulation.

Regulation 46

Protection of stairways and lift trunks in accommodation spaces, service spaces and control stations

1 Stairways which penetrate only a single deck shall be protected at least at one level by at least "B-0" class divisions and self-closing doors. Lifts which penetrate only a single deck shall be surrounded by "A-0" class divisions with steel doors at both levels. Stairways and lift trunks which penetrate more than a single deck shall be surrounded by at least "A-0" class divisions and be protected by self-closing doors at all levels.

2 On ships having accommodation for 12 persons or less, where stairways penetrate more than a single deck and where there are at least two escape routes direct to the open deck at every accommodation level, consideration may be given by the Administration to reducing the "A-0" requirements of paragraph 1 to "B-0".

3 All stairways shall be of steel frame construction except where the Administration sanctions the use of other equivalent material.

Regulation 47

Doors in fire resisting divisions

1 The fire resistance of doors shall, as far as practicable, be equivalent to that of the division in which they are fitted. Doors and door frames in "A" class divisions shall be constructed of steel. Doors in "B" class divisions shall be non-combustible. Doors fitted in boundary bulkheads of machinery spaces of category A shall be reasonably gastight and self-closing. In ships constructed according to method IC, an Administration may permit the use of combustible materials in doors separating cabins from individual interior sanitary accommodation such as showers.

2 Doors required to be self-closing shall not be fitted with hold-back hooks. However, hold-back arrangements fitted with remote release devices of the fail-safe type may be utilized.

3 In corridor bulkheads ventilation openings may be permitted only in and under the doors of cabins and public spaces. The openings shall be provided only in the lower half of a door. Where such opening is in or under a door the total net area of any such opening or openings shall not exceed 0.05 m². When such opening is cut in a door it shall be fitted with a grille made of non-combustible material.

- 4 Watertight doors need not be insulated.

Regulation 48

Ventilation systems

The ventilation systems of cargo ships shall be in compliance with the provisions of Regulation 16, except paragraph 8.

Regulation 49

Restricted use of combustible materials

- 1 All exposed surfaces in corridors and stairway enclosures and surfaces including grounds in concealed or inaccessible spaces in accommodation and service spaces and control stations shall have low flame-spread characteristics.* Exposed surfaces of ceilings in accommodation and service spaces and control stations shall have low flame-spread characteristics.
- 2 Paints, varnishes and other finishes used on exposed interior surfaces shall not offer an undue fire hazard in the judgement of the Administration and shall not be capable of producing excessive quantities of smoke.
- 3 Primary deck coverings, if applied, in accommodation and service spaces and control stations shall be of an approved material which will not readily ignite.**

Regulation 50

Details of construction

- 1 *Method IC* – In accommodation and service spaces and control stations all linings, draught stops, ceilings and their associated grounds shall be of non-combustible materials.
- 2 *Methods IIC and IIIC* – In corridors and stairway enclosures serving accommodation and service spaces and control stations, ceilings, linings, draught stops and their associated grounds shall be of non-combustible materials.
- 3 *Methods IC, IIC and IIIC*
 - 3.1 Except in cargo spaces or refrigerated compartments of service spaces, insulating materials shall be non-combustible. Vapour barriers and adhesives used in conjunction with insulation, as well as the insulation of pipe fittings,

* Reference is made to Guidelines on the Evaluation of Fire Hazard Properties of Materials, adopted by the Organization by resolution A.166(ES.IV).

** Reference is made to Improved Provisional Guidelines on Test Procedures for Primary Deck Coverings, adopted by the Organization by resolution A.214(VII).

for cold service systems, need not be of non-combustible materials, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have qualities of resistance to the propagation of flame to the satisfaction of the Administration.

3.2 Where non-combustible bulkheads, linings and ceilings are fitted in accommodation and service spaces they may have a combustible veneer not exceeding 2.0 mm in thickness within any such space except corridors, stairway enclosures and control stations, where the veneer shall not exceed 1.5 mm in thickness.

3.3 Air spaces enclosed behind ceilings, panellings, or linings, shall be divided by close-fitting draught stops spaced not more than 14 m apart. In the vertical direction, such air spaces, including those behind linings of stairways, trunks, etc., shall be closed at each deck.

Regulation 51

Arrangements for gaseous fuel for domestic purposes

Where gaseous fuel is used for domestic purposes the arrangements, storage, distribution and utilization of the fuel shall be such that, having regard to the hazards of fire and explosion which the use of such fuel may entail, the safety of the ship and the persons on board is preserved.

Regulation 52

Fixed fire detection and fire alarm systems Automatic sprinkler, fire detection and fire alarm systems

1 In ships in which method IC is adopted, a smoke detection system in accordance with the relevant provisions of Regulation 13 shall be so installed and arranged as to protect all corridors, stairways and escape routes within accommodation spaces.

2 In ships in which method IIC is adopted, an automatic sprinkler, fire detection and fire alarm system of an approved type and complying with the relevant provisions of Regulation 12 shall be so installed and arranged as to protect accommodation spaces, galleys and other service spaces, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc. In addition, a smoke detection system in accordance with the relevant provisions of Regulation 13 shall be so arranged and installed as to protect corridors, stairways and escape routes within accommodation spaces.

3 In ships in which method IIIC is adopted, a fixed fire detection and fire alarm system of an approved type and complying with the relevant provisions of Regulation 13 shall be so installed and arranged as to detect the presence of fire in all accommodation spaces and service spaces, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc.

4 Notwithstanding the provisions of the above, the Administration need

not require the installation of detectors required in accordance with the provisions of Regulation 13.2.2 until 1 September 1985.

Regulation 53

Fire protection arrangements in cargo spaces

1 General

1.1 Except for cargo spaces covered in paragraphs 2 and 3, cargo spaces of ships of 2,000 tons gross tonnage and upwards shall be protected by a fixed gas fire-extinguishing system complying with the provisions of Regulation 5 or by a fire-extinguishing system which gives equivalent protection.

1.2 The Administration may exempt from the requirements of paragraph 1.1 cargo spaces of any ship if constructed and solely intended for carrying ore, coal, grain, unseasoned timber and non-combustible cargoes or cargoes which, in the opinion of the Administration, constitute a low fire risk. Such exemptions may be granted only if the ship is fitted with steel hatch covers and effective means of closing all ventilators and other openings leading to the cargo spaces.

1.3 Notwithstanding the provisions of paragraph 1.1, any ship engaged in the carriage of dangerous goods shall be provided in any cargo spaces with a fixed gas fire-extinguishing system complying with the provisions of Regulation 5 or by a fire-extinguishing system which in the opinion of the Administration give equivalent protection for the cargoes carried.

2 Ro/ro cargo spaces

2.1 Fire detection

There shall be provided an approved automatic fire detection and fire alarm system. The design and arrangements of this system shall be considered in conjunction with the ventilation requirements referred to in 2.3.

2.2 Fire-extinguishing arrangements

2.2.1 Ro/ro cargo spaces capable of being sealed shall be fitted with a fixed gas fire-extinguishing system which shall comply with the provisions of Regulation 5, except that:

- .1 if a carbon dioxide system is fitted, the quantity of gas available shall be at least sufficient to give a minimum volume of free gas equal to 45 per cent of the gross volume of the largest such cargo space which is capable of being sealed, and the arrangements shall be such as to ensure that at least two thirds of the gas required for the relevant space shall be introduced during 10 minutes;
- .2 a halogenated hydrocarbon system may be used only for spaces designated only for vehicles which are not carrying any cargo;
- .3 any other fixed gas fire-extinguishing system or fixed high expansion

foam fire-extinguishing system may be fitted provided the Administration is satisfied that an equivalent protection is achieved;

- .4 as an alternative, a system meeting the requirements of Regulation 37.1.3 may be fitted. However, the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. If this is not possible the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information.* Such information shall be included in the stability information supplied to the master as required by Regulation II-1/22.

2.2.2 Ro/ro cargo spaces not capable of being sealed shall be fitted with a system meeting the requirements of Regulation 37.1.3. However, the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. If this is not possible the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information*. Such information shall be included in the stability information supplied to the master as required by Regulation II-1/22.

2.2.3 There shall be provided for use in any ro/ro cargo space such number of portable fire extinguishers as the Administration may deem sufficient. At least one portable extinguisher shall be located at each access to such a cargo space.

2.2.4 Each ro/ro cargo space intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion shall be provided with:

- .1 at least three water fog applicators;
- .2 one portable foam applicator unit complying with the provisions of Regulation 6.4 provided that at least two such units are available in the ship for use in such ro/ro cargo spaces.

2.3 Ventilation system

2.3.1 Closed ro/ro cargo spaces shall be provided with an effective power ventilation system sufficient to provide at least six air changes per hour based on an empty hold. Ventilation fans shall normally be run continuously whenever vehicles are on board. Where this is impracticable, they shall be operated for a limited period daily as weather permits and in any case for a reasonable period prior to discharge, after which period the ro/ro cargo space shall be proved gas free. One or more portable combustible gas detecting instruments shall be carried for this purpose. The system shall be entirely separate from other ventilating systems. Ventilation ducts serving ro/ro cargo spaces capable of being effectively sealed shall be separated for each cargo space. The Administration may require an increased number of air changes when vehicles are being loaded or unloaded. The system shall be capable of being controlled from a position outside such spaces.

* Reference is made to Recommendation on Fixed Fire-Extinguishing Systems for Special Category Spaces, adopted by the Organization by resolution A.123(V).

2.3.2 The ventilation shall be so arranged as to prevent air stratification and the formation of air pockets.

2.3.3 Means shall be provided to indicate any loss of the required ventilating capacity on the navigating bridge.

2.3.4 Arrangements shall be provided to permit a rapid shut-down and effective closure of the ventilation system in case of fire, taking into account the weather and sea conditions.

2.3.5 Ventilation ducts, including dampers, shall be made of steel and their arrangement shall be to the satisfaction of the Administration.

2.4 Precautions against ignition of flammable vapours

Closed ro/ro cargo spaces carrying motor vehicles with fuel in their tanks for their own propulsion shall comply with the following additional provisions:

- .1 Except as provided in paragraph 2.4.2, electrical equipment and wiring shall be of a type suitable for use in explosive petrol and air mixtures.
 - .2 Above a height of 450 mm from the deck, electrical equipment of a type so enclosed and protected as to prevent the escape of sparks shall be permitted as an alternative on condition that the ventilating system is so designed and operated as to provide continuous ventilation of the cargo spaces at the rate of at least ten air changes per hour whenever vehicles are on board.
 - .3 Other equipment which may constitute a source of ignition of flammable vapours shall not be permitted.
 - .4 Electrical equipment and wiring in an exhaust ventilation duct shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.
 - .5 Scuppers shall not be led to machinery or other spaces where sources of ignition may be present.
- 3 *Cargo spaces, other than ro/ro cargo spaces, intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion*

Spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion shall comply with requirements of paragraph 2, except that paragraph 2.2.4 need not be complied with.

Regulation 54

Special requirements for ships carrying dangerous goods

1 *General*

1.1 In addition to complying with the requirements of Regulation 53 for cargo ships and with the requirements of Regulations 38 and 39 for passenger ships as appropriate, ship types and cargo spaces, referred to in paragraph 1.2, intended for the carriage of dangerous goods shall comply with the requirements of this Regulation, as appropriate, except when carrying dangerous goods in limited quantities* unless such requirements have already been met by compliance with the requirements elsewhere in this Chapter. The types of ships and modes of carriage of dangerous goods are referred to in paragraph 1.2 and in table 54.1, where the numbers appearing in paragraph 1.2 are referred to in the top line.

1.2 The following ship types and cargo spaces shall govern the application of tables 54.1 and 54.2:

- .1 Ships and cargo spaces not specifically designed for the carriage of freight containers but intended for the carriage of dangerous goods in packaged form including goods in freight containers and portable tanks.
- .2 Purpose built container ships and cargo spaces intended for the carriage of dangerous goods in freight containers and portable tanks.
- .3 Ro/ro ships and ro/ro cargo spaces intended for the carriage of dangerous goods.
- .4 Ships and cargo spaces intended for the carriage of solid dangerous goods in bulk.
- .5 Ships and cargo spaces intended for carriage of dangerous goods other than liquids and gases in bulk in shipborne barges.

2 *Special requirements*

Unless otherwise specified the following requirements shall govern the application of tables 54.1, 54.2 and 54.3 to both "on deck" and "under deck" stowage of dangerous goods where the numbers of the following paragraphs are indicated in the first column.

2.1 Water supplies

2.1.1 Arrangements shall be made to ensure immediate availability of a supply of water from the fire main at the required pressure either by permanent pressurization or by suitably placed remote starting arrangements for the fire pumps.

* Reference is made to Section 18 of the General Introduction to the International Maritime Dangerous Goods Code (the IMDG Code) for a definition of the term "limited quantities"

TABLE 54.1 – APPLICATION OF THE REQUIREMENTS TO DIFFERENT MODES OF CARRIAGE OF DANGEROUS GOODS IN SHIPS AND CARGO SPACES

Wherever "x" appears in table 54.1 it means that this requirement is applicable to all classes of dangerous goods as given in the appropriate line of table 54.3, except as indicated by the notes.

Regulation 54.1.2 Regulation 54.2	.1 Not specifically designed	.2 Container cargo spaces	.3			.4 Solid dangerous goods in bulk	.5 Shipborne barges
			Closed ro/ro cargo spaces	Open ro/ro cargo spaces	Weather decks		
.1.1	x	x	x	x	x	For application of requirements of Regulation 54 to different classes of dangerous goods – see Table 54.2	x
.1.2	x	x	x	x	x		—
.1.3	x	x	x	x	—		x
.1.4	x	x	x	x	—		x
.2	x	x	x	x	—		x ^{d/}
.3	x	x	x	—	—		x ^{d/}
.4.1	x	x ^{a/}	x	—	—		x ^{d/}
.4.2	x	x ^{a/}	x	—	—		x ^{d/}
.5	x	x	x	—	—		—
.6.1	x	x	x	x	x		—
.6.2	x	x	x	x	x		—
.7	x	—	—	x	x		—
.8	x	x ^{b/}	x	x	x		—
.9	—	—	x ^{c/}	x	—	—	

Notes

- a/ For classes 4 and 5.1 not applicable to closed freight containers. For classes 2, 3, 6.1 and 8 when carried in closed freight containers the ventilation rate may be reduced to not less than two air changes. For the purpose of this requirement a portable tank is a closed freight container.
- b/ Applicable to decks only.
- c/ Applies only to closed ro/ro cargo spaces, not capable of being sealed.
- d/ In the special case where the barges are capable of containing flammable vapours or alternatively if they are capable of discharging flammable vapours to a safe space outside the barge carrier compartment by means of ventilation ducts connected to the barges, these requirements may be reduced or waived to the satisfaction of the Administration.

TABLE 54.2 – APPLICATION OF THE REQUIREMENTS TO DIFFERENT CLASSES OF DANGEROUS GOODS FOR SHIPS AND CARGO SPACES CARRYING SOLID DANGEROUS GOODS IN BULK

Class – Chapter VII Regulation 54.2	4.1	4.2	4.3 ^{f/}	5.1	6.1	8	9
.1.1	x	x	–	x	x ^{g/}	x ^{g/}	x
.1.2 ^{e/}	x	x	–	x	–	–	x
.2	x	x ^{g/}	x	x ^{g/}	–	–	x ^{g/}
.4.1 ^{h/}	x ^{g/}	x ^{g/}	x	x ^{g/}	–	–	x ^{g/}
.4.2 ^{h/}	x	x ^{g/}	x	x ^{g/}	–	–	x ^{g/}
.6	x	x	x	x	x	x	x
.8	x	x	x	x ^{g/}	x ^{g/}	x ^{g/}	x

Notes

- ^{e/} This requirement is applicable when the characteristics of the substance call for large quantities of water for fire fighting.
- ^{f/} The hazards of substances in this class which may be carried in bulk are such that special consideration must be given by the Administration to the construction and equipment of the ships involved in addition to those enumerated in this table.
- ^{g/} Reference is made to the International Maritime Dangerous Goods Code (resolution A.81(IV) as amended) or the Code of Safe Practice for Solid Bulk Cargoes (resolution A.434(XI) as amended), as appropriate.
- ^{h/} At least natural ventilation is required in enclosed cargo spaces intended for carriage of solid dangerous goods in bulk. In cases where power ventilation is required in the Code of Safe Practice for Solid Bulk Cargoes (resolution A.434(XI) as amended), the use of portable ventilation units (equipment) to the satisfaction of the Administration may suffice.

TABLE 54.3 – APPLICATION OF THE REQUIREMENTS TO DIFFERENT CLASSES OF DANGEROUS GOODS EXCEPT SOLID DANGEROUS GOODS IN BULK

Class -- Chapter VII Regulation 54.2	1	2	3	4	5.1	5.2	6.1	8
.1.1	x	x	x	x ^{p/}	x	x ^{p/}	x	x
.1.2 ^{i/}	x	x	x	x ^{p/}	x	x ^{p/}	—	—
.1.3	x ^{k/}	—	—	—	—	—	—	—
.1.4	x ^{k/}	—	—	—	—	—	—	—
.2	x ^{k/}	x ^{l/}	x ^{m/}	—	—	—	x ^{m/} x ^{p/}	x ^{m/} x ^{p/}
.3	x	x	x	x	x	—	x	x
.4.1	—	x ^{j/}	x ^{m/}	x ^{p/}	x ^{p/}	—	x ^{m/} x ^{p/}	x ^{m/} x ^{p/}
.4.2	—	x ^{l/}	x ^{m/}	—	—	—	x ^{m/} x ^{p/}	x ^{m/} x ^{p/}
.5	—	—	x ^{m/}	—	—	—	x ^{n/}	x ^{m/}
.6	—	x	x	x	x	x ^{p/}	x	x
.7	—	—	x	x	x	x ^{p/}	x ^{p/}	x ^{p/}
.8	x ^{k/} o/	x	x	x	x ^{p/}	—	x ^{p/}	x ^{p/}
.9	x	x	x ^{m/}	x ^{p/}	x	—	x ^{m/}	x ^{m/}

Notes

- i/ This requirement is applicable when the characteristics of the substance call for large quantities of water for fire fighting.
- j/ Applicable to flammable or poisonous gases.
- k/ Except goods of class 1 in division 1.4, compatibility group S.
- l/ All flammable gases.
- m/ All liquids having a flashpoint below 23°C (closed cup test).
- n/ Liquids only.
- o/ Goods of class 1 shall be stowed 3 m horizontally away from the machinery space boundaries in all cases.
- p/ Reference is made to the International Maritime Dangerous Goods Code (resolution A.81(IV) as amended), or the Code of Safe Practice for Solid Bulk Cargoes (resolution A.434(XI) as amended), as appropriate.

2.1.2 The quantity of water delivered shall be capable of supplying four nozzles of a size and at pressures as specified in Regulation 4, capable of being trained on any part of the cargo space when empty. This amount of water may be applied by equivalent means to the satisfaction of the Administration.

2.1.3 Means of effectively cooling the designated under deck cargo space by copious quantities of water, either by a fixed arrangement of spraying nozzles, or flooding the cargo space with water, shall be provided. Hoses may be used for this purpose in small cargo spaces and in small areas of larger cargo spaces at the discretion of the Administration. In any event the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. If this is not possible the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information.*

2.1.4 Provision to flood a designated under deck cargo space with suitable specified media may be substituted for the requirements in paragraph 2.1.3.

2.2 Sources of ignition

Electrical equipment and wiring shall not be fitted in enclosed cargo spaces, closed vehicle deck spaces, or open vehicle deck spaces unless it is essential for operational purposes in the opinion of the Administration. However, if electrical equipment is fitted in such spaces, it shall be of a certified safe type** for use in the dangerous environments to which it may be exposed unless it is possible to completely isolate the electrical system (by removal of links in the system, other than fuses). Cable penetrations of the decks and bulkheads shall be sealed against the passage of gas or vapour. Through runs of cables and cables within the cargo spaces shall be protected against damage from impact. Any other equipment which may constitute a source of ignition of flammable vapour shall not be permitted.

2.3 Detection system

An approved fire detection and fire alarm system shall be fitted to all enclosed cargo spaces including closed vehicle deck spaces. Where the detection system utilizes samples of atmosphere drawn from such cargo spaces provision shall be made to prevent, in the event of cargo leakage, the discharge of contaminated atmosphere through the sampling system into the space in which the detection apparatus is situated. A notice stating that the samples shall be discharged to the open air when cargoes giving off toxic fumes are being carried shall be permanently exhibited at the equipment.

2.4 Ventilation

2.4.1 Adequate power ventilation shall be provided in enclosed cargo spaces. The arrangement shall be such as to provide for at least six air changes per

* Reference is made to Recommendation on Fixed Fire-Extinguishing Systems for Special Category Spaces, adopted by the Organization by resolution A.123(V).

** Reference is made to Recommendations published by the International Electrotechnical Commission and, in particular, Publication 92 - Electrical Installations in Ships.

hour in the cargo space based on an empty cargo space and for removal of vapours from the upper or lower parts of the cargo space, as appropriate.

2.4.2 The fans shall be such as to avoid the possibility of ignition of flammable gas air mixtures. Suitable wire mesh guards shall be fitted over inlet and outlet ventilation openings.

2.5 Bilge pumping

Where it is intended to carry flammable or toxic liquids in enclosed cargo spaces the bilge pumping system shall be designed to ensure against inadvertent pumping of such liquids through machinery space piping or pumps. Where large quantities of such liquids are carried, consideration shall be given to the provision of additional means of draining those cargo spaces. These means shall be to the satisfaction of the Administration.

2.6 Personnel protection

2.6.1 Four sets of full protective clothing resistant to chemical attack shall be provided in addition to the fireman's outfits required by Regulation 17. The protective clothing shall cover all skin, so that no part of the body is unprotected.

2.6.2 At least two self-contained breathing apparatuses additional to those required by Regulation 17 shall be provided.

2.7 Portable fire extinguishers

Portable fire extinguishers with a total capacity of at least 12 kg of dry powder or equivalent shall be provided for the cargo spaces. These extinguishers shall be in addition to any portable fire extinguishers required elsewhere in this Chapter.

2.8 Insulation of machinery space boundaries

Bulkheads forming boundaries between cargo spaces and machinery spaces of category A shall be insulated to "A-60" standard, unless the dangerous goods are stowed at least 3 m horizontally away from such bulkheads. Other boundaries between such spaces shall be insulated to "A-60" standard.

2.9 Water spray system

Each open ro/ro cargo space having a deck above it and each space deemed to be a closed ro/ro cargo space not capable of being sealed shall be fitted with an approved fixed pressure water-spraying system for manual operation which shall protect all parts of any deck and vehicle platform in such space, except that the Administration may permit the use of any other fixed fire-extinguishing system that has been shown by full-scale test to be no less effective. In any event the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. If this is not possible the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information.*

* Reference is made to Recommendation on Fixed Fire-Extinguishing Systems for Special Category Spaces, adopted by the Organisation by resolution A.123(V).

3 *Document of compliance*

The Administration shall provide the ship with an appropriate document as evidence of compliance of construction and equipment with the requirements of this Regulation.

PART D – FIRE SAFETY MEASURES FOR TANKERS

(The requirements of this Part are additional to those of Part C except for Regulations 53 and 54 which do not apply to tankers and except as provided otherwise in Regulations 57 and 58)

Regulation 55

Application

1 Unless expressly provided otherwise, this Part shall apply to tankers carrying crude oil and petroleum products having a flashpoint not exceeding 60°C (closed cup test), as determined by an approved flashpoint apparatus, and a Reid vapour pressure which is below atmospheric pressure and other liquid products having a similar fire hazard.

2 Where liquid cargoes other than those referred to in paragraph 1 or liquefied gases which introduce additional fire hazards are intended to be carried, additional safety measures shall be required to the satisfaction of the Administration, having due regard to the provisions of the Bulk Chemical Code and the Gas Carrier Code.

3 This paragraph applies to all ships which are combination carriers. Such ships shall not carry solid cargoes unless all cargo tanks are empty of oil and gas freed or unless the arrangements provided in each case are to the satisfaction of the Administration and in accordance with the relevant operational requirements contained in the Guidelines for Inert Gas Systems*.

4 Tankers carrying petroleum products having a flashpoint exceeding 60°C (closed cup test) as determined by an approved flashpoint apparatus shall comply with the provisions of Part C, except that in lieu of the fixed fire-extinguishing system required in Regulation 53 they shall be fitted with a fixed deck foam system which shall comply with the provisions of Regulation 61.

5 The requirements for inert gas systems of Regulation 60 need not be applied to all chemical tankers or gas carriers when carrying cargoes described in paragraph 1, provided that alternative arrangements, to be developed by the Organization, are fitted.**

* Reference is made to Guidelines for Inert Gas Systems, adopted by the Maritime Safety Committee at its forty-second session in May 1980 (MSC/Circ.282).

** Reference is made to Interim Regulation for Inert Gas Systems on Chemical Tankers Carrying Petroleum Products, adopted by the Organization by resolution A.473(XII).

6 Chemical tankers and gas carriers shall comply with the requirements of this Part, except where alternative and supplementary arrangements are provided to the satisfaction of the Administration, having due regard to the provisions of the Bulk Chemical Code and the Gas Carrier Code.

Regulation 56

Location and separation of spaces

1 Machinery spaces of category A other than such spaces for bow thrusters and their associated equipment shall be positioned aft of cargo tanks and slop tanks; they shall also be situated aft of cargo pump rooms and cofferdams, but not necessarily aft of the oil fuel bunker tanks. Any machinery space of category A shall be isolated from cargo tanks and slop tanks by a cofferdam, a cargo pump room, or an oil fuel bunker tank. However, the lower portion of the pump room may be recessed into machinery spaces of category A to accommodate pumps provided that the deckhead of the recess is in general not more than one third of the moulded depth above the keel except that in the case of ships of not more than 25,000 tonnes deadweight, where it can be demonstrated that for reasons of access and satisfactory piping arrangements this is impracticable, the Administration may permit a recess in excess of such height, but not exceeding one half of the moulded depth above the keel.

2 Accommodation spaces, main cargo control stations, control stations and service spaces (excluding isolated cargo handling gear lockers) shall be positioned aft of all cargo tanks, slop tanks, cargo pump rooms and cofferdams which isolate cargo or slop tanks from machinery spaces of category A. Any common bulkheads separating a cargo pump room, including the cargo pump room entrance, from accommodation and service spaces and control stations shall be constructed to "A-60" standard. Where deemed necessary, accommodation spaces, control stations, machinery spaces other than those of category A, and service spaces may be permitted forward of all cargo tanks, slop tanks, cargo pump rooms and cofferdams subject to an equivalent standard of safety and appropriate availability of fire-extinguishing arrangements being provided to the satisfaction of the Administration.

3 Where the fitting of a navigation position above the cargo tank area is shown to be necessary it shall be for navigation purposes only and it shall be separated from the cargo tank deck by means of an open space with a height of at least 2 m. The fire protection of such navigation position shall in addition be as required for control spaces as set forth in Regulation 58.1 and 58.2 and other provisions, as applicable, of this Part.

4 Means shall be provided to keep deck spills away from the accommodation and service areas. This may be accomplished by provision of a permanent continuous coaming of a suitable height extending from side to side. Special consideration shall be given to the arrangements associated with stern loading.

5 Exterior boundaries of superstructures and deckhouses enclosing accommodation and service spaces and including any overhanging decks which support such accommodation, shall be insulated to "A-60" standard for the whole of the portions which face cargo oil tanks and for 3 m aft of the front boundary. In the case of the sides of these superstructures and deckhouses, such insulation shall be carried as high as is deemed necessary by the Administration.

6.1 Entrances, air inlets and openings to accommodation spaces, service spaces and control stations shall not face the cargo area. They shall be located on the end bulkhead not facing the cargo area and/or on the outboard side of the superstructure or deckhouse at a distance of at least 25 per cent of the length of the ship but not less than 3 m from the end of the superstructure or deckhouse facing the cargo area. This distance, however, need not exceed 5 m.

6.2 No doors shall be permitted within the limits mentioned in paragraph 6.1, except that doors to those spaces not having access to accommodation spaces, service spaces and control stations, such as cargo control stations, provision rooms and store-rooms may be permitted by the Administration. Where such doors are fitted, the boundaries of the space shall be insulated to "A-60" standard. Bolted plates for removal of machinery may be fitted within the limits specified in paragraph 6.1. Navigating bridge doors and wheelhouse windows may be located within the limits specified in paragraph 6.1 so long as they are so designed that a rapid and efficient gas and vapour tightening of the navigating bridge can be ensured.

6.3 Port lights facing the cargo area and on the sides of the superstructures and deckhouses within the limits specified in paragraph 6.1 shall be of the fixed (non-opening) type. Such port lights in the first tier on the main deck shall be fitted with inside covers of steel or other equivalent material.

Regulation 57

Structure, bulkheads within accommodation and service spaces and details of construction

1 For the application of the requirements of Regulations 42, 43 and 50 to tankers, only method IC as defined in Regulation 42.5.1 shall be used.

2 Skylights to cargo pump rooms shall be of steel, shall not contain any glass and shall be capable of being closed from outside the pump room.

Regulation 58

Fire integrity of bulkheads and decks

1 In lieu of Regulation 44 and in addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this Part the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 58.1 and 58.2.

TABLE 58.1 – FIRE INTEGRITY OF BULKHEADS SEPARATING ADJACENT SPACES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Control stations (1)	A-0 ^{c/}	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*
Corridors (2)		C	B-0	B-0 A-0 ^{a/}	B-0	A-60	A-0	A-60	A-0	*
Accommodation spaces (3)			C	B-0 A-0 ^{a/}	B-0	A-60	A-0	A-60	A-0	*
Stairways (4)				B-0 A-0 ^{a/}	B-0 A-0 ^{a/}	A-60	A-0	A-60	A-0	*
Service spaces (low risk) (5)					C	A-60	A-0	A-60	A-0	*
Machinery spaces of category A (6)						*	A-0	A-0 ^{d/}	A-60	*
Other machinery spaces (7)							A-0 ^{b/}	A-0	A-0	*
Cargo pump rooms (8)								*	A-60	*
Service spaces (high risk) (9)									A-0 ^{b/}	*
Open decks (10)										—

Notes: To be applied to tables 58.1 and 58.2, as appropriate.

a/ For clarification as to which applies, see Regulations 43 and 46 of this Chapter.

b/ Where spaces are of the same numerical category and superscript b appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose, e.g. in category (9). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.

c/ Bulkheads separating the wheelhouse, chartroom and radio room from each other may be "B-0" rating.

d/ Bulkheads and decks between cargo pump rooms and machinery spaces of category A may be penetrated by cargo pump shaft glands and similar glanded penetrations, provided that gastight seals with efficient lubrication or other means of ensuring the permanence of the gas seal are fitted in way of the bulkhead or deck.

e/ Fire insulation need not be fitted if the machinery space in category (7), in the opinion of the Administration, has little or no fire risk.

* Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material but is not required to be of "A" class standard.

TABLE 58.2 – FIRE INTEGRITY OF DECKS SEPARATING ADJACENT SPACES

Space below ↓	Space above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Control stations	(1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	–	A-0	*
Corridors	(2)	A-0	*	*	A-0	*	A-60	A-0	–	A-0	*
Accommodation spaces	(3)	A-60	A-0	*	A-0	*	A-60	A-0	–	A-0	*
Stairways	(4)	A-0	A-0	A-0	*	A-0	A-60	A-0	–	A-0	*
Service spaces (low risk)	(5)	A-15	A-0	A-0	A-0	*	A-60	A-0	–	A-0	*
Machinery spaces of category A	(6)	A-60	A-60	A-60	A-60	A-60	*	A-50 ^{e/}	A-0	A-60	*
Other machinery spaces	(7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*
Cargo pump rooms	(8)	–	–	–	–	–	A-0 ^{d/}	A-0	*	–	*
Service spaces (high risk)	(9)	A-60	A-0	A-0	A-0	A-0	A-60	A-0	–	A-0 ^{b/}	*
Open decks	(10)	*	*	*	*	*	*	*	*	*	–

- 2 The following requirements shall govern application of the tables:
- .1 Tables 58.1 and 58.2 shall apply respectively to the bulkhead and decks separating adjacent spaces.
 - .2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (10) below. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.
 - (1) *Control stations*

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.
Spaces containing the ship's radio equipment.
Fire-extinguishing rooms, fire control rooms and fire-recording stations.
Control room for propulsion machinery when located outside the machinery space.
Spaces containing centralized fire alarm equipment.
 - (2) *Corridors*

Corridors and lobbies.
 - (3) *Accommodation spaces*

Spaces as defined in Regulation 3.10, excluding corridors.
 - (4) *Stairways*

Interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connexion, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.
 - (5) *Service spaces (low risk)*

Lockers and store-rooms having areas of less than 2 m², drying rooms and laundries.
 - (6) *Machinery spaces of category A*

Spaces as defined in Regulation 3.19.
 - (7) *Other machinery spaces*

Spaces as defined in Regulation 3.20 excluding machinery spaces of category A.
 - (8) *Cargo pump rooms*

Spaces containing cargo pumps and entrances and trunks to such spaces.

(9) *Service spaces (high risk)*

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having an area of 2 m² or more, workshops other than those forming part of the machinery spaces.

(10) *Open decks*

Open deck spaces and enclosed promenades having no fire risk. Air spaces (the space outside superstructures and deck-houses).

3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

4 External boundaries which are required in Regulation 57.1 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries to have "A" class integrity elsewhere in these Requirements. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be of materials to the satisfaction of the Administration.

5 Permanent approved gastight lighting enclosures for illuminating cargo pump rooms may be permitted in bulkheads and decks separating cargo pump rooms and other spaces provided they are of adequate strength and the integrity and gastightness of the bulkhead or deck is maintained.

Regulation 59

Venting, purging, gas freeing and ventilation

1 *Cargo tank venting*

1.1 The venting systems of cargo tanks are to be entirely distinct from the air pipes of the other compartments of the ship. The arrangements and position of openings in the cargo tank deck from which emission of flammable vapours can occur shall be such as to minimize the possibility of flammable vapours being admitted to enclosed spaces containing a source of ignition, or collecting in the vicinity of deck machinery and equipment which may constitute an ignition hazard. In accordance with this general principle the criteria in paragraphs 1.2 to 1.10 will apply.

1.2 The venting arrangements shall be so designed and operated as to ensure that neither pressure nor vacuum in cargo tanks shall exceed design parameters and be such as to provide for:

- .1 the flow of the small volumes of vapour, air or inert gas mixtures caused by thermal variations in a cargo tank in all cases through pressure/vacuum valves; and
- .2 the passage of large volumes of vapour, air or inert gas mixtures during cargo loading and ballasting, or during discharging.

1.3.1 The venting arrangements in each cargo tank may be independent or combined with other cargo tanks and may be incorporated into the inert gas piping.

1.3.2 Where the arrangements are combined with other cargo tanks either stop valves or other acceptable means shall be provided to isolate each cargo tank. Where stop valves are fitted, they shall be provided with locking arrangements which shall be under the control of the responsible ship's officer. Any isolation must continue to permit the flow caused by thermal variations in a cargo tank in accordance with paragraph 1.2.1.

1.4 The venting arrangements shall be connected to the top of each cargo tank and shall be self-draining to the cargo tanks under all normal conditions of trim and list of the ship. Where it may not be possible to provide self-draining lines permanent arrangements shall be provided to drain the vent lines to a cargo tank.

1.5 The venting system shall be provided with devices to prevent the passage of flame into the cargo tanks. The design, testing and locating of these devices shall comply with the requirements established by the Administration which shall contain at least the standards adopted by the Organization.

1.6 Provision shall be made to guard against liquid rising in the venting system to a height which would exceed the design head of cargo tanks. This shall be accomplished by high level alarms or overflow control systems or other equivalent means, together with gauging devices and cargo tank filling procedures.

1.7 Openings for pressure release required by paragraph 1.2.1 shall:

- .1 have as great a height as is practicable above the cargo tank deck to obtain maximum dispersal of flammable vapours but in no case less than 2 m above the cargo tank deck;
- .2 be arranged at the furthest distance practicable but not less than 5 m from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery and equipment which may constitute an ignition hazard.

1.8 Pressure/vacuum valves required by paragraph 1.2.1 may be provided with a by-pass arrangement when they are located in a vent main or masthead riser. Where such an arrangement is provided there shall be suitable indicators to show whether the by-pass is open or closed.

1.9 Vent outlets for cargo loading, discharging and ballasting required by paragraph 1.2.2 shall:

- .1.1 permit the free flow of vapour mixtures; or
- .1.2 permit the throttling of the discharge of the vapour mixtures to achieve a velocity of not less than 30 m/sec;
- .2 be so arranged that the vapour mixture is discharged vertically upwards;

- .3 where the method is by free flow of vapour mixtures, be such that the outlet shall be not less than 6 m above the cargo tank deck or fore and aft gangway if situated within 4 m of the gangway and located not less than 10 m measured horizontally from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery and equipment which may constitute an ignition hazard;
- .4 where the method is by high velocity discharge, be located at a height not less than 2 m above the cargo tank deck and not less than 10 m measured horizontally from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery and equipment which may constitute an ignition hazard. These outlets shall be provided with high velocity devices of an approved type;
- .5 be designed on the basis of the maximum designed loading rate multiplied by a factor of at least 1.25 to take account of gas evolution, in order to prevent the pressure in any cargo tank from exceeding the design pressure. The master shall be provided with information regarding the maximum permissible loading rate for each cargo tank and in the case of combined venting systems, for each group of cargo tanks.

1.10 In combination carriers, the arrangement to isolate slop tanks containing oil or oil residues from other cargo tanks shall consist of blank flanges which will remain in position at all times when cargoes other than liquid cargoes referred to in Regulation 55.1 are carried.

2 *Cargo tank purging and/or gas freeing*

Arrangements for purging and/or gas freeing shall be such as to minimize the hazards due to the dispersal of flammable vapours in the atmosphere and to flammable mixtures in a cargo tank. Accordingly:

- .1 When the ship is provided with an inert gas system the cargo tanks shall first be purged in accordance with the provisions of Regulation 62.13 until the concentration of hydrocarbon vapours in the cargo tanks has been reduced to less than 2 per cent by volume. Thereafter, venting may be at the cargo tank deck level.
- .2 When the ship is not provided with an inert gas system, the operation shall be such that the flammable vapour is initially discharged:
 - .2.1 through the vent outlets as specified in paragraph 1.9; or
 - .2.2 with a vertical exit velocity of at least 20 m/sec through outlets at least 2 m above the cargo tank deck level and which are protected by suitable devices to prevent the passage of flame.

When the flammable gas concentration in the outlet has been reduced to 30 per cent of the lower flammable limit the discharge of the gas mixture may be at the cargo tank deck level.

3 *Ventilation*

3.1 Cargo pump rooms shall be mechanically ventilated and discharges from the exhaust fans shall be led to a safe place on the open deck. The ventilation of these rooms shall have sufficient capacity to minimize the possibility of accumulation of flammable vapours. The number of changes of air shall be at least 20 per hour, based upon the gross volume of the space. The air ducts shall be arranged so that all of the space is effectively ventilated. The ventilation shall be of the suction type using fans of the non-sparking type.

3.2 The arrangement of ventilation inlets and outlets and other deckhouse and superstructure boundary space openings shall be such as to complement the provisions of paragraph 1. Such vents especially for machinery spaces shall be situated as far aft as practicable. Due consideration in this regard should be given when the ship is equipped to load or discharge at the stern. Sources of ignition such as electrical equipment shall be so arranged as to avoid an explosion hazard.

3.3 In combination carriers all cargo spaces and any enclosed spaces adjacent to cargo spaces shall be capable of being mechanically ventilated. The mechanical ventilation may be provided by portable fans. An approved fixed gas warning system capable of monitoring flammable vapours shall be provided in cargo pump rooms and pipe ducts and cofferdams referred to in Regulation 56.1 adjacent to slop tanks. Suitable arrangements shall be made to facilitate measurement of flammable vapours in all other spaces within the cargo tank area. Such measurements shall be made possible from open deck or easily accessible positions.

Regulation 60

Cargo tank protection

1 For tankers of 20,000 tonnes deadweight and upwards the protection of the cargo tanks deck area and cargo tanks shall be achieved by a fixed deck foam system and a fixed inert gas system in accordance with the requirements of Regulations 61 and 62, except that, in lieu of the above installations, the Administration, after having given consideration to the ship's arrangement and equipment, may accept other combinations of fixed installations if they afford protection equivalent to the above, in accordance with Regulation I/5.

2 To be considered equivalent, the system proposed in lieu of the deck foam system shall:

- .1 be capable of extinguishing spill fires and also preclude ignition of spilled oil not yet ignited; and
- .2 be capable of combating fires in ruptured tanks.

3 To be considered equivalent, the system proposed in lieu of the fixed inert gas system shall:

- .1 be capable of preventing dangerous accumulations of explosive mixtures in intact cargo tanks during normal service throughout the

ballast voyage and necessary in-tank operations; and

- .2 be so designed as to minimize the risk of ignition from the generation of static electricity by the system itself.

4 Tankers of 20,000 tonnes deadweight and upwards constructed before 1 September 1984 which are engaged in the trade of carrying crude oil shall be fitted with an inert gas system, complying with the requirements of paragraph 1, not later than:

- .1 for a tanker of 70,000 tonnes deadweight and upwards 1 September 1984 or the date of delivery of the ship, whichever occurs later; and
- .2 for a tanker of less than 70,000 tonnes deadweight 1 May 1985 or the date of delivery of the ship, whichever occurs later except that for tankers of less than 40,000 tonnes deadweight not fitted with tank washing machines having an individual throughput of greater than 60 m³/hour the Administration may exempt such tankers from the requirements of this paragraph, if it would be unreasonable and impracticable to apply these requirements, taking into account the ship's design characteristics.

5 Tankers of 40,000 tonnes deadweight and upwards constructed before 1 September 1984 which are engaged in the trade of carrying oil other than crude oil and any such tanker of 20,000 tonnes deadweight and upwards engaged in the trade of carrying oil other than crude oil fitted with tank washing machines having an individual throughput of greater than 60 m³/hour shall be fitted with an inert gas system, complying with the requirements of paragraph 1, not later than:

- .1 for a tanker of 70,000 tonnes deadweight and upwards 1 September 1984 or the date of delivery of the ship, whichever occurs later; and
- .2 for a tanker of less than 70,000 tonnes deadweight 1 May 1985 or the date of delivery of the ship, whichever occurs later.

6 All tankers operating with a cargo tank cleaning procedure using crude oil washing shall be fitted with an inert gas system complying with the requirements of Regulation 62 and with fixed tank washing machines.

7 All tankers fitted with a fixed inert gas system shall be provided with a closed ullage system.

8 Tankers of less than 20,000 tonnes deadweight shall be provided with a deck foam system complying with the requirements of Regulation 61.

Regulation 61

Fixed deck foam systems

1 The arrangements for providing foam shall be capable of delivering foam to the entire cargo tank area as well as into any cargo tank the deck of which has been ruptured.

2 The deck foam system shall be capable of simple and rapid operation. The main control station for the system shall be suitably located outside the cargo tank area, adjacent to the accommodation spaces and readily accessible and operable in the event of fire in the areas protected.

3 The rate of supply of foam solution shall be not less than the greatest of the following:

- .1 0.6 ℓ/minute per square metre of cargo deck area, where cargo deck area means the maximum breadth of the ship multiplied by the total longitudinal extent of the cargo tank spaces;
- .2 6 ℓ/minute per square metre of the horizontal sectional area of the single tank having the largest such area; or
- .3 3 ℓ/minute per square metre of the area protected by the largest monitor, such area being entirely forward of the monitor, but not less than 1,250 ℓ/minute.

4 Sufficient foam concentrate shall be supplied to ensure at least 20 minutes of foam generation in tankers fitted with an inert gas installation or 30 minutes of foam generation in tankers not fitted with an inert gas installation when using solution rates stipulated in paragraphs 3.1, 3.2 or 3.3, whichever is the greatest. The foam expansion ratio (i.e. the ratio of the volume of foam produced to the volume of the mixture of water and foam-making concentrate supplied) shall not generally exceed 12 to 1. Where systems essentially produce low expansion foam but at an expansion ratio slightly in excess of 12 to 1 the quantity of foam solution available shall be calculated as for 12 to 1 expansion ratio systems. When medium expansion ratio foam (between 50 to 1 and 150 to 1 expansion ratio) is employed the application rate of the foam and the capacity of a monitor installation shall be to the satisfaction of the Administration.

5 Foam from the fixed foam system shall be supplied by means of monitors and foam applicators. At least 50 per cent of the foam solution supply rate required in paragraphs 3.1 and 3.2 shall be delivered from each monitor. On tankers of less than 4,000 tonnes deadweight the Administration may not require installation of monitors but only applicators. However, in such a case the capacity of each applicator shall be at least 25 per cent of the foam solution supply rate required in paragraphs 3.1 or 3.2.

6.1 The number and position of monitors shall be such as to comply with paragraph 1. The capacity of any monitor shall be at least 3 ℓ/minute of foam solution per square metre of deck area protected by that monitor, such area being entirely forward of the monitor. Such capacity shall be not less than 1,250 ℓ/minute.

6.2 The distance from the monitor to the farthest extremity of the protected area forward of that monitor shall not be more than 75 per cent of the monitor throw in still air conditions.

7 A monitor and hose connexion for a foam applicator shall be situated both port and starboard at the front of the poop or accommodation spaces facing the cargo deck. On tankers of less than 4,000 tonnes deadweight a hose

connexion for a foam applicator shall be situated both port and starboard at the front of the poop or accommodation spaces facing the cargo deck.

8 Applicators shall be provided to ensure flexibility of action during fire-fighting operations and to cover areas screened from the monitors. The capacity of any applicator shall be not less than 400 ℓ and the applicator throw in still air conditions shall be not less than 15 m. The number of foam applicators provided shall be not less than four. The number and disposition of foam main outlets shall be such that foam from at least two applicators can be directed on to any cargo tank deck area.

9 Valves shall be provided in the foam main, and in the fire main when this is an integral part of the deck foam system, immediately forward of any monitor position to isolate damaged sections of those mains.

10 Operation of a deck foam system at its required output shall permit the simultaneous use of the minimum required number of jets of water at the required pressure from the fire main.

Regulation 62

Inert gas systems

1 The inert gas system referred to in Regulation 60 shall be designed, constructed and tested to the satisfaction of the Administration. It shall be so designed and operated as to render and maintain the atmosphere of the cargo tanks* non-flammable at all times, except when such tanks are required to be gas free. In the event that the inert gas system is unable to meet the operational requirement set out above and it has been assessed that it is impractical to effect a repair, then cargo discharge, deballasting and necessary tank cleaning shall only be resumed when the "emergency conditions" laid down in the Guidelines on Inert Gas Systems** are complied with.

2 The system shall be capable of:

- .1 inerting empty cargo tanks by reducing the oxygen content of the atmosphere in each tank to a level at which combustion cannot be supported;
- .2 maintaining the atmosphere in any part of any cargo tank with an oxygen content not exceeding 8 per cent by volume and at a positive pressure at all times in port and at sea except when it is necessary for such a tank to be gas free;
- .3 eliminating the need for air to enter a tank during normal operations except when it is necessary for such a tank to be gas free;
- .4 purging empty cargo tanks of hydrocarbon gas, so that subsequent

* Throughout this Regulation the term "cargo tank" includes also "slop tanks".

** Reference is made to Guidelines for Inert Gas Systems, adopted by the Maritime Safety Committee at its forty-second session in May 1980 (MSC/Circ.282).

gas freeing operations will at no time create a flammable atmosphere within the tank.

3.1 The system shall be capable of delivering inert gas to the cargo tanks at a rate of at least 125 per cent of the maximum rate of discharge capacity of the ship expressed as a volume.

3.2 The system shall be capable of delivering inert gas with an oxygen content of not more than 5 per cent by volume in the inert gas supply main to the cargo tanks at any required rate of flow.

4 The inert gas supply may be treated flue gas from main or auxiliary boilers. The Administration may accept systems using flue gases from one or more separate gas generators or other sources or any combination thereof, provided that an equivalent standard of safety is achieved. Such systems should, as far as practicable, comply with the requirements of this Regulation. Systems using stored carbon dioxide shall not be permitted unless the Administration is satisfied that the risk of ignition from generation of static electricity by the system itself is minimized.

5 Flue gas isolating valves shall be fitted in the inert gas supply mains between the boiler uptakes and the flue gas scrubber. These valves shall be provided with indicators to show whether they are open or shut, and precautions shall be taken to maintain them gastight and keep the seatings clear of soot. Arrangements shall be made to ensure that boiler soot blowers cannot be operated when the corresponding flue gas valve is open.

6.1 A flue gas scrubber shall be fitted which will effectively cool the volume of gas specified in paragraph 3 and remove solids and sulphur combustion products. The cooling water arrangements shall be such that an adequate supply of water will always be available without interfering with any essential services on the ship. Provision shall also be made for an alternative supply of cooling water.

6.2 Filters or equivalent devices shall be fitted to minimize the amount of water carried over to the inert gas blowers.

6.3 The scrubber shall be located aft of all cargo tanks, cargo pump rooms and cofferdams separating these spaces from machinery spaces of category A.

7.1 At least two blowers shall be fitted which together shall be capable of delivering to the cargo tanks at least the volume of gas required by paragraph 3. In the system with gas generator the Administration may permit only one blower if that system is capable of delivering the total volume of gas required by paragraph 3 to the protected cargo tanks, provided that sufficient spares for the blower and its prime mover are carried on board to enable any failure of the blower and its prime mover to be rectified by the ship's crew.

7.2 Two fuel oil pumps shall be fitted to the inert gas generator. The Administration may permit only one fuel oil pump on condition that sufficient spares for the fuel oil pump and its prime mover are carried on board to enable any failure of the fuel oil pump and its prime mover to be rectified by the ship's crew.

7.3 The inert gas system shall be so designed that the maximum pressure which it can exert on any cargo tank will not exceed the test pressure of any cargo tank. Suitable shut-off arrangements shall be provided on the suction and discharge connexions of each blower. Arrangements shall be provided to enable the functioning of the inert gas plant to be stabilized before commencing cargo discharge. If the blowers are to be used for gas freeing, their air inlets shall be provided with blanking arrangements.

7.4 The blowers shall be located aft of all cargo tanks, cargo pump rooms and cofferdams separating these spaces from machinery spaces of category A.

8.1 Special consideration shall be given to the design and location of scrubber and blowers with relevant piping and fittings in order to prevent flue gas leakages into enclosed spaces.

8.2 To permit safe maintenance, an additional water seal or other effective means of preventing flue gas leakage shall be fitted between the flue gas isolating valves and scrubber or incorporated in the gas entry to the scrubber.

9.1 A gas regulating valve shall be fitted in the inert gas supply main. This valve shall be automatically controlled to close as required in paragraphs 19.2 and 19.3. It shall also be capable of automatically regulating the flow of inert gas to the cargo tanks unless means are provided to automatically control the speed of the inert gas blowers required in paragraph 7.

9.2 The valve referred to in paragraph 9.1 shall be located at the forward bulkhead of the forwardmost gas safe space* through which the inert gas supply main passes.

10.1 At least two non-return devices, one of which shall be a water seal, shall be fitted in the inert gas supply main, in order to prevent the return of hydrocarbon vapour to the machinery space uptakes or to any gas safe spaces under all normal conditions of trim, list and motion of the ship. They shall be located between the automatic valve required by paragraph 9.1 and the aftermost connexion to any cargo tank or cargo pipeline.

10.2 The devices referred to in paragraph 10.1 shall be located in the cargo tank area on deck.

10.3 The water seal referred to in paragraph 10.1 shall be capable of being supplied by two separate pumps, each of which shall be capable of maintaining an adequate supply at all times.

10.4 The arrangement of the seal and its associated fittings shall be such that it will prevent backflow of hydrocarbon vapours and will ensure the proper functioning of the seal under operating conditions.

10.5 Provision shall be made to ensure that the water seal is protected against freezing, in such a way that the integrity of seal is not impaired by overheating.

* Gas safe space is a space in which the entry of hydrocarbon gases would produce hazards with regard to flammability or toxicity.

10.6 A water loop or other approved arrangement shall also be fitted to each associated water supply and drain pipe and each venting or pressure-sensing pipe leading to gas safe spaces. Means shall be provided to prevent such loops from being emptied by vacuum.

10.7 The deck water seal and all loop arrangements shall be capable of preventing return of hydrocarbon vapours at a pressure equal to the test pressure of the cargo tanks.

10.8 The second device shall be a non-return valve or equivalent capable of preventing the return of vapours or liquids and fitted forward of the deck water seal required in paragraph 10.1. It shall be provided with positive means of closure. As an alternative to positive means of closure, an additional valve having such means of closure may be provided forward of the non-return valve to isolate the deck water seal from the inert gas main to the cargo tanks.

10.9 As an additional safeguard against the possible leakage of hydrocarbon liquids or vapours back from the deck main, means shall be provided to permit this section of the line between the valve having positive means of closure referred to in paragraph 10.8 and the valve referred to in paragraph 9 to be vented in a safe manner when the first of these valves is closed.

11.1 The inert gas main may be divided into two or more branches forward of the non-return devices required by paragraph 10.

11.2.1 The inert gas supply mains shall be fitted with branch piping leading to each cargo tank. Branch piping for inert gas shall be fitted with either stop valves or equivalent means of control for isolating each tank. Where stop valves are fitted, they shall be provided with locking arrangements, which shall be under the control of a responsible ship's officer.

11.2.2 In combination carriers, the arrangement to isolate the slop tanks containing oil or oil residues from other tanks shall consist of blank flanges which will remain in position at all times when cargoes other than oil are being carried except as provided for in the relevant section of the Guidelines on Inert Gas Systems.

11.3 Means shall be provided to protect cargo tanks against the effect of overpressure or vacuum caused by thermal variations when the cargo tanks are isolated from the inert gas mains.

11.4 Piping systems shall be so designed as to prevent the accumulation of cargo or water in the pipelines under all normal conditions.

11.5 Suitable arrangements shall be provided to enable the inert gas main to be connected to an external supply of inert gas.

12 The arrangements for the venting of all vapours displaced from the cargo tanks during loading and ballasting shall comply with Regulation 59.1 and shall consist of either one or more mast risers, or a number of high velocity vents. The inert gas supply mains may be used for such venting.

13 The arrangements for inerting, purging or gas freeing of empty tanks as

required in paragraph 2 shall be to the satisfaction of the Administration and shall be such that the accumulation of hydrocarbon vapours in pockets formed by the internal structural members in a tank is minimized and that:

- .1 on individual cargo tanks the gas outlet pipe, if fitted, shall be positioned as far as practicable from the inert gas/air inlet and in accordance with Regulation 59.1. The inlet of such outlet pipes may be located either at deck level or at not more than 1 m above the bottom of the tank;
- .2 the cross sectional area of such gas outlet pipe referred to in paragraph 13.1 shall be such that an exit velocity of at least 20 m/sec can be maintained when any three tanks are being simultaneously supplied with inert gas. Their outlets shall extend not less than 2 m above deck level;
- .3 each gas outlet referred to in paragraph 13.2 shall be fitted with suitable blanking arrangements;
- .4.1 if a connexion is fitted between the inert gas supply mains and the cargo piping system, arrangements shall be made to ensure an effective isolation having regard to the large pressure difference which may exist between the systems. This shall consist of two shut-off valves with an arrangement to vent the space between the valves in a safe manner or an arrangement consisting of a spool-piece with associated blanks;
- .4.2 the valve separating the inert gas supply main from the cargo main and which is on the cargo main side shall be a non-return valve with a positive means of closure.

14.1 One or more pressure-vacuum breaking devices shall be provided on the inert gas supply main to prevent the cargo tanks from being subject to:

- .1 a positive pressure in excess of the test pressure of the cargo tank if the cargo were to be loaded at the maximum specified rate and all other outlets were left shut; or
- .2 a negative pressure in excess of 700 mm water gauge if cargo were to be discharged at the maximum rated capacity of the cargo pumps and the inert gas blowers were to fail.

14.2 The location and design of the devices referred to in paragraph 14.1 shall be in accordance with Regulation 59.1.

15 Means shall be provided for continuously indicating the temperature and pressure of the inert gas at the discharge side of the gas blowers, whenever the gas blowers are operating.

16.1 Instrumentation shall be fitted for continuously indicating and permanently recording, when the inert gas is being supplied:

- .1 the pressure of the inert gas supply mains forward of the non-return devices required by paragraph 10.1; and
- .2 the oxygen content of the inert gas in the inert gas supply mains on

the discharge side of the gas blowers.

16.2 The devices referred to in paragraph 16.1 shall be placed in the cargo control room where provided. But where no cargo control room is provided, they shall be placed in a position easily accessible to the officer in charge of cargo operations.

16.3 In addition, meters shall be fitted:

- .1 in the navigating bridge to indicate at all times the pressure referred to in paragraph 16.1.1 and the pressure in the slop tanks of combination carriers, whenever those tanks are isolated from the inert gas supply main; and
- .2 in the machinery control room or in the machinery space to indicate the oxygen content referred to in paragraph 16.1.2.

17 Portable instruments for measuring oxygen and flammable vapour concentration shall be provided. In addition, suitable arrangement shall be made on each cargo tank such that the condition of the tank atmosphere can be determined using these portable instruments.

18 Suitable means shall be provided for the zero and span calibration of both fixed and portable gas concentration measurement instruments, referred to in paragraphs 16 and 17.

19.1 Audible and visual alarms shall be provided to indicate:

- .1 low water pressure or low water flow rate to the flue gas scrubber as referred to in paragraph 6.1;
- .2 high water level in the flue gas scrubber as referred to in paragraph 6.1;
- .3 high gas temperature as referred to in paragraph 15;
- .4 failure of the inert gas blowers referred to in paragraph 7;
- .5 oxygen content in excess of 8 per cent by volume as referred to in paragraph 16.1.2;
- .6 failure of the power supply to the automatic control system for the gas regulating valve and to the indicating devices as referred to in paragraphs 9 and 16.1;
- .7 low water level in the water seal as referred to in paragraph 10.1;
- .8 gas pressure less than 100 mm water gauge as referred to in paragraph 16.1.1. The alarm arrangement shall be such as to ensure that the pressure in slop tanks in combination carriers can be monitored at all times; and
- .9 high gas pressure as referred to in paragraph 16.1.1.

19.2 In the system with gas generators audible and visual alarms shall be provided in accordance with 19.1.1, 19.1.3, 19.1.5 to 19.1.9 and additional

alarms to indicate:

- .1 insufficient fuel oil supply;
- .2 failure of the power supply to the generator;
- .3 failure of the power supply to the automatic control system for the generator.

19.3 Automatic shut-down of the inert gas blowers and gas regulating valve shall be arranged on predetermined limits being reached in respect of paragraphs 19.1.1, 19.1.2 and 19.1.3.

19.4 Automatic shut-down of the gas regulating valve shall be arranged in respect of paragraph 19.1.4.

19.5 In respect of paragraph 19.1.5, when the oxygen content of the inert gas exceeds 8 per cent by volume, immediate action shall be taken to improve the gas quality. Unless the quality of the gas improves, all cargo tank operations shall be suspended so as to avoid air being drawn in to the tanks and the isolation valve referred to in paragraph 10.8 shall be closed.

19.6 The alarms required in paragraphs 19.1.5, 19.1.6 and 19.1.8 shall be fitted in the machinery space and cargo control room, where provided, but in each case in such a position that they are immediately received by responsible members of the crew.

19.7. In respect of paragraph 19.1.7 the Administration shall be satisfied as to the maintenance of an adequate reserve of water at all times and the integrity of the arrangements to permit the automatic formation of the water seal when the gas flow ceases. The audible and visual alarm on the low level of water in the water seal shall operate when the inert gas is not being supplied.

19.8 An audible alarm system independent of that required in paragraph 19.1.8 or automatic shut-down of cargo pumps shall be provided to operate on predetermined limits of low pressure in the inert gas mains being reached.

20 . Tankers constructed before 1 September 1984 which are required to have an inert gas system shall at least comply with the requirements of Regulation 62 of Chapter II-2 of the International Convention for the Safety of Life at Sea, 1974*. In addition they shall comply with the requirements of this Regulation, except that:

- .1 inert gas systems fitted on board such tankers before 1 June 1981 need not comply with the following paragraphs: 3.2, 6.3, 7.4, 8, 9.2, 10.2, 10.7, 10.9, 11.3, 11.4, 13.2, 13.4.2 and 19.8;
- .2 inert gas systems fitted on board such tankers on or after 1 June 1981 need not comply with the following paragraphs: 3.2, 6.3, 7.4 and 13.2.

21 Detailed instruction manuals shall be provided on board, covering the

* The text as adopted by the International Conference on Safety of Life at Sea, 1974.

operations, safety and maintenance requirements and occupational health hazards relevant to the inert gas system and its application to the cargo tank system*. The manuals shall include guidance on procedures to be followed in the event of a fault or failure of the inert gas system.

Regulation 63

Cargo pump rooms

1 Each cargo pump room shall be provided with one of the following fixed fire-extinguishing systems operated from a readily accessible position outside the pump room. Cargo pump rooms should be provided with a system suitable for machinery spaces of category A.

1.1 Either a carbon dioxide or a halogenated hydrocarbon system complying with the provisions of Regulation 5 and with the following:

- .1 the alarms referred to in Regulation 5.1.6 shall be safe for use in a flammable cargo vapour/air mixture;
- .2 a notice shall be exhibited at the controls stating that due to the electrostatic ignition hazard, the system is to be used only for fire extinguishing and not for inerting purposes.

1.2 A high expansion foam system complying with the provisions of Regulation 9, provided that the foam concentrate supply is suitable for extinguishing fires involving the cargoes carried.

1.3 A fixed pressure water-spraying system complying with the provisions of Regulation 10.

2 Where the extinguishing medium used in the cargo pump room system is also used in systems serving other spaces, the quantity of medium provided or its delivery rate need not be more than the maximum required for the largest compartment.

* Reference is made to Guidelines for Inert Gas Systems, adopted by the Maritime Safety Committee at its forty-second session in May 1980 (MSC/Circ.282)

CHAPTER III

LIFE-SAVING APPLIANCES, ETC.

Regulation 1

Application

The existing text of sub-paragraph (c)(iii)(2) is replaced by the following:

(2) Regulations II-2/28.1.5 and II-2/28.1.6; and

Regulation 27

Lifeboats, liferafts and buoyant apparatus

In sub-paragraph (c)(iii), reference to "paragraph (d) of Regulation 1 of Chapter II-1" is amended to read:

Regulation II-1/1.5

In sub-paragraph (c)(vii), the reference to "paragraph (d) of Regulation 1 of Chapter II-1" is amended to read:

Regulation II-1/1.5

Regulation 30

Lighting for deck, lifeboats, liferafts, etc.

In paragraph (a), the reference to "Regulation 25 of Chapter II-1" is amended to read:

Regulation II-1/42

Regulation 38

Emergency lighting

The reference to "Regulation 26 of Chapter II-1" is amended to read:

Regulation II-1/43

CHAPTER IV

RADIOTELEGRAPHY AND RADIOTELEPHONY

The following new Regulation is added:

Regulation 4-1

VHF radiotelephone installation

- (a) Passenger ships irrespective of size and cargo ships of 300 tons gross tonnage and upwards shall be fitted with a VHF radiotelephone installation complying with the provisions of Regulation 17.
- (b) The provisions of Regulation 17 shall also apply for VHF radiotelephone installations required by a Contracting Government for all ships to which Chapter V applies navigating in an area under its jurisdiction and for which a VHF radiotelephone installation is not made compulsory by paragraph (a).

The existing text of Regulation 7 is replaced by the following:

Regulation 7

Watches – radiotelephone

- (a) Each ship which is fitted with a radiotelephone station in accordance with Regulation 4 shall, for safety purposes while at sea, maintain continuous watch on the radiotelephone distress frequency in the place on board from which the ship is usually navigated, by use of a radiotelephone distress frequency watch receiver, using a loudspeaker, a filtered loudspeaker or radiotelephone auto alarm.
- (b) Each ship referred to in paragraph (a) shall carry qualified radiotelephone operators (who may be the master, an officer or a member of the crew) as follows:
- (i) if of 300 tons gross tonnage and upwards but less than 500 tons gross tonnage, at least one operator;
 - (ii) if of 500 tons gross tonnage and upwards but less than 1,600 tons gross tonnage, at least two operators. If such a ship carries one

radiotelephone operator exclusively employed for duties related to radiotelephony, a second operator is not obligatory.

(c) Each ship which in accordance with Regulation 3 or Regulation 4 is fitted with a radiotelegraph station shall, while at sea, maintain continuous watch on the radiotelephone distress frequency in a place to be determined by the Administration, by use of a radiotelephone distress frequency watch receiver, using a loudspeaker, a filtered loudspeaker or radiotelephone auto alarm.

The existing text of Regulation 8 is replaced by the following:

Regulation 8

Watches – VHF radiotelephone

Each ship which is fitted with a VHF radiotelephone installation in accordance with Regulation 4-1 shall at sea maintain a continuous listening watch on the navigating bridge:

- (i) on 156.8 MHz (channel 16) when practicable; and/or
- (ii) for such periods and on such channels as may be required by the Contracting Government referred to in Regulation 4-1(b).

Regulation 10

Radiotelegraph installations

The existing text of paragraph (g) is replaced by the following:

(g-1) The main and reserve transmitters shall, when connected to the main antenna, have a minimum normal range as specified below, that is to say, they must be capable of transmitting clearly perceptible signals from ship to ship by day and under normal conditions and circumstances over the specified

	Minimum normal range in miles	
	Main transmitter	Reserve transmitter
All passenger ships and cargo ships of 1,600 tons gross tonnage and upwards	150	100
Cargo ships below 1,600 tons gross tonnage	100	75

ranges.* (Clearly perceptible signals will normally be received if the R.M.S. value of the field strength at the receiver is at least 50 microvolts per metre.)

(g-2) The radiotelegraph installation shall include facilities for radiotelephone transmission and reception on the radiotelephone distress frequency. This requirement may be fulfilled by including such facilities in the main or reserve installation or other installed equipment. The transmitter power and receiver sensitivity of the radiotelephony part of the installation shall comply with Regulation 16(c)(i) and (f) respectively if that part is fitted after 1 September 1986. For installations fitted prior to that date, such transmitter power and receiver sensitivity shall be as determined by the Administration. The location and other conditions of the radiotelephony facilities required by this Regulation shall be as determined by the Administration, except when they form part of the main or reserve radiotelegraph installation.

* In the absence of a direct measurement of the field strength the following data may be used as a guide for approximately determining the normal range:

A. In the case of antennae other than self-supporting types.

Normal range in miles	Metre-amperes ^{1/}
200	128
175	102
150	76
125	58
100	45
75	34

^{1/} The product of the distance (in metres) from the highest part of the antenna to the deepest load water-line and the antenna current (in amperes).

The values given in the second column of the table correspond to an average value of the ratio

$$\frac{\text{effective antenna height}}{\text{maximum antenna height}} = 0.47$$

This ratio varies with local conditions of the antenna and may vary between about 0.3 and 0.7.

B. In the case of self-supporting transmitting antennae:

Normal range in miles	Metre-amperes ^{2/}
200	305
175	215
150	150
125	110
100	85
75	55

^{2/} The product of the distance (in metres) from the highest part of the antenna to the deepest load water-line and the current (in amperes) measured at the base of the radiating portion of the antenna. The values given in the second column are based on the propagation curves given in CCIR Recommendation 368-2 and also the method, experimental results and calculations in CCIR Report 502-1 and Opinion 43-1. The necessary value of metre-amperes varies considerably with local conditions of the antenna.

The existing text of sub-paragraph (h)(iv) is replaced by the following:

- (h)(iv)(1) The radiotelephone transmitting facility required by paragraph (g-2) shall be fitted with an automatic device for generating the radiotelephone alarm signal, so designed as to prevent actuation by mistake, and complying with the requirements of Regulation 16(e). The device shall be capable of being taken out of operation at any time in order to permit the immediate transmission of a distress message. For installations fitted prior to 1 September 1986, the fitting of automatic devices for generating the radiotelephone alarm signal shall be as determined by the Administration.
- (2) Arrangements shall be made to check periodically the proper functioning of the automatic device for generating the radiotelephone alarm signal on frequencies other than the radiotelephone distress frequency using a suitable artificial antenna. An exception shall be made for radiotelephone emergency equipment having only the radiotelephone distress frequency in which case a suitable artificial antenna shall be employed.

Note: While all reasonable steps shall be taken to maintain the apparatus in an efficient condition, malfunction of the radiotelephone transmitting facilities required by this Regulation shall not be considered as making the ship unseaworthy or as a reason for delaying the ship in ports where repair facilities are not readily available.

The existing text of sub-paragraph (1)(ii) is deleted.

The existing text of sub-paragraph (m)(iv) is replaced by the following:

- (m)(iv) the VHF installation in accordance with the provisions of Regulation 17(c);

Regulation 16

Radiotelephone installations

The existing text of paragraph (b) is amended by deleting A3H, A3A and A3J.

The existing text of paragraph (c) is replaced by the following:

- (c) (i) In the case of cargo ships of 300 tons gross tonnage and upwards but less than 1,600 tons gross tonnage the transmitter shall have a minimum normal range of 150 miles, i.e. it shall be capable of transmitting clearly perceptible signals from ship to ship by day and under normal conditions and circumstances over this range.*

* In the absence of field strength measurements, it may be assumed that this range will be obtained by a power in the antenna of 15 watts (unmodulated carrier) with an antenna efficiency of 27 per cent for double sideband emissions or 60 watts peak envelope power for single sideband full carrier emissions when 100 per cent modulated by a single sinusoidal oscillation.

(Clearly perceptible signals will normally be received if the R.M.S. value of the field strength produced at the receiver by an unmodulated carrier is at least 25 microvolts per metre for double sideband and single sideband full carrier emissions.)

- (ii) In the case of existing installations using double sideband emissions on cargo ships of 300 tons gross tonnage and upwards but less than 500 tons gross tonnage, the transmitter shall have a minimum normal range of at least 75 miles.

The existing text of sub-paragraph (j)(iv) is replaced by:

- (iv) the VHF installation in accordance with the provisions of Regulation 17(c).

The existing text of Regulation 17 is replaced by the following:

Regulation 17

VHF radiotelephone installation

- (a) The VHF radiotelephone installation shall be in the upper part of the ship complying with the provisions of this Regulation and comprising a transmitter and receiver, a source of energy capable of actuating them at their rated power levels, and an antenna suitable for efficient radiating and receiving signals at the operating frequencies.
- (b) On board passenger ships irrespective of size and cargo ships of 500 tons gross tonnage and upwards it shall be possible to operate the VHF radiotelephone installation from a source of energy which is situated in the upper part of the ship and has sufficient capacity for at least six hours of operation.
- (c) The Administration may authorize the use of the reserve source of energy of the radiotelegraph installation or the radiotelephone installation respectively referred to in Regulation 10(m) and Regulation 16(j) to supply the VHF radiotelephone installation. In this case the reserve source of energy is required to be of a capacity sufficient to operate simultaneously the VHF radiotelephone installation and:
 - (i) the reserve radiotelegraph transmitter and receiver for at least six hours unless a switching device is fitted to ensure alternate operation only; or
 - (ii) the radiotelephone transmitter and receiver for at least six hours unless a switching device is fitted to ensure alternate operation only.
- (d) The VHF radiotelephone installation shall conform to the requirements laid down in the Radio Regulations for equipment used in the VHF maritime mobile radiotelephone service and shall be capable of operation on those channels specified by the Radio Regulations and as may be required by the Contracting Government referred to in Regulation 4-1(b).

(e) The Contracting Government referred to in Regulation 4-1(b) shall not require the transmitter R.F. carrier power output to be greater than 10 watts. The antenna shall, in so far as is practicable, have an unobstructed view in all directions.*

(f) Control of the channels required for navigational safety shall be immediately available on the navigating bridge convenient to the conning position and, where necessary, facilities should be available to permit radiocommunications from the wings of the navigating bridge.

Regulation 19

Radio logs

The following paragraph is added to the existing text and the existing paragraph (c) is relettered as paragraph (d):

(c) On each ship fitted with a VHF radiotelephone installation in accordance with Regulation 4-1:

- (i) the entries required by the Radio Regulations shall be recorded in the radio log in accordance with the requirements of the Administration;
- (ii) a summary of all communications relating to distress, urgency and safety traffic shall be recorded in the ship's log.

* For guidance purposes, it is assumed that each ship is fitted with a vertically polarized unity gain antenna at a nominal height of 9.15 m above water, a transmitter R.F. power output of 10 watts, and a receiver sensitivity of 2 microvolts across the input terminals for 20 dB signal-to-noise ratio.

CHAPTER V

SAFETY OF NAVIGATION

The existing text of Regulation 12 is replaced by the following:

Regulation 12

Shipborne navigational equipment

- (a) For the purpose of this Regulation "constructed" in respect of a ship means a stage of construction where:
- (i) the keel is laid; or
 - (ii) construction identifiable with a specific ship begins; or
 - (iii) assembly of that ship has commenced comprising at least 50 tonnes or 1 per cent of the estimated mass of all structural material, whichever is less.
- (b) (i) Ships of 150 tons gross tonnage and upwards shall be fitted with:
- (1) a standard magnetic compass, except as provided in sub-paragraph (iv);
 - (2) a steering magnetic compass, unless heading information provided by the standard compass required under (1) is made available and is clearly readable by the helmsman at the main steering position;
 - (3) adequate means of communication between the standard compass position and the normal navigation control position to the satisfaction of the Administration; and
 - (4) means for taking bearings as nearly as practicable over an arc of the horizon of 360°.
- (ii) Each magnetic compass referred to in sub-paragraph (i) shall be properly adjusted and its table or curve of residual deviations shall be available at all times.
- (iii) A spare magnetic compass, interchangeable with the standard compass, shall be carried, unless the steering compass mentioned in sub-paragraph (i)(2) or a gyro compass is fitted.
- (iv) The Administration, if it considers it unreasonable or unnecessary to require a standard magnetic compass, may exempt individual ships or classes of ships from these requirements if the nature of the voyage, the ship's proximity to land or the type of ship does not warrant a standard compass, provided that a suitable steering compass is in all cases carried.

(c) Ships of less than 150 tons gross tonnage shall, as far as the Administration considers it reasonable and practicable, be fitted with a steering compass and have means for taking bearings.

(d) Ships of 500 tons gross tonnage and upwards constructed on or after 1 September 1984 shall be fitted with a gyro compass complying with the following requirements:

- (i) the master gyro compass or a gyro repeater shall be clearly readable by the helmsman at the main steering position;
- (ii) on ships of 1,600 tons gross tonnage and upwards a gyro repeater or gyro repeaters shall be provided and shall be suitably placed for taking bearings as nearly as practicable over an arc of the horizon of 360°.

(e) Ships of 1,600 tons gross tonnage and upwards, constructed before 1 September 1984 when engaged on international voyages, shall be fitted with a gyro compass complying with the requirements of paragraph (d).

(f) On ships provided with emergency steering positions, arrangements shall be made to supply heading information to such positions.

(g) Ships of 500 tons gross tonnage and upwards constructed on or after 1 September 1984 and ships of 1,600 tons gross tonnage and upwards constructed before 1 September 1984 shall be fitted with a radar installation.

(h) Ships of 10,000 tons gross tonnage and upwards shall be fitted with two radar installations, each capable of being operated independently* of the other.

(i) Facilities for plotting radar readings shall be provided on the navigating bridge of ships required by paragraph (g) or (h) to be fitted with a radar installation. In ships of 1,600 tons gross tonnage and upwards constructed on or after 1 September 1984 the plotting facilities shall be at least as effective as a reflection plotter.

(j) (i) An automatic radar plotting aid shall be fitted on:

- (1) ships of 10,000 tons gross tonnage and upwards, constructed on or after 1 September 1984;
- (2) tankers constructed before 1 September 1984 as follows:
 - (aa) if of 40,000 tons gross tonnage and upwards by 1 January 1985;
 - (bb) if of 10,000 tons gross tonnage and upwards but less than 40,000 tons gross tonnage, by 1 January 1986;

* Reference is made to section 4 of the Recommendation on Performance Standards for Radar Equipment, adopted by the Organization by resolution A.477(XII).

- (3) ships constructed before 1 September 1984, that are not tankers, as follows:
- (aa) if of 40,000 tons gross tonnage and upwards by 1 September 1986;
 - (bb) if of 20,000 tons gross tonnage and upwards, but less than 40,000 tons gross tonnage, by 1 September 1987;
 - (cc) if of 15,000 tons gross tonnage and upwards, but less than 20,000 tons gross tonnage, by 1 September 1988.
- (ii) Automatic radar plotting aids fitted prior to 1 September 1984 which do not fully conform to the performance standards adopted by the Organization may, at the discretion of the Administration, be retained until 1 January 1991.
- (iii) The Administration may exempt ships from the requirements of this paragraph, in cases where it considers it unreasonable or unnecessary for such equipment to be carried, or when the ships will be taken permanently out of service within two years of the appropriate implementation date.
- (k) When engaged on international voyages ships of 1,600 tons gross tonnage and upwards constructed before 25 May 1980 and ships of 500 tons gross tonnage and upwards constructed on or after 25 May 1980 shall be fitted with an echo-sounding device.
- (l) When engaged on international voyages ships of 500 tons gross tonnage and upwards constructed on or after 1 September 1984 shall be fitted with a device to indicate speed and distance. Ships required by paragraph (j) to be fitted with an automatic radar plotting aid shall be fitted with a device to indicate speed and distance through the water.
- (m) Ships of 1,600 tons gross tonnage and upwards constructed before 1 September 1984 and all ships of 500 tons gross tonnage and upwards constructed on or after 1 September 1984 shall be fitted with indicators showing the rudder angle, the rate of revolution of each propeller and in addition, if fitted with variable pitch propellers or lateral thrust propellers, the pitch and operational mode of such propellers. All these indicators shall be readable from the conning position.
- (n) Ships of 100,000 tons gross tonnage and upwards constructed on or after 1 September 1984 shall be fitted with a rate-of-turn indicator.
- (o) Except as provided in Regulations I/7(b)(ii), I/8 and I/9, while all reasonable steps shall be taken to maintain the apparatus referred to in paragraphs (d) to (n) in efficient working order, malfunctions of the equipment shall not be considered as making a ship unseaworthy or as a reason for delaying the ship in ports where repair facilities are not readily available.
- (p) When engaged on international voyages ships of 1,600 tons gross tonnage and upwards shall be fitted with a radio direction-finding apparatus complying with the provisions of Regulation IV/12(a). The Administration

may, in areas where it considers it unreasonable or unnecessary for such apparatus to be carried, exempt any ship of less than 5,000 tons gross tonnage from this requirement, due regard being had to the fact that radio direction-finding apparatus is of value both as a navigational instrument and as an aid to locating ships, aircraft or survival craft.

(q) When engaged on international voyages ships of 1,600 tons gross tonnage and upwards constructed on or after 25 May 1980 shall be fitted with radio equipment for homing on the radiotelephone distress frequency, complying with the relevant provisions of Regulation IV/12(b).

(r) All equipment fitted in compliance with this Regulation shall be of a type approved by the Administration. Equipment installed on board ships on or after 1 September 1984 shall conform to appropriate performance standards not inferior to those adopted by the Organization. Equipment fitted prior to the adoption of related performance standards may be exempted from full compliance with those standards at the discretion of the Administration, having due regard to the recommended criteria which the Organization might adopt in connexion with the standards concerned.

(s) A rigidly connected composite unit of a pushing vessel and associated pushed vessel, when designed as a dedicated and integrated tug and barge combination, shall be regarded as a single ship for the purpose of this Regulation.

(t) If the application of the requirements of this Regulation necessitates structural alterations to a ship constructed before 1 September 1984, the Administration may allow extension of the time limit for fitting the required equipment not later than 1 September 1989, taking into account the first scheduled dry-docking of such a ship required by the present Regulations.

(u) Except as provided elsewhere in this Regulation, the Administration may grant to individual ships exemptions of a partial or conditional nature, when any such ship is engaged on a voyage where the maximum distance of the ship from the shore, the length and nature of the voyage, the absence of general navigation hazards, and other conditions affecting safety are such as to render the full application of this Regulation unreasonable or unnecessary. When deciding whether or not to grant exemptions to an individual ship, the Administration shall have regard to the effect that an exemption may have upon the safety of all other ships.

Regulation 16

Life-saving signals

The existing text of paragraph (d) is replaced by the following:

(d) Signals used by aircraft engaged on search and rescue operations to direct ships towards an aircraft, ship or person in distress:

(i) The following manoeuvres performed in sequence by an aircraft

mean that the aircraft wishes to direct a surface craft towards an aircraft or a surface craft in distress:

- (1) circling the surface craft at least once;
- (2) crossing the projected course of the surface craft close ahead at low altitude, and:
 - rocking the wings; or
 - opening and closing the throttle; or
 - changing the propeller pitch;(Due to high noise level on board surface craft, the sound signals may be less effective than the visual signal and are regarded as alternative means of attracting attention.)
- (3) heading in the direction in which the surface craft is to be directed.

Repetition of such manoeuvres has the same meaning.

- (ii) The following manoeuvre by an aircraft means that the assistance of the surface craft to which the signal is directed is no longer required:

crossing the wake of the surface craft close astern at a low altitude, and:

- rocking the wings; or
- opening and closing the throttle; or
- changing the propeller pitch.

(Due to high noise level on board surface craft, the sound signals may be less effective than the visual signal and are regarded as an alternative means of attracting attention.)

Note: Advance notification of changes in these signals will be given by the Organization as necessary.

Regulation 18

VHF radiotelephones

The existing text of this Regulation is deleted (see Regulation IV/4-1(b)).

Regulation 19

Use of the automatic pilot

The following paragraph is added to the existing text:

- (d) The manual steering shall be tested after prolonged use of the automatic pilot, and before entering areas where navigation demands special caution.

The following Regulations are added to this Chapter:

Regulation 19-1

Operation of steering gear

In areas where navigation demands special caution, ships shall have more than one steering gear power unit in operation when such units are capable of simultaneous operation.

Regulation 19-2

Steering gear – testing and drills

- (a) Within 12 hours before departure, the ship's steering gear shall be checked and tested by the ship's crew. The test procedure shall include, where applicable, the operation of the following:
- (i) the main steering gear;
 - (ii) the auxiliary steering gear;
 - (iii) the remote steering gear control systems;
 - (iv) the steering positions located on the navigating bridge;
 - (v) the emergency power supply;
 - (vi) the rudder angle indicators in relation to the actual position of the rudder;
 - (vii) the remote steering gear control system power failure alarms;
 - (viii) the steering gear power unit failure alarms; and
 - (ix) automatic isolating arrangements and other automatic equipment.
- (b) The checks and tests shall include:
- (i) the full movement of the rudder according to the required capabilities of the steering gear;
 - (ii) a visual inspection of the steering gear and its connecting linkage; and
 - (iii) the operation of the means of communication between the navigating bridge and steering gear compartment.
- (c)
- (i) Simple operating instructions with a block diagram showing the change-over procedures for remote steering gear control systems and steering gear power units shall be permanently displayed on the navigating bridge and in the steering gear compartment.
 - (ii) All ships' officers concerned with the operation or maintenance of steering gear shall be familiar with the operation of the steering systems fitted on the ship and with the procedures for changing from one system to another.

(d) In addition to the routine checks and tests prescribed in paragraphs (a) and (b), emergency steering drills shall take place at least once every three months in order to practise emergency steering procedures. These drills shall include direct control from within the steering gear compartment, the communications procedure with the navigating bridge and, where applicable, the operation of alternative power supplies.

(e) The Administration may waive the requirement to carry out the checks and tests prescribed in paragraphs (a) and (b) for ships which regularly engage on voyages of short duration. Such ships shall carry out these checks and tests at least once every week.

(f) The date upon which the checks and tests prescribed in paragraphs (a) and (b) are carried out and the date and details of emergency steering drills carried out under paragraph (d), shall be recorded in the log book as may be prescribed by the Administration.

CHAPTER VI

CARRIAGE OF GRAIN

PART A – GENERAL PROVISIONS

The existing text of Regulation 1 is replaced by the following:

Regulation 1

Application

Unless expressly provided otherwise this Chapter applies to the carriage of grain in all ships to which the present Regulations apply and in cargo ships of less than 500 tons gross tonnage.

PART B – CALCULATION OF ASSUMED HEELING MOMENTS

SECTION V – ALTERNATIVE LOADING ARRANGEMENTS FOR EXISTING SHIPS

(A) GENERAL

Amend the second paragraph to read:

For the purpose of this Part the term “Existing Ship” means “a ship, the keel of which is laid before 25 May 1980.”

(B) STOWAGE OF SPECIALLY SUITABLE SHIPS

The existing text of sub-paragraph (a)(ii)(2) is replaced by the following:

- (2) in partly filled compartments or holds free grain surfaces settle and shift as in sub-paragraph (1) or to such larger angle as may be deemed necessary by the Administration, or by a Contracting Government on behalf of the Administration, and grain surfaces, if overstowed, with the bulk grain levelled and topped off with bagged grain or other suitable cargo tightly stowed and extending to a height of not less than 1.22 m above the top of the bulk grain within spaces divided by a longitudinal bulkhead or shifting board, and not less than 1.52 m within spaces not so divided and the bagged grain or other suitable cargo supported on suitable platforms laid over the whole surface of the bulk grain, such platforms consisting of bearers spaced not more than 1.22 m apart and 25 mm boards laid thereon spaced not more than 0.10 m apart or of strong separation cloths with adequate overlapping, will shift to an angle of 8 degrees with the original levelled surfaces. For the purpose of this paragraph shifting boards, if fitted, will be considered to limit the transverse shift of the surface of the grain.

RESOLUTION MSC.1(XLV)
adopted on 20 November 1981

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.6(48)
adopted on 17 June 1983
ADOPTION OF AMENDMENTS TO THE
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.6(48)
adopted on 17 June 1983

**ADOPTION OF AMENDMENTS TO THE
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT
SEA, 1974**

THE MARITIME SAFETY COMMITTEE,

NOTING article VIII(b) of the International Convention for the Safety of Life at Sea, 1974, hereafter referred to as "the Convention", concerning the procedure for amending the Annex to the Convention, other than the provisions of chapter I thereof,

NOTING FURTHER the functions which the Convention confers upon the Maritime Safety Committee for the consideration and adoption of amendments to the Convention,

HAVING CONSIDERED at its forty-eighth session amendments to the Convention proposed and circulated in accordance with article VIII(b)(i) thereof,

1 ADOPTS in accordance with article VIII(b)(iv) of the Convention amendments to chapters II-1, II-2, III, IV and VII of the Convention, the texts of which are given in the Annex to the present resolution;

2 DETERMINES in accordance with article VIII(b)(vi)(2)(bb) of the Convention that the amendments to chapters II-1, II-2, III, IV and VII shall be deemed to have been accepted on 1 January 1986 unless prior to this date more than one third of Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3 INVITES Contracting Governments to note that in accordance with article VIII(b)(vii)(2) of the Convention the amendments to chapters II-1, II-2, III, IV and VII shall enter into force on 1 July 1986 upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General in conformity with article VIII(b)(v) of the Convention to transmit certified copies of the present resolution and the texts of the amendments contained in the Annex to all Contracting Governments to the International Convention for the Safety of Life at Sea, 1974;

5 FURTHER REQUESTS the Secretary-General to transmit copies of the resolution and its Annex to Members of the Organization which are not Contracting Governments to the Convention.

1. At its forty-eighth session held in June 1983, the Maritime Safety Committee adopted amendments to the International Convention for the Safety of Life at Sea, 1974 (SOLAS). Thirty-three Contracting Governments to the Convention were present at the session and all the texts of the amendments were adopted in accordance with the procedure specified in Article VIII(b)(iv).
2. The amendments adopted at the session consist of complete replacement texts of Chapters III and VII and amendments to Chapters II-1, II-2 and IV.
3. The decimal numbering system has been used in Chapters II-1, II-2, III and VII. Metric and Imperial units have been replaced with those of the Système International (SI Units), except where conventionally accepted nautical units were considered more appropriate.
4. Cross references are given in a concise form, e.g. Regulation II-2/10.4 meaning paragraph 4 of Regulation 10 of Chapter II-2.
5. Footnotes given throughout the Convention, as well as amendments thereto, refer to the relevant recommendations annexed to the Convention and other internationally accepted standards. The Maritime Safety Committee has emphasized that these footnotes do not form part of the Convention and are only inserted for ease of reference. The footnotes are to be altered to reflect any changes which may be made to the resolutions, recommendations or documents on which they are based. References to draft resolutions to be considered by the Assembly at its thirteenth regular session are to be replaced by the definitive numbers of the resolutions as adopted by the Assembly.

ANNEX

**1983 AMENDMENTS TO THE INTERNATIONAL CONVENTION
 FOR THE SAFETY OF LIFE AT SEA, 1974**

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Part 1

CHAPTER II-1

**CONSTRUCTION – SUBDIVISION AND STABILITY,
MACHINERY AND ELECTRICAL INSTALLATIONS**

Chapter II-1 of the Convention is replaced by the text of chapter II-1 annexed to resolution MSC.1(XLV), further amended as follows:

Regulation 1

Application

In paragraph 1.1 line 3 delete "1 September 1984" and insert "1 July 1986".

In paragraph 1.3.2 line 2 delete "1 September 1984" and insert "1 July 1986".

Replace the whole of paragraph 2 by:

"Unless expressly provided otherwise, for ships constructed before 1 July 1986 the Administration shall ensure that the requirements which are applicable under chapter II-1 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolution MSC.1(XLV), are complied with."

Delete the footnote.

In paragraph 3 lines 4 and 9 delete "1 September 1984" and insert "1 July 1986".

Delete paragraph 5 and renumber paragraph 6 as paragraph 5.

Regulation 3

Definitions relating to Parts C, D and E

In paragraph 18 delete "fiire" and insert "fire".

Amend paragraph 19 as follows:

"'Chemical tanker' is a cargo ship constructed or adapted and used for the carriage in bulk of any liquid product listed in either:

- .1 chapter 17 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Maritime Safety Committee by resolution MSC.4(48), hereinafter referred to as 'the International Bulk Chemical Code', as may be amended by the Organization; or

- .2 chapter VI of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Assembly of the Organization by resolution A.212(VII), hereinafter referred to as 'the Bulk Chemical Code', as has been or may be amended by the Organization;

whichever is applicable."

Amend paragraph 20 to read:

" 'Gas carrier' is a cargo ship constructed or adapted and used for the carriage in bulk of any liquefied gas or other products listed in either:

- .1 chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Maritime Safety Committee by resolution MSC.5(48) hereinafter referred to as 'the International Gas Carrier Code', as may be amended by the Organization; or
- .2 chapter XIX of the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Assembly of the Organization by resolution A.328(IX), hereinafter referred to as 'the Gas Carrier Code', as has been or may be amended by the Organization;

whichever is applicable."

Regulation 4

Floodable length in passenger ships

Paragraph 1, line 3 delete "andd" and insert "and".

Regulation 5

Permeability in passenger ships

Amend paragraph 4.1 to read:

"4.1 In the case of special subdivision required in regulation 6.5, the uniform average permeability throughout the portion of the ship forward of or abaft the machinery space shall be $95 \cdot 35 \frac{b}{v}$ where:

b = the volume of the spaces below the margin line and above the tops of floors, inner bottom, or peak tanks, as the case may be, which are appropriated to and used as cargo spaces, coal or oil fuel bunkers, store-rooms, baggage and mail rooms, chain lockers and fresh water tanks, forward of or abaft the machinery space; and

v = the whole volume of the portion of the ship below the margin line forward of or abaft the machinery space."

Regulation 6

Permissible length of compartments in passenger ships

Paragraph 2.2, line 2 delete "seervice" and insert "service".

Replace the heading of section 5 by "Special subdivision standards for ships complying with regulation III/20.1.2."

Insert new paragraphs 5.3 and 5.4 as follows:

"5.3 The special provisions regarding permeability given in regulation 5.4 shall be employed when calculating the floodable length curves.

5.4 Where the Administration is satisfied that, having regard to the nature and conditions of the intended voyages compliance with the other provisions of this chapter and of chapter II-2 is sufficient, the requirements of this paragraph need not be complied with."

Regulation 41

Main source of electrical power and lighting systems

Paragraph 1.3, line 3 insert "of rotation" after "direction".

Regulation 42

Emergency source of electrical power in passenger ships

Amend sub-paragraph 2.1.1 to read:

"1 at every muster and embarkation station and over the sides as required by regulations III/11.4 and III/15.7".

Insert new sub-paragraph 2.1.2 to read:

"2 in alleyways, stairways and exits giving access to the muster and embarkation stations, as required by regulation III/11.5".

Renumber sub-paragraphs 2.1.2 to 2.1.7 to read 2.1.3 to 2.1.8.

Paragraph 2.3.4 line 2 delete "manual fire alarms" and insert "manually operated call points".

Regulation 43

Emergency source of electrical power in cargo ships

Paragraph 1.3, line 10 delete "sppace" and insert "space".

Amend paragraph 2.1 to read:

"2.1 For a period of 3 h, emergency lighting at every muster and embarkation station and over the sides as required by regulations III/11.4 and III/15.7."

Paragraph 2.4.4, line 2 delete "manual fire alarms" and insert "manually operated call points".

Regulation 49

Control of propulsion machinery from the navigating bridge

Paragraph 3, line 6 delete "the machinery space" and insert "the main machinery space"

delete "the machinery control room" and insert "the main machinery control room".

Paragraph 5, line 3 insert "of the propeller" after "thrust".

Paragraph 6.1, line 1 delete "in case" and insert "in the case".

Paragraph 6.2, line 1 delete "in case" and insert "in the case".

Part 2

CHAPTER II-2

CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION
AND FIRE EXTINCTION

Chapter II-2 of the Convention is replaced by the text of chapter II-2 annexed to resolution MSC.1(XLV), further amended as follows:

Regulation 1

Application

In paragraph 1.1 line 3 delete "1 September 1984" and insert "1 July 1986"

In paragraph 1.3.2 line 2 delete "1 September 1984" and insert "1 July 1986".

Replace the whole of paragraph 2 by:

"Unless expressly provided otherwise, for ships constructed before 1 July 1986 the Administration shall ensure that the requirements which are applicable under chapter II-2 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolution MSC.1 (XLV), are complied with."

In paragraph 3 lines 4 and 9 delete "1 September 1984" and insert "1 July 1986".

Delete the footnote.

Regulation 3

Definitions

In paragraph 12 correct "main and specie rooms" to read "mail and specie rooms".

Paragraph 30, amend to:

"'Chemical tanker' is a tanker constructed or adapted and used for the carriage in bulk of any liquid product of a flammable nature listed in either:

- .1 chapter 17 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Maritime Safety Committee by resolution MSC.4(48), hereinafter referred to as 'the International Bulk Chemical Code', as may be amended by the Organization; or

- .2 chapter VI of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Assembly of the Organization by resolution A.212(VII), hereinafter referred to as 'the Bulk Chemical Code', as has been or may be amended by the Organization;

whichever is applicable."

Paragraph 31 amend to:

"'Gas carrier' is a tanker constructed or adapted and used for the carriage in bulk of any liquefied gas or other products of a flammable nature listed in either:

- .1 chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Maritime Safety Committee by resolution MSC.5(48), hereinafter referred to as 'the International Gas Carrier Code', as may be amended by the Organization; or
- .2 chapter XIX of the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk adopted by the Assembly of the Organization by resolution A.328(IX), hereinafter referred to as 'the Gas Carrier Code', as has been or may be amended by the Organization;

whichever is applicable."

Add an additional paragraph to read:

"32 'Cargo area' is that part of the ship that contains cargo tanks, slop tanks and cargo pump rooms including pump rooms, cofferdams, ballast and void spaces adjacent to cargo tanks and also deck areas throughout the entire length and breadth of the part of the ship over the above-mentioned spaces."

Regulation 4

Fire pumps, fire mains, hydrants and hoses

In paragraph 3.3.2.6 line 3 delete "room" and insert "station".

Regulation 5

Fixed gas fire-extinguishing systems

In paragraph 2.2 line 2 delete "quantity" and insert "volume".

In paragraph 2.2 line 3 delete "quantities" and insert "volumes".

Regulation 6

Fire extinguishers

In paragraph 7 line 2 delete "provideed" and insert "provided".

Regulation 7

Fire-extinguishing arrangements in machinery spaces

In paragraph 1.2 lines 1 and 2 delete "air foam equipment" and insert "foam applicator unit".

Regulation 11

Special arrangements in machinery spaces

In the first line of paragraph 8 amend "An approved automatic fire detection and alarm system" to read "A fixed fire detection and alarm system".

Regulation 12

Automatic sprinkler, fire detection and fire alarm systems

In paragraph 3 correct "sppaced" to read "spaced".

Regulation 13

Fixed fire detection and fire alarm systems

In paragraph 2.1 lines 1, 2, 3 and 5 delete "Manual" and insert "Manually operated".

Regulation 14

*Fixed fire detection and fire alarm systems for
periodically unattended machinery spaces*

In paragraph 1, line 1 amend to read "A fixed fire detection and fire alarm system of an approved type in accordance with the".

Regulation 15

Arrangements for oil fuel, lubricating oil and other flammable oils

Insert a new paragraph 6 to read:

"6 *Prohibition of carriage of flammable oils in forepeak tanks*

Oil fuel, lubricating oil and other flammable oils shall not be carried in forepeak tanks".

Regulation 20

Fire control plans

Paragraph 1, lines 14 and 15 delete "national language" and insert "official language of the flag State".

Regulation 26

Fire integrity of bulkheads and decks in ships carrying more than 36 passengers

Paragraph 2.2, line 1 delete "for the purpose of" and insert "For".
line 10 delete "number".

Paragraph 2.2(1), line 4 delete "fire control and recording stations" and insert "fire control rooms and fire-recording stations".

Paragraph 2.2(5), line 3 delete "Air space" and insert "Air spaces".

Table 26.2, line 5 delete "space" and insert "spaces".

Regulation 27

Fire integrity of bulkheads and decks in ships carrying not more than 36 passengers

Paragraph 2.2(1), line 4 delete "stations" and insert "rooms".

In Table 27.1, line 2, column 4
line 3, column 4
line 4, column 4
line 4, column 5

replace B-0^{e/} by A-0^{a/}
A-0^{a/} B-0^{e/}.

Paragraph 4, line 4 delete "this chapter" and insert "this part".

Regulation 32

Ventilation systems

Paragraph 1.4.3.1, line 1 delete "restricted" and insert "low".

Replace Regulation 36 by:

"Regulation 36

*Fixed fire detection and fire alarm systems
Automatic sprinkler, fire detection and fire alarm systems*

In any ship to which this part applies, there shall be installed throughout each separate zone, whether vertical or horizontal, in all accommodation and service spaces and, where it is considered necessary by the Administration, in control stations, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc., either:

- .1 a fixed fire detection and fire alarm system of an approved type and complying with the requirements of regulation 13 and so installed and arranged as to detect the presence of fire in such spaces; or
- .2 an automatic sprinkler, fire detection and fire alarm system of an approved type and complying with the requirements of regulation 12 and so installed and arranged as to protect such spaces and in addition a fixed fire detection and fire alarm system of an approved type complying with the requirements of regulation 13 so installed and arranged as to provide smoke detection in corridors, stairways and escape routes within accommodation spaces."

Regulation 37

Protection of special category spaces

Amend the text of paragraph 1.4.1 to read:

"1.4.1 An efficient patrol system shall be maintained in special category spaces. In any such space in which the patrol is not maintained by a continuous fire watch at all times during the voyage there shall be provided a fixed fire detection and fire alarm system of an approved type complying with the requirements of regulation 13. The fixed fire detection system shall be capable of rapidly detecting the onset of fire. The spacing and location of detectors shall be tested to the satisfaction of the Administration taking into account the effects of ventilation and other relevant factors."

Amend the text of paragraph 2.2.1 to read:

“2.2.1 On any deck or platform, if fitted, on which vehicles are carried and on which explosive vapours might be expected to accumulate, except platforms with openings of sufficient size permitting penetration of petrol gases downwards, equipment which may constitute a source of ignition of flammable vapours and, in particular, electrical equipment and wiring, shall be installed at least 450 mm above the deck or platform. Electrical equipment installed at more than 450 mm above the deck or platform shall be of a type so enclosed and protected as to prevent the escape of sparks. However, if the Administration is satisfied that the installation of electrical equipment and wiring at less than 450 mm above the deck or platform is necessary for the safe operation of the ship, such electrical equipment and wiring may be installed provided that it is of a type approved for use in an explosive petrol and air mixture.”

Regulation 40

Fire patrols, detection, alarms and public address systems

Amend paragraphs 1 and 2 to read:

“1 Manually operated call points complying with the requirements of regulation 13 shall be installed”.

“2 A fixed fire detection and fire alarm system of an approved type shall be provided”.

Regulation 42

Structure

In paragraph 1, second line, amend “deck” to read “decks”.

Regulation 49

Restricted use of combustibile materials

Amend the text of paragraph 3 to read:

“Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of approved material which will not readily ignite, or give rise to toxic or explosive hazards at elevated temperatures. **”

Regulation 51

Arrangements for gaseous fuel for domestic purposes

Delete comma and insert “for the” after “arrangements”.

Regulation 52

Fixed fire detection and fire alarm systems
Automatic sprinkler, fire detection and fire alarm systems

Amend the first three paragraphs to read:

“1 In ships in which method IC is adopted, a fixed fire detection and fire alarm system of an approved type complying with the requirements of regulation 13 shall be so installed and arranged as to provide smoke detection and manually operated call points in all corridors, stairways and escape routes within accommodation spaces.

2 In ships in which method IIC is adopted, an automatic sprinkler, fire detection and fire alarm system of an approved type complying with the relevant requirements of regulation 12 shall be so installed and arranged as to protect accommodation spaces, galleys and other service spaces, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc. In addition, a fixed fire detection and fire alarm system of an approved type complying with the requirements of regulation 13 shall be so installed and arranged as to provide smoke detection and manually operated call points in all corridors, stairways and escape routes within accommodation spaces.

3 In ships in which method IIIC is adopted, a fixed fire detection and fire alarm system of an approved type complying with the requirements of regulation 13 shall be so installed and arranged as to detect the presence of fire in all accommodation spaces and service spaces, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc.”

Delete paragraph 4.

Regulation 53

Fire protection arrangements in cargo spaces

In paragraph 1.3, line 4, delete “by” and insert “with”.

Amend the first sentence of paragraph 2.1 to read: “There shall be provided a fixed fire detection and fire alarm system of an approved type.”

Replace paragraph 2.4.2 by the following:

“2 Above a height of 450 mm from the deck and from each platform for vehicles, if fitted, except platforms with openings of sufficient size permitting penetration of petrol gases downwards, electrical equipment of a type so enclosed and protected as to prevent the escape of sparks shall be permitted as an alternative on condition that the ventilating system is so designed and operated as to provide continuous ventilation of the cargo spaces at the rate of at least 10 air changes per hour whenever vehicles are on board.”

Regulation 54

Special requirements for ships carrying dangerous goods

In table 54.2, note f, amend “. . . in addition to those enumerated . . .” to read “. . . in addition to meeting the requirements enumerated . . .”.

Amend the first sentence in paragraph 2.3 to read: “A fixed fire detection and fire alarm system of an approved type shall be fitted to all enclosed cargo spaces including closed vehicle deck spaces.”

Regulation 55

Application

Amend paragraph 2 to read:

“Where liquid cargoes other than those referred to in paragraph 1 or liquefied gases which introduce additional fire hazards are intended to be carried, additional safety measures shall be required to the satisfaction of the Administration, having due regard to the provisions of the International Bulk Chemical Code, the Bulk Chemical Code, the International Gas Carrier Code and the Gas Carrier Code, as appropriate.”

Amend paragraph 6 to read:

“Chemical tankers and gas carriers shall comply with the requirements of this part, except where alternative and supplementary arrangements are provided to the satisfaction of the Administration, having due regard to the provisions of the International Bulk Chemical Code, the Bulk Chemical Code, the International Gas Carrier Code and the Gas Carrier Code, as appropriate.”

Regulation 56

Location and separation of spaces

Replace the text of the whole regulation by:

“1 Machinery spaces shall be positioned aft of cargo tanks and slop tanks; they shall also be situated aft of cargo pump rooms and cofferdams, but not necessarily aft of the oil fuel bunker tanks. Any machinery space shall be isolated from cargo tanks and slop tanks by cofferdams, cargo pump rooms, oil fuel bunker tanks or permanent ballast tanks. Pump rooms containing pumps and their accessories for ballasting those spaces situated adjacent to cargo tanks and slop tanks and pumps for oil fuel transfer shall be considered as equivalent to a cargo pump room within the context of this regulation, provided that such pump rooms have the same safety standard as that required for cargo pump rooms. However, the lower portion of the pump room may be recessed into machinery spaces of category A to accommodate pumps, provided that the deck head of the recess is in general not more than one third of the moulded depth above the keel, except that in the case

of ships of not more than 25,000 tonnes deadweight, where it can be demonstrated that for reasons of access and satisfactory piping arrangements this is impracticable, the Administration may permit a recess in excess of such height, but not exceeding one half of the moulded depth above the keel.

2 Accommodation spaces, main cargo control stations, control stations and service spaces (excluding isolated cargo handling gear lockers) shall be positioned aft of all cargo tanks, slop tanks, cargo pump rooms and cofferdams which isolate cargo or slop tanks from machinery spaces but not necessarily aft of the oil fuel bunker tanks. A recess provided in accordance with paragraph 1 need not be taken into account when the position of these spaces is being determined.

3 However, where deemed necessary, accommodation spaces, control stations, machinery spaces other than those of category A, and service spaces may be permitted forward of the cargo area, provided they are isolated from the cargo tanks and slop tanks by cofferdams, cargo pump rooms, oil fuel bunker tanks or permanent ballast tanks and subject to an equivalent standard of safety and appropriate availability of fire-extinguishing arrangements being provided to the satisfaction of the Administration. In addition, where deemed necessary for the safety or navigation of the ship, the Administration may permit machinery spaces containing internal combustion machinery not being main propulsion machinery having an output greater than 375 kW to be located forward of the cargo area provided the arrangements are in accordance with the provisions of this paragraph.

4 In combination carriers only:

- 1 The slop tanks are to be surrounded by cofferdams except where the boundaries of the slop tanks where slop may be carried on dry cargo voyages are the hull, main cargo deck, cargo pump room bulkhead or oil fuel bunker tank. These cofferdams shall not be open to a double bottom, pipe tunnel, pump room or other enclosed space. Means shall be provided for filling the cofferdams with water and for draining them. Where the boundary of a slop tank is the cargo pump room bulkhead the pump room shall not be open to the double bottom, pipe tunnel or other enclosed space, however, openings provided with gastight bolted covers may be permitted.
- 2 Means shall be provided for isolating the piping connecting the pump room with the slop tanks referred to in paragraph 4.1. The means of isolation shall consist of a valve followed by a spectacle flange or a spool piece with appropriate blank flanges. This arrangement shall be located adjacent to the slop tanks, but where this is unreasonable or impracticable it may be located within the pump room directly after the piping penetrates the bulkhead. A separate pumping and piping arrangement shall be provided for discharging the contents of the slop tanks directly over the open deck when the ship is in the dry cargo mode.
- 3 Hatches and tank cleaning openings to slop tanks shall only be permitted on the open deck and shall be fitted with closing arrangements. Except where they consist of bolted plates with bolts at watertight spacing, these closing arrangements shall be provided with locking arrangements which shall be under the control of the responsible ship's officer.

4 Where cargo wing tanks are provided, cargo oil lines below deck shall be installed inside these tanks. However, the Administration may permit cargo oil lines to be placed in special ducts which shall be capable of being adequately cleaned and ventilated and be to the satisfaction of the Administration. Where cargo wing tanks are not provided cargo oil lines below deck shall be placed in special ducts.

5 Where the fitting of a navigation position above the cargo area is shown to be necessary, it shall be for navigation purposes only and it shall be separated from the cargo tank deck by means of an open space with a height of at least 2 m. The fire protection of such a navigation position shall in addition be as required for control spaces in regulation 58.1 and 58.2 and other provisions, as applicable, of this part.

6 Means shall be provided to keep deck spills away from the accommodation and service areas. This may be accomplished by provision of a permanent continuous coaming of a suitable height extending from side to side. Special consideration shall be given to the arrangements associated with stern loading.

7 Exterior boundaries of superstructures and deckhouses enclosing accommodation and including any overhanging decks which support such accommodation, shall be insulated to 'A-60' standard for the whole of the portions which face the cargo area and for 3 m aft of the front boundary. In the case of the sides of those superstructures and deckhouses, such insulation shall be carried as high as is deemed necessary by the Administration.

8.1 Entrances, air inlets and openings to accommodation spaces, service spaces and control stations shall not face the cargo area. They shall be located on the transverse bulkhead not facing the cargo area or on the outboard side of the superstructure or deckhouse at a distance of at least 4% of the length of the ship but not less than 3 m from the end of the superstructure or deckhouse facing the cargo area. This distance, however, need not exceed 5 m.

8.2 No doors shall be fitted within the limits specified in paragraph 8.1 except that doors to spaces not having access to accommodation spaces, service spaces and control stations may be permitted by the Administration. Such spaces may be cargo control stations, provision rooms and store-rooms. Where such doors are fitted to spaces located aft of the cargo area, the boundaries of the space shall be insulated to 'A-60' standard, with the exception of the boundary facing the cargo area. Bolted plates for removal of machinery may be fitted within the limits specified in paragraph 8.1. Wheelhouse doors and wheelhouse windows may be located within the limits specified in paragraph 8.1 so long as they are designed to ensure that the wheelhouse can be made rapidly and efficiently gas and vapour tight.

8.3 Windows and sidescuttles facing the cargo area and on the sides of the superstructures and deckhouses within the limits specified in paragraph 8.1 shall be of the fixed (non-opening) type. Such windows and sidescuttles in the first tier on the main deck shall be fitted with inside covers of steel or other equivalent material."

Regulation 58

Fire integrity of bulkheads and decks

In table 1, note b/, line 1 – delete “b” and insert “b/”.

Paragraph 4, line 4 delete “these Requirements” and insert “this part”

Regulation 59

Venting, purging, gas freeing and ventilation

Paragraph 2, line 16 delete “gas” and insert “vapour”.

line 18 delete “gas” and insert “vapour”.

lines 16, 17 and 18 “When . . . level,” forms part of paragraph 2 and must be moved to that paragraph's margin.

Amend paragraph 3.3 as follows:

In the third sentence amend “referred to in Regulation 56.1” to read “referred to in regulation 56.4”.

In the fourth sentence amend “cargo tank area” to read “cargo area”.

Regulation 61

Fixed deck foam systems

In paragraph 1 amend “cargo tank area” to read “cargo tanks deck area”.

In paragraph 2 amend “cargo tank area” to read “cargo area” in the second sentence.

In paragraph 3.1 amend “cargo deck area” to read “cargo tanks deck area”.

In paragraph 7 in the first and second sentence amend “cargo deck” to read “cargo tank deck”.

In paragraph 8, third line, amend “400 l” to read “400 l/min”. In the fourth sentence amend “any cargo tank deck area” to read “any part of the cargo tanks deck area”.

Regulation 62

Inert gas systems

In paragraph 1 delete "non flammable" and insert "non flammable".

In paragraph 9.1, lines 2 and 3 delete "19.2" and "19.3" and insert "19.3" and "19.4" respectively.

In paragraph 10.2 amend "cargo tank area" to read "cargo area".

Replace paragraph 14.1 by:

"14.1 One or more pressure vacuum breaking devices shall be provided to prevent the cargo tanks from being subject to:

- .1 a positive pressure in excess of the test pressure of the cargo tank if the cargo were to be loaded at the maximum rated capacity and all other outlets are left shut; and
- .2 a negative pressure in excess of 700 mm water gauge if cargo were to be discharged at the maximum rated capacity of the cargo pumps and the inert gas blowers were to fail.

Such devices shall be installed on the inert gas main unless they are installed in the venting system required by regulation 59.1.1 or on individual cargo tanks."

In paragraph 20.1 amend the last line to read "10.2, 10.7, 10.9, 11.3, 11.4, 12, 13.1, 13.2, 13.4.2, 14.2 and 19.8;"

In paragraph 20.2 amend the last line to read "12, 13.1, 13.2 and 14.2."

Part 3

CHAPTER III

The existing text of chapter III is replaced by the following:

LIFE-SAVING APPLIANCES AND ARRANGEMENTS

PART A – GENERAL

Regulation 1

Application

- 1 Unless expressly provided otherwise, this chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 July 1986.
- 2 For the purpose of this chapter the term "a similar stage of construction" means the stage at which:
 - .1 construction identifiable with a specific ship begins; and
 - .2 assembly of that ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less.
- 3 For the purpose of this chapter:
 - .1 the expression "ships constructed" means "ships the keels of which are laid or which are at a similar stage of construction";
 - .2 the expression "all ships" means "ships constructed before, on or after 1 July 1986"; the expressions "all passenger ships" and "all cargo ships" shall be construed accordingly;
 - .3 a cargo ship, whenever built, which is converted to a passenger ship shall be treated as a passenger ship constructed on the date on which such a conversion commences.
- 4 For ships constructed before 1 July 1986, the Administration shall:
 - .1 ensure that, subject to the provisions of paragraph 4.2 and 4.3, the requirements which are applicable under chapter III of the International Convention for the Safety of Life at Sea, 1974, in force prior to 1 July 1986 to new or existing ships as prescribed by that chapter are complied with;

- .2 consider the life-saving appliances and arrangements in ships which do not comply with the requirements referred to in paragraph 4.1, with a view to securing, so far as this is reasonable and practicable and as early as possible, substantial compliance with those requirements;
- .3 ensure that when life-saving appliances or arrangements on such ships are replaced or such ships undergo repairs, alterations or modifications of a major character which involve replacement of, or any addition to, their existing life-saving appliances or arrangements, such life-saving appliances or arrangements, in so far as is reasonable and practicable, comply with the requirements of this chapter. However, if a survival craft is replaced without replacing its launching appliance, or vice versa, the survival craft or launching appliance may be of the same type as that replaced;
- .4 approve the life-saving appliances to be provided in compliance with paragraph 6. The Administration may permit those life-saving appliances provided on board ships prior to 1 July 1991 not to comply fully with the requirements of this chapter as long as they remain in a satisfactory condition;
- .5 except as provided for survival craft and launching appliances referred to in paragraph 4.3, ensure that life-saving appliances replaced or installed on or after 1 July 1991 are evaluated, tested and approved in accordance with the requirements of regulations 4 and 5.

5 With respect to ships constructed before 1 July 1986 the requirements of regulations 8, 9, 10, 18 and 25 and, to the extent prescribed therein, regulation 19 shall apply.

6 With respect to ships constructed before 1 July 1986 the requirements of regulations 6.2.3, 6.2.4, 21.3, 21.4, 26.3, 27.2, 27.3 and 30.2.7 shall apply not later than 1 July 1991.

Regulation 2

Exemptions

1 The Administration may, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of this chapter unreasonable or unnecessary, exempt from those requirements individual ships or classes of ships which, in the course of their voyage, do not proceed more than 20 miles from the nearest land.

2 In the case of passenger ships which are employed in special trades for the carriage of large numbers of special trade passengers, such as the pilgrim trade, the Administration, if satisfied that it is impracticable to enforce compliance with the requirements of this chapter, may exempt such ships from those requirements, provided that such ships comply fully with the provisions of:

- .1 the rules annexed to the Special Trade Passenger Ships Agreement, 1971;
and

- .2 the rules annexed to the Protocol on Space Requirements for Special Trade Passenger Ships, 1973.

Regulation 3

Definitions

For the purpose of this chapter, unless expressly provided otherwise:

- 1 *Certificated person* is a person who holds a certificate of proficiency in survival craft issued under the authority of, or recognized as valid by, the Administration in accordance with the requirements of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, in force; or a person who holds a certificate issued or recognized by the Administration of a State not a Party to that Convention for the same purpose as the convention certificate.
- 2 *Detection* is the determination of the location of survivors or survival craft.
- 3 *Embarkation ladder* is the ladder provided at survival craft embarkation stations to permit safe access to survival craft after launching.
- 4 *Float-free launching* is that method of launching a survival craft whereby the craft is automatically released from a sinking ship and is ready for use.
- 5 *Free-fall launching* is that method of launching a survival craft whereby the craft with its complement of persons and equipment on board is released and allowed to fall into the sea without any restraining apparatus.
- 6 *Immersion suit* is a protective suit which reduces the body heat-loss of a person wearing it in cold water.
- 7 *Inflatable appliance* is an appliance which depends upon non-rigid, gas filled chambers for buoyancy and which is normally kept uninflated until ready for use.
- 8 *Inflated appliance* is an appliance which depends upon non-rigid, gas filled chambers for buoyancy and which is kept inflated and ready for use at all times.
- 9 *Launching appliance or arrangement* is a means of transferring a survival craft or rescue boat from its stowed position safely to the water.
- 10 *Length* is 96% of the total length on a waterline at 85% of the least moulded depth measured from the top of the keel, or the length from the fore-side of the stem to the axis of the rudder stock on that waterline, if that be greater. In ships designed with a rake of keel the waterline on which this is measured shall be parallel to the designed waterline.
- 11 *Moulded depth*
 - .1 The moulded depth is the vertical distance measured from the top of the keel to the top of the freeboard deck beam at side. In wood and composite ships the distance is measured from the lower edge of the keel rabbet. Where the form at the lower part of the midship section is of

a hollow character, or where thick garboards are fitted, the distance is measured from the point where the line of the flat of the bottom continued inwards cuts the side of the keel.

- .2 In ships having rounded gunwales, the moulded depth shall be measured to the point of intersection of the moulded lines of the deck and side shell plating, the lines extending as though the gunwale were of angular design.
- .3 Where the freeboard deck is stepped and the raised part of the deck extends over the point at which the moulded depth is to be determined, the moulded depth shall be measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part.

12 *Novel life-saving appliance or arrangement* is a life-saving appliance or arrangement which embodies new features not fully covered by the provisions of this chapter but which provides an equal or higher standard of safety.

13 *Rescue boat* is a boat designed to rescue persons in distress and to marshal survival craft.

14 *Retrieval* is the safe recovery of survivors.

15 *Retro-reflective material* is a material which reflects in the opposite direction a beam of light directed on it.

16 *Short international voyage* is an international voyage in the course of which a ship is not more than 200 miles from a port or place in which the passengers and crew could be placed in safety. Neither the distance between the last port of call in the country in which the voyage begins and the final port of destination nor the return voyage shall exceed 600 miles. The final port of destination is the last port of call in the scheduled voyage at which the ship commences its return voyage to the country in which the voyage began.

17 *Survival craft* is a craft capable of sustaining the lives of persons in distress from the time of abandoning the ship.

18 *Thermal protective aid* is a bag or suit made of waterproof material with low thermal conductivity.

Regulation 4

Evaluation, testing and approval of life-saving appliances and arrangements

1 Except as provided in paragraphs 5 and 6, life-saving appliances and arrangements required by this chapter shall be approved by the Administration.

2 Before giving approval to life-saving appliances and arrangements, the Administration shall ensure that such life-saving appliances and arrangements:

- .1 are tested, to confirm that they comply with the requirements of this chapter, in accordance with the recommendations of the Organization;* or
 - .2 have successfully undergone, to the satisfaction of the Administration, tests which are substantially equivalent to those specified in those recommendations.
- 3 Before giving approval to novel life-saving appliances or arrangements, the Administration shall ensure that such appliances or arrangements:
- .1 provide safety standards at least equivalent to the requirements of this chapter and have been evaluated and tested in accordance with the recommendations of the Organization;** or
 - .2 have successfully undergone, to the satisfaction of the Administration, evaluation and tests which are substantially equivalent to those recommendations.
- 4 Procedures adopted by the Administration for approval shall also include the conditions whereby approval would continue or would be withdrawn.
- 5 Before accepting life-saving appliances and arrangements that have not been previously approved by the Administration, the Administration shall be satisfied that life-saving appliances and arrangements comply with the requirements of this chapter.
- 6 Life-saving appliances required by this chapter for which detailed specifications are not included in part C shall be to the satisfaction of the Administration.

Regulation 5

Production tests

The Administration shall require life-saving appliances to be subjected to such production tests as are necessary to ensure that the life-saving appliances are manufactured to the same standard as the approved prototype.

* Reference is made to the "Recommendation on testing of life-saving appliances" to be submitted to the Assembly of the Organization at its thirteenth session for adoption.

** Reference is made to the "Code of practice for the evaluation, testing and acceptance of prototype novel life-saving appliances and arrangements" to be submitted to the Assembly of the Organization at its thirteenth session for adoption.

PART B – SHIP REQUIREMENTS

SECTION I – PASSENGER SHIPS AND CARGO SHIPS

Regulation 6

Communications

1 Paragraphs 2.3 and 2.4 apply to all ships. With respect to ships constructed before 1 July 1986, paragraphs 2.3 and 2.4 shall apply not later than 1 July 1991.

2 *Radio life-saving appliances*

2.1 *Portable radio apparatus for survival craft*

2.1.1 A portable radio apparatus for survival craft complying with the requirements of regulation IV/14 shall be provided. The portable radio apparatus shall be stowed in a protected and easily accessible position ready to be moved to any survival craft in an emergency, except that in the case of a ship with lifeboats stowed in widely separated positions fore and aft, the portable radio apparatus shall be stowed in the vicinity of the lifeboats which are furthest away from the ship's main transmitter.

2.1.2 The requirements of paragraph 2.1.1 need not be complied with if a radio installation complying with the requirements of regulation IV/13 is fitted in a lifeboat on each side of the ship or in the stern-launched lifeboat referred to in regulation 26.1.2.1.

2.1.3 On ships engaged on voyages of such duration that in the opinion of the Administration portable radio apparatus for survival craft is unnecessary, the Administration may allow such equipment to be dispensed with.

2.2 *Radiotelegraph installation for lifeboats*

On passenger ships engaged on international voyages which are not short international voyages:

- .1 where the total number of persons on board is more than 199 but less than 1,500, a radiotelegraph installation complying with the requirements of regulation IV/13 shall be fitted in at least one of the lifeboats required by regulation 20.1.1.1;
- .2 where the total number of persons on board is 1,500 or more, at least one lifeboat on each side shall be so fitted.

2.3 *Survival craft emergency position-indicating radio beacons*

One manually activated emergency position-indicating radio beacon complying with the requirements of regulation IV/14.1 shall be carried on each side of the ship. They shall be so stowed that they can be rapidly placed in any survival craft other than the liferaft or liferafts required by regulation 26.1.4.

2.4 *Two-way radiotelephone apparatus*

2.4.1 Two-way radiotelephone apparatus complying with the requirements of regulation IV/14-3 shall be provided for communication between survival craft, between survival craft and ship and between ship and rescue boat. An apparatus need not be provided for every survival craft; however, at least three apparatus shall be provided on each ship. This requirement may be complied with by other apparatus used on board provided such apparatus is not incompatible with the appropriate requirements of regulation IV/14-3.

2.4.2 For ships constructed before 1 July 1986 such apparatus need only comply with the frequency requirements of regulation IV/14-3.

3 *Distress flares*

Not less than 12 rocket parachute flares, complying with the requirements of regulation 35, shall be carried and be stowed on or near the navigating bridge.

4 *On-board communications and alarm systems*

4.1 An emergency means comprised of either fixed or portable equipment or both shall be provided for two-way communications between emergency control stations, muster and embarkation stations and strategic positions on board.

4.2 A general emergency alarm system complying with the requirements of regulation 50 shall be provided and shall be used for summoning passengers and crew to muster stations and to initiate the actions included in the muster list. The system shall be supplemented by either a public address system or other suitable means of communication.

Regulation 7

Personal life-saving appliances

1 *Lifebuoys*

1.1 Lifebuoys complying with the requirements of regulation 31.1 shall be:

- .1 so distributed as to be readily available on both sides of the ship and as far as practicable on all open decks extending to the ship's side; at least one shall be placed in the vicinity of the stern;
- .2 so stowed as to be capable of being rapidly cast loose, and not permanently secured in any way.

1.2 At least one lifebuoy on each side of the ship shall be fitted with a buoyant lifeline complying with the requirements of regulation 31.4 equal in length to not less than twice the height at which it is stowed above the waterline in the lightest seagoing condition, or 30 m, whichever is the greater.

1.3 Not less than one half of the total number of lifebuoys shall be provided with self-igniting lights complying with the requirements of regulation 31.2; not less than two of these shall also be provided with self-activating smoke signals complying with the requirements of regulation 31.3 and be capable of quick release from the navigating bridge; lifebuoys with lights and those with lights and smoke signals shall be equally distributed on both sides of the ship and shall not be the lifebuoys provided with lifelines in compliance with the requirements of paragraph 1.2.

1.4 Each lifebuoy shall be marked in block capitals of the Roman alphabet with the name and port of registry of the ship on which it is carried.

2 *Lifejackets*

2.1 A lifejacket complying with the requirements of regulation 32.1 or 32.2 shall be provided for every person on board the ship and, in addition:

- 1 a number of lifejackets suitable for children equal to at least 10% of the number of passengers on board shall be provided or such greater number as may be required to provide a lifejacket for each child;
- 2 a sufficient number of lifejackets shall be carried for persons on watch and for use at remotely located survival craft stations.

2.2 Lifejackets shall be so placed as to be readily accessible and their position shall be plainly indicated. Where, due to the particular arrangements of the ship, the lifejackets provided in compliance with the requirements of paragraph 2.1 may become inaccessible, alternative provisions shall be made to the satisfaction of the Administration which may include an increase in the number of lifejackets to be carried.

3 *Immersion suits*

3.1 An immersion suit, of an appropriate size, complying with the requirements of regulation 33 shall be provided for every person assigned to crew the rescue boat.

Regulation 8

Muster list and emergency instructions

- 1 This regulation applies to all ships.
- 2 Clear instructions to be followed in the event of an emergency shall be provided for every person on board.
- 3 Muster lists complying with the requirements of regulation 53 shall be exhibited in conspicuous places throughout the ship including the navigating bridge, engine-room and crew accommodation spaces.
- 4 Illustrations and instructions in appropriate languages shall be posted in passenger cabins and be conspicuously displayed at muster stations and other passenger spaces to inform passengers of:

- .1 their muster station;
- .2 the essential actions they must take in an emergency;
- .3 the method of donning lifejackets.

Regulation 9

Operating instructions

- 1 This regulation applies to all ships.
- 2 Posters or signs shall be provided on or in the vicinity of survival craft and their launching controls and shall:
 - .1 illustrate the purpose of controls and the procedures for operating the appliance and give relevant instructions or warnings;
 - .2 be easily seen under emergency lighting conditions;
 - .3 use symbols in accordance with the recommendations of the Organization.

Regulation 10

Manning of survival craft and supervision

- 1 This regulation applies to all ships.
- 2 There shall be a sufficient number of trained persons on board for mustering and assisting untrained persons.
- 3 There shall be a sufficient number of crew members, who may be deck officers or certificated persons, on board for operating the survival craft and launching arrangements required for abandonment by the total number of persons on board.
- 4 A deck officer or certificated person shall be placed in charge of each survival craft to be used. However, the Administration, having due regard to the nature of the voyage, the number of persons on board and the characteristics of the ship, may permit persons practised in the handling and operation of liferafts to be placed in charge of liferafts in lieu of persons qualified as above. A second-in-command shall also be nominated in the case of lifeboats.
- 5 The person in charge of the survival craft shall have a list of the survival craft crew and shall see that the crew under his command are acquainted with their duties. In lifeboats the second-in-command shall also have a list of the lifeboat crew.
- 6 Every lifeboat required to carry a radiotelegraph installation complying with the requirements of regulation 6.2.2 shall have a person assigned who is capable of operating the equipment.

7 Every motorized survival craft shall have a person assigned who is capable of operating the engine and carrying out minor adjustments.

8 The master shall ensure the equitable distribution of persons referred to in paragraphs 2, 3 and 4 among the ship's survival craft.

Regulation 11

Survival craft muster and embarkation arrangements

1 Lifeboats and liferafts for which approved launching appliances are required shall be stowed as close to accommodation and service spaces as possible.

2 Muster stations shall be provided close to the embarkation stations. Each muster station shall have sufficient space to accommodate all persons assigned to muster at that station.

3 Muster and embarkation stations shall be readily accessible from accommodation and work areas.

4 Muster and embarkation stations shall be adequately illuminated by lighting supplied from the emergency source of electrical power required by regulation II-1/42 or II-1/43, as appropriate.

5 Alleyways, stairways and exits giving access to the muster and embarkation stations shall be lighted. Such lighting shall be capable of being supplied by the emergency source of electrical power required by regulation II-1/42 or II-1/43, as appropriate.

6 Davit-launched survival craft muster and embarkation stations shall be so arranged as to enable stretcher cases to be placed in survival craft.

7 An embarkation ladder complying with the requirements of regulation 48.7 extending, in a single length, from the deck to the waterline in the lightest seagoing condition under unfavourable conditions of trim and with the ship listed not less than 15° either way shall be provided at each launching station or at every two adjacent launching stations. However, the Administration may permit such ladders to be replaced by approved devices to afford access to the survival craft when waterborne, provided that there shall be at least one embarkation ladder on each side of the ship. Other means of embarkation may be permitted for the liferafts required by regulation 26.1.4.

8 Where necessary, means shall be provided for bringing the davit-launched survival craft against the ship's side and holding them alongside so that persons can be safely embarked.

Regulation 12

Launching stations

Launching stations shall be in such positions as to ensure safe launching having particular regard to clearance from the propeller and steeply overhanging portions of the hull and so that, as far as possible, survival craft, except survival

craft specially designed for free-fall launching, can be launched down the straight side of the ship. If positioned forward, they shall be located abaft the collision bulkhead in a sheltered position and, in this respect, the Administration shall give special consideration to the strength of the launching appliance.

Regulation 13

Stowage of survival craft

- 1 Each survival craft shall be stowed:
 - 1 so that neither the survival craft nor its stowage arrangements will interfere with the operation of any other survival craft or rescue boat at any other launching station;
 - 2 as near the water surface as is safe and practicable and, in the case of a survival craft other than a liferaft intended for throw-overboard launching, in such a position that the survival craft in the embarkation position is not less than 2 m above the waterline with the ship in the fully loaded condition under unfavourable conditions of trim and listed up to 20° either way, or to the angle at which the ship's weatherdeck edge becomes submerged, whichever is less;
 - 3 in a state of continuous readiness so that two crew members can carry out preparations for embarkation and launching in less than 5 min;
 - 4 fully equipped as required by this chapter;
 - 5 as far as practicable, in a secure and sheltered position and protected from damage by fire and explosion.

2 Lifeboats for lowering down the ship's side shall be stowed as far forward of the propeller as practicable. On cargo ships of 80 m in length and upwards but less than 120 m in length, each lifeboat shall be so stowed that the after end of the lifeboat is not less than the length of the lifeboat forward of the propeller. On cargo ships of 120 m in length and upwards and passenger ships of 80 m in length and upwards, each lifeboat shall be so stowed that the after end of the lifeboat is not less than 1.5 times the length of the lifeboat forward of the propeller. Where appropriate, the ship shall be so arranged that lifeboats, in their stowed positions, are protected from damage by heavy seas.

3 Lifeboats shall be stowed attached to launching appliances.

4 In addition to meeting the requirements of regulations 23 and 29, liferafts shall be so stowed as to permit manual release from their securing arrangements.

5 Davit-launched liferafts shall be stowed within reach of the lifting hooks, unless some means of transfer is provided which is not rendered inoperable within the limits of trim and list prescribed in paragraph 1.2 or by ship motion or power failure.

6 Liferrafts intended for throw-overboard launching shall be so stowed as to be readily transferable for launching on either side of the ship unless liferafts, of the aggregate capacity required by regulation 26.1 to be capable of being launched on either side, are stowed on each side of the ship.

Regulation 14

Stowage of rescue boats

Rescue boats shall be stowed:

- .1 in a state of continuous readiness for launching in not more than 5 min;
- .2 in a position suitable for launching and recovery;
- .3 so that neither the rescue boat nor its stowage arrangements will interfere with the operation of any survival craft at any other launching station;
- .4 if it is also a lifeboat, in compliance with the requirements of regulation 13.

Regulation 15

Survival craft launching and recovery arrangements

1 Launching appliances complying with the requirements of regulation 48 shall be provided for all survival craft except:

- .1 survival craft which are boarded from a position on deck which is less than 4.5 m above the waterline in the lightest seagoing condition and which either:
 - .1.1 have a mass of not more than 185 kg; or
 - .1.2 are stowed for launching directly from the stowed position under unfavourable conditions of trim of up to 10° and with the ship listed not less than 20° either way;
- .2 survival craft having a mass of not more than 185 kg and which are carried in excess of the survival craft for 200% of the total number of persons on board the ship.

2 Each lifeboat shall be provided with an appliance which is capable of launching and recovering the lifeboat.

3 Launching and recovery arrangements shall be such that the appliance operator on the ship is able to observe the survival craft at all times during launching and for lifeboats during recovery.

4 Only one type of release mechanism shall be used for similar survival craft carried on board the ship.

5 Preparation and handling of survival craft at any one launching station shall not interfere with the prompt preparation and handling of any other survival craft or rescue boat at any other station.

6 Falls, where used, shall be long enough for the survival craft to reach the water with the ship in its lightest seagoing condition, under unfavourable conditions of trim and with the ship listed not less than 20° either way.

7 During preparation and launching, the survival craft, its launching appliance, and the area of water into which it is to be launched shall be adequately illuminated by lighting supplied from the emergency source of electrical power required by regulation II-1/42 or II-1/43, as appropriate.

8 Means shall be available to prevent any discharge of water on to survival craft during abandonment.

9 If there is a danger of the survival craft being damaged by the ship's stabilizer wings, means shall be available, powered by an emergency source of energy, to bring the stabilizer wings inboard; indicators operated by an emergency source of energy shall be available on the navigating bridge to show the position of the stabilizer wings.

10 If lifeboats complying with the requirements of regulation 42 or 43 are carried, a davit span shall be provided, fitted with not less than two lifelines of sufficient length to reach the water with the ship in its lightest seagoing condition, under unfavourable conditions of trim and with the ship listed not less than 20° either way.

Regulation 16

Rescue boat embarkation, launching and recovery arrangements

1 The rescue boat embarkation and launching arrangements shall be such that the rescue boat can be boarded and launched in the shortest possible time.

2 If the rescue boat is one of the ship's survival craft, the embarkation arrangements and launching station shall comply with the requirements of regulations 11 and 12.

3 Launching arrangements shall comply with the requirements of regulation 15. However, all rescue boats shall be capable of being launched, where necessary utilizing painters, with the ship making headway at speeds up to 5 knots in calm water.

4 Rapid recovery of the rescue boat shall be possible when loaded with its full complement of persons and equipment. If the rescue boat is also a lifeboat, rapid recovery shall be possible when loaded with its lifeboat equipment and the approved rescue boat complement of at least six persons.

Regulation 17

Line-throwing appliances

A line-throwing appliance complying with the requirements of regulation 49 shall be provided.

Regulation 18

Abandon ship training and drills

1 This regulation applies to all ships.

2 *Manuals*

A training manual complying with the requirements of regulation 51 shall be provided in each crew messroom and recreation room or in each crew cabin.

3 *Practice musters and drills*

3.1 Each member of the crew shall participate in at least one abandon ship drill and one fire drill every month. The drills of the crew shall take place within 24 h of the ship leaving a port if more than 25% of the crew have not participated in abandon ship and fire drills on board that particular ship in the previous month. The Administration may accept other arrangements that are at least equivalent for those classes of ship for which this is impracticable.

3.2 On a ship engaged on an international voyage which is not a short international voyage, musters of the passengers shall take place within 24 h after their embarkation. Passengers shall be instructed in the use of the lifejackets and the action to take in an emergency. If only a small number of passengers embark at a port after the muster has been held it shall be sufficient, instead of holding another muster, to draw the attention of these passengers to the emergency instructions required by regulations 8.2 and 8.4.

3.3 On a ship engaged on a short international voyage, if a muster of the passengers is not held on departure, the attention of the passengers shall be drawn to the emergency instructions required by regulations 8.2 and 8.4.

3.4 Each abandon ship drill shall include.

- .1 summoning of passengers and crew to muster stations with the alarm required by regulation 6.4.2 and ensuring that they are made aware of the order to abandon ship specified in the muster list;
- .2 reporting to stations and preparing for the duties described in the muster list;
- .3 checking that passengers and crew are suitably dressed;
- .4 checking that lifejackets are correctly donned;

- 5 lowering of at least one lifeboat after any necessary preparation for launching;
 - .6 starting and operating the lifeboat engine;
 - .7 operation of davits used for launching liferafts.
- 3.5 Different lifeboats shall, as far as practicable, be lowered in compliance with the requirements of paragraph 3.4.5 at successive drills.
- 3.6 Drills shall, as far as practicable, be conducted as if there were an actual emergency.
- 3.7 Each lifeboat shall be launched with its assigned operating crew aboard and manoeuvred in the water at least once every 3 months during an abandon ship drill. The Administration may allow ships operating on short international voyages not to launch the lifeboats on one side if their berthing arrangements in port and their trading patterns do not permit launching of lifeboats on that side. However, all such lifeboats shall be lowered at least once every 3 months and launched at least annually.
- 3.8 As far as is reasonable and practicable, rescue boats other than lifeboats which are also rescue boats, shall be launched each month with their assigned crew aboard and manoeuvred in the water. In all cases this requirement shall be complied with at least once every 3 months.
- 3.9 If lifeboat and rescue boat launching drills are carried out with the ship making headway, such drills shall, because of the dangers involved, be practised in sheltered waters only and under the supervision of an officer experienced in such drills.
- 3.10 Emergency lighting for mustering and abandonment shall be tested at each abandon ship drill.

4 *On-board training and instructions*

- 4.1 On-board training in the use of the ship's life-saving appliances, including survival craft equipment, shall be given as soon as possible but not later than 2 weeks after a crew member joins the ship. However, if the crew member is on a regularly scheduled rotating assignment to the ship, such training shall be given not later than 2 weeks after the time of first joining the ship.
- 4.2 Instructions in the use of the ship's life-saving appliances and in survival at sea shall be given at the same interval as the drills. Individual instruction may cover different parts of the ship's life-saving system, but all the ship's life-saving equipment and appliances shall be covered within any period of 2 months. Each member of the crew shall be given instructions which shall include but not necessarily be limited to:
- .1 operation and use of the ship's inflatable liferafts;
 - .2 problems of hypothermia, first-aid treatment for hypothermia and other appropriate first-aid procedures;

- .3 special instructions necessary for use of the ship's life-saving appliances in severe weather and severe sea conditions.

4.3 On-board training in the use of davit-launched liferafts shall take place at intervals of not more than 4 months on every ship fitted with such appliances. Whenever practicable this shall include the inflation and lowering of a liferaft. This liferaft may be a special liferaft intended for training purposes only, which is not part of the ship's life-saving equipment; such a special liferaft shall be conspicuously marked.

5 *Records*

The date when musters are held, details of abandon ship drills and fire drills, drills of other life-saving appliances and on-board training shall be recorded in such log-book as may be prescribed by the Administration. If a full muster, drill or training session is not held at the appointed time, an entry shall be made in the log-book stating the circumstances and the extent of the muster, drill or training session held.

Regulation 19

Operational readiness, maintenance and inspections

1 This regulation applies to all ships. The requirements of paragraphs 3 and 6.2 shall be complied with, as far as is practicable, on ships constructed before 1 July 1986.

2 *Operational readiness*

Before the ship leaves port and at all times during the voyage, all life-saving appliances shall be in working order and ready for immediate use.

3 *Maintenance*

3.1 Instructions for on-board maintenance of life-saving appliances complying with the requirements of regulation 52 shall be provided and maintenance shall be carried out accordingly.

3.2 The Administration may accept, in lieu of the instructions required by paragraph 3.1, a shipboard planned maintenance programme which includes the requirements of regulation 52.

4 *Maintenance of falls*

Falls used in launching shall be turned end for end at intervals of not more than 30 months and be renewed when necessary due to deterioration of the falls or at intervals of not more than 5 years, whichever is the earlier.

5 *Spares and repair equipment*

Spares and repair equipment shall be provided for life-saving appliances and their components which are subject to excessive wear or consumption and need to be replaced regularly.

6 *Weekly inspection*

The following tests and inspections shall be carried out weekly:

- .1 all survival craft, rescue boats and launching appliances shall be visually inspected to ensure that they are ready for use;
- .2 all engines in lifeboats and rescue boats shall be run ahead and astern for a total period of not less than 3 min provided the ambient temperature is above the minimum temperature required for starting the engine. In special cases the Administration may waive this requirement for ships constructed before 1 July 1986;
- .3 the general emergency alarm system shall be tested.

7 *Monthly inspections*

Inspection of the life-saving appliances, including lifeboat equipment, shall be carried out monthly using the checklist required by regulation 52.1 to ensure that they are complete and in good order. A report of the inspection shall be entered in the log-book.

8 *Servicing of inflatable liferafts, inflatable lifejackets and inflated rescue boats*

8.1 Every inflatable liferaft and inflatable lifejacket shall be serviced:

- .1 at intervals not exceeding 12 months. However, in cases where it appears proper and reasonable, the Administration may extend this period to 17 months;
- .2 at an approved servicing station which is competent to service them, maintains proper servicing facilities and uses only properly trained personnel.*

8.2 All repairs and maintenance of inflated rescue boats shall be carried out in accordance with the manufacturer's instructions. Emergency repairs may be carried out on board the ship; however, permanent repairs shall be effected at an approved servicing station.

* Reference is made to the "Recommendation on the conditions for the approval of servicing stations for inflatable liferafts" adopted by the Organization by resolution A.333(IX).

9 *Periodic servicing of hydrostatic release units*

Hydrostatic release units shall be serviced:

- .1 at intervals not exceeding 12 months. However, in cases where it appears proper and reasonable, the Administration may extend this period to 17 months;
- .2 at a servicing station which is competent to service them, maintains proper servicing facilities and uses only properly trained personnel.

SECTION II – PASSENGER SHIPS

(ADDITIONAL REQUIREMENTS)

Regulation 20

Survival craft and rescue boats

1 *Survival craft*

1.1 Passenger ships engaged on international voyages which are not short international voyages shall carry:

- .1 lifeboats complying with the requirements of regulation 42, 43, or 44 on each side of such aggregate capacity as will accommodate not less than 50% of the total number of persons on board. The Administration may permit the substitution of lifeboats by liferafts of equivalent total capacity provided that there shall never be less than sufficient lifeboats on each side of the ship to accommodate 37.5% of the total number of persons on board. The liferafts shall comply with the requirements of regulation 39 or 40 and shall be served by launching appliances equally distributed on each side of the ship; and
- .2 in addition, liferafts complying with the requirements of regulation 39 or 40 of such aggregate capacity as will accommodate at least 25% of the total number of persons on board. These liferafts shall be served by at least one launching appliance on each side which may be those provided in compliance with the requirements of paragraph 1.1.1 or equivalent approved appliances capable of being used on both sides. However, stowage of these liferafts need not comply with the requirements of regulation 13.5.

1.2 Passenger ships engaged on short international voyages and complying with the special standards of subdivision prescribed by regulation II-1/6.5 shall carry:

- .1 lifeboats complying with the requirements of regulation 42, 43 or 44 equally distributed, as far as practicable, on each side of the ship and of such aggregate capacity as will accommodate at least 30% of the total

number of persons on board and liferafts complying with requirements of regulation 39 or 40 of such aggregate capacity that, together with the lifeboat capacity, the survival craft will accommodate the total number of persons on board. The liferafts shall be served by launching appliances equally distributed on each side of the ship; and

- .2 in addition, liferafts complying with the requirements of regulation 39 or 40 of such aggregate capacity as will accommodate at least 25% of the total number of persons on board. These liferafts shall be served by at least one launching appliance on each side which may be those provided in compliance with the requirements of paragraph 1.2.1 or equivalent approved appliances capable of being used on both sides. However, stowage of these liferafts need not comply with the requirements of regulation 13.5.

1.3 Passenger ships engaged on short international voyages and not complying with the special standard of subdivision prescribed by regulation II-1/6.5, shall carry survival craft complying with the requirements of paragraph 1.1.

1.4 All survival craft required to provide for abandonment by the total number of persons on board shall be capable of being launched with their full complement of persons and equipment within a period of 30 min from the time the abandon ship signal is given.

1.5 In lieu of meeting the requirements of paragraph 1.1, 1.2 or 1.3, passenger ships of less than 500 tons gross tonnage where the total number of persons on board is less than 200, may comply with the following:

- .1 They shall carry on each side of the ship, liferafts complying with the requirements of regulation 39 or 40 and of such aggregate capacity as will accommodate the total number of persons on board.
- .2 Unless the liferafts required by paragraph 1.5.1 can be readily transferred for launching on either side of the ship, additional liferafts shall be provided so that the total capacity available on each side will accommodate 150% of the total number of persons on board.
- .3 If the rescue boat required by paragraph 2.2 is also a lifeboat complying with the requirements of regulation 42, 43 or 44, it may be included in the aggregate capacity required by paragraph 1.5.1, provided that the total capacity available on either side of the ship is at least 150% of the total number of persons on board.
- .4 In the event of any one survival craft being lost or rendered unserviceable, there shall be sufficient survival craft available for use on each side to accommodate the total number of persons on board.

2 *Rescue boats*

2.1 Passenger ships of 500 tons gross tonnage and over shall carry at least one rescue boat complying with the requirements of regulation 47 on each side of the ship.

2.2 Passenger ships of less than 500 tons gross tonnage shall carry at least one rescue boat complying with the requirements of regulation 47.

2.3 A lifeboat may be accepted as a rescue boat provided it also complies with the requirements for a rescue boat.

3 *Marshalling of liferafts*

3.1 The number of lifeboats and rescue boats that are carried on passenger ships shall be sufficient to ensure that in providing for abandonment by the total number of persons on board not more than six liferafts need be marshalled by each lifeboat or rescue boat.

3.2 The number of lifeboats and rescue boats that are carried on passenger ships engaged on short international voyages and complying with the special standards of subdivision prescribed by regulation II-1/6.5 shall be sufficient to ensure that in providing for abandonment by the total number of persons on board not more than nine liferafts need be marshalled by each lifeboat or rescue boat.

Regulation 21

Personal life-saving appliances

1 *Lifebuoys*

1.1 A passenger ship shall carry not less than the number of lifebuoys complying with the requirements of regulations 7.1 and 31 prescribed in the following table:

Length of ship in metres	Minimum number of lifebuoys
Under 60	8
60 and under 120	12
120 and under 180	18
180 and under 240	24
240 and over	30

1.2 Notwithstanding regulation 7.1.3, passenger ships of under 60 m in length shall carry not less than six lifebuoys provided with self-igniting lights.

2 *Lifejackets*

In addition to the lifejackets required by regulation 7.2, every passenger ship shall carry lifejackets for not less than 5% of the total number of persons on board. These lifejackets shall be stowed in conspicuous places on deck or at muster stations.

3 *Lifejacket lights*

3.1 This paragraph applies to all passenger ships. With respect to passenger ships constructed before 1 July 1986, the requirements of this paragraph shall apply not later than 1 July 1991.

3.2 On passenger ships engaged on international voyages which are not short international voyages each lifejacket shall be fitted with a light complying with the requirements of regulation 32.3.

4 *Immersion suits and thermal protective aids*

4.1 This paragraph applies to all passenger ships. With respect to passenger ships constructed before 1 July 1986, the requirements of this paragraph shall apply not later than 1 July 1991.

4.2 Passenger ships shall carry for each lifeboat on the ship at least three immersion suits complying with the requirements of regulation 33 and, in addition, a thermal protective aid complying with the requirements of regulation 34 for every person to be accommodated in the lifeboat and not provided with an immersion suit. These immersion suits and thermal protective aids need not be carried:

- .1 for persons to be accommodated in totally or partially enclosed lifeboats;
or
- .2 if the ship is constantly engaged on voyages in warm climates where, in the opinion of the Administration, thermal protective aids are unnecessary.

4.3 The provisions of paragraph 4.2.1 also apply to totally or partially enclosed lifeboats not complying with the requirements of regulation 42, 43 or 44, provided they are carried on ships constructed before 1 July 1986.

Regulation 22

Survival craft and rescue boat embarkation arrangements

1 On passenger ships, survival craft embarkation arrangements shall be designed for:

- .1 all lifeboats to be boarded and launched either directly from the stowed position or from an embarkation deck but not both;
- .2 davit-launched liferafts to be boarded and launched from a position immediately adjacent to the stowed position or from a position to which, in compliance with the requirements of regulation 13.5, the liferaft is transferred prior to launching.

2 Rescue boat arrangements shall be such that the rescue boat can be boarded and launched directly from the stowed position with the number of persons assigned to crew the rescue boat on board. Notwithstanding the requirements of

paragraph 1.1, if the rescue boat is also a lifeboat and the other lifeboats are boarded and launched from an embarkation deck, the arrangements shall be such that the rescue boat can also be boarded and launched from the embarkation deck.

Regulation 23

Stowage of liferafts

On passenger ships, every liferaft shall be stowed with its painter permanently attached to the ship and with a float-free arrangement complying with the requirements of regulation 38.6 so that, as far as practicable, the liferaft floats free and, if inflatable, inflates automatically when the ship sinks.

Regulation 24

Muster stations

Every passenger ship shall, in addition to complying with the requirements of regulation 11, have passenger muster stations which shall:

- .1 be in the vicinity of, and permit ready access for the passengers to, the embarkation stations unless in the same location;
- .2 have ample room for marshalling and instruction of the passengers.

Regulation 25

Drills

- 1 This regulation applies to all passenger ships.
- 2 On passenger ships, an abandon ship drill and fire drill shall take place weekly.

SECTION III – CARGO SHIPS
(ADDITIONAL REQUIREMENTS)

Regulation 26

Survival craft and rescue boats

1 *Survival craft*

1.1 Cargo ships shall carry:

- 1 one or more lifeboats complying with the requirements of regulation 44 of such aggregate capacity on each side of the ship as will accommodate the total number of persons on board. The Administration may, however, permit cargo ships (except oil tankers, chemical tankers and gas carriers) operating under favourable climatic conditions and in suitable areas, to carry lifeboats complying with the requirements of regulation 43, provided the limits of the trade area are specified in the Cargo Ship Safety Equipment Certificate; and
- 2 in addition, a liferaft or liferafts, complying with the requirements of regulation 39 or 40, capable of being launched on either side of the ship and of such aggregate capacity as will accommodate the total number of persons on board. If the liferaft or liferafts cannot be readily transferred for launching on either side of the ship, the total capacity available on each side shall be sufficient to accommodate the total number of persons on board.

1.2 In lieu of meeting the requirements of paragraph 1.1, cargo ships may carry:

- 1 one or more lifeboats, complying with the requirements of regulation 44, capable of being free fall launched over the stern of the ship of such aggregate capacity as will accommodate the total number of persons on board; and
- 2 in addition, one or more liferafts complying with the requirements of regulation 39 or 40, on each side of the ship, of such aggregate capacity as will accommodate the total number of persons on board. The liferafts on at least one side of the ship shall be served by launching appliances.

1.3 In lieu of meeting the requirements of paragraph 1.1 or 1.2, cargo ships of less than 85 m in length other than oil tankers, chemical tankers and gas carriers, may comply with the following:

- 1 They shall carry on each side of the ship, one or more liferafts complying with the requirements of regulation 39 or 40 and of such aggregate capacity as will accommodate the total number of persons on board.
- 2 Unless the liferafts required by paragraph 1.3.1 can be readily transferred for launching on either side of the ship, additional liferafts shall be provided so that the total capacity available on each side will accommodate 150% of the total number of persons on board.

- .3 If the rescue boat required by paragraph 2 is also a lifeboat complying with the requirements of regulation 43 or 44, it may be included in the aggregate capacity required by paragraph 1.3.1, provided that the total capacity available on either side of the ship is at least 150% of the total number of persons on board.
- .4 In the event of any one survival craft being lost or rendered unserviceable, there shall be sufficient survival craft available for use on each side to accommodate the total number of persons on board.

1.4 Cargo ships where the survival craft are stowed in a position which is more than 100 m from the stem or stern shall carry, in addition to the liferafts required by paragraphs 1.1.2 and 1.2.2, a liferaft stowed as far forward or aft, or one as far forward and another as far aft, as is reasonable and practicable. Notwithstanding the requirements of regulation 29, such liferaft or liferafts may be securely fastened so as to permit manual release and need not be of the type which can be launched from an approved launching device.

1.5 With the exception of the survival craft referred to in regulation 15.1.1, all survival craft required to provide for abandonment by the total number of persons on board shall be capable of being launched with their full complement of persons and equipment within a period of 10 min from the time the abandon ship signal is given.

1.6 Chemical tankers and gas carriers carrying cargoes emitting toxic vapours or gases* shall carry, in lieu of lifeboats complying with the requirements of regulation 43 or 44, lifeboats complying with the requirements of regulation 45.

1.7 Oil tankers, chemical tankers and gas carriers carrying cargoes having a flash-point not exceeding 60° C (closed cup test) shall carry, in lieu of lifeboats complying with the requirements of regulation 43 or 44, lifeboats complying with the requirements of regulation 46.

2 *Rescue boats*

Cargo ships shall carry at least one rescue boat complying with the requirements of regulation 47. A lifeboat may be accepted as a rescue boat, provided that it also complies with the requirements for a rescue boat.

3 In addition to their lifeboats, cargo ships constructed before 1 July 1986 shall carry not later than 1 July 1991:

- .1 one or more liferafts of such aggregate capacity as will accommodate the total number of persons on board. The liferaft or liferafts shall be equipped with a lashing or an equivalent means of securing the liferaft which will automatically release it from a sinking ship;

* Reference is made to products for which emergency escape respiratory protection is required in chapter 17 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) adopted by the Maritime Safety Committee by resolution MSC.4(48) and in chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) adopted by the Maritime Safety Committee by resolution MSC.5(48).

- .2 where the survival craft are stowed in a position which is more than 100 m from the stem or stern, in addition to the liferafts required by paragraph 3.1, a liferaft stowed as far forward or aft, or one as far forward and another as far aft, as is reasonable and practicable. Notwithstanding the requirements of paragraph 3.1, such liferaft or liferafts may be securely fastened so as to permit manual release.

Regulation 27

Personal life-saving appliances

1 *Lifebuoys*

- 1.1 Cargo ships shall carry not less than the number of lifebuoys complying with the requirements of regulations 7.1 and 31 prescribed in the following table:

Length of ship in metres	Minimum number of lifebuoys
Under 100	8
100 and under 150	10
150 and under 200	12
200 and over	14

- 1.2 Self-igniting lights for lifebuoys on tankers required by regulation 7.1.3 shall be of an electric battery type.

2 *Lifejacket lights*

- 2.1 This paragraph applies to all cargo ships. With respect to cargo ships constructed before 1 July 1986, this paragraph shall apply not later than 1 July 1991.

- 2.2 On cargo ships, each lifejacket shall be fitted with a light complying with the requirements of regulation 32.3.

3 *Immersion suits and thermal protective aids*

- 3.1 This paragraph applies to all cargo ships. With respect to cargo ships constructed before 1 July 1986, this paragraph shall apply not later than 1 July 1991.

- 3.2 Cargo ships shall carry for each lifeboat on the ship at least three immersion suits complying with the requirements of regulation 33 or, if the Administration considers it necessary and practicable, one immersion suit complying with the requirements of regulation 33 for every person on board the ship; however, the ship shall carry in addition to the thermal protective aids required by regulations 38.5.1.24, 41.8.31 and 47.2.2.13, thermal protective aids complying with the

requirements of regulation 34 for persons on board not provided with immersion suits. These immersion suits and thermal protective aids need not be required if the ship:

- .1 has totally enclosed lifeboats on each side of the ship of such aggregate capacity as will accommodate the total number of persons on board; or
- .2 has totally enclosed lifeboats capable of being launched by free-fall over the stern of the ship of such aggregate capacity as will accommodate the total number of persons on board and which are boarded and launched directly from the stowed position, together with liferafts on each side of the ship of such aggregate capacity as will accommodate the total number of persons on board; or
- .3 is constantly engaged on voyages in warm climates where, in the opinion of the Administration, immersion suits are unnecessary.

3.3 Cargo ships complying with the requirements of regulation 26.1.3 shall carry immersion suits complying with the requirements of regulation 33 for every person on board unless the ship:

- .1 has davit-launched liferafts; or
- .2 has liferafts served by equivalent approved appliances capable of being used on both sides of the ship and which do not require entry into the water to board the liferaft; or
- .3 is constantly engaged on voyages in warm climates where, in the opinion of the Administration, immersion suits are unnecessary.

3.4 The immersion suits required by this regulation may be used to comply with the requirements of regulation 7.3.

3.5 The totally enclosed lifeboats referred to in paragraphs 3.2.1 and 3.2.2 carried on cargo ships constructed before 1 July 1986 need not comply with the requirements of regulation 44.

Regulation 28

Survival craft embarkation and launching arrangements

1 Cargo ship survival craft embarkation arrangements shall be so designed that lifeboats can be boarded and launched directly from the stowed position and davit-launched liferafts can be boarded and launched from a position immediately adjacent to the stowed position or from a position to which the liferaft is transferred prior to launching in compliance with the requirements of regulation 13.5.

2 On cargo ships of 20,000 tons gross tonnage and upwards, lifeboats shall be capable of being launched, where necessary utilizing painters, with the ship making headway at speeds up to 5 knots in calm water.

Regulation 29

Stowage of liferafts

On cargo ships, every liferaft, other than those required by regulation 26.1.4, shall be stowed with its painter permanently attached to the ship and with a float-free arrangement complying with the requirements of regulation 38.6 so that the liferaft floats free and, if inflatable, inflates automatically when the ship sinks.

PART C – LIFE-SAVING APPLIANCE REQUIREMENTS

SECTION I – GENERAL

Regulation 30

General requirements for life-saving appliances

- 1 Paragraph 2.7 applies to all ships. With respect to ships constructed before 1 July 1986, paragraph 2.7 shall apply not later than 1 July 1991.
- 2 Unless expressly provided otherwise or unless, in the opinion of the Administration having regard to the particular voyages on which the ship is constantly engaged, other requirements are appropriate, all life-saving appliances prescribed in this part shall:
 - .1 be constructed with proper workmanship and materials;
 - .2 not be damaged in stowage throughout the air temperature range -30°C to $+65^{\circ}\text{C}$;
 - .3 if they are likely to be immersed in seawater during their use, operate throughout the seawater temperature range -1°C to $+30^{\circ}\text{C}$;
 - .4 where applicable, be rot-proof, corrosion-resistant, and not be unduly affected by seawater, oil or fungal attack;
 - .5 where exposed to sunlight, be resistant to deterioration;
 - .6 be of a highly visible colour on all parts where this will assist detection;
 - .7 be fitted with retro-reflective material where it will assist in detection and in accordance with the recommendations of the Organization*;
 - .8 if they are to be used in a seaway, be capable of satisfactory operation in that environment.

* Reference is made to the "Recommendation on retro-reflective tapes on life-saving appliances" adopted by the Organization in resolution A.274(VIII).

3 The Administration shall determine the period of acceptability of life-saving appliances which are subject to deterioration with age. Such life-saving appliances shall be marked with a means for determining their age or the date by which they must be replaced.

SECTION II – PERSONAL LIFE-SAVING APPLIANCES

Regulation 31

Lifebuoys

1 *Lifebuoy specification*

Every lifebuoy shall:

- .1 have an outer diameter of not more than 800 mm and an inner diameter of not less than 400 mm;
- .2 be constructed of inherently buoyant material; it shall not depend upon rushes, cork shavings or granulated cork, any other loose granulated material or any air compartment which depends on inflation for buoyancy;
- .3 be capable of supporting not less than 14.5 kg of iron in fresh water for a period of 24 hr;
- .4 have a mass of not less than 2.5 kg;
- .5 not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s;
- .6 be constructed to withstand a drop into the water from the height at which it is stowed above the waterline in the lightest seagoing condition or 30 m, whichever is the greater, without impairing either its operating capability or that of its attached components;
- .7 if it is intended to operate the quick-release arrangement provided for the self-activated smoke signals and self-igniting lights, have a mass sufficient to operate the quick-release arrangement or 4 kg, whichever is the greater;
- .8 be fitted with a grabline not less than 9.5 mm in diameter and not less than 4 times the outside diameter of the body of the buoy in length. The grabline shall be secured at four equidistant points around the circumference of the buoy to form four equal loops.

2 *Lifebuoy self-igniting lights*

Self-igniting lights required by regulation 7.1.3 shall:

- .1 be such that they cannot be extinguished by water;

- .2 be capable of either burning continuously with a luminous intensity of not less than 2 cd in all directions of the upper hemisphere or flashing (discharge flashing) at a rate of not less than 50 flashes per minute with at least the corresponding effective luminous intensity;
 - .3 be provided with a source of energy capable of meeting the requirement of paragraph 2.2 for a period of at least 2 hr;
 - .4 be capable of withstanding the drop test required by paragraph 1.6.
- 3 *Lifebuoy self-activating smoke signals*

Self-activating smoke signals required by regulation 7.1.3 shall:

- .1 emit smoke of a highly visible colour at a uniform rate for a period of at least 15 min when floating in calm water;
 - .2 not ignite explosively or emit any flame during the entire smoke emission time of the signal;
 - .3 not be swamped in a seaway;
 - .4 continue to emit smoke when fully submerged in water for a period of at least 10 s;
 - .5 be capable of withstanding the drop test required by paragraph 1.6.
- 4 *Buoyant lifelines*

Buoyant lifelines required by regulation 7.1.2 shall:

- .1 be non-kinking;
- .2 have a diameter of not less than 8 mm;
- .3 have a breaking strength of not less than 5 kN.

Regulation 32

Lifejackets

1 *General requirements for lifejackets*

- 1.1 A lifejacket shall not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s.
- 1.2 A lifejacket shall be so constructed that:
 - .1 after demonstration, a person can correctly don it within a period of 1 min without assistance;
 - .2 it is capable of being worn inside-out or is clearly capable of being worn in only one way and, as far as possible, cannot be donned incorrectly;

- .3 it is comfortable to wear;
 - .4 it allows the wearer to jump from a height of at least 4.5 m into the water without injury and without dislodging or damaging the lifejacket.
- 1.3 A lifejacket shall have sufficient buoyancy and stability in calm fresh water to:
- .1 lift the mouth of an exhausted or unconscious person not less than 120 mm clear of the water with the body inclined backwards at an angle of not less than 20° and not more than 50° from the vertical position;
 - .2 turn the body of an unconscious person in the water from any position to one where the mouth is clear of the water in not more than 5 s.
- 1.4 A lifejacket shall have buoyancy which is not reduced by more than 5% after 24 h submersion in fresh water.
- 1.5 A lifejacket shall allow the person wearing it to swim a short distance and to board a survival craft.
- 1.6 Each lifejacket shall be fitted with a whistle firmly secured by a cord.

2 *Inflatable lifejackets*

A lifejacket which depends on inflation for buoyancy shall have not less than two separate compartments and comply with the requirements of paragraph 1 and shall:

- .1 inflate automatically on immersion, be provided with a device to permit inflation by a single manual motion and be capable of being inflated by mouth;
 - .2 in the event of loss of buoyancy in any one compartment be capable of complying with the requirements of paragraphs 1.2, 1.3 and 1.5;
 - .3 comply with the requirements of paragraph 1.4 after inflation by means of the automatic mechanism.
- ## 3 *Lifejacket lights*
- 3.1 Each lifejacket light shall:
- .1 have a luminous intensity of not less than 0.75 cd;
 - .2 have a source of energy capable of providing a luminous intensity of 0.75 cd for a period of at least 8 h;
 - .3 be visible over as great a segment of the upper hemisphere as is practicable when attached to a lifejacket.
- 3.2 If the light referred to in paragraph 3.1 is a flashing light it shall, in addition:
- .1 be provided with a manually operated switch;

- .2 not be fitted with a lens or curved reflector to concentrate the beam;
- .3 flash at a rate of not less than 50 flashes per minute with an effective luminous intensity of at least 0.75 cd.

Regulation 33

Immersion suits

1 *General requirements for immersion suits*

1.1 The immersion suit shall be constructed with waterproof materials such that:

- .1 it can be unpacked and donned without assistance within 2 min, taking into account any associated clothing*, and a lifejacket if the immersion suit is to be worn in conjunction with a lifejacket;
- .2 it will not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s;
- .3 it will cover the whole body with the exception of the face. Hands shall also be covered unless permanently attached gloves are provided;
- .4 it is provided with arrangements to minimize or reduce free air in the legs of the suit;
- .5 following a jump from a height of not less than 4.5 m into the water there is no undue ingress of water into the suit.

1.2 An immersion suit which also complies with the requirements of regulation 32 may be classified as a lifejacket.

1.3 An immersion suit shall permit the person wearing it, and also wearing a lifejacket if the immersion suit is to be worn in conjunction with a lifejacket, to:

- .1 climb up and down a vertical ladder at least 5 m in length;
- .2 perform normal duties during abandonment;
- .3 jump from a height of not less than 4.5 m into the water without damaging or dislodging the immersion suit, or being injured; and
- .4 swim a short distance through the water and board a survival craft.

1.4 An immersion suit which has buoyancy and is designed to be worn without a lifejacket shall be fitted with a light complying with the requirements of regulation 32.3 and the whistle prescribed by regulation 32.1.6.

* Reference is made to paragraph 3.1.3.1 of the "Recommendation on testing of life-saving appliances" to be submitted to the Assembly of the Organization at its thirteenth session for adoption.

1.5 If the immersion suit is to be worn in conjunction with a lifejacket, the lifejacket shall be worn over the immersion suit. A person wearing such an immersion suit shall be able to don a lifejacket without assistance.

2 *Thermal performance requirements for immersion suits*

2.1 An immersion suit made of material which has no inherent insulation shall be:

- .1 marked with instructions that it must be worn in conjunction with warm clothing;
- .2 so constructed that, when worn in conjunction with warm clothing, and with a lifejacket if the immersion suit is to be worn with a lifejacket, the immersion suit continues to provide sufficient thermal protection, following one jump by the wearer into the water from a height of 4.5 m, to ensure that when it is worn for a period of 1 h in calm circulating water at a temperature of 5°C, the wearer's body core temperature does not fall more than 2°C.

2.2 An immersion suit made of material with inherent insulation, when worn either on its own or with a lifejacket, if the immersion suit is to be worn in conjunction with a lifejacket, shall provide the wearer with sufficient thermal insulation, following one jump into the water from a height of 4.5 m, to ensure that the wearer's body core temperature does not fall more than 2°C after a period of 6 h immersion in calm circulating water at a temperature of between 0°C and 2°C.

2.3 The immersion suit shall permit the person wearing it with hands covered to pick up a pencil and write after being immersed in water at 5°C for a period of 1 h.

3 *Buoyancy requirements*

A person in fresh water wearing either an immersion suit complying with the requirements of regulation 32, or an immersion suit with a lifejacket, shall be able to turn from a face-down to a face-up position in not more than 5 s.

Regulation 34

Thermal protective aids

1 A thermal protective aid shall be made of waterproof material having a thermal conductivity of not more than 0.25 W/(m·K) and shall be so constructed that, when used to enclose a person, it shall reduce both the convective and evaporative heat loss from the wearer's body.

2 The thermal protective aid shall:

- .1 cover the whole body of a person wearing a lifejacket with the exception of the face. Hands shall also be covered unless permanently attached gloves are provided;

- .2 be capable of being unpacked and easily donned without assistance in a survival craft or rescue boat;
 - .3 permit the wearer to remove it in the water in not more than 2 min, if it impairs ability to swim.
- 3 The thermal protective aid shall function properly throughout an air temperature range -30°C to $+20^{\circ}\text{C}$.

SECTION III – VISUAL SIGNALS

Regulation 35

Rocket parachute flares

- I The rocket parachute flare shall:
- .1 be contained in a water-resistant casing;
 - .2 have brief instructions or diagrams clearly illustrating the use of the rocket parachute flare printed on its casing;
 - .3 have integral means of ignition;
 - .4 be so designed as not to cause discomfort to the person holding the casing when used in accordance with the manufacturer's operating instructions.
- 2 The rocket shall, when fired vertically, reach an altitude of not less than 300 m. At or near the top of its trajectory, the rocket shall eject a parachute flare, which shall:
- .1 burn with a bright red colour;
 - .2 burn uniformly with an average luminous intensity of not less than 30,000 cd;
 - .3 have a burning period of not less than 40 s;
 - .4 have a rate of descent of not more than 5 m/s;
 - .5 not damage its parachute or attachments while burning.

Regulation 36

Hand flares

- I The hand flare shall:
- .1 be contained in a water-resistant casing;

- .2 have brief instructions or diagrams clearly illustrating the use of the hand flare printed on its casing;
 - .3 have a self-contained means of ignition;
 - .4 be so designed as not to cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions.
- 2 The hand flare shall:
- .1 burn with a bright red colour;
 - .2 burn uniformly with an average luminous intensity of not less than 15,000 cd;
 - .3 have a burning period of not less than 1 min;
 - .4 continue to burn after having been immersed for a period of 10 s under 100 mm of water.

Regulation 37

Buoyant smoke signals

- 1 The buoyant smoke signal shall:
- .1 be contained in a water-resistant casing;
 - .2 not ignite explosively when used in accordance with the manufacturer's operating instructions;
 - .3 have brief instructions or diagrams clearly illustrating the use of the buoyant smoke signal printed on its casing.
- 2 The buoyant smoke signal shall:
- .1 emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 min when floating in calm water;
 - .2 not emit any flame during the entire smoke emission time;
 - .3 not be swamped in a seaway;
 - .4 continue to emit smoke when submerged in water for a period of 10 s under 100 mm of water.

SECTION IV – SURVIVAL CRAFT

Regulation 38

General requirements for liferafts

1 *Construction of liferafts*

1.1 Every liferaft shall be so constructed as to be capable of withstanding exposure for 30 days afloat in all sea conditions.

1.2 The liferaft shall be so constructed that when it is dropped into the water from a height of 18 m, the liferaft and its equipment will operate satisfactorily. If the liferaft is to be stowed at a height of more than 18 m above the waterline in the lightest seagoing condition, it shall be of a type which has been satisfactorily drop-tested from at least that height.

1.3 The floating liferaft shall be capable of withstanding repeated jumps on to it from a height of at least 4.5 m above its floor both with and without the canopy erected.

1.4 The liferaft and its fittings shall be so constructed as to enable it to be towed at a speed of 3 knots in calm water when loaded with its full complement of persons and equipment and with one of its sea-anchors streamed.

1.5 The liferaft shall have a canopy to protect the occupants from exposure which is automatically set in place when the liferaft is launched and waterborne. The canopy shall comply with the following:

- .1 it shall provide insulation against heat and cold by means of either two layers of material separated by an air gap or other equally efficient means. Means shall be provided to prevent accumulation of water in the air gap;
- .2 its interior shall be of a colour that does not cause discomfort to the occupants;
- .3 each entrance shall be clearly indicated and be provided with efficient adjustable closing arrangements which can be easily and quickly opened from inside and outside the liferaft so as to permit ventilation but exclude seawater, wind and cold. Liferafts accommodating more than eight persons shall have at least two diametrically opposite entrances;
- .4 it shall admit sufficient air for the occupants at all times, even with the entrances closed;
- .5 it shall be provided with at least one viewing port;
- .6 it shall be provided with means for collecting rain water;
- .7 it shall have sufficient headroom for sitting occupants under all parts of the canopy.

2 *Minimum carrying capacity and mass of liferafts*

2.1 No liferaft shall be approved which has a carrying capacity of less than six persons calculated in accordance with the requirements of regulation 39.3 or 40.3, as appropriate.

2.2 Unless the liferaft is to be launched by an approved launching appliance complying with the requirements of regulation 48 and is not required to be portable, the total mass of the liferaft, its container and its equipment shall not be more than 185 kg.

3 *Liferaft fittings*

3.1 Lifelines shall be securely becketed around the inside and outside of the liferaft.

3.2 The liferaft shall be provided with arrangements for adequately siting and securing in the operating position the antenna provided with the portable radio apparatus required by regulation 6.2.1.

3.3 The liferaft shall be fitted with an efficient painter of length equal to not less than twice the distance from the stowed position to the waterline in the lightest seagoing condition or 15 m whichever is the greater.

4 *Davit-launched liferafts*

4.1 In addition to the above requirements, a liferaft for use with an approved launching appliance shall:

- .1 when the liferaft is loaded with its full complement of persons and equipment, be capable of withstanding a lateral impact against the ship's side at an impact velocity of not less than 3.5 m/s and also a drop into the water from a height of not less than 3 m without damage that will affect its function;
- .2 be provided with means for bringing the liferaft alongside the embarkation deck and holding it securely during embarkation.

4.2 Every passenger ship davit-launched liferaft shall be so arranged that it can be rapidly boarded by its full complement of persons.

4.3 Every cargo ship davit-launched liferaft shall be so arranged that it can be boarded by its full complement of persons in not more than 3 min from the time the instruction to board is given.

5 *Equipment*

5.1 The normal equipment of every liferaft shall consist of:

- .1 one buoyant rescue quoit, attached to not less than 30 m of buoyant line;

- .2 one knife of the non-folding type having a buoyant handle and lanyard attached and stowed in a pocket on the exterior of the canopy near the point at which the painter is attached to the liferaft. In addition, a liferaft which is permitted to accommodate 13 persons or more shall be provided with a second knife which need not be of the non-folding type;
- .3 for a liferaft which is permitted to accommodate not more than 12 persons, one buoyant bailer. For a liferaft which is permitted to accommodate 13 persons or more, two buoyant bailers;
- .4 two sponges;
- .5 two sea-anchors each with a shock-resistant hawser and tripping line, one being spare and the other permanently attached to the liferaft in such a way that when the liferaft inflates or is waterborne it will cause the liferaft to lie oriented to the wind in the most stable manner. The strength of each sea-anchor and its hawser and tripping line shall be adequate for all sea conditions. The sea-anchors shall be fitted with a swivel at each end of the line and shall be of a type which is unlikely to turn inside-out between its shroud lines;
- .6 two buoyant paddles;
- .7 three tin openers. Safety knives containing special tin-opener blades are satisfactory for this requirement;
- .8 one first-aid outfit in a waterproof case capable of being closed tightly after use;
- .9 one whistle or equivalent sound signal;
- .10 four rocket parachute flares complying with the requirements of regulation 35;
- .11 six hand flares complying with the requirements of regulation 36;
- .12 two buoyant smoke signals complying with the requirements of regulation 37;
- .13 one waterproof electric torch suitable for Morse signalling together with one spare set of batteries and one spare bulb in a waterproof container;
- .14 an efficient radar reflector;
- .15 one daylight signalling mirror with instructions on its use for signalling to ships and aircraft;
- .16 one copy of the life-saving signals referred to in regulation V/16 on a waterproof card or in a waterproof container;
- .17 one set of fishing tackle;
- .18 a food ration totalling not less than 10,000 kJ for each person the liferaft is permitted to accommodate; these rations shall be kept in airtight packaging and be stowed in a watertight container;

- .19 watertight receptacles containing a total of 1.5 ℓ of fresh water for each person the liferaft is permitted to accommodate, of which 0.5 ℓ per person may be replaced by a de-salting apparatus capable of producing an equal amount of fresh water in 2 days;
- .20 one rustproof graduated drinking vessel;
- .21 six doses of anti-seasickness medicine and one seasickness bag for each person the liferaft is permitted to accommodate;
- .22 instructions on how to survive;
- .23 instructions for immediate action;
- .24 thermal protective aids complying with the requirements of regulation 34 sufficient for 10% of the number of persons the liferaft is permitted to accommodate or two, whichever is the greater.

5.2 The marking required by regulations 39.7.3.5 and 40.7.7 on liferafts equipped in accordance with paragraph 5.1 shall be "SOLAS A PACK" in block capitals of the Roman alphabet.

5.3 In the case of passenger ships engaged on short international voyages of such a nature and duration that, in the opinion of the Administration, not all the items specified in paragraph 5.1 are necessary, the Administration may allow the liferafts carried on any such ships to be provided with the equipment specified in paragraphs 5.1.1 to 5.1.6 inclusive, 5.1.8, 5.1.9, 5.1.13 to 5.1.16 inclusive and 5.1.21 to 5.1.24 inclusive and one half of the equipment specified in paragraphs 5.1.10 to 5.1.12 inclusive. The marking required by regulations 39.7.3.5 and 40.7.7 on such liferafts shall be "SOLAS B PACK" in block capitals of the Roman alphabet.

5.4 Where appropriate the equipment shall be stowed in a container which, if it is not an integral part of, or permanently attached to, the liferaft, shall be stowed and secured inside the liferaft and be capable of floating in water for at least 30 min without damage to its contents.

6 *Float-free arrangements for liferafts*

6.1 *Painter system*

The liferaft painter system shall provide a connection between the ship and the liferaft and shall be so arranged as to ensure that the liferaft when released and, in the case of an inflatable liferaft, inflated is not dragged under by the sinking ship.

6.2 *Weak link*

If a weak link is used in the float-free arrangement, it shall:

- .1 not be broken by the force required to pull the painter from the liferaft container;
- .2 if applicable, be of sufficient strength to permit the inflation of the liferaft;
- .3 break under a strain of 2.2 ± 0.4 kN.

6.3 *Hydrostatic release units*

If a hydrostatic release unit is used in the float-free arrangements, it shall:

- .1 be constructed of compatible materials so as to prevent malfunction of the unit. Galvanizing or other forms of metallic coating on parts of the hydrostatic release unit shall not be accepted;
- .2 automatically release the liferaft at a depth of not more than 4 m;
- .3 have drains to prevent the accumulation of water in the hydrostatic chamber when the unit is in its normal position;
- .4 be so constructed as to prevent release when seas wash over the unit;
- .5 be permanently marked on its exterior with its type and serial number;
- .6 be provided with a document or identification plate stating the date of manufacture, type and serial number;
- .7 be such that each part connected to the painter system has a strength of not less than that required for the painter.

Regulation 39

Inflatable liferafts

1 Inflatable liferafts shall comply with the requirements of regulation 38 and, in addition, shall comply with the requirements of this regulation.

2 *Construction of inflatable liferafts*

2.1 The main buoyancy chamber shall be divided into not less than two separate compartments, each inflated through a non-return inflation valve on each compartment. The buoyancy chambers shall be so arranged that, in the event of any one of the compartments being damaged or failing to inflate, the intact compartments shall be able to support, with positive freeboard over the liferaft's entire periphery, the number of persons which the liferaft is permitted to accommodate, each having a mass of 75 kg and seated in their normal positions.

2.2 The floor of the liferaft shall be waterproof and shall be capable of being sufficiently insulated against cold either:

- .1 by means of one or more compartments that the occupants can inflate, or which inflate automatically and can be deflated and reinflated by the occupants; or
- .2 by other equally efficient means not dependent on inflation.

2.3 The liferaft shall be inflated with a non-toxic gas. Inflation shall be completed within a period of 1 min at an ambient temperature of between 18° C and 20° C and within a period of 3 min at an ambient temperature of -30° C. After inflation the liferaft shall maintain its form when loaded with its full complement of persons and equipment.

2.4 Each inflatable compartment shall be capable of withstanding a pressure equal to at least 3 times the working pressure and shall be prevented from reaching a pressure exceeding twice the working pressure either by means of relief valves or by a limited gas supply. Means shall be provided for fitting the topping-up pump or bellows required by paragraph 10.1.2 so that the working pressure can be maintained.

3 *Carrying capacity of inflatable liferafts*

The number of persons which a liferaft shall be permitted to accommodate shall be equal to the lesser of:

- .1 the greatest whole number obtained by dividing by 0.096 the volume, measured in cubic metres of the main buoyancy tubes (which for this purpose shall include neither the arches nor the thwarts if fitted) when inflated; or
- .2 the greatest whole number obtained by dividing by 0.372 the inner horizontal cross-sectional area of the liferaft measured in square metres (which for this purpose may include the thwart or thwarts, if fitted) measured to the innermost edge of the buoyancy tubes; or
- .3 the number of persons having an average mass of 75 kg, all wearing lifejackets, that can be seated with sufficient comfort and headroom without interfering with the operation of any of the liferaft's equipment.

4 *Access into inflatable liferafts*

4.1 At least one entrance shall be fitted with a semi-rigid boarding ramp to enable persons to board the liferaft from the sea so arranged as to prevent significant deflation of the liferaft if the ramp is damaged. In the case of a davit-launched liferaft having more than one entrance, the boarding ramp shall be fitted at the entrance opposite the bowing lines and embarkation facilities.

4.2 Entrances not provided with a boarding ramp shall have a boarding ladder, the lowest step of which shall be situated not less than 0.4 m below the liferaft's light waterline.

4.3 There shall be means inside the liferaft to assist persons to pull themselves into the liferaft from the ladder.

5 *Stability of inflatable liferafts*

5.1 Every inflatable liferaft shall be so constructed that, when fully inflated and floating with the canopy uppermost, it is stable in a seaway.

5.2 The stability of the liferaft when in the inverted position shall be such that it can be righted in a seaway and in calm water by one person.

5.3 The stability of the liferaft when loaded with its full complement of persons and equipment shall be such that it can be towed at speeds of up to 3 knots in calm water.

6 *Inflatable liferaft fittings*

6.1 The breaking strength of the painter system including its means of attachment to the liferaft, except the weak link required by regulation 38.6, shall be not less than 10.0 kN for a liferaft permitted to accommodate nine persons or more, and not less than 7.5 kN for any other liferaft. The liferaft shall be capable of being inflated by one person.

6.2 A manually controlled lamp visible on a dark night with a clear atmosphere at a distance of at least 2 miles for a period of not less than 12 h shall be fitted to the top of the liferaft canopy. If the light is a flashing light it shall flash at a rate of not less than 50 flashes per minute for the first 2 h of operation of the 12 h operating period. The lamp shall be powered by a sea-activated cell or a dry chemical cell and shall light automatically when the liferaft inflates. The cell shall be of a type that does not deteriorate due to damp or humidity in the stowed liferaft.

6.3 A manually controlled lamp shall be fitted inside the liferaft capable of continuous operation for a period of at least 12 h. It shall light automatically when the liferaft inflates and be of sufficient intensity to enable reading of survival and equipment instructions.

7 *Containers for inflatable liferafts*

7.1 The liferaft shall be packed in a container that is:

- .1 so constructed as to withstand hard wear under conditions encountered at sea;
- .2 of sufficient inherent buoyancy, when packed with the liferaft and its equipment, to pull the painter from within and to operate the inflation mechanism should the ship sink;
- .3 as far as practicable watertight, except for drain holes in the container bottom.

7.2 The liferaft shall be packed in its container in such a way as to ensure, as far as possible, that the waterborne liferaft inflates in an upright position on breaking free from its container.

7.3 The container shall be marked with:

- .1 maker's name or trade mark;
- .2 serial number;
- .3 name of approved authority and the number of persons it is permitted to carry;
- .4 SOLAS;
- .5 type of emergency pack enclosed;
- .6 date when last serviced;
- .7 length of painter;

- .8 maximum permitted height of stowage above waterline (depending on drop-test height and length of painter);
- .9 launching instructions.

8 *Markings on inflatable liferafts*

The liferaft shall be marked with:

- .1 maker's name or trade mark;
- .2 serial number;
- .3 date of manufacture (month and year);
- .4 name of approving authority;
- .5 name and place of servicing station where it was last serviced;
- .6 number of persons it is permitted to accommodate over each entrance in characters not less than 100 mm in height of a colour contrasting with that of the liferaft.

9 *Davit-launched inflatable liferafts*

9.1 In addition to complying with the above requirements, a liferaft for use with an approved launching appliance shall, when suspended from its lifting hook or bridle, withstand a load of:

- .1 4 times the mass of its full complement of persons and equipment, at an ambient temperature and a stabilized liferaft temperature of $20 \pm 3^{\circ}\text{C}$ with all relief valves inoperative; and
- .2 1.1 times the mass of its full complement of persons and equipment at an ambient temperature and a stabilized liferaft temperature of -30°C with all relief valves operative.

9.2 Rigid containers for liferafts to be launched by a launching appliance shall be so secured that the container or parts of it are prevented from falling into the sea during and after inflation and launching of the contained liferaft.

10 *Additional equipment for inflatable liferafts*

10.1 In addition to the equipment required by regulation 38.5, every inflatable liferaft shall be provided with:

- .1 one repair outfit for repairing punctures in buoyancy compartments;
- .2 one topping-up pump or bellows.

10.2 The knives required by regulation 38.5.1.2 shall be safety knives.

Regulation 40

Rigid liferafts

1 Rigid liferafts shall comply with the requirements of regulation 38 and, in addition, shall comply with the requirements of this regulation.

2 *Construction of rigid liferafts*

2.1 The buoyancy of the liferaft shall be provided by approved inherently buoyant material placed as near as possible to the periphery of the liferaft. The buoyant material shall be fire-retardant or be protected by a fire-retardant covering.

2.2 The floor of the liferaft shall prevent the ingress of water and shall effectively support the occupants out of the water and insulate them from cold.

3 *Carrying capacity of rigid liferafts*

The number of persons which a liferaft shall be permitted to accommodate shall be equal to the lesser of:

- .1 the greatest whole number obtained by dividing by 0.096 the volume, measured in cubic metres of the buoyancy material multiplied by a factor of 1 minus the specific gravity of that material; or
- .2 the greatest whole number obtained by dividing by 0.372 the horizontal cross-sectional area of the floor of the liferaft measured in square metres; or
- .3 the number of persons having an average mass of 75 kg, all wearing lifejackets, that can be seated with sufficient comfort and headroom without interfering with the operation of any of the liferaft's equipment.

4 *Access into rigid liferafts*

4.1 At least one entrance shall be fitted with a rigid boarding ramp to enable persons to board the liferaft from the sea. In the case of a davit-launched liferaft having more than one entrance, the boarding ramp shall be fitted at the entrance opposite to the bowing and embarkation facilities.

4.2 Entrances not provided with a boarding ramp shall have a boarding ladder, the lowest step of which shall be situated not less than 0.4 m below the liferaft's light waterline.

4.3 There shall be means inside the liferaft to assist persons to pull themselves into the liferaft from the ladder.

5 *Stability of rigid liferafts*

5.1 Unless the liferaft is capable of operating safely whichever way up it is floating, its strength and stability shall be such that it is either self-righting or can be readily righted in a seaway and in calm water by one person.

5.2 The stability of a liferaft when loaded with its full complement of persons and equipment shall be such that it can be towed at speeds of up to 3 knots in calm water.

6 *Rigid liferaft fittings*

6.1 The liferaft shall be fitted with an efficient painter. The breaking strength of the painter system, including its means of attachment to the liferaft, except the weak link required by regulation 38.6, shall be not less than 10.0 kN for liferafts permitted to accommodate nine persons or more, and not less than 7.5 kN for any other liferaft.

6.2 A manually controlled lamp visible on a dark night with a clear atmosphere at a distance of at least 2 miles for a period of not less than 12 h shall be fitted to the top of the liferaft canopy. If the light is a flashing light it shall flash at a rate of not less than 50 flashes per minute for the first 2 h of operation of the 12 h operating period. The lamp shall be powered by a sea-activated cell or a dry chemical cell and shall light automatically when the liferaft canopy is set in place. The cell shall be of a type that does not deteriorate due to damp or humidity in the stowed liferaft.

6.3 A manually controlled lamp shall be fitted inside the liferaft, capable of continuous operation for a period of at least 12 h. It shall light automatically when the canopy is set in place and be of sufficient intensity to enable reading of survival and equipment instructions.

7 *Markings on rigid liferafts*

The liferaft shall be marked with:

- .1 name and port of registry of the ship to which it belongs;
- .2 maker's name or trade mark;
- .3 serial number;
- .4 name of approving authority;
- .5 number of persons it is permitted to accommodate over each entrance in characters not less than 100 mm in height of a colour contrasting with that of the liferaft;
- .6 SOLAS;
- .7 type of emergency pack enclosed;
- .8 length of painter;
- .9 maximum permitted height of stowage above waterline (drop-test height);
- .10 launching instructions.

8 *Davit-launched rigid liferafts*

In addition to the above requirements, a rigid liferaft for use with an approved launching appliance shall, when suspended from its lifting hook or bridle, withstand a load of 4 times the mass of its full complement of persons and equipment.

Regulation 41

General requirements for lifeboats

1 *Construction of lifeboats*

1.1 All lifeboats shall be properly constructed and shall be of such form and proportions that they have ample stability in a seaway and sufficient freeboard when loaded with their full complement of persons and equipment. All lifeboats shall have rigid hulls and shall be capable of maintaining positive stability when in an upright position in calm water and loaded with their full complement of persons and equipment and holed in any one location below the waterline, assuming no loss of buoyancy material and no other damage.

1.2 All lifeboats shall be of sufficient strength to:

- .1 enable them to be safely lowered into the water when loaded with their full complement of persons and equipment; and
- .2 be capable of being launched and towed when the ship is making headway at a speed of 5 knots in calm water.

1.3 Hulls and rigid covers shall be fire-retardant or non-combustible.

1.4 Seating shall be provided on thwarts, benches or fixed chairs fitted as low as practicable in the lifeboat and constructed so as to be capable of supporting the number of persons each weighing 100 kg for which spaces are provided in compliance with the requirements of paragraph 2.2.2.

1.5 Each lifeboat shall be of sufficient strength to withstand a load, without residual deflection on removal of that load:

- .1 in the case of boats with metal hulls, 1.25 times the total mass of the lifeboat when loaded with its full complement of persons and equipment; or
- .2 in the case of other boats, twice the total mass of the lifeboat when loaded with its full complement of persons and equipment.

1.6 Each lifeboat shall be of sufficient strength to withstand, when loaded with its full complement of persons and equipment and with, where applicable, skates or fenders in position, a lateral impact against the ship's side at an impact velocity of at least 3.5 m/s and also a drop into the water from a height of at least 3 m.

1.7 The vertical distance between the floor surface and the interior of the enclosure or canopy over 50% of the floor area shall be:

- 1 not less than 1.3 m for a lifeboat permitted to accommodate nine persons or less;
- 2 not less than 1.7 m for a lifeboat permitted to accommodate 24 persons or more;
- 3 not less than the distance as determined by linear interpolation between 1.3 m and 1.7 m for a lifeboat permitted to accommodate between nine and 24 persons.

2 *Carrying capacity of lifeboats*

2.1 No lifeboat shall be approved to accommodate more than 150 persons.

2.2 The number of persons which a lifeboat shall be permitted to accommodate shall be equal to the lesser of:

- 1 the number of persons having an average mass of 75 kg, all wearing life-jackets, that can be seated in a normal position without interfering with the means of propulsion or the operation of any of the lifeboat's equipment; or
- 2 the number of spaces that can be provided on the seating arrangements in accordance with Figure 1. The shapes may be overlapped as shown, provided footrests are fitted and there is sufficient room for legs and the vertical separation between the upper and lower seat is not less than 350 mm.

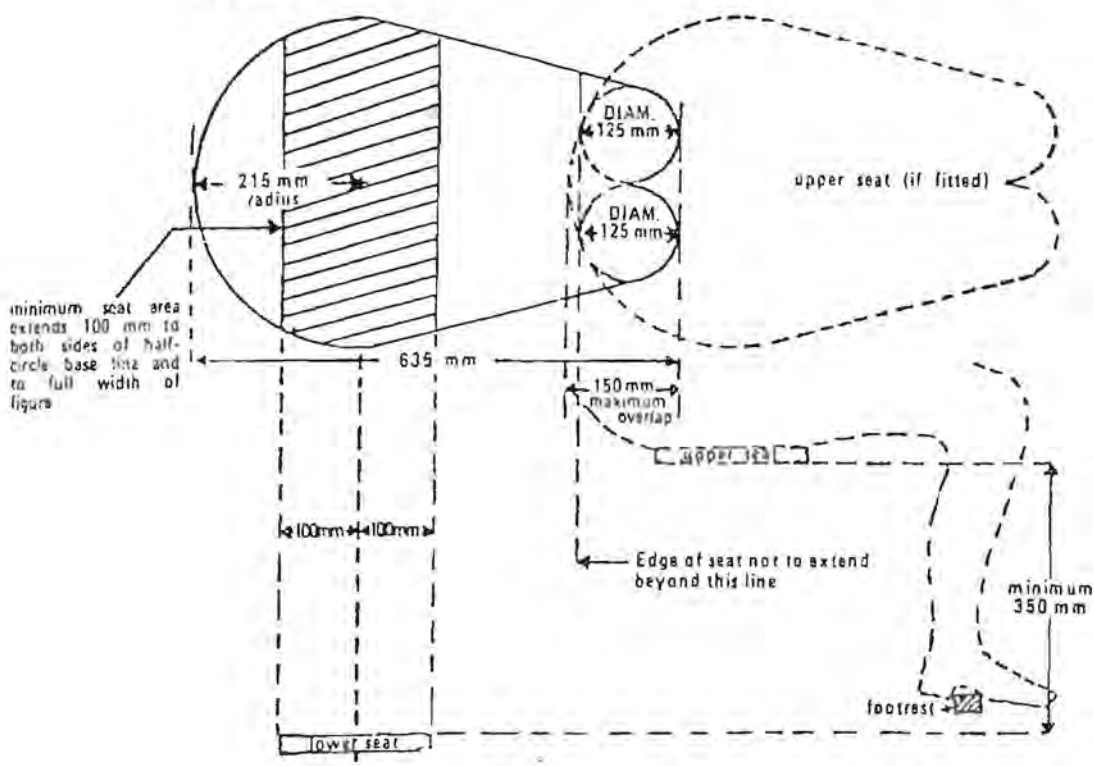


Figure 1

2.3 Each seating position shall be clearly indicated in the lifeboat.

3 *Access into lifeboats*

3.1 Every passenger ship lifeboat shall be so arranged that it can be rapidly boarded by its full complement of persons. Rapid disembarkation shall also be possible.

3.2 Every cargo ship lifeboat shall be so arranged that it can be boarded by its full complement of persons in not more than 3 min from the time the instruction to board is given. Rapid disembarkation shall also be possible.

3.3 Lifeboats shall have a boarding ladder that can be used on either side of the lifeboat to enable persons in the water to board the lifeboat. The lowest step of the ladder shall be not less than 0.4 m below the lifeboat's light waterline.

3.4 The lifeboat shall be so arranged that helpless people can be brought on board either from the sea or on stretchers.

3.5 All surfaces on which persons might walk shall have a non-skid finish.

4 *Lifeboat buoyancy*

All lifeboats shall have inherent buoyancy or shall be fitted with inherently buoyant material which shall not be adversely affected by seawater, oil or oil products, sufficient to float the lifeboat with all its equipment on board when flooded and open to the sea. Additional inherently buoyant material, equal to 280 N of buoyant force per person shall be provided for the number of persons the lifeboat is permitted to accommodate. Buoyant material, unless in addition to that required above, shall not be installed external to the hull of the lifeboat.

5 *Lifeboat freeboard and stability*

All lifeboats, when loaded with 50% of the number of persons the lifeboat is permitted to accommodate seated in their normal positions to one side of the centreline, shall have a freeboard, measured from the waterline to the lowest opening through which the lifeboat may become flooded, of at least 1.5% of the lifeboat's length or 100 mm, whichever is the greater.

6 *Lifeboat propulsion*

6.1 Every lifeboat shall be powered by a compression ignition engine. No engine shall be used for any lifeboat if its fuel has a flashpoint of 43°C or less (closed cup test).

6.2 The engine shall be provided with either a manual starting system, or a power starting system with two independent rechargeable energy sources. Any necessary starting aids shall also be provided. The engine starting systems and starting aids shall start the engine at an ambient temperature of -15°C within 2 min of commencing the start procedure unless, in the opinion of the Administration having regard to the particular voyages in which the ship carrying the lifeboat is constantly engaged, a different temperature is appropriate. The starting systems shall not be impeded by the engine casing, thwarts or other obstructions.

6.3 The engine shall be capable of operating for not less than 5 min after starting from cold with the lifeboat out of the water.

6.4 The engine shall be capable of operating when the lifeboat is flooded up to the centreline of the crank shaft.

6.5 The propeller shafting shall be so arranged that the propeller can be disengaged from the engine. Provision shall be made for ahead and astern propulsion of the lifeboat.

6.6 The exhaust pipe shall be so arranged as to prevent water from entering the engine in normal operation.

6.7 All lifeboats shall be designed with due regard to the safety of persons in the water and to the possibility of damage to the propulsion system by floating debris.

6.8 The speed of a lifeboat when proceeding ahead in calm water, when loaded with its full complement of persons and equipment and with all engine-powered auxiliary equipment in operation, shall be at least 6 knots and at least 2 knots when towing a 25-person liferaft loaded with its full complement of persons and equipment or its equivalent. Sufficient fuel, suitable for use throughout the temperature range expected in the area in which the ship operates, shall be provided to run the fully loaded lifeboat at 6 knots for a period of not less than 24 h.

6.9 The lifeboat engine, transmission and engine accessories shall be enclosed in a fire-retardant casing or other suitable arrangements providing similar protection. Such arrangements shall also protect persons from coming into accidental contact with hot or moving parts and protect the engine from exposure to weather and sea. Adequate means shall be provided to reduce the engine noise. Starter batteries shall be provided with casings which form a watertight enclosure around the bottom and sides of the batteries. The battery casings shall have a tight fitting top which provides for necessary gas venting.

6.10 The lifeboat engine and accessories shall be designed to limit electromagnetic emissions so that engine operation does not interfere with the operation of radio life-saving appliances used in the lifeboat.

6.11 Means shall be provided for recharging all engine-starting, radio and search-light batteries. Radio batteries shall not be used to provide power for engine starting. Means shall be provided for recharging lifeboat batteries from the ship's power supply at a supply voltage not exceeding 55 V which can be disconnected at the lifeboat embarkation station.

6.12 Water-resistant instructions for starting and operating the engine shall be provided and mounted in a conspicuous place near the engine starting controls.

7 *Lifeboat fittings*

7.1 All lifeboats shall be provided with at least one drain valve fitted near the lowest point in the hull, which shall automatically open to drain water from the hull when the lifeboat is not waterborne and shall automatically close to prevent entry of water when the lifeboat is waterborne. Each drain valve shall be provided with a cap or plug to close the valve, which shall be attached to the lifeboat by a lanyard, a chain, or other suitable means. Drain valves shall be readily accessible from inside the lifeboat and their position shall be clearly indicated.

7.2 All lifeboats shall be provided with a rudder and tiller. When a wheel or other remote steering mechanism is also provided the tiller shall be capable of controlling the rudder in case of failure of the steering mechanism. The rudder shall be permanently attached to the lifeboat. The tiller shall be permanently installed on, or linked to, the rudder stock; however, if the lifeboat has a remote steering mechanism, the tiller may be removable and securely stowed near the rudder stock. The rudder and tiller shall be so arranged as not to be damaged by operation of the release mechanism or the propeller.

7.3 Except in the vicinity of the rudder and propeller, a buoyant lifeline shall be becketed around the outside of the lifeboat.

7.4 Lifeboats which are not self-righting when capsized shall have suitable handholds on the underside of the hull to enable persons to cling to the lifeboat. The handholds shall be fastened to the lifeboat in such a way that, when subjected to an impact sufficient to cause them to break away from the lifeboat, they break away without damaging the lifeboat.

7.5 All lifeboats shall be fitted with sufficient watertight lockers or compartments to provide for the storage of the small items of equipment, water and provisions required by paragraph 8. Means shall be provided for the storage of collected rainwater.

7.6 Every lifeboat to be launched by a fall or falls shall be fitted with a release mechanism complying with the following requirements:

- .1 The mechanism shall be so arranged that all hooks are released simultaneously.
- .2 The mechanism shall have two release capabilities as follows:
 - .2.1 a normal release capability which will release the lifeboat when it is waterborne or when there is no load on the hooks;
 - .2.2 an on-load release capability which will release the lifeboat with a load on the hooks. This release shall be so arranged as to release the lifeboat under any conditions of loading from no-load with the lifeboat waterborne to a load of 1.1 times the total mass of the lifeboat when loaded with its full complement of persons and equipment. This release capability shall be adequately protected against accidental or premature use.
- .3 The release control shall be clearly marked in a colour that contrasts with its surroundings.
- .4 The mechanism shall be designed with a factor of safety of 6 based on the ultimate strength of the materials used, assuming the mass of the lifeboat is equally distributed between the falls.

7.7 Every lifeboat shall be fitted with a release device to enable the forward painter to be released when under tension.

7.8 Every lifeboat shall be provided with a permanently installed earth connection and arrangements for adequately siting and securing in the operating position the antenna provided with the portable radio apparatus required by regulation 6.2.1.

7.9 Lifeboats intended for launching down the side of a ship shall have skates and fenders as necessary to facilitate launching and prevent damage to the lifeboat.

7.10 A manually controlled lamp visible on a dark night with a clear atmosphere at a distance of at least 2 miles for a period of not less than 12 h shall be fitted to the top of the cover or enclosure. If the light is a flashing light, it shall initially flash at a rate of not less than 50 flashes per minute over the first 2 h of operation of the 12 h operating period.

7.11 A lamp or source of light shall be fitted inside the lifeboat to provide illumination for not less than 12 h to enable reading of survival and equipment instructions; however, oil lamps shall not be permitted for this purpose.

7.12 Unless expressly provided otherwise, every lifeboat shall be provided with effective means of bailing or be automatically self-bailing.

7.13 Every lifeboat shall be so arranged that an adequate view forward, aft and to both sides is provided from the control and steering position for safe launching and manoeuvring.

8 *Lifeboat equipment*

All items of lifeboat equipment, whether required by this paragraph or elsewhere in this chapter, with the exception of boat-hooks which shall be kept free for fending off purposes, shall be secured within the lifeboat by lashings, storage in lockers or compartments, storage in brackets or similar mounting arrangements or other suitable means. The equipment shall be secured in such a manner as not to interfere with any abandonment procedures. All items of lifeboat equipment shall be as small and of as little mass as possible and shall be packed in a suitable and compact form. Except where otherwise stated, the normal equipment of every lifeboat shall consist of:

- .1 sufficient buoyant oars to make headway in calm seas. Thole pins, crutches or equivalent arrangements shall be provided for each oar provided. Thole pins or crutches shall be attached to the boat by lanyards or chains;
- .2 two boat-hooks;
- .3 a buoyant bailer and two buckets;
- .4 a survival manual;
- .5 a binnacle containing an efficient compass which is luminous or provided with suitable means of illumination. In a totally enclosed lifeboat, the binnacle shall be permanently fitted at the steering position; in any other lifeboat, it shall be provided with suitable mounting arrangements;
- .6 a sea-anchor of adequate size fitted with a shock-resistant hawser and a tripping line which provides a firm hand grip when wet. The strength of the sea-anchor, hawser and tripping line shall be adequate for all sea conditions;
- .7 two efficient painters of a length equal to not less than twice the distance from the stowage position of the lifeboat to the waterline in the lightest

- seagoing condition or 15 m, whichever is the greater. One painter attached to the release device required by regulation 41.7.7 shall be placed at the forward end of the lifeboat and the other shall be firmly secured at or near the bow of the lifeboat ready for use;
- .8 two hatchets, one at each end of the lifeboat;
 - .9 watertight receptacles containing a total of 3 ℓ of fresh water for each person the lifeboat is permitted to accommodate, of which 1 ℓ per person may be replaced by a de-salting apparatus capable of producing an equal amount of fresh water in 2 days;
 - .10 a rustproof dipper with lanyard;
 - .11 a rustproof graduated drinking vessel;
 - .12 a food ration totalling not less than 10,000 kJ for each person the lifeboat is permitted to accommodate; these rations shall be kept in airtight packaging and be stowed in a watertight container;
 - .13 four rocket parachute flares complying with the requirements of regulation 35;
 - .14 six hand flares complying with the requirements of regulation 36;
 - .15 two buoyant smoke signals complying with the requirements of regulation 37;
 - .16 one waterproof electric torch suitable for Morse signalling together with one spare set of batteries and one spare bulb in a waterproof container;
 - .17 one daylight signalling mirror with instructions for its use for signalling to ships and aircraft;
 - .18 one copy of the life-saving signals prescribed by regulation V/16 on a waterproof card or in a waterproof container;
 - .19 one whistle or equivalent sound signal;
 - .20 a first-aid outfit in a waterproof case capable of being closed tightly after use;
 - .21 six doses of anti-seasickness medicine and one seasickness bag for each person;
 - .22 a jack-knife to be kept attached to the boat by a lanyard;
 - .23 three tin openers;
 - .24 two buoyant rescue quoits, attached to not less than 30 m of buoyant line;
 - .25 a manual pump;
 - .26 one set of fishing tackle;
 - .27 sufficient tools for minor adjustments to the engine and its accessories;

- .28 portable fire-extinguishing equipment suitable for extinguishing oil fires;
- .29 a searchlight capable of effectively illuminating a light-coloured object at night having a width of 18 m at a distance of 180 m for a total period of 6 h and of working for not less than 3 h continuously;
- .30 an efficient radar reflector;
- .31 thermal protective aids complying with the requirements of regulation 34 sufficient for 10% of the number of persons the lifeboat is permitted to accommodate or two, whichever is the greater.
- .32 In the case of ships engaged on voyages of such a nature and duration that, in the opinion of the Administration, the items specified in paragraphs 8.12 and 8.26 are unnecessary, the Administration may allow these items to be dispensed with.

9 *Lifeboat markings*

- 9.1 The dimensions of the lifeboat and the number of persons which it is permitted to accommodate shall be marked on it in clear permanent characters.
- 9.2 The name and port of registry of the ship to which the lifeboat belongs shall be marked on each side of the lifeboat's bow in block capitals of the Roman alphabet.
- 9.3 Means of identifying the ship to which the lifeboat belongs and the number of the lifeboat shall be marked in such a way that they are visible from above.

Regulation 42

Partially enclosed lifeboats

- 1 Partially enclosed lifeboats shall comply with the requirements of regulation 41 and in addition shall comply with the requirements of this regulation.
- 2 Every partially enclosed lifeboat shall be provided with effective means of bailing or be automatically self-bailing.
- 3 Partially enclosed lifeboats shall be provided with permanently attached rigid covers extending over not less than 20% of the length of the lifeboat from the stem and not less than 20% of the length of the lifeboat from the aftermost part of the lifeboat. The lifeboat shall be fitted with a permanently attached foldable canopy which together with the rigid covers completely encloses the occupants of the lifeboat in a weatherproof shelter and protects them from exposure. The canopy shall be so arranged that:
 - .1 it is provided with adequate rigid sections or battens to permit erection of the canopy;
 - .2 it can be easily erected by not more than two persons;

- .3 it is insulated to protect the occupants against heat and cold by means of not less than two layers of material separated by an air gap or other equally efficient means; means shall be provided to prevent accumulation of water in the air gap;
 - .4 its exterior is of a highly visible colour and its interior is of a colour which does not cause discomfort to the occupants;
 - .5 it has entrances at both ends and on each side, provided with efficient adjustable closing arrangements which can be easily and quickly opened and closed from inside or outside so as to permit ventilation but exclude seawater, wind and cold; means shall be provided for holding the entrances securely in the open and closed position;
 - .6 with the entrances closed, it admits sufficient air for the occupants at all times;
 - .7 it has means for collecting rainwater;
 - .8 the occupants can escape in the event of the lifeboat capsizing.
- 4 The interior of the lifeboat shall be of a highly visible colour.
- 5 The radiotelegraph installation required by regulation 6.2.2 shall be installed in a cabin large enough to accommodate both the equipment and the person using it. No separate cabin is required if the construction of the lifeboat provides a sheltered space to the satisfaction of the Administration.

Regulation 43

Self-righting partially enclosed lifeboats

- 1 Self-righting partially enclosed lifeboats shall comply with the requirements of regulation 41 and in addition shall comply with the requirements of this regulation.
- 2 *Enclosure*
- 2.1 Permanently attached rigid covers shall be provided extending over not less than 20% of the length of the lifeboat from the stem and not less than 20% of the length of the lifeboat from the aftermost part of the lifeboat.
- 2.2 The rigid covers shall form two shelters. If the shelters have bulkheads they shall have openings of sufficient size to permit easy access by persons each wearing an immersion suit or warm clothes and a lifejacket. The interior height of the shelters shall be sufficient to permit persons easy access to their seats in the bow and stern of the lifeboat.
- 2.3 The rigid covers shall be so arranged that they include windows or translucent panels to admit sufficient daylight to the inside of the lifeboat with the openings or canopies closed so as to make artificial light unnecessary.

2.4 The rigid covers shall have railings to provide a secure handhold for persons moving about the exterior of the lifeboat.

2.5 Open parts of the lifeboat shall be fitted with a permanently attached foldable canopy so arranged that:

- .1 it can be easily erected by not more than two persons in not more than 2 min;
- .2 it is insulated to protect the occupants against cold by means of not less than two layers of material separated by an air gap or other equally efficient means.

2.6 The enclosure formed by the rigid covers and canopy shall be so arranged:

- .1 as to allow launching and recovery operations to be performed without any occupant having to leave the enclosure;
- .2 that it has entrances at both ends and on each side, provided with efficient adjustable closing arrangements which can be easily and quickly opened and closed from inside or outside so as to permit ventilation but exclude seawater, wind and cold; means shall be provided for holding the entrances securely in the open and in the closed position;
- .3 that with the canopy erected and all entrances closed, sufficient air is admitted for the occupants at all times;
- .4 that it has means for collecting rainwater;
- .5 that the exterior of the rigid covers and canopy and the interior of that part of the lifeboat covered by the canopy is of a highly visible colour. The interior of the shelters shall be of a colour which does not cause discomfort to the occupants;
- .6 that it is possible to row the lifeboat.

3 *Capsizing and re-righting*

3.1 A safety belt shall be fitted at each indicated seating position. The safety belt shall be so designed as to hold a person of a mass of 100 kg securely in place when the lifeboat is in a capsized position.

3.2 The stability of the lifeboat shall be such that it is inherently or automatically self-righting when loaded with its full or a partial complement of persons and equipment and the persons are secured with safety belts.

4 *Propulsion*

4.1 The engine and transmission shall be controlled from the helmsman's position.

4.2 The engine and engine installation shall be capable of running in any position during capsize and continue to run after the lifeboat returns to the upright or shall automatically stop on capsizing and be easily restarted after the lifeboat returns to the upright and the water has been drained from the lifeboat. The design of the fuel

and lubricating systems shall prevent the loss of fuel and the loss of more than 250 ml of lubricating oil from the engine during capsize.

4.3 Air-cooled engines shall have a duct system to take in cooling air from, and exhaust it to, the outside of the lifeboat. Manually operated dampers shall be provided to enable cooling air to be taken in from, and exhausted to, the interior of the lifeboat.

5 *Construction and fendering*

5.1 Notwithstanding regulation 41.1.6, a self-righting partially enclosed lifeboat shall be so constructed and fendered as to ensure that the lifeboat renders protection against harmful accelerations resulting from an impact of the lifeboat, when loaded with its full complement of persons and equipment, against the ship's side at an impact velocity of not less than 3.5 m/s.

5.2 The lifeboat shall be automatically self-bailing.

Regulation 44

Totally enclosed lifeboats

1 Totally enclosed lifeboats shall comply with the requirements of regulation 41 and in addition shall comply with the requirements of this regulation.

2 *Enclosure*

Every totally enclosed lifeboat shall be provided with a rigid watertight enclosure which completely encloses the lifeboat. The enclosure shall be so arranged that:

- .1 it protects the occupants against heat and cold;
- .2 access to the lifeboat is provided by hatches which can be closed to make the lifeboat watertight;
- .3 hatches are positioned so as to allow launching and recovery operations to be performed without any occupant having to leave the enclosure;
- .4 access hatches are capable of being opened and closed from both inside and outside and are equipped with means to hold them securely in open positions;
- .5 it is possible to row the lifeboat;
- .6 it is capable, when the lifeboat is in the capsized position with the hatches closed and without significant leakage, of supporting the entire mass of the lifeboat, including all equipment, machinery and its full complement of persons;
- .7 it includes windows or translucent panels on both sides which admit sufficient daylight to the inside of the lifeboat with the hatches closed to make artificial light unnecessary;

- .8 its exterior is of a highly visible colour and its interior of a colour which does not cause discomfort to the occupants;
- .9 handrails provide a secure handhold for persons moving about the exterior of the lifeboat, and aid embarkation and disembarkation;
- .10 persons have access to their seats from an entrance without having to climb over thwarts or other obstructions;
- .11 the occupants are protected from the effects of dangerous subatmospheric pressures which might be created by the lifeboat's engine.

3 *Capsizing and re-righting*

3.1 A safety belt shall be fitted at each indicated seating position. The safety belt shall be designed to hold a person of a mass of 100 kg securely in place when the lifeboat is in a capsized position.

3.2 The stability of the lifeboat shall be such that it is inherently or automatically self-righting when loaded with its full or a partial complement of persons and equipment and all entrances and openings are closed watertight and the persons are secured with safety belts.

3.3 The lifeboat shall be capable of supporting its full complement of persons and equipment when the lifeboat is in the damaged condition prescribed in regulation 41.1.1 and its stability shall be such that in the event of capsizing, it will automatically attain a position that will provide an above-water escape for its occupants.

3.4 The design of all engine exhaust pipes, air ducts and other openings shall be such that water is excluded from the engine when the lifeboat capsizes and re-rights.

4 *Propulsion*

4.1 The engine and transmission shall be controlled from the helmsman's position.

4.2 The engine and engine installation shall be capable of running in any position during capsize and continue to run after the lifeboat returns to the upright or shall automatically stop on capsizing and be easily restarted after the lifeboat returns to the upright. The design of the fuel and lubricating systems shall prevent the loss of fuel and the loss of more than 250 ml of lubricating oil from the engine during capsize.

4.3 Air cooled engines shall have a duct system to take in cooling air from, and exhaust it to, the outside of the lifeboat. Manually operated dampers shall be provided to enable cooling air to be taken in from, and exhausted to, the interior of the lifeboat.

5 *Construction and fendering*

Notwithstanding regulation 41.1.6, a totally enclosed lifeboat shall be so constructed and fendered as to ensure that the lifeboat renders protection against harmful accelerations resulting from an impact of the lifeboat, when loaded with its full complement of persons and equipment, against the ship's side at an impact velocity of not less than 3.5 m/s.

6 *Free-fall lifeboats*

A lifeboat arranged for free-fall launching shall be so constructed that it is capable of rendering protection against harmful accelerations resulting from being launched, when loaded with its full complement of persons and equipment, from at least the maximum height at which it is designed to be stowed above the waterline with the ship in its lightest seagoing condition, under unfavourable conditions of trim of up to 10° and with the ship listed not less than 20° either way.

Regulation 45

Lifeboats with a self-contained air support system

In addition to complying with the requirements of regulations 41 and 44, a lifeboat with a self-contained air support system shall be so arranged that, when proceeding with all entrances and openings closed, the air in the lifeboat remains safe and breathable and the engine runs normally for a period of not less than 10 min. During this period the atmospheric pressure inside the lifeboat shall never fall below the outside atmospheric pressure nor shall it exceed it by more than 20 mbar. The system shall have visual indicators to indicate the pressure of the air supply at all times.

Regulation 46

Fire-protected lifeboats

1 In addition to complying with the requirements of regulations 41, 44 and 45, a fire-protected lifeboat when waterborne shall be capable of protecting the number of persons it is permitted to accommodate when subjected to a continuous oil fire that envelops the lifeboat for a period of not less than 8 min.

2 *Water spray system*

A lifeboat which has a water spray fire-protection system shall comply with the following:

- 1 water for the system shall be drawn from the sea by a self-priming motor pump. It shall be possible to turn "on" and turn "off" the flow of water over the exterior of the lifeboat;
- 2 the seawater intake shall be so arranged as to prevent the intake of flammable liquids from the sea surface;
- 3 the system shall be arranged for flushing with fresh water and allowing complete drainage.

SECTION V – RESCUE BOATS

Regulation 47

Rescue boats

1 *General requirements*

1.1 Except as provided by this regulation, all rescue boats shall comply with the requirements of regulations 41.1 to 41.7.4 inclusive and 41.7.6, 41.7.7, 41.7.9, 41.7.12 and 41.9.

1.2 Rescue boats may be either of rigid or inflated construction or a combination of both and shall:

- .1 be not less than 3.8 m and not more than 8.5 m in length;
- .2 be capable of carrying at least five seated persons and a person lying down.

1.3 Rescue boats which are a combination of rigid and inflated construction shall comply with the appropriate requirements of this regulation to the satisfaction of the Administration.

1.4 Unless the rescue boat has adequate sheer, it shall be provided with a bow cover extending for not less than 15% of its length.

1.5 Rescue boats shall be capable of manoeuvring at speeds up to 6 knots and maintaining that speed for a period of at least 4 h.

1.6 Rescue boats shall have sufficient mobility and manoeuvrability in a seaway to enable persons to be retrieved from the water, marshal liferafts and tow the largest liferaft carried on the ship when loaded with its full complement of persons and equipment or its equivalent at a speed of at least 2 knots.

1.7 A rescue boat shall be fitted with an inboard engine or outboard motor. If it is fitted with an outboard motor, the rudder and tiller may form part of the engine. Notwithstanding the requirements of regulation 41.6.1, petrol-driven outboard engines with an approved fuel system may be fitted in rescue boats provided the fuel tanks are specially protected against fire and explosion.

1.8 Arrangements for towing shall be permanently fitted in rescue boats and shall be sufficiently strong to marshal or tow liferafts as required by paragraph 1.6.

1.9 Rescue boats shall be fitted with weathertight stowage for small items of equipment.

2 *Rescue boat equipment*

2.1 All items of rescue boat equipment, with the exception of boat-hooks which shall be kept free for fending off purposes, shall be secured within the rescue boat by lashings, storage in lockers or compartments, storage in brackets or similar

mounting arrangements, or other suitable means. The equipment shall be secured in such a manner as not to interfere with any launching or recovery procedures. All items of rescue boat equipment shall be as small and of as little mass as possible and shall be packed in suitable and compact form.

2.2 The normal equipment of every rescue boat shall consist of:

- .1 sufficient buoyant oars or paddles to make headway in calm seas. Thole pins, crutches or equivalent arrangements shall be provided for each oar. Thole pins or crutches shall be attached to the boat by lanyards or chains;
- .2 a buoyant bailer;
- .3 a binnacle containing an efficient compass which is luminous or provided with suitable means of illumination;
- .4 a sea-anchor and tripping line with a hawser of adequate strength not less than 10 m in length;
- .5 a painter of sufficient length and strength, attached to the release device complying with the requirements of regulation 41.7.7 and placed at the forward end of the rescue boat;
- .6 one buoyant line, not less than 50 m in length, of sufficient strength to tow a liferaft as required by paragraph 1.6;
- .7 one waterproof electric torch suitable for Morse signalling, together with one spare set of batteries and one spare bulb in a waterproof container;
- .8 one whistle or equivalent sound signal;
- .9 a first-aid outfit in a waterproof case capable of being closed tightly after use;
- .10 two buoyant rescue quoits, attached to not less than 30 m of buoyant line;
- .11 a searchlight capable of effectively illuminating a light-coloured object at night having a width of 18 m at a distance of 180 m for a total period of 6 h and of working for at least 3 h continuously;
- .12 an efficient radar reflector.
- .13 thermal protective aids complying with the requirements of regulation 34 sufficient for 10% of the number of persons the rescue boat is permitted to accommodate or two, whichever is the greater.

2.3 In addition to the equipment required by paragraph 2.2, the normal equipment of every rigid rescue boat shall include:

- .1 a boat-hook;
- .2 a bucket;
- .3 a knife or hatchet.

2.4 In addition to the equipment required by paragraph 2.2 the normal equipment of every inflated rescue boat shall consist of:

- .1 a buoyant safety knife;
- .2 two sponges;
- .3 an efficient manually operated bellows or pump;
- .4 a repair kit in a suitable container for repairing punctures;
- .5 a safety boat-hook.

3 *Additional requirements for inflated rescue boats*

3.1 The requirements of regulations 41.1.3 and 41.1.5 do not apply to inflated rescue boats.

3.2 An inflated rescue boat shall be constructed in such a way that, when suspended by its bridle or lifting hook:

- .1 it is of sufficient strength and rigidity to enable it to be lowered and recovered with its full complement of persons and equipment;
- .2 it is of sufficient strength to withstand a load of 4 times the mass of its full complement of persons and equipment at an ambient temperature of $20 \pm 3^{\circ}\text{C}$ with all relief valves inoperative;
- .3 it is of sufficient strength to withstand a load of 1.1 times the mass of its full complement of persons and equipment at an ambient temperature of -30°C , with all relief valves operative.

3.3 Inflated rescue boats shall be so constructed as to be capable of withstanding exposure:

- .1 when stowed on an open deck on a ship at sea;
- .2 for 30 days afloat in all sea conditions.

3.4 In addition to complying with the requirements of regulation 41.9, inflated rescue boats shall be marked with a serial number, the maker's name or trade mark and the date of manufacture.

3.5 The buoyancy of an inflated rescue boat shall be provided by either a single tube subdivided into at least five separate compartments of approximately equal volume or two separate tubes neither exceeding 60% of the total volume. The buoyancy tubes shall be so arranged that, in the event of any one of the compartments being damaged, the intact compartments shall be able to support the number of persons which the rescue boat is permitted to accommodate, each having a mass of 75 kg, when seated in their normal positions with positive freeboard over the rescue boat's entire periphery.

3.6 The buoyancy tubes forming the boundary of the inflated rescue boat shall on inflation provide a volume of not less than 0.17 m^3 for each person the rescue boat is permitted to accommodate.

3.7 Each buoyancy compartment shall be fitted with a non-return valve for manual inflation and means for deflation. A safety relief valve shall also be fitted unless the Administration is satisfied that such an appliance is unnecessary.

3.8 Underneath the bottom and on vulnerable places on the outside of the inflated rescue boat, rubbing strips shall be provided to the satisfaction of the Administration.

3.9 Where a transom is fitted it shall not be inset by more than 20% of the overall length of the rescue boat.

3.10 Suitable patches shall be provided for securing the painters fore and aft and the becketed lifelines inside and outside the boat.

3.11 The inflated rescue boat shall be maintained at all times in a fully inflated condition.

SECTION VI – LAUNCHING AND EMBARKATION APPLIANCES

Regulation 48

Launching and embarkation appliances

1 *General requirements*

1.1 Each launching appliance together with all its lowering and recovery gear shall be so arranged that the fully equipped survival craft or rescue boat it serves can be safely lowered against a trim of up to 10° and a list of up to 20° either way:

- .1 when boarded, as required by regulation 22 or 28, by its full complement of persons;
- .2 without persons in the survival craft or rescue boat.

1.2 Notwithstanding the requirements of paragraph 1.1, lifeboat launching appliances for oil tankers, chemical tankers and gas carriers with a final angle of heel greater than 20° calculated in accordance with the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 Protocol related thereto and the recommendations of the Organization*, as applicable, shall be capable of operating at the final angle of heel on the lower side of the ship.

1.3 A launching appliance shall not depend on any means other than gravity or stored mechanical power which is independent of the ship's power supplies to launch the survival craft or rescue boat it serves in the fully loaded and equipped condition and also in the light condition.

* Reference is made to the damage stability requirements of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) adopted by the Maritime Safety Committee by resolution MSC.4(48) and the International Code for the Construction and Equipment of Ships carrying Liquefied Gases in Bulk (IGC Code) adopted by the Maritime Safety Committee by resolution MSC.5(48).

1.4 A launching mechanism shall be so arranged that it may be actuated by one person from a position on the ship's deck, and from a position within the survival craft or rescue boat; the survival craft shall be visible to the person on deck operating the launching mechanism.

1.5 Each launching appliance shall be so constructed that a minimum amount of routine maintenance is necessary. All parts requiring regular maintenance by the ship's crew shall be readily accessible and easily maintained.

1.6 The winch brakes of a launching appliance shall be of sufficient strength to withstand:

- .1 a static test with a proof load of not less than 1.5 times the maximum working load; and
- .2 a dynamic test with a proof load of not less than 1.1 times the maximum working load at maximum lowering speed.

1.7 The launching appliance and its attachments other than winch brakes shall be of sufficient strength to withstand a static proof load on test of not less than 2.2 times the maximum working load.

1.8 Structural members and all blocks, falls, padeyes, links, fastenings and all other fittings used in connection with launching equipment shall be designed with not less than a minimum factor of safety on the basis of the maximum working load assigned and the ultimate strength of the material used for construction. A minimum factor of safety of 4.5 shall be applied to all davit and winch structural members, and a minimum factor of safety of 6 shall be applied to falls, suspension chains, links and blocks.

1.9 Each launching appliance shall, as far as practicable, remain effective under conditions of icing.

1.10 A lifeboat launching appliance shall be capable of recovering the lifeboat with its crew.

1.11 The arrangements of the launching appliance shall be such as to enable safe boarding of the survival craft in accordance with the requirements of regulations 38.4.2, 38.4.3, 41.3.1 and 41.3.2.

2 *Launching appliances using falls and a winch*

2.1 Falls shall be of rotation-resistant and corrosion-resistant steel wire rope.

2.2 In the case of a multiple drum winch, unless an efficient compensatory device is fitted, the falls shall be so arranged as to wind off the drums at the same rate when lowering, and to wind on to the drums evenly at the same rate when hoisting.

2.3 Every rescue boat launching appliance shall be fitted with a powered winch motor of such capacity that the rescue boat can be raised from the water with its full complement of persons and equipment.

2.4 An efficient hand gear shall be provided for recovery of each survival craft and rescue boat. Hand gear handles or wheels shall not be rotated by moving parts of the winch when the survival craft or rescue boat is being lowered or when it is being hoisted by power.

2.5 Where davit arms are recovered by power, safety devices shall be fitted which will automatically cut off the power before the davit arms reach the stops in order to avoid overstressing the falls or davits, unless the motor is designed to prevent such overstressing.

2.6 The speed at which the survival craft or rescue boat is lowered into the water shall be not less than that obtained from the formula:

$$S = 0.4 + (0.02 \times H)$$

where S = speed of lowering in metres per second

and H = height in metres from davit head to the waterline at the lightest seagoing condition.

2.7 The maximum lowering speed shall be established by the Administration having regard to the design of the survival craft or rescue boat, the protection of its occupants from excessive forces, and the strength of the launching arrangements taking into account inertia forces during an emergency stop. Means shall be incorporated in the appliance to ensure that this speed is not exceeded.

2.8 Every rescue boat launching appliance shall be capable of hoisting the rescue boat when loaded with its full rescue boat complement of persons and equipment at a rate of not less than 0.3 m/s.

2.9 Every launching appliance shall be fitted with brakes capable of stopping the descent of the survival craft or rescue boat and holding it securely when loaded with its full complement of persons and equipment; brake pads shall, where necessary, be protected from water and oil.

2.10 Manual brakes shall be so arranged that the brake is always applied unless the operator, or a mechanism activated by the operator, holds the brake control in the "off" position.

3 *Float-free launching*

Where a survival craft requires a launching appliance and is also designed to float free, the float-free release of the survival craft from its stowed position shall be automatic.

4 *Free-fall launching*

Every free-fall launching appliance using an inclined plane shall, in addition to complying with the applicable requirements of paragraph 1, also comply with the following requirements:

- 1 The launching appliance shall be so arranged that excessive forces are not experienced by the occupants of the survival craft during launching.

- .2 The launching appliance shall be a rigid structure with a ramp angle and length sufficient to ensure that the survival craft effectively clears the ship.
- .3 The launching appliance shall be efficiently protected against corrosion and be so constructed as to prevent incendive friction or impact sparking during the launching of the survival craft.

5 *Evacuation-slide launching and embarkation*

Every evacuation-slide launching appliance shall, in addition to complying with the applicable requirements of paragraph 1, also comply with the following requirements:

- .1 The evacuation slide shall be capable of being deployed by one person at the embarkation station.
- .2 The evacuation slide shall be capable of being used in high winds and in a seaway.

6 *Liferaft launching appliances*

Every liferaft launching appliance shall comply with the requirements of paragraphs 1 and 2, except with regard to use of gravity for turning out the appliance, embarkation in the stowed position and recovery of the loaded liferaft. The launching appliance shall be so arranged as to prevent premature release during lowering and shall release the liferaft when waterborne.

7 *Embarkation ladders*

7.1 Handholds shall be provided to ensure a safe passage from the deck to the head of the ladder and vice versa.

7.2 The steps of the ladder shall be:

- .1 made of hardwood, free from knots or other irregularities, smoothly machined and free from sharp edges and splinters, or of suitable material of equivalent properties;
- .2 provided with an efficient non-slip surface either by longitudinal grooving or by the application of an approved non-slip coating;
- .3 not less than 480 mm long, 115 mm wide and 25 mm in depth, excluding any non-slip surface or coating;
- .4 equally spaced not less than 300 mm or more than 380 mm apart and secured in such a manner that they will remain horizontal.

7.3 The side ropes of the ladder shall consist of two uncovered manila ropes not less than 65 mm in circumference on each side. Each rope shall be continuous with no joints below the top step. Other materials may be used provided the dimensions, breaking strain, weathering, stretching and gripping properties are at least equivalent to those of manila rope. All rope ends shall be secured to prevent unravelling.

SECTION VII – OTHER LIFE-SAVING APPLIANCES

Regulation 49

Line-throwing appliances

- 1 Every line-throwing appliance shall:
 - .1 be capable of throwing a line with reasonable accuracy;
 - .2 include not less than four projectiles each capable of carrying the line at least 230 m in calm weather;
 - .3 include not less than four lines each having a breaking strength of not less than 2 kN;
 - .4 have brief instructions or diagrams clearly illustrating the use of the line-throwing appliance.
- 2 The rocket, in the case of a pistol fired rocket, or the assembly, in the case of an integral rocket and line, shall be contained in a water-resistant casing. In addition, in the case of a pistol-fired rocket, the line and rockets together with the means of ignition shall be stowed in a container which provides protection from the weather.

Regulation 50

General emergency alarm system

The general emergency alarm system shall be capable of sounding the general emergency alarm signal consisting of seven or more short blasts followed by one long blast on the ship's whistle or siren and additionally on an electrically operated bell or klaxon or other equivalent warning system, which shall be powered from the ship's main supply and the emergency source of electrical power required by regulation II-1/42 or II-1/43, as appropriate. The system shall be capable of operation from the navigating bridge and, except for the ship's whistle, also from other strategic points. The system shall be audible throughout all the accommodation and normal crew working spaces.

SECTION VIII – MISCELLANEOUS

Regulation 51

Training manual

The training manual, which may comprise several volumes, shall contain instructions and information, in easily understood terms illustrated wherever possible, on the life-saving appliances provided in the ship and on the best methods of survival. Any part of such information may be provided in the form of audio-visual aids in lieu of the manual. The following shall be explained in detail:

- .1 donning of lifejackets and immersion suits, as appropriate;
- .2 muster at the assigned stations;
- .3 boarding, launching, and clearing the survival craft and rescue boats;
- .4 method of launching from within the survival craft;
- .5 release from launching appliances;
- .6 methods and use of devices for protection in launching areas, where appropriate;
- .7 illumination in launching areas;
- .8 use of all survival equipment;
- .9 use of all detection equipment;
- .10 with the assistance of illustrations, the use of radio life-saving appliances;
- .11 use of drogues;
- .12 use of engine and accessories;
- .13 recovery of survival craft and rescue boats including stowage and securing;
- .14 hazards of exposure and the need for warm clothing;
- .15 best use of the survival craft facilities in order to survive;
- .16 methods of retrieval, including the use of helicopter rescue gear (slings, baskets, stretchers), breeches-buoy and shore life-saving apparatus and ship's line-throwing apparatus;
- .17 all other functions contained in the muster list and emergency instructions;
- .18 instructions for emergency repair of the life-saving appliances.

Regulation 52

Instructions for on-board maintenance

Instructions for on-board maintenance of life-saving appliances shall be easily understood, illustrated wherever possible, and, as appropriate, shall include the following for each appliance:

- .1 a checklist for use when carrying out the inspections required by regulation 19.7;
- .2 maintenance and repair instructions;
- .3 schedule of periodic maintenance;
- .4 diagram of lubrication points with the recommended lubricants;
- .5 list of replaceable parts;
- .6 list of sources of spare parts;
- .7 log for records of inspections and maintenance.

Regulation 53

Muster list and emergency instructions

1 The muster list shall specify details of the general emergency alarm signal prescribed by regulation 50 and also action to be taken by crew and passengers when this alarm is sounded. The muster list shall also specify how the order to abandon ship will be given.

2 The muster list shall show the duties assigned to the different members of the crew including:

- .1 closing of the watertight doors, fire doors, valves, scuppers, sidescuttles, skylights, portholes and other similar openings in the ship;
- .2 equipping of the survival craft and other life-saving appliances;
- .3 preparation and launching of survival craft;
- .4 general preparations of other life-saving appliances;
- .5 muster of passengers;
- .6 use of communication equipment;
- .7 manning of fire parties assigned to deal with fires;
- .8 special duties assigned in respect of the use of fire-fighting equipment and installations.

3 The muster list shall specify which officers are assigned to ensure that life-saving and fire appliances are maintained in good condition and are ready for immediate use.

4 The muster list shall specify substitutes for key persons who may become disabled, taking into account that different emergencies may call for different actions.

5 The muster list shall show the duties assigned to members of the crew in relation to passengers in case of emergency. These duties shall include:

- .1 warning the passengers;
- .2 seeing that they are suitably clad and have donned their lifejackets correctly;
- .3 assembling passengers at muster stations;
- .4 keeping order in the passageways and on the stairways and generally controlling the movements of the passengers;
- .5 ensuring that a supply of blankets is taken to the survival craft.

6 The muster list shall be prepared before the ship proceeds to sea. After the muster list has been prepared, if any change takes place in the crew which necessitates an alteration in the muster list, the master shall either revise the list or prepare a new list.

7 The format of the muster list used on passenger ships shall be approved."

Part 4

CHAPTER IV

RADIOTELEGRAPHY AND RADIOTELEPHONY

Regulation 2

Terms and definitions

The following new sub-paragraph is added:

- “(i) ‘Emergency position-indicating radio beacon’ means a station in the mobile service the emissions of which are intended to facilitate search and rescue operations.”

The following new regulations are added:

“Regulation 14-1

Survival craft emergency position-indicating radio beacons

- (a) Survival craft emergency position-indicating radio beacons required by regulation III/6.2.3 to be carried in survival craft shall provide transmissions to enable aircraft to locate the survival craft and may also provide transmissions for alerting purposes.
- (b) Survival craft emergency position-indicating radio beacons shall, at least, be capable of transmitting alternately or simultaneously signals complying with the relevant standards and recommended practices of the International Civil Aviation Organization (ICAO) on the frequencies 121.5 MHz and 243.0 MHz.
- (c) Survival craft emergency position-indicating radio beacons shall:
- (i) be of a highly visible colour, so designed that they can be used by an unskilled person and so constructed that they may be easily tested and maintained. Batteries shall not require replacement at intervals of less than 12 months, taking into account testing arrangements;
 - (ii) be watertight, capable of floating and being dropped into the water without damage from a height of at least 20 m;
 - (iii) be capable only of manual activation and de-activation;
 - (iv) be portable, lightweight, and compact;
 - (v) be provided with an indication that signals are being emitted;

- (vi) derive their energy supply from a battery forming an integral part of the device and having sufficient capacity to operate the apparatus for a period of 48 h. The transmission may be intermittent. Determination of the duty cycle should take into account the probability of homing being properly carried out, the need to avoid congestion on the frequencies and the need to comply with the requirements of the International Civil Aviation Organization (ICAO); and
- (vii) be tested and, if necessary, have their source of energy replaced at intervals not exceeding 12 months.

Regulation 14-2

Periodic inspection and testing of emergency position-indicating radio beacons

Emergency position-indicating radio beacons provided in accordance with regulation III/6.2.3 shall at intervals not exceeding 12 months be inspected, tested and, if necessary, have their source of energy replaced. However, in cases where it appears proper and reasonable, the Administration may extend this period to 17 months.

Regulation 14-3

Two-way radiotelephone apparatus for survival craft

- (a) The apparatus required by regulation III/6.2.4 shall be so designed that it can be used in an emergency by an unskilled person.
- (b) The apparatus shall be portable and capable of being used for on-board communications.
- (c) The apparatus shall conform to the requirements laid down in the relevant Radio Regulations for equipment used in the maritime mobile service for on-board communications and shall be capable of operation on those channels specified by the Radio Regulations and as required by the Administration. If the apparatus is operating in the VHF band, precautions shall be taken to prevent the inadvertent selection of VHF channel 16 on equipment capable of being operated on that frequency.
- (d) The apparatus shall be operated from a battery of adequate capacity to ensure 4 h operation with a duty cycle of 1 : 9.
- (e) While at sea, the equipment shall be maintained in satisfactory condition, and, whenever necessary, the battery shall be brought to the fully charged condition or replaced."

Part 5

CHAPTER VII

CARRIAGE OF DANGEROUS GOODS

The existing text of chapter VII is replaced by the following:

PART A – CARRIAGE OF DANGEROUS GOODS IN PACKAGED FORM
OR IN SOLID FORM IN BULK

Regulation 1

Application

- 1 Unless expressly provided otherwise, this part applies to dangerous goods, classified under regulation 2 which are carried in packaged form or in solid form in bulk (hereinafter referred to as "dangerous goods"), in all ships to which the present regulations apply and in cargo ships of less than 500 tons gross tonnage.
- 2 The provisions of this part do not apply to ships' stores and equipment.
- 3 The carriage of dangerous goods is prohibited except in accordance with the provisions of this part.
- 4 To supplement the provisions of this part, each Contracting Government shall issue, or cause to be issued, detailed instructions on safe packaging and stowage of dangerous goods which shall include the precautions necessary in relation to other cargo.*

Regulation 2

Classification

Dangerous goods shall be divided into the following classes:

- Class 1 – Explosives
- Class 2 – Gases: compressed, liquefied or dissolved under pressure

* Reference is made to the International Maritime Dangerous Goods Code (IMDG Code) adopted by the Organization by resolution A.81(IV), and to the relevant sections and the related parts of Appendix B of the Code of Safe Practice for Solid Bulk Cargoes (BC Code) adopted by the Organization by resolution A.434(XI), as have been or may be amended by the Maritime Safety Committee.

- Class 3 — Flammable* liquids
- Class 4.1 — Flammable* solids
- Class 4.2 — Substances liable to spontaneous combustion
- Class 4.3 — Substances which, in contact with water, emit flammable gases
- Class 5.1 — Oxidizing substances
- Class 5.2 — Organic peroxides
- Class 6.1 — Poisonous (toxic) substances
- Class 6.2 — Infectious substances
- Class 7 — Radioactive materials
- Class 8 — Corrosives
- Class 9 — Miscellaneous dangerous substances, that is any other substance which experience has shown, or may show, to be of such a dangerous character that the provisions of this part shall apply to it.

Regulation 3

Packaging

- 1 The packaging of dangerous goods shall be:
 - .1 well made and in good condition;
 - .2 of such a character that any interior surface with which the contents may come in contact is not dangerously affected by the substance being conveyed; and
 - .3 capable of withstanding the ordinary risks of handling and carriage by sea.
- 2 Where the use of absorbent or cushioning material is customary in the packaging of liquids in receptacles, that material shall be:
 - .1 capable of minimizing the dangers to which the liquid may give rise;
 - .2 so disposed as to prevent movement and ensure that the receptacle remains surrounded; and
 - .3 where reasonably possible, of sufficient quantity to absorb the liquid in the event of breakage of the receptacle.
- 3 Receptacles containing dangerous liquids shall have an ullage at the filling temperature sufficient to allow for the highest temperature during the course of normal carriage.

* "Flammable" has the same meaning as "inflammable".

4 Cylinders or receptacles for gases under pressure shall be adequately constructed, tested, maintained and correctly filled.

5 Empty uncleaned receptacles which have been used previously for the carriage of dangerous goods shall be subject to the provisions of this part for filled receptacles, unless adequate measures have been taken to nullify any hazard.

Regulation 4

Marking, labelling and placarding

1 Packages containing dangerous goods shall be durably marked with the correct technical name; trade names alone shall not be used.

2 Packages containing dangerous goods shall be provided with distinctive labels or stencils of the labels, or placards, as appropriate, so as to make clear the dangerous properties of the goods contained therein.

3 The method of marking the correct technical name and of affixing labels or applying stencils of labels, or of affixing placards on packages containing dangerous goods, shall be such that this information will still be identifiable on packages surviving at least three months' immersion in the sea. In considering suitable marking, labelling and placarding methods, account shall be taken of the durability of the materials used and of the surface of the package.

4 Packages containing dangerous goods shall be so marked and labelled except that:

- .1 packages containing dangerous goods of a low degree of hazard or packed in limited quantities*; or
- .2 when special circumstances permit, packages that are stowed and handled in units that are identified by labels or placards*;

may be exempted from labelling requirements.

Regulation 5

Documents

1 In all documents relating to the carriage of dangerous goods by sea where the goods are named, the correct technical name of the goods shall be used (trade names alone shall not be used) and the correct description given in accordance with the classification set out in regulation 2.

2 The shipping documents prepared by the shipper shall include, or be accompanied by, a signed certificate or declaration that the shipment offered for carriage is properly packaged and marked, labelled or placarded, as appropriate, and in proper condition for carriage.

* Reference is made to the specific exemptions provided for in the International Maritime Dangerous Goods Code (IMDG Code).

3 Each ship carrying dangerous goods shall have a special list or manifest setting forth, in accordance with the classification set out in regulation 2, the dangerous goods on board and the location thereof. A detailed stowage plan which identifies by class and sets out the location of all dangerous goods on board may be used in place of such special list or manifest.

Regulation 6

Stowage requirements

1 Dangerous goods shall be stowed safely and appropriately in accordance with the nature of the goods. Incompatible goods shall be segregated from one another.

2 Explosives (except ammunition) which present a serious risk shall be stowed in a magazine which shall be kept securely closed while at sea. Such explosives shall be segregated from detonators. Electrical apparatus and cables in any compartment in which explosives are carried shall be so designed and used as to minimize the risk of fire or explosion.

3 Dangerous goods in packaged form which give off dangerous vapours shall be stowed in a mechanically ventilated space or on deck. Dangerous goods in solid form in bulk which give off dangerous vapours shall be stowed in a well ventilated space.

4 In ships carrying flammable liquids or gases, special precautions shall be taken where necessary against fire or explosion.

5 Substances which are liable to spontaneous heating or combustion shall not be carried unless adequate precautions have been taken to minimize the likelihood of the outbreak of fire.

Regulation 7

Explosives in passenger ships

1 In passenger ships the following explosives only may be carried:

- .1 safety cartridges and safety fuses;
- .2 small quantities of explosives not exceeding 10 kg total net mass;
- .3 distress signals for use in ships or aircraft, if the total mass of such signals does not exceed 1,000 kg;
- .4 except in ships carrying unberthed passengers, fireworks which are unlikely to explode violently.

2 Notwithstanding the provisions of paragraph 1, additional quantities or types of explosives may be carried in passenger ships in which special safety measures approved by the Administration are taken.

**PART B – CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING
DANGEROUS LIQUID CHEMICALS IN BULK**

Regulation 8

Definitions

For the purpose of this part, unless expressly provided otherwise:

1. "International Bulk Chemical Code" means the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Maritime Safety Committee of the Organization by resolution MSC.4(48), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I.
2. "Chemical tanker" means a cargo ship constructed or adapted and used for the carriage in bulk of any liquid product listed in chapter 17 of the International Bulk Chemical Code.
3. For the purpose of regulation 9, "ship constructed" means a ship the keel of which is laid or which is at a similar stage of construction.
4. "At a similar stage of construction" means the stage at which:
 - .1 construction identifiable with a specific ship begins; and
 - .2 assembly of that ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less.

Regulation 9

Application to chemical tankers

1. Unless expressly provided otherwise, this part applies to chemical tankers constructed on or after 1 July 1986 including those of less than 500 tons gross tonnage. Such tankers shall comply with the requirements of this part in addition to any other applicable requirements of the present regulations.
2. Any chemical tanker, irrespective of the date of construction, which undergoes repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to the ship. Such a ship, if constructed before 1 July 1986, shall, as a rule, comply with the requirements for a ship constructed on or after that date to at least the same extent as before undergoing such repairs, alterations, modifications or outfitting. Repairs, alterations and modifications of a major character, and outfitting related thereto, shall meet the requirements for a ship constructed on or after 1 July 1986 in so far as the Administration deems reasonable and practicable.

3 A ship, irrespective of the date of construction, which is converted to a chemical tanker shall be treated as a chemical tanker constructed on the date on which such conversion commenced.

Regulation 10

Requirements for chemical tankers

1 A chemical tanker shall comply with the requirements of the International Bulk Chemical Code and shall, in addition to the requirements of regulations I/8, I/9, and I/10, as applicable, be surveyed and certified as provided for in that Code. For the purpose of this regulation, the requirements of the Code shall be treated as mandatory.

2 A chemical tanker holding a certificate issued pursuant to the provisions of paragraph 1 shall be subject to the control established in regulation I/19. For this purpose such certificate shall be treated as a certificate issued under Regulation I/12 or I/13.

PART C – CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING LIQUEFIED GASES IN BULK

Regulation 11

Definitions

For the purpose of this part, unless expressly provided otherwise:

1 "International Gas Carrier Code" means the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk as adopted by the Maritime Safety Committee of the Organization by resolution MSC.5(48), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I.

2 "Gas carrier" means a cargo ship constructed or adapted and used for the carriage in bulk of any liquefied gas or other product listed in chapter 19 of the International Gas Carrier Code.

3 For the purpose of regulation 12, "ship constructed" means a ship the keel of which is laid or which is at a similar stage of construction.

4 "At a similar stage of construction" means the stage at which:

- 1 construction identifiable with a specific ship begins; and
- 2 assembly of that ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less.

Regulation 12

Application to gas carriers

1 Unless expressly provided otherwise, this part applies to gas carriers constructed on or after 1 July 1986 including those of less than 500 tons gross tonnage. Such gas carriers shall comply with the requirements of this part in addition to any other applicable requirements of the present regulations.

2 Any gas carrier, irrespective of the date of construction, which undergoes repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to the ship. Such a ship if constructed before 1 July 1986 shall, as a rule, comply with the requirements for a ship constructed on or after that date to at least the same extent as before undergoing such repairs, alterations, modifications or outfitting. Repairs, alterations and modifications of a major character, and outfitting related thereto, shall meet the requirements for a ship constructed on or after 1 July 1986 in so far as the Administration deems reasonable and practicable.

3 A ship, irrespective of the date of construction, which is converted to a gas carrier shall be treated as a gas carrier constructed on the date on which such conversion commenced.

Regulation 13

Requirements for gas carriers

1 A gas carrier shall comply with the requirements of the International Gas Carrier Code and shall, in addition to the requirements of regulations I/8, I/9 and I/10, as applicable, be surveyed and certified as provided for in that Code. For the purpose of this regulation, the requirements of the Code shall be treated as mandatory.

2 A gas carrier holding a certificate issued pursuant to the provisions of paragraph 1 shall be subject to the control established in regulation I/19. For this purpose such certificate shall be treated as a certificate issued under regulation I/12 or I/13.

RESOLUTION MSC.6(48)
adopted on 17 June 1983
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RESOLUTION MSC.13(57)
(adopted on 11 April 1989)
ADOPTION OF AMENDMENTS TO THE INTERNATIONAL
CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

RESOLUTION MSC.13(57)
(adopted on 11 April 1989)
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RESOLUTION MSC.13(57)
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THE MARITIME SAFETY COMMITTEE,

NOTING Article 28(b) of the Convention of the International Maritime Organization concerning the functions of the Committee,

NOTING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea, 1974, hereafter referred to as "the Convention" concerning the procedures for amending the Annex to the Convention, other than the provisions of chapter I,

HAVING CONSIDERED at its fifty-seventh session amendments to the Convention proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, the amendments to the Convention, the text of which is set out in the Annex to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 31 July 1991 unless prior to that date more than one third of the Contracting Governments to the Convention, or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;
3. INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 February 1992 upon their acceptance in accordance with paragraph 2 above;

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4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annex to all Contracting Governments to the International Convention for the Safety of Life at Sea, 1974;

5. FURTHER REQUESTS the Secretary-General to transmit copies of the resolution to Members of the Organization which are not Contracting Governments to the Convention.

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ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE
SAFETY OF LIFE AT SEA, 1974, AS AMENDED

Chapter II-1

CONSTRUCTION - SUBDIVISION AND STABILITY
MACHINERY AND ELECTRICAL INSTALLATIONS

Regulation 11

The existing heading is replaced by the following:

"Peak and machinery space bulkheads and stern tubes in cargo ships".

The following text is inserted after the heading:

"(Paragraphs 8 and 9 of this regulation apply to ships constructed on or
after 1 February 1992)".

The following new paragraphs 8 and 9 are added after paragraph 7:

"8 Bulkheads shall be fitted separating the machinery space from cargo and
passenger spaces forward and aft and made watertight up to the freeboard deck.

9 Stern tubes shall be enclosed in a watertight space (or spaces) of
moderate volume. Other measures to minimize the danger of water penetrating
into the ship in case of damage to stern tube arrangements may be taken at the
discretion of the Administration".

Regulation 12

Double bottoms in passenger ships

In paragraph 5 the words "regulation III/2" in the third line is replaced by
"regulation III/3.16".

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Regulation 12-1

The following new regulation II-1/12-1 is added after regulation 12:

"Double bottoms in cargo ships other than tankers"

(This regulation applies to ships constructed on or after 1 February 1992)

1 A double bottom shall be fitted extending from the collision bulkhead to the afterpeak bulkhead, as far as this is practicable and compatible with the design and proper working of the ship.

2 Where a double bottom is required to be fitted, its depth shall be to the satisfaction of the Administration and the inner bottom shall be continued out to the ship's side in such a manner as to protect the bottom to the turn of the bilge.

3 Small wells constructed in the double bottom, in connection with the drainage arrangements of holds, shall not extend in depth more than necessary. A well extending to the outer bottom, may, however, be permitted at the after end of the shaft tunnel of the ship. Other wells may be permitted by the Administration if it is satisfied that the arrangements give protection equivalent to that afforded by a double bottom complying with this regulation.

4 A double bottom need not be fitted in way of watertight compartments used exclusively for the carriage of liquids, provided the safety of the ship in the event of bottom damage is not, in the opinion of the Administration, thereby impaired".

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Regulation 15

The existing text of this regulation is replaced by the following:

"Openings in watertight bulkheads in passenger ships

(This regulation applies to ships constructed on or after 1 February 1992)

1 The number of openings in watertight bulkheads shall be reduced to the minimum compatible with the design and proper working of the ship; satisfactory means shall be provided for closing these openings.

2.1 Where pipes, scuppers, electric cables, etc., are carried through watertight subdivision bulkheads, arrangements shall be made to ensure the watertight integrity of the bulkheads.

2.2 Valves not forming part of a piping system shall not be permitted in watertight subdivision bulkheads.

2.3 Lead or other heat sensitive materials shall not be used in systems which penetrate watertight subdivision bulkheads, where deterioration of such systems in the event of fire would impair the watertight integrity of the bulkheads.

3.1 No doors, manholes, or access openings are permitted:

- .1 in the collision bulkhead below the margin line;
- .2 in watertight transverse bulkheads dividing a cargo space from an adjoining cargo space or from a permanent or reserve bunker, except as provided in paragraph 10.1 and in regulation 16.

3.2 Except as provided in paragraph 3.3, the collision bulkhead may be pierced below the margin line by not more than one pipe for dealing with fluid in the forepeak tank, provided that the pipe is fitted with a screwdown valve capable of being operated from above the bulkhead deck, the valve chest being secured inside the forepeak to the collision bulkhead. The Administration

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may, however, authorize the fitting of this valve on the after side of the collision bulkhead provided that the valve is readily accessible under all service conditions and the space in which it is located is not a cargo space.

3.3 If the forepeak is divided to hold two different kinds of liquids the Administration may allow the collision bulkhead to be pierced below the margin line by two pipes, each of which is fitted as required by paragraph 3.2, provided the Administration is satisfied that there is no practical alternative to the fitting of such a second pipe and that, having regard to the additional subdivision provided in the forepeak, the safety of the ship is maintained.

4.1 Watertight doors fitted in bulkheads between permanent and reserve bunkers shall always be accessible, except as provided in paragraph 9.4 for between-deck bunker doors.

4.2 Satisfactory arrangements shall be made by means of screens or otherwise to prevent the coal from interfering with the closing of watertight bunker doors.

5 Subject to paragraph 11, not more than one door, apart from the doors to bunkers and shaft tunnels, may be fitted in each main transverse bulkhead within spaces containing the main and auxiliary propulsion machinery including boilers serving the needs of propulsion and all permanent bunkers. Where two or more shafts are fitted, the tunnels shall be connected by an intercommunicating passage. There shall be only one door between the machinery space and the tunnel spaces where two shafts are fitted and only two doors where there are more than two shafts. All these doors shall be of the sliding type and shall be so located as to have their sills as high as practicable. The hand gear for operating these doors from above the bulkhead deck shall be situated outside the spaces containing the machinery.

6.1 Watertight doors, except as provided in paragraph 10.1 or regulation 16, shall be power-operated sliding doors complying with the requirements of paragraph 7 capable of being closed simultaneously from the central operating console at the navigating bridge in not more than 60 seconds with the ship in the upright position.

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6.2 The means of operation whether by power or by hand of any power-operated sliding watertight door shall be capable of closing the door with the ship listed to 15° either way. Consideration shall also be given to the forces which may act on either side of the door as may be experienced when water is flowing through the opening applying a static head equivalent to a water height of at least 1 m above the sill on the centreline of the door.

6.3 Watertight door controls, including hydraulic piping and electric cables, shall be kept as close as practicable to the bulkhead in which the doors are fitted, in order to minimize the likelihood of them being involved in any damage which the ship may sustain. The positioning of watertight doors and their controls shall be such that if the ship sustains damage within one fifth of the breadth of the ship, as defined in regulation 2, such distance being measured at right angles to the centreline at the level of the deepest subdivision load line, the operation of the watertight doors clear of the damaged portion of the ship is not impaired.

6.4 All power-operated sliding watertight doors shall be provided with means of indication which will show at all remote operating positions whether the doors are open or closed. Remote operating positions shall only be at the navigating bridge as required by paragraph 7.1.5 and, at the location where hand operation above the bulkhead deck is required by paragraph 7.1.4.

7.1 Each power-operated sliding watertight door:

- .1 shall have a vertical or horizontal motion;
- .2 shall, subject to paragraph 11, be normally limited to a maximum clear opening width of 1.2 m. The Administration may permit larger doors only to the extent considered necessary for the effective operation of the ship provided that other safety measures, including the following, are taken into consideration:
 - .1 special consideration shall be given to the strength of the door and its closing appliances in order to prevent leakages;
 - .2 the door shall be located outside the damage zone B/5;

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- .3 the door shall be kept closed when the ship is at sea, except for limited periods when absolutely necessary as determined by the Administration;
- .3 shall be fitted with the necessary equipment to open and close the door using electric power, hydraulic power, or any other form of power that is acceptable to the Administration;
- .4 shall be provided with an individual hand-operated mechanism. It shall be possible to open and close the door by hand at the door itself from either side, and in addition, close the door from an accessible position above the bulkhead deck with an all round crank motion or some other movement providing the same degree of safety acceptable to the Administration. Direction of rotation or other movement is to be clearly indicated at all operating positions. The time necessary for the complete closure of the door, when operating by hand gear, shall not exceed 90 seconds with the ship in the upright position;
- .5 shall be provided with controls for opening and closing the door by power from both sides of the door and also for closing the door by power from the central operating console at the navigating bridge;
- .6 shall be provided with an audible alarm, distinct from any other alarm in the area, which will sound whenever the door is closed remotely by power and which shall sound for at least five seconds but no more than ten seconds before the door begins to move and shall continue sounding until the door is completely closed. In the case of remote hand operation it is sufficient for the audible alarm to sound only when the door is moving. Additionally, in passenger areas and areas of high ambient noise the Administration may require the audible alarm to be supplemented by an intermittent visual signal at the door; and
- .7 shall have an approximately uniform rate of closure under power. The closure time, from the time the door begins to move to the time it reaches the completely closed position, shall in no case be less than 20 seconds or more than 40 seconds with the ship in the upright position.

7.2 The electrical power required for power-operated sliding watertight doors shall be supplied from the emergency switchboard either directly or by a dedicated distribution board situated above the bulkhead deck. The associated control, indication and alarm circuits shall be supplied from the emergency switchboard either directly or by a dedicated distribution board situated above the bulkhead deck and be capable of being automatically supplied by the transitional source of emergency electrical power required by regulation 42.3.1.3 in the event of failure of either the main or emergency source of electrical power.

7.3 Power-operated sliding watertight doors shall have either:

- .1 a centralized hydraulic system with two independent power sources each consisting of a motor and pump capable of simultaneously closing all doors. In addition, there shall be for the whole installation hydraulic accumulators of sufficient capacity to operate all the doors at least three times, i.e. closed-open-closed, against an adverse list of 15°. This operating cycle shall be capable of being carried out when the accumulator is at the pump cut-in pressure. The fluid used shall be chosen considering the temperatures liable to be encountered by the installation during its service. The power operating system shall be designed to minimize the possibility of having a single failure in the hydraulic piping adversely affect the operation of more than one door. The hydraulic system shall be provided with a low-level alarm for hydraulic fluid reservoirs serving the power-operated system and a low gas pressure alarm or other effective means of monitoring loss of stored energy in hydraulic accumulators. These alarms are to be audible and visual and shall be situated on the central operating console at the navigating bridge; or
- .2 an independent hydraulic system for each door with each power source consisting of a motor and pump capable of opening and closing the door. In addition, there shall be a hydraulic accumulator of sufficient capacity to operate the door at least three times, i.e. closed-open-closed, against an adverse list of 15°. This

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operating cycle shall be capable of being carried out when the accumulator is at the pump cut-in pressure. The fluid used shall be chosen considering the temperatures liable to be encountered by the installation during its service. A low gas pressure group alarm or other effective means of monitoring loss of stored energy in hydraulic accumulators shall be provided at the central operating console on the navigating bridge. Loss of stored energy indication at each local operating position shall also be provided; or

- .3 an independent electrical system and motor for each door with each power source consisting of a motor capable of opening and closing the door. The power source shall be capable of being automatically supplied by the transitional source of emergency electrical power as required by regulation 42.4.2 - in the event of failure of either the main or emergency source of electrical power and with sufficient capacity to operate the door at least three times, i.e. closed-open-closed against an adverse list of 15°.

For the systems specified in 7.3.1, 7.3.2 and 7.3.3, provision should be made as follows:

Power systems for power-operated watertight sliding doors shall be separate from any other power system. A single failure in the electric or hydraulic power-operated systems excluding the hydraulic actuator shall not prevent the hand operation of any door.

7.4 Control handles shall be provided at each side of the bulkhead at a minimum height of 1.6 m above the floor and shall be so arranged as to enable persons passing through the doorway to hold both handles in the open position without being able to set the power closing mechanism in operation accidentally. The direction of movement of the handles in opening and closing the door shall be in the direction of door movement and shall be clearly indicated.

7.5 As far as practicable, electrical equipment and components for watertight doors shall be situated above the bulkhead deck and outside hazardous areas and spaces.

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7.6 The enclosures of electrical components necessarily situated below the bulkhead deck shall provide suitable protection against the ingress of water.*

7.7 Electric power, control, indication and alarm circuits shall be protected against fault in such a way that a failure in one door circuit will not cause a failure in any other door circuit. Short circuits or other faults in the alarm or indicator circuits of a door shall not result in a loss of power operation of that door. Arrangements shall be such that leakage of water into the electrical equipment located below the bulkhead deck will not cause the door to open.

7.8 A single electrical failure in the power operating or control system of a power-operated sliding watertight door shall not result in a closed door opening. Availability of the power supply should be continuously monitored at a point in the electrical circuit as near as practicable to each of the motors required by paragraph 7.3. Loss of any such power supply should activate an audible and visual alarm at the central operating console at the navigating bridge.

* Reference is made to the following IEC publication 529 : 1976:

- .1 electrical motors, associated circuits and control components; protected to IP x 7 standard;
- .2 door position indicators and associated circuit components; protected to IP x 8 standard; and
- .3 door movement warning signals; protected to IP x 6 standard.

Other arrangements for the enclosures of electrical components may be fitted provided the Administration is satisfied that an equivalent protection is achieved. The water pressure testing of the enclosures protected to IP x 8 shall be based on the pressure that may occur at the location of the component during flooding for a period of 36 hours.

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8.1 The central operating console at the navigating bridge shall have a "master mode" switch with two modes of control: a "local control" mode which shall allow any door to be locally opened and locally closed after use without automatic closure, and a "doors closed" mode which shall automatically close any door that is open. The "doors closed" mode shall permit doors to be opened locally and shall automatically reclose the doors upon release of the local control mechanism. The "master mode" switch shall normally be in the "local control" mode. The "doors closed" mode shall only be used in an emergency or for testing purposes. Special consideration shall be given to the reliability of the "master mode" switch.

8.2 The central operating console at the navigating bridge shall be provided with a diagram showing the location of each door, with visual indicators to show whether each door is open or closed. A red light shall indicate a door is fully open and a green light shall indicate a door is fully closed. When the door is closed remotely the red light shall indicate the intermediate position by flashing. The indicating circuit shall be independent of the control circuit for each door.

8.3 It shall not be possible to remotely open any door from the central operating console.

9.1 All watertight doors shall be kept closed during navigation except that they may be opened during navigation as specified in paragraphs 9.2, 9.3 and 9.4. Watertight doors of width of more than 1.2 m permitted by paragraph 11 may only be opened in the circumstances detailed in that paragraph. Any door which is opened in accordance with this paragraph shall be ready to be immediately closed.

9.2 A watertight door may be opened during navigation to permit the passage of passengers or crew, or when work in the immediate vicinity of the door necessitates it being opened. The door must be immediately closed when transit through the door is complete or when the task which necessitated it being open is finished.

9.3 Certain watertight doors may be permitted to remain open during navigation only if considered absolutely necessary; that is, being open is determined essential to the safe and effective operation of the ship's

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machinery or to permit passengers normally unrestricted access throughout the passenger area. Such determination shall be made by the Administration only after careful consideration of the impact on ship operations and survivability. A watertight door permitted to remain thus open shall be clearly indicated in the ship's stability information and shall always be ready to be immediately closed.

9.4 Sliding watertight doors fitted between bunkers in the between-decks below the bulkhead deck may sometimes be open at sea for the purpose of trimming coal. The opening and closing of these doors shall be recorded in such log book as may be prescribed by the Administration.

10.1 If the Administration is satisfied that such doors are essential, watertight doors of satisfactory construction may be fitted in watertight bulkheads dividing cargo between deck spaces. Such doors may be hinged, rolling or sliding doors but shall not be remotely controlled. They shall be fitted at the highest level and as far from the shell plating as practicable, but in no case shall the outboard vertical edges be situated at a distance from the shell plating which is less than one fifth of the breadth of the ship, as defined in regulation 2, such distance being measured at right angles to the centreline at the level of the deepest subdivision load line.

10.2 Such doors shall be closed before the voyage commences and shall be kept closed during navigation; the time of opening such doors in port and of closing them before the ship leaves port shall be entered in the log book. Should any of the doors be accessible during the voyage, they shall be fitted with a device which prevents unauthorized opening. When it is proposed to fit such doors, the number and arrangements shall receive the special consideration of the Administration.

11 Portable plates on bulkheads shall not be permitted except in machinery spaces. Such plates shall always be in place before the ship leaves port, and shall not be removed during navigation except in case of urgent necessity at the discretion of the master. The times of removal and replacement of any such portable plates shall be recorded in the log book, and the necessary precautions shall be taken in replacing them to ensure that the joints are

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watertight. The Administration may permit not more than one power-operated sliding watertight door in each main transverse bulkhead larger than those specified in paragraph 7.1.2 to be substituted for these portable plates, provided these doors are closed before the ship leaves port and remain closed during navigation except in case of urgent necessity at the discretion of the master. These doors need not meet the requirements of paragraph 7.1.4 regarding complete closure by hand-operated gear in 90 seconds. The time of opening and closing these doors, whether the ship is at sea or in port, shall be recorded in the log book.

12.1 Where trunkways or tunnels for access from crew accommodation to the stokehold, for piping, or for any other purpose are carried through main transverse watertight bulkheads, they shall be watertight and in accordance with the requirements of regulation 19. The access to at least one end of each such tunnel or trunkway, if used as a passage at sea, shall be through a trunk extending watertight to a height sufficient to permit access above the margin line. The access to the other end of the trunkway or tunnel may be through a watertight door of the type required by its location in the ship. Such trunkways or tunnels shall not extend through the first subdivision bulkhead abaft the collision bulkhead.

12.2 Where it is proposed to fit tunnels piercing main transverse watertight bulkheads, these shall receive the special consideration of the Administration.

12.3 Where trunkways in connection with refrigerated cargo and ventilation or forced draught trunks are carried through more than one watertight bulkhead, the means of closure at such openings shall be operated by power and be capable of being closed from a central position situated above the bulkhead deck".

Regulation 16

Passenger ships carrying goods vehicles and accompanying personnel

The reference to "regulation 15.12" in paragraph 2 is replaced by reference to "regulation 15.10".

Regulation 21

Bilge pumping arrangements

The following text is inserted after the heading:

"(Paragraphs 1.6 and 2.9 of this regulation apply to ships constructed on or after 1 February 1992)".

The following new paragraph 1.6 is added after paragraph 1.5:

"1.6 Provisions shall be made for the drainage of enclosed cargo spaces situated on the bulkhead deck of a passenger ship and on the freeboard deck of a cargo ship, provided that the Administration may permit the means of drainage to be dispensed with in any particular compartment of any ship or class of ship if it is satisfied that by reason of size or internal subdivision of those spaces the safety of the ship is not thereby impaired.

1.6.1 Where the freeboard to the bulkhead deck or the freeboard deck, respectively, is such that the deck edge is immersed when the ship heels more than 5°, the drainage shall be by means of a sufficient number of scuppers of suitable size discharging directly overboard, fitted in accordance with the requirements of regulation 17 in the case of a passenger ship and the requirements for scuppers, inlets and discharges of the International Convention on Load Lines in force in the case of a cargo ship.

1.6.2 Where the freeboard is such that the edge of the bulkhead deck or the edge of the freeboard deck, respectively, is immersed when the ship heels 5° or less, the drainage of the enclosed cargo spaces on the bulkhead deck or on the freeboard deck, respectively, shall be led to a suitable space, or spaces, of adequate capacity, having a high water level alarm and provided with suitable arrangements for discharge overboard. In addition it shall be ensured that:

- .1 the number, size and disposition of the scuppers are such as to prevent unreasonable accumulation of free water;

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- .2 the pumping arrangements required by this regulation for passenger ships or cargo ships, as applicable, take account of the requirements for any fixed pressure water-spraying fire-extinguishing system;
- .3 water contaminated with petrol or other dangerous substances is not drained to machinery spaces or other spaces where sources of ignition may be present; and
- .4 where the enclosed cargo space is protected by a carbon dioxide fire-extinguishing system the deck scuppers are fitted with means to prevent the escape of the smothering gas".

The definition of "D" in paragraph 2.9 is replaced by the following:

"D is the moulded depth of the ship to the bulkhead deck (metres) provided that, in a ship having an enclosed cargo space on the bulkhead deck which is internally drained in accordance with the requirements of paragraph 1.6.2 and which extends for the full length of the ship, D shall be measured to the next deck above the bulkhead deck. Where the enclosed cargo spaces cover a lesser length, D shall be taken as the moulded depth to the bulkhead deck plus lh/L where l and h are the aggregate length and height respectively of the enclosed cargo spaces (metres)".

Regulation 23-1

The following new regulation 23-1 is added after regulation 23:

"Damage control in dry cargo ships

(This regulation applies to ships constructed on or after 1 February 1992)

1 There shall be permanently exhibited or readily available on the navigating bridge, for the guidance of the officer in charge of the ship, a plan showing clearly for each deck and hold the boundaries of the watertight compartments, the openings therein with the means of closure and position of any controls thereof, and the arrangements for the correction of any list due to flooding. In addition, booklets containing the aforementioned information shall be made available to the officers of the ship.

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2 Indicators shall be provided for all sliding doors and for hinged doors in watertight bulkheads. Indication showing whether the doors are open or closed shall be given on the navigating bridge. In addition, shell doors and other openings which, in the opinion of the Administration, could lead to major flooding if left open or not properly secured, shall be provided with such indicators.

3.1 General precautions shall consist of a listing of equipment, conditions and operational procedures, considered by the Administration to be necessary to maintain watertight integrity under normal ship operations.

3.2 Specific precautions shall consist of a listing of elements (i.e. closures, security of cargo, sounding of alarms, etc.) considered by the Administration to be vital to the survival of the ship and its crew".

Regulation 42

Emergency sources of electrical power in passenger ships

The following text is inserted after the heading:

"(Paragraphs 2.6.1 and 4.2 of this regulation apply to ships constructed on or after 1 February 1992)".

The second sentence in paragraph 2.6.1 is deleted.

The existing text of paragraph 4.2 is replaced by the following:

"4.2 Power to operate the watertight doors, as required by regulation 15.7.3.3, but not necessarily all of them simultaneously, unless an independent temporary source of stored energy is provided. Power to the control, indication and alarm circuits as required by regulation 15.7.2 for half an hour".

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CHAPTER II-2

CONSTRUCTION - FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

Regulation 4

Fire pumps, fire mains, hydrants and hoses

The following text is inserted after the heading:

"(Paragraph 3.3.2.5 of this regulation applies to ships constructed on or after 1 February 1992)".

The existing text of paragraph 3.3.2.5 is replaced by the following:

"2.5 The total suction head and the net positive suction head of the pump shall be such that the requirements of paragraphs 3.3.2, 3.3.2.1, 3.3.2.2 and 4.2 of this regulation shall be obtained under all conditions of list, trim, roll and pitch likely to be encountered in service".

In paragraph 7.1 between "of" and "material" in the first line the word "non-perishable" is inserted.

In paragraph 7.1, the following new sentence is inserted after the first sentence:

"Fire hoses of non-perishable material shall be provided in ships constructed on or after 1 February 1992, and on ships constructed before 1 February 1992 when the existing fire hoses are replaced".

Regulation 13-1

The following new regulation 13-1 is added after regulation 13:

"Sample extraction smoke detection systems

(This regulation applies to ships constructed on or after 1 February 1992)

1 General requirements

1.1 Wherever in the text of this regulation the word "system" appears, it shall mean "sample extraction smoke detection system".

1.2 Any required system shall be capable of continuous operation at all times except that systems operating on a sequential scanning principle may be accepted, provided that the interval between scanning the same position twice gives an overall response time to the satisfaction of the Administration.

1.3 Power supplies necessary for the operation of the system shall be monitored for loss of power. Any loss of power shall initiate a visual and audible signal at the control panel and the navigating bridge which shall be distinct from a signal indicating smoke detection.

1.4 An alternative power supply for the electrical equipment used in the operation of the system shall be provided.

1.5 The control panel shall be located on the navigating bridge or in the main fire control station.

1.6 The detection of smoke or other products of combustion shall initiate a visual and audible signal at the control panel and the navigating bridge.

1.7 Clear information shall be displayed on or adjacent to the control panel designating the spaces covered.

1.8 The sampling pipe arrangements shall be such that the location of the fire can be readily identified.

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1.9 Suitable instructions and component spares shall be provided for the testing and maintenance of the system.

1.10 The functioning of the system shall be periodically tested to the satisfaction of the Administration. The system shall be of a type that can be tested for correct operation and restored to normal surveillance without the renewal of any component.

1.11 The system shall be designed, constructed and installed so as to prevent the leakage of any toxic or flammable substances or fire-extinguishing media into any accommodation and service space, control station or machinery space.

2 Installation requirements

2.1 At least one smoke accumulator shall be located in every enclosed space for which smoke detection is required. However, where a space is designed to carry oil or refrigerated cargo alternatively with cargoes for which a smoke sampling system is required, means may be provided to isolate the smoke accumulators in such compartments for the system. Such means shall be to the satisfaction of the Administration.

2.2 Smoke accumulators shall be located for optimum performance and shall be spaced so that no part of the overhead deck area is more than 12 m measured horizontally from an accumulator. Where systems are used in spaces which may be mechanically ventilated, the position of the smoke accumulators shall be considered having regard to the effects of ventilation.

2.3 Smoke accumulators shall be positioned where impact or physical damage is unlikely to occur.

2.4 Not more than four accumulators shall be connected to each sampling point.

2.5 Smoke accumulators from more than one enclosed space shall not be connected to the same sampling point.

2.6 Sampling pipes shall be self-draining and suitably protected from impact or damage from cargo working.

3 Design requirements

3.1 The system and equipment shall be suitably designed to withstand supply voltage variations and transients, ambient temperature changes, vibration, humidity, shock, impact and corrosion normally encountered in ships and to avoid the possibility of ignition of flammable gas air mixture.

3.2 The sensing unit shall be certified to operate before the smoke density within the sensing chamber exceeds 6.65% obscuration per metre.

3.3 Duplicate sample extraction fans shall be provided. The fans shall be of sufficient capacity to operate with the normal conditions or ventilation in the protected area and shall give an overall response time to the satisfaction of the Administration.

3.4 The control panel shall permit observation of smoke in the individual sampling pipe.

3.5 Means shall be provided to monitor the airflow through the sampling pipes so designed as to ensure that as far as practicable equal quantities are extracted from each interconnected accumulator.

3.6 Sampling pipes shall be a minimum of 12 mm internal diameter except when used in conjunction with fixed gas fire-extinguishing systems when the minimum size of pipe should be sufficient to permit the fire-extinguishing gas to be discharged within the appropriate time.

3.7 Sampling pipes shall be provided with an arrangement for periodically purging with compressed air".

Regulation 15

Arrangements for oil fuel, lubricating oil and other flammable oils

The following text is inserted after the heading:

"(Paragraphs 2.6 and 3 of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of paragraph 2.6 is replaced by the following:

".6 Safe and efficient means of ascertaining the amount of oil fuel contained in any oil fuel tank shall be provided.

.6.1 Where sounding pipes are used, they shall not terminate in any space where the risk of ignition of spillage from the sounding pipe might arise. In particular, they shall not terminate in passenger or crew spaces. As a general rule, they shall not terminate in machinery spaces. However, where the Administration considers that these latter requirements are impracticable, it may permit termination of sounding pipes in machinery spaces on condition that all the following requirements are met:

.6.1.1 in addition, an oil-level gauge is provided meeting the requirements of subparagraph .6.2;

.6.1.2 the sounding pipes terminate in locations remote from ignition hazards unless precautions are taken such as the fitting of effective screens to prevent the oil fuel in the case of spillage through the terminations of the sounding pipes from coming into contact with a source of ignition;

- .6.1.3 the termination of sounding pipes are fitted with self-closing blanking devices and with a small-diameter self-closing control cock located below the blanking device for the purpose of ascertaining before the blanking device is opened that oil fuel is not present. Provision shall be made so as to ensure that any spillage of oil fuel through the control cock involves no ignition hazard.

- .6.2 Other oil-level gauges may be used in place of sounding pipes. Such means, like the means provided in subparagraph .6.1.1, are subject to the following conditions:
 - .6.2.1 in passenger ships, such means shall not require penetration below the top of the tank and their failure or overfilling of the tanks shall not permit release of fuel;

 - .6.2.2 in cargo ships, the failure of such means or overfilling of the tank shall not permit release of fuel into the space. The use of cylindrical gauge glasses is prohibited. The Administration may permit the use of oil-level gauges with flat glasses and self-closing valves between the gauges and fuel tanks.

- 6.3 Means prescribed in .6.2.1 or .6.2.2 which are acceptable to the Administration shall be maintained in the proper condition to ensure their continued accurate functioning in service".

The existing text of paragraph 3 is replaced by the following:

"3 The arrangements for the storage, distribution and utilization of oil used in pressure lubrication systems shall be such as to ensure the safety of the ship and persons on board. The arrangements made in machinery spaces of category A, and whenever practicable in other machinery spaces, shall at least comply with the provisions of paragraphs 2.1, 2.4, 2.5, 2.6, 2.7 and 2.8, except that:

- .1 this does not preclude the use of sight-flow glasses in lubricating systems provided that they are shown by test to have a suitable degree of fire resistance;

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- .2 sounding pipes may be authorized in machinery spaces; the requirements of paragraphs 2.6.1.1 and 2.6.1.3 need not be applied on condition that the sounding pipes are fitted with appropriate means of closure".

Regulation 18

Miscellaneous items

The following text is inserted after the heading:

"(Paragraphs 2.4 and 8 of this regulation apply to ships constructed on or after 1 February 1992. Paragraph 7 of this regulation applies to all ships)".

The following new paragraph 2.4 is added after paragraph 2.3:

"2.4 For the protection of cargo tanks carrying crude oil and petroleum products having a flashpoint not exceeding 60°C, materials readily rendered ineffective by heat shall not be used for valves, fittings, tank opening covers, cargo vent piping, and cargo piping so as to prevent the spread of fire to the cargo".

The following new paragraphs 7 and 8 are added after paragraph 6:

"7 Paint lockers and flammable liquid lockers shall be protected by an appropriate fire-extinguishing arrangement approved by the Administration.

8 Helicopter decks shall be of a steel or steel equivalent fire-resistant construction. If the space below the helicopter deck is a high fire risk space, the insulation standard shall be to the satisfaction of the Administration. Each helicopter facility shall have an operations manual, including a description and a checklist of safety precautions, procedures, and equipment requirements. If the Administration permits aluminium or other low melting metal construction that is not made equivalent to steel, the following provisions shall be satisfied:

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- .1 If the platform is cantilevered over the side of the ship, after each fire on the ship or on the platform, the platform shall undergo a structural analysis to determine its suitability for further use.
- .2 If the platform is located above the ship's deckhouse or similar structure, the following conditions shall be satisfied:
 - .2.1 the deckhouse top and bulkheads under the platform shall have no openings;
 - .2.2 all windows under the platform shall be provided with steel shutters;
 - .2.3 the required fire-fighting equipment shall be to the satisfaction of the Administration;
 - .2.4 after each fire on the platform or in close proximity, the platform shall undergo a structural analysis to determine its suitability for further use".

Regulation 26

Fire integrity of bulkheads and decks in ships
carrying more than 36 passengers

The following text is inserted after the heading:

"(Paragraphs 2.2(7) and 2.2(13) of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of the third sentence in paragraph 2.2(7) is replaced by the following:

"Isolated lockers and small store-rooms in accommodation spaces having areas less than 4 m² (in which flammable liquids are not stowed)".

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The following sentence is added at the end of paragraph 2.2(13):

"Lockers and store-rooms having areas greater than 4 m², other than those spaces that have provisions for the storage of flammable liquids".

Regulation 27

Fire integrity of bulkheads and decks in ships
carrying not more than 36 passengers

The following text is inserted after the heading:

"(Paragraph 2.(5) and 2.(9) of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of paragraphs 2.(5) and 2.(9) are replaced by the following:

"(5) Service spaces (low risk)

Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m² and drying rooms and laundries".

"(9) Service spaces (high risk)

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces".

Regulation 38

Protection of cargo spaces, other than special category
spaces, intended for the carriage of motor vehicles
with fuel in their tanks for their own propulsion

The following text is inserted after the heading:

"(Paragraph 1 of this regulation applies to ships constructed on or after 1 February 1992)".

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The existing text of paragraph 1 is replaced by the following:

"1 Fixed Fire Detection

There shall be provided a fixed fire detection and fire alarm system complying with the requirements of regulation 13 or a sample extraction smoke detection system complying with the requirements of regulation 13-1. The design and arrangements of this system shall be considered in conjunction with the ventilation requirements referred to in paragraph 3".

Regulation 40

Fire patrols, detection, alarms and public address systems

The following text is inserted after the heading:

"(Paragraph 2 of this regulation applies to ships constructed on or after 1 February 1992)".

The existing text of paragraph 2 is replaced by the following:

"2 A fixed fire detection and fire alarm system complying with the requirements of regulation 13 or a sample extraction smoke detection system complying with the requirements of regulation 13-1 shall be provided in any cargo space which, in the opinion of the Administration, is not accessible, except where it is shown to the satisfaction of the Administration that the ship is engaged on voyages of such short duration that it would be unreasonable to apply this requirement".

Regulation 44

Fire integrity of bulkheads and decks

The following text is inserted after the heading:

"(Paragraphs 2.(5) and 2.(9) of this regulation apply to ships constructed on or after 1 February 1992)".

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The existing text of paragraphs 2.(5) and 2.(9) is replaced by the following:

"(5) Service spaces (low risk)

Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m^2 and drying rooms and laundries".

"(9) Service spaces (high risk)

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 4 m^2 or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces".

Regulation 50

Details of construction

The following text is inserted after the heading:

"(Paragraphs 3.2 and 3.3 of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of paragraph 3.2 is replaced by the following:

"3.2 Where non-combustible bulkheads, linings and ceilings are fitted in accommodation and service spaces they may have a combustible veneer with a calorific value not exceeding 45 MJ/m^2 of the area for the thickness used".

The following new paragraph 3.3 is added after paragraph 3.2:

"3.3 The total volume of combustible facings, mouldings, decorations and veneers in any accommodation and service space bounded by non-combustible bulkheads, ceilings and linings shall not exceed a volume equivalent to a 2.5 mm veneer on the combined area of the walls and ceilings".

The existing paragraph 3.3 is renumbered paragraph 3.4.

Regulation 53

Fire protection arrangements in cargo spaces

The following text is inserted after the heading:

(Paragraphs 2.1 and 3 of this regulation apply to ships constructed on or after 1 February 1992)".

In paragraph 1.2 the word "and" between "timber" and "non-combustible" in the third line is replaced by ",,".

An asterisk is added at the end of paragraph 1.2 and the following text of a footnote is inserted:

"* Reference is made to the Code of Safe Practice for Solid Bulk Cargoes - Emergency Schedule B14, entry for coal".

The existing text of paragraph 2.1 is replaced by the following:

"2.1 There shall be provided a fixed fire detection and fire alarm system complying with the requirements of regulation 13. The fixed fire detection system shall be capable of rapidly detecting the onset of fire. The type of detectors and their spacing and location shall be to the satisfaction of the Administration taking into account the effects of ventilation and other relevant factors. After being installed, the system shall be tested under normal ventilation conditions and shall give an overall response time to the satisfaction of the Administration".

The existing text of paragraph 3 is replaced by the following:

"3 Cargo spaces, other than ro-ro cargo spaces, intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion

Cargo spaces, other than ro-ro spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion shall comply with the requirements of paragraph 2 except that in lieu of the requirements of

paragraph 2.1 a sample extraction smoke detection system complying with the requirements of regulation 13-1 may be permitted and paragraph 2.2.4 need not be complied with".

Regulation 54

Special requirements for ships carrying dangerous goods

The following text is inserted after the heading:

"(Paragraph 2.3 of this regulation applies to ships constructed on or after 1 February 1992)".

The existing text of paragraph 1.1 and footnote is replaced by the following:

"1.1 In addition to complying with the requirements of regulation 53 for cargo ships and with the requirements of regulations 37*, 38 and 39 for passenger ships as appropriate, ship-types and cargo spaces, referred to in paragraph 1.2, intended for the carriage of dangerous goods shall comply with the requirements of this regulation, as appropriate, except when carrying dangerous goods in limited quantities** unless such requirements have already been met by compliance with the requirements elsewhere in this chapter. The types of ships and modes of carriage of dangerous goods are referred to in paragraph 1.2 and in table 54.1, where the numbers appearing in paragraph 1.2 are referred to in the top line. Cargo ships of less than 500 tons gross tonnage constructed on or after 1 February 1992 shall comply with this regulation, but Administrations may reduce the requirements and such reduced requirements shall be recorded in the document of compliance referred to in paragraph 3.

* Reference is made to section 17 of the General Introduction to the International Maritime Dangerous Goods Code (IMDG Code) for operational measures in association with the requirements of this regulation.

** Reference is made to section 18 of the General Introduction to the International Maritime Dangerous Goods Code (IMDG Code) for a definition of the term 'limited quantities'".

The existing text of paragraph 2.3 is replaced by the following:

"2.3 Detection system

Ro-ro cargo spaces shall be fitted with a fixed fire detection and fire alarm system complying with the requirements of regulation 13. All other types of cargo spaces shall be fitted with either a fixed fire detection and fire alarm system complying with the requirements of regulation 13 or a sample extraction smoke detection system complying with the requirements of regulation 13-1. If a sample extraction smoke detection system is fitted, particular attention shall be made to regulation 13-1.1.11 in order to prevent the leakage of toxic fumes into occupied areas".

Regulation 55

Application

The existing text of paragraph 5 is replaced by the following:

"5 The requirements for inert gas systems of regulation 60 need not be applied to:

- .1 chemical tankers constructed before, on or after 1 July 1986 when carrying cargoes described in paragraph 1, provided that they comply with the requirements for inert gas systems on chemical tankers developed by the Organization*; or
- .2 chemical tankers constructed before 1 July 1986, when carrying crude oil or petroleum products, provided that they comply with the requirements for inert gas systems on chemical tankers carrying petroleum products developed by the Organization**; or
- .3 gas carriers constructed before, on or after 1 July 1986 when carrying cargoes described in paragraph 1, provided that they are fitted with cargo tank inerting arrangements equivalent to those specified in paragraph 5.1 or 5.2; or

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- .4 chemical tankers and gas carriers when carrying flammable cargoes other than crude oil or petroleum products such as cargoes listed in chapters VI and VII of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk or chapters 17 and 18 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk:
- .4.1 if constructed before 1 July 1986; or
- .4.2 if constructed on or after 1 July 1986, provided that the capacity of tanks used for their carriage does not exceed 3,000 m³ and the individual nozzle capacities of tank washing machines do not exceed 17.5 m³/h and the total combined throughput from the number of machines in use in a cargo tank at any one time does not exceed 110 m³/h.

* Reference is made to Regulation for Inert Gas Systems on Chemical Tankers adopted by the Organization by resolution A.567(14).

** Reference is made to Interim Regulation for Inert Gas Systems on Chemical Tankers Carrying Petroleum Products, adopted by the Organization by resolution A.473(XII)".

Regulation 56

Location and separation of spaces

The existing text of this regulation is replaced by the following:

"(This regulation applies to ships constructed on or after
1 February 1992)

1 Machinery spaces shall be positioned aft of cargo tanks and slop tanks; they shall also be situated aft of cargo pump-rooms and cofferdams, but not necessarily aft of the oil fuel bunker tanks. Any machinery space shall be

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isolated from cargo tanks and slop tanks by cofferdams, cargo pump-rooms, oil fuel bunker tanks or ballast tanks. Pump-rooms containing pumps and their accessories for ballasting those spaces situated adjacent to cargo tanks and slop tanks and pumps for oil fuel transfer shall be considered as equivalent to a cargo pump-room within the context of this regulation, provided that such pump-rooms have the same safety standard as that required for cargo pump-rooms. However, the lower portion of the pump-room may be recessed into machinery spaces of category A to accommodate pumps, provided that the deck head of the recess is in general not more than one third of the moulded depth above the keel, except that in the case of ships of not more than 25,000 tonnes deadweight, where it can be demonstrated that for reasons of access and satisfactory piping arrangements this is impracticable, the Administration may permit a recess in excess of such height, but not exceeding one half of the moulded depth above the keel.

2 Accommodation spaces, main cargo control stations, control stations and service spaces (excluding isolated cargo handling gear lockers) shall be positioned aft of all cargo tanks, slop tanks, and spaces which isolate cargo or slop tanks from machinery spaces but not necessarily aft of the oil fuel bunker tanks and ballast tanks, but shall be arranged in such a way that a single failure of a deck or bulkhead shall not permit the entry of gas or fumes from the cargo tanks into an accommodation space, main cargo control stations, control station, or service spaces. A recess provided in accordance with paragraph 1 need not be taken into account when the position of these spaces is being determined.

3 However, where deemed necessary, the Administration may permit accommodation spaces, main cargo control stations, control stations, and service spaces forward of the cargo tanks, slop tanks and spaces which isolate cargo and slop tanks from machinery spaces, but not necessarily forward of oil fuel bunker tanks or ballast tanks. Machinery spaces, other than those of category A, may be permitted forward of the cargo tanks and slop tanks provided they are isolated from the cargo tanks and slop tanks by cofferdams, cargo pump-rooms, oil fuel bunker tanks or ballast tanks. All of the above spaces shall be subject to an equivalent standard of safety and appropriate

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availability of fire-extinguishing arrangements being provided to the satisfaction of the Administration. Accommodation spaces, main cargo control spaces, control stations and service spaces shall be arranged in such a way that a single failure of a deck or bulkhead shall not permit the entry of gas or fumes from the cargo tanks into such spaces. In addition, where deemed necessary for the safety or navigation of the ship, the Administration may permit machinery spaces containing internal combustion machinery not being main propulsion machinery having an output greater than 375 kW to be located forward of the cargo area provided the arrangements are in accordance with the provisions of this paragraph.

4 In combination carriers only:

- .1 The slop tanks shall be surrounded by cofferdams except where the boundaries of the slop tanks where slop may be carried on dry cargo voyages are the hull, main cargo deck, cargo pump-room bulkhead or oil fuel bunker tank. These cofferdams shall not be open to a double bottom, pipe tunnel, pump-room or other enclosed space. Means shall be provided for filling the cofferdams with water and for draining them. Where the boundary of a slop tank is the cargo pump-room bulkhead the pump-room shall not be open to the double bottom, pipe tunnel or other enclosed space; however, openings provided with gastight bolted covers may be permitted.
- .2 Means shall be provided for isolating the piping connecting the pump-room with the slop tanks referred to in paragraph 4.1. The means of isolation shall consist of a valve followed by a spectacle flange or a spool piece with appropriate blank flanges. This arrangement shall be located adjacent to the slop tanks, but where this is unreasonable or impracticable, it may be located within the pump-room directly after the piping penetrates the bulkhead. A separate pumping and piping arrangement incorporating a manifold shall be provided for discharging the contents of the slop tanks directly to the open deck for disposal to shore reception facilities when the ship is in the dry cargo mode.

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- .3 Hatches and tank cleaning openings to slop tanks shall only be permitted on the open deck and shall be fitted with closing arrangements. Except where they consist of bolted plates with bolts at watertight spacing, these closing arrangements shall be provided with locking arrangements which shall be under the control of the responsible ship's officer.
- .4 Where cargo wing tanks are provided, cargo oil lines below deck shall be installed inside these tanks. However, the Administration may permit cargo oil lines to be placed in special ducts which shall be capable of being adequately cleaned and ventilated and be to the satisfaction of the Administration. Where cargo wing tanks are not provided cargo oil lines below deck shall be placed in special ducts.
- 5 Where the fitting of a navigation position above the cargo area is shown to be necessary, it shall be for navigation purposes only and it shall be separated from the cargo tank deck by means of an open space with a height of at least 2 m. The fire protection of such a navigation position shall in addition be as required for control spaces in regulation 58.1 and 58.2 and other provisions, as applicable, of this part.
- 6 Means shall be provided to keep deck spills away from the accommodation and service areas. This may be accomplished by provision of a permanent continuous coaming of a suitable height extending from side to side. Special consideration shall be given to the arrangements associated with stern loading.
- 7 Exterior boundaries of superstructures and deckhouses enclosing accommodation and including any overhanging decks which support such accommodation, shall be insulated to "A-60" standard for the whole of the portions which face the cargo area and on the outward sides for a distance of 3 m from the end boundary facing the cargo area. In the case of the sides of those superstructures and deckhouses, such insulation shall be carried as high as is deemed necessary by the Administration.
- 8.1 Except as permitted in paragraph 8.2 below, access doors, air inlets and openings to accommodation spaces, service spaces, control stations and machinery spaces shall not face the cargo area. They shall be located on the

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transverse bulkhead not facing the cargo area or on the outboard side of the superstructure or deckhouse at a distance of at least 4% of the length of the ship but not less than 3 m from the end of the superstructure or deckhouse facing the cargo area. This distance need not exceed 5 m.

8.2 The Administration may permit access doors in boundary bulkheads facing the cargo area or within the 5 m limits specified in paragraph 8.1, to main cargo control stations and to such service spaces as provision rooms, store rooms and lockers, provided they do not give access directly or indirectly, to any other space containing or provided for accommodation, control stations or service spaces such as galleys, pantries or workshops, or similar spaces containing sources of vapour ignition. The boundary of such a space shall be insulated to "A-60" standard, with the exception of the boundary facing the cargo area. Bolted plates for the removal of machinery may be fitted within the limits specified in paragraph 8.1. Wheelhouse doors and wheelhouse windows may be located within the limits specified in paragraph 8.1 so long as they are designed to ensure that the wheelhouse can be made rapidly and efficiently gas and vapour tight.

8.3 Windows and sidescuttles facing the cargo area and on the sides of the superstructures and deckhouses within the limits specified in paragraph 8.1 shall be of the fixed (non-opening) type. Such windows and sidescuttles in the first tier on the main deck shall be fitted with inside covers of steel or other equivalent material".

Regulation 58

Fire integrity of bulkheads and decks

The following text is inserted after the heading:

"(Paragraph 2.(5) and 2.(9) of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of paragraphs 2.(5) and 2.(9) is replaced by the following:

"(5) Service spaces (low risk)

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Lockers and store-rooms not having provision for the storage of flammable liquids and having areas less than 4 m² and drying rooms and laundries".

"(9) Service spaces (high risk)

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces".

Regulation 59

Venting, purging, gas-freeing and ventilation

The following text is inserted after the heading:

"(Paragraph 2 of this regulation applies to ships constructed on or after 1 February 1992)".

The existing text of paragraph 2 is replaced by the following:

"2 Cargo tank purging and/or gas-freeing*

Arrangements for purging and/or gas-freeing shall be such as to minimize the hazards due to the dispersal of flammable vapours in the atmosphere and to flammable mixtures in a cargo tank. Accordingly:

- .1 When the ship is provided with an inert gas system, the cargo tanks shall first be purged in accordance with the provisions of regulation 62.13 until the concentration of hydrocarbon vapours in the cargo tanks has been reduced to less than 2% by volume. Thereafter, gas-freeing may take place at the cargo tank deck level.
- .2 When the ship is not provided with an inert gas system, the operation shall be such that the flammable vapour is discharged initially:

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- .2.1 through the vent outlets as specified in paragraph 1.9; or
- .2.2 through outlets at least 2 m above the cargo tank deck level with a vertical efflux velocity of at least 30 m/sec maintained during the gas-freeing operation; or
- .2.3 through outlets at least 2 m above the cargo tank deck level with a vertical efflux velocity of at least 20 m/sec and which are protected by suitable devices to prevent the passage of flame.

When the flammable vapour concentration at the outlet has been reduced to 30% of the lower flammable limit, gas-freeing may thereafter be continued at cargo tank deck level.

* Reference is made to the Revised Standards for the Design, Testing and Locating of Devices to Prevent the Passage of Flame into Cargo Tanks in Tankers (MSC/Circ.373/Rev.1) and to Revised Factors to be taken into Consideration when Designing Cargo Tank Venting and Gas-Freeing Arrangements (MSC/Circ.450/Rev.1)".

Regulation 62

Inert gas systems

The following text is inserted after the heading:

"(Paragraphs 19.1 and 19.2 of this regulation apply to ships constructed on or after 1 February 1992)".

The existing text of the first line of paragraph 19.1 is replaced by the following:

"For inert gas systems of both the flue, gas type and the inert gas generator type, audible and visual alarms shall be provided to indicate:".

The existing text of the first three lines of paragraph 19.2 is replaced by the following:

"For inert gas systems of the inert gas generator type, additional visual and audible alarms shall be provided to indicate:".

CHAPTER III

LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Regulation 41

General requirements for lifeboats

The existing text of paragraph 8.18 is replaced by the following:

"One copy of the life-saving signals referred to in regulation V/16 on a waterproof card or in a waterproof container;"

Regulation 48

Launching and embarkation appliances

For the existing text of paragraph 1.4 "o" is replaced by "y" (Spanish text only).

CHAPTER IV

Regulation 13

Radiotelegraph installations for fitting in motor lifeboats

The existing title is replaced by "Radiotelegraph installations for lifeboats".

In paragraph (a), first line, the existing words "Regulation 14 of Chapter III" are replaced by "regulation III/6.2.2".

In paragraph (h), second line, the existing words "Regulation 14 of Chapter III" are replaced by "regulation III/41.8.29".

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Regulation 14

Portable radio apparatus for survival craft

In paragraph (a), first line, the existing words "Regulation 13 of Chapter III" are replaced by "regulation III/6.2.1".

CHAPTER V

SAFETY OF NAVIGATION

Regulation 3

Information required in danger messages

The reference to "Greenwich Mean Time" in subparagraph (a)(iii), (b)(ii) and (e)(i) is replaced by reference to "Universal Co-ordinated Time".

The references to "GMT" under "Examples" is replaced by "UTC".

Regulation 9

Misuse of distress signals

The existing text of this regulation is replaced by the following:

"The use of an international distress signal, except for the purpose of indicating that a ship, aircraft or person is in distress, and the use of any signal which may be confused with an international distress signal, are prohibited".

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Regulation 12

Shipborne navigational equipment

The existing text of paragraph (f) is replaced by the following:

"(f) Ships with emergency steering positions shall at least be provided with a telephone or other means of communication for relaying heading information to such positions. In addition, ships of 500 tons gross tonnage and upwards constructed on or after 1 February 1992, shall be provided with arrangements for supplying visual compass readings to the emergency steering position".

Regulation 13

Manning

The existing text of regulation V/13 is renumbered as paragraph (a).

The following new paragraph (b) is added:

"(b) Every ship to which chapter I of this Convention applies shall be provided with an appropriate safe manning document or equivalent issued by the Administration as evidence of the minimum safe manning considered necessary to comply with the provisions of paragraph (a)".

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Regulation 16

Life-saving signals

The existing text of this regulation is replaced by the following:

"Life-saving signals* shall be used by life-saving stations, maritime rescue units and aircraft engaged in search and rescue operations when communicating with ships or persons in distress or to direct ships, and by ships or persons in distress when communicating with life-saving stations, maritime rescue units and aircraft engaged in search and rescue operations. An illustrated table describing the life-saving signals shall be readily available to the officer of the watch of every ship to which this chapter applies.

* Such life-saving signals are described in the Merchant Ship Search and Rescue Manual (MERSAR) (resolution A.229(VII), as amended), the IMO Search and Rescue Manual (IMOSAR) (resolution A.439(XI), as amended) and illustrated in the International Code of Signals as amended pursuant to resolution A.80(IV)".

CHAPTER VII

CARRIAGE OF DANGEROUS GOODS

Regulation 7

The existing text of regulation is replaced by the following:

"Explosives in passenger ships"

1 Explosives in division 1.4, compatibility group S may be carried in any amount in passenger ships. No other explosives may be carried except any one of the following:

- .1 explosive articles for life-saving purposes, if the total net explosives mass of such articles does not exceed 50 kg per ship; or

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- .2 explosives in compatibility groups C, D and E, if the total net explosives mass does not exceed 10 kg per ship; or
 - .3 explosive articles in compatibility group G other than those requiring special stowage, if the total net explosives mass does not exceed 10 kg per ship; or
 - .4 explosive articles in compatibility group B, if the total net explosives mass does not exceed 5 kg per ship.
- 2 Notwithstanding the provisions of paragraph 1, additional quantities or types of explosives may be carried in passenger ships in which special safety measures approved by the Administration are taken.

* Reference is made to class 1 of the International Maritime Dangerous Goods Code (IMDG Code)".

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ANNEX 34

RESOLUTION MSC.22(59)

(adopted on 23 May 1991)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION
FOR THE SAFETY OF LIFE AT SEA, 1974

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING article VIII(b) of the International Convention for the Safety of Life at Sea, 1974, hereinafter referred to as "the Convention" concerning the procedures for amending the Annex to the Convention, other than the provisions of chapter I,

HAVING CONSIDERED, at its fifty-ninth session, amendments to the Convention proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, the amendments to the Convention, the texts of which are set out in the Annex to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 1 July 1993 unless, prior to that date, more than one third of the Contracting Governments to the Convention, or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;
3. INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 1994 upon their acceptance in accordance with paragraph 2 above;
4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annex to all Contracting Governments to the International Convention for the Safety of Life at Sea, 1974;
5. FURTHER REQUESTS the Secretary-General to transmit copies of the resolution to Members of the Organization which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE
SAFETY OF LIFE AT SEA, 1974, AS AMENDED

Chapter II-2

CONSTRUCTION - FIRE PROTECTION, FIRE DETECTION
AND FIRE EXTINCTION

Regulation 20

Fire control plans

The existing heading is replaced by the following:

"Fire control plans and fire drills".

The following text is inserted after the heading:

"(This regulation applies to all ships)".

The following new paragraph 3 is added after paragraph 2:

"3 Fire drills shall be conducted in accordance with the provisions of regulation III/18".

Regulation 21

Ready availability of fire-extinguishing appliances

The following text is added after the heading:

"(This regulation applies to all ships)".

The existing text of this regulation is replaced by the following:

"Fire-extinguishing appliances shall be kept in good order and be available for immediate use at all times".

Regulation 28

Means of escape

The following text is inserted after the heading:

"(Paragraph 1.8 of this regulation applies to ships constructed on or after 1 January 1994)".

The following new subparagraph 1.8 is added after existing subparagraph 1.7:

"1.8 Where public spaces span three or more decks and contain combustibles such as furniture and enclosed spaces such as shops, offices and restaurants, each level within the space shall have two means of escape, one of which shall give direct access to an enclosed vertical means of escape meeting the requirements of paragraph 5".

Regulation 32

Ventilation systems

The following text is inserted after the heading:

"(Paragraph 1.7 of this regulation applies to ships constructed on or after 1 January 1994)".

The following new paragraph 1.7 is inserted between existing paragraphs 1.6 and 2:

"1.7 Where public spaces span three or more open decks and contain combustibles such as furniture and enclosed spaces such as shops, offices and restaurants, the space shall be equipped with a smoke extraction system. The smoke extraction system shall be activated by the required smoke detection system and be capable of manual control. The fans shall be sized such that the entire volume within the space can be exhausted in 10 min or less".

Regulation 36

Fixed fire detection and fire alarm systems Automatic sprinkler, fire detection and fire alarm systems

The following text is inserted after the heading:

"(Paragraph 2 applies to ships constructed on or after 1 January 1994)".

The existing paragraph is numbered as paragraph 1, and the following new paragraph 2 is added after new paragraph 1:

"2 Where public spaces span three or more open decks and contain combustibles such as furniture and enclosed spaces such as shops, offices and restaurants, the entire main vertical zone containing the space shall be protected throughout with an automatic sprinkler system in compliance with regulation 12".

Regulation 40

Fire patrols, detection, alarms and public address systems

The following text is inserted after the heading:

"(Paragraph 7 applies to ships constructed on or after 1 January 1994)".

The following new paragraph 7 is added after existing paragraph 6:

"7 Where public spaces span three or more open decks and contain combustibles such as furniture and enclosed spaces such as shops, offices and restaurants, the entire main vertical zone containing the space shall be protected throughout with a smoke detection system complying with regulation 13, with the exception of paragraph 1.9".

Chapter III

LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Regulation 18

Abandon ship training and drills

The existing heading and text of this regulation are replaced by the following:

"Emergency training and drills

1 This regulation applies to all ships.

2 Manuals

A training manual complying with the requirements of regulation 51 shall be provided in each crew messroom and recreation room or in each crew cabin.

3 Practice musters and drills

3.1 Each member of the crew shall participate in at least one abandon ship drill and one fire drill every month. The drills of the crew shall take place within 24 h of the ship leaving a port if more than 25% of the crew have not participated in abandon ship and fire drills on board that particular ship in the previous month. The Administration may accept other arrangements that are at least equivalent for those classes of ship for which this is impracticable.

3.2 On a ship engaged on an international voyage which is not a short international voyage, musters of the passengers shall take place within 24 h after their embarkation. Passengers shall be instructed in the use of the lifejackets and the action to take in an emergency. If only a small number of passengers embark at a port after the muster has been held it shall be sufficient, instead of holding another muster, to draw the attention of these passengers to the emergency instructions required by regulations 8.2 and 8.4.

3.3 On a ship engaged on a short international voyage, if a muster of the passengers is not held on departure, the attention of the passengers shall be drawn to the emergency instructions required by regulations 8.2 and 8.4.

3.4 Each abandon ship drill shall include:

- .1 summoning of passengers and crew to muster stations with the alarm required by regulation 6.4.2 and ensuring that they are made aware of the order to abandon ship specified in the muster list;
- .2 reporting to stations and preparing for the duties described in the muster list;
- .3 checking that passengers and crew are suitably dressed;
- .4 checking that lifejackets are correctly donned;
- .5 lowering of at least one lifeboat after any necessary preparation for launching;
- .6 starting and operating the lifeboat engine;
- .7 operation of davits used for launching liferafts.

3.5 Different lifeboats shall, as far as practicable, be lowered in compliance with the requirements of paragraph 3.4.5 at successive drills.

3.6 Each lifeboat shall be launched with its assigned operating crew aboard and manoeuvred in the water at least once every 3 months during an abandon ship drill. The Administration may allow ships operating on short international voyages not to launch the lifeboats on one side if their berthing arrangements in port and their trading patterns do not permit launching of lifeboats on that side. However, all such lifeboats shall be lowered at least once every 3 months and launched at least annually.

3.7 As far as is reasonable and practicable, rescue boats other than lifeboats which are also rescue boats, shall be launched each month with their assigned crew aboard and manoeuvred in the water. In all cases this requirement shall be complied with at least once every 3 months.

3.8 If lifeboat and rescue boat launching drills are carried out with the ship making headway, such drills shall, because of the dangers involved, be practised in sheltered waters only and under the supervision of an officer experienced in such drills.

3.9 Emergency lighting for mustering and abandonment shall be tested at each abandon ship drill.

3.10 Each fire drill shall include:

- .1 reporting to stations and preparing for the duties described in the muster list required by regulation 8.3;
- .2 starting a fire pump using at least the two required jets of water to show that the system is in proper working order;

- .3 checking fireman's outfits and other personal rescue equipment;
- .4 checking the relevant communication equipment;
- .5 checking the operation of watertight doors, fire doors, and fire dampers;
- .6 checking the necessary arrangements for subsequent abandonment of the ship.

3.11 Fire drills should be planned in such a way that due consideration is given to regular practice in the various emergencies that may occur depending on the type of ship and its cargo.

3.12 The equipment used during drills shall immediately be brought back to its fully operational condition, and any faults and defects discovered during the drills shall be remedied as soon as possible.

3.13 Drills shall, as far as practicable, be conducted as if there were an actual emergency.

4 On-board training and instructions

4.1 On-board training and instructions in the use of the ship's life-saving appliances, including survival craft equipment, and in the use of the ship's fire-extinguishing appliances shall be given as soon as possible but not later than 2 weeks after a crew member joins the ship. However, if the crew member is on a regularly scheduled rotating assignment to the ship, such training shall be given not later than 2 weeks after the time of first joining the ship. Individual instruction may cover different parts of the ship's life-saving and fire-extinguishing appliances, but all the ship's life-saving and fire-extinguishing appliances shall be covered within any period of 2 months.

4.2 Each member of the crew shall be given instructions which shall include but not necessarily be limited to:

- .1 operation and use of the ship's inflatable liferafts;
- .2 problems of hypothermia, first-aid treatment of hypothermia and other appropriate first-aid procedures;
- .3 special instructions necessary for use of the ship's life-saving appliances in severe weather and severe sea conditions;
- .4 operation and use of fire-extinguishing appliances.

4.3 On-board training in the use of davit-launched liferafts shall take place at intervals of not more than 4 months on every ship fitted with such appliances. Whenever practicable this shall include the inflation and lowering of a liferaft. This liferaft may be a special liferaft intended for training purposes only, which is not part of the ship's life-saving equipment: such a special liferaft shall be conspicuously marked.

5 Records

The date when musters are held, details of abandon ship drills and fire drills, drills of other life-saving appliances and on-board training shall be recorded in such log-book as may be prescribed by the Administration. If a full muster, drill or training session is not held at the appointed time, an entry shall be made in the log-book stating the circumstances and the extent of the muster, drill or training session held."

CHAPTER V

SAFETY OF NAVIGATION

Regulation 17

Pilot ladders and mechanical pilot hoists

The existing heading and text of this regulation are replaced by the following:

"Pilot transfer arrangements

(a) Application

- (i) Ships engaged on voyages in the course of which pilots are likely to be employed shall be provided with pilot transfer arrangements.
- (ii) Equipment and arrangements for pilot transfer which are installed on or after 1 January 1994 shall comply with the requirements of this regulation and due regard shall be paid to the standards adopted by the Organization.*
- (iii) Equipment and arrangements for pilot transfer which are provided on ships before 1 January 1994 shall at least comply with the requirements of regulation 17 in force prior to that date and due regard shall be paid to the standards adopted by the Organization prior to that date.**
- (iv) Equipment and arrangements which are replaced after 1 January 1994 shall, in so far as is reasonable and practicable, comply with the requirements of this regulation.

* Reference is made to the Recommendation on Pilot Transfer Arrangements adopted by the Organization by resolution A.667(16).

** Reference is made to the Recommendation on Performance Standards for Mechanical Pilot Hoists adopted by the Organization by resolution A.275(VIII) and to the Recommendation on Arrangements for Embarking and Disembarking Pilots in Very Large Ships adopted by the Organization by resolution A.426(XI).

(b) General

- (i) All arrangements used for pilot transfer shall efficiently fulfil their purpose of enabling pilots to embark and disembark safely. The appliances shall be kept clean, properly maintained and stowed and shall be regularly inspected to ensure that they are safe to use. They shall be used solely for the embarkation and disembarkation of personnel.
- (ii) The rigging of the pilot transfer arrangements and the embarkation and disembarkation of a pilot shall be supervised by a responsible officer having means of communication with the navigating bridge who shall also arrange for the escort of the pilot by a safe route to and from the navigating bridge. Personnel engaged in rigging and operating any mechanical equipment shall be instructed in the safe procedures to be adopted and the equipment shall be tested prior to use.

(c) Transfer arrangements

- (i) Arrangements shall be provided to enable the pilot to embark and disembark safely on either side of the ship.
- (ii) In all ships where the distance from sea level to the point of access to, or egress from, the ship exceeds 9 m, and when it is intended to embark and disembark pilots by means of the accommodation ladder, or by means of mechanical pilot hoists or other equally safe and convenient means in conjunction with a pilot ladder, the ship shall carry such equipment on each side, unless the equipment is capable of being transferred for use on either side.
- (iii) Safe and convenient access to, and egress from, the ship shall be provided by either:
 - (1) a pilot ladder requiring a climb of not less than 1.5 m and not more than 9 m above the surface of the water so positioned and secured that:
 - (aa) it is clear of any possible discharges from the ship;
 - (bb) it is within the parallel body length of the ship and, as far as is practicable, within the mid-ship half length of the ship;
 - (cc) each step rests firmly against the ship's side; where constructional features, such as rubbing bands, would prevent the implementation of this provision, special arrangements shall, to the satisfaction of the Administration, be made to ensure that persons are able to embark and disembark safely;

(dd) the single length of pilot ladder is capable of reaching the water from the point of access to, or egress from, the ship and due allowance is made for all conditions of loading and trim of the ship, and for an adverse list of 15°; the securing strongpoints, shackles and securing ropes shall be at least as strong as the side ropes;

(2) an accommodation ladder in conjunction with the pilot ladder, or other equally safe and convenient means, whenever the distance from the surface of the water to the point of access to the ship is more than 9 m. The accommodation ladder shall be sited leading aft. When in use, the lower end of the accommodation ladder shall rest firmly against the ship's side within the parallel body length of the ship and, as far as is practicable, within the mid-ship half length and clear of all discharges; or

(3) a mechanical pilot hoist so located that it is within the parallel body length of the ship and, as far as is practicable, within the mid-ship half length of the ship and clear of all discharges.

(d) Access to the ship's deck

Means shall be provided to ensure safe, convenient and unobstructed passage for any person embarking on, or disembarking from, the ship between the head of the pilot ladder, or of any accommodation ladder or other appliance, and the ship's deck. Where such passage is by means of:

(i) a gateway in the rails or bulwark, adequate handholds shall be provided;

(ii) a bulwark ladder, two handhold stanchions rigidly secured to the ship's structure at or near their bases and at higher points shall be fitted. The bulwark ladder shall be securely attached to the ship to prevent overturning.

(e) Shipside doors

Shipside doors used for pilot transfer shall not open outwards.

(f) Mechanical pilot hoists

(i) The mechanical pilot hoist and its ancillary equipment shall be of a type approved by the Administration. The pilot hoist shall be designed to operate as a moving ladder to lift and lower one person on the side of the ship, or as a platform to lift and lower one or more persons on the side of the ship. It shall be of such design and construction as to ensure that the pilot can be embarked and disembarked in a safe manner, including a safe access from the hoist to the deck and vice versa. Such access shall be gained directly by a platform securely guarded by handrails.

- (ii) Efficient hand gear shall be provided to lower or recover the person or persons carried, and kept ready for use in the event of power failure.
- (iii) The hoist shall be securely attached to the structure of the ship. Attachment shall not be solely by means of the ship's side rails. Proper and strong attachment points shall be provided for hoists of the portable type on each side of the ship.
- (iv) If belting is fitted in the way of the hoist position, such belting shall be cut back sufficiently to allow the hoist to operate against the ship's side.
- (v) A pilot ladder shall be rigged adjacent to the hoist and available for immediate use so that access to it is available from the hoist at any point of its travel. The pilot ladder shall be capable of reaching the sea level from its own point of access to the ship.
- (vi) The position on the ship's side where the hoist will be lowered shall be indicated.
- (vii) An adequate protected stowage position shall be provided for the portable hoist. In very cold weather, to avoid the danger of ice formation, the portable hoist shall not be rigged until its use is imminent.

(g) Associated equipment

- (i) The following associated equipment shall be kept at hand ready for immediate use when persons are being transferred:
 - (1) two man-ropes of not less than 28 mm in diameter properly secured to the ship if required by the pilot;
 - (2) a lifebuoy equipped with a self-igniting light;
 - (3) a heaving line.
- (ii) When required by paragraph (d), stanchions and bulwark ladders shall be provided.

(h) Lighting

Adequate lighting shall be provided to illuminate the transfer arrangements overside, the position on deck where a person embarks or disembarks and the controls of the mechanical pilot hoist."

CHAPTER VI

The title and text of chapter VI are replaced by the following:

"CARRIAGE OF CARGOES

PART A

GENERAL PROVISIONS

Regulation 1

Application

1 This chapter applies to the carriage of cargoes (except liquids in bulk, gases in bulk and those aspects of carriage covered by other chapters) which, owing to their particular hazards to ships or persons on board, may require special precautions in all ships to which the present regulations apply and in cargo ships of less than 500 tons gross tonnage. However, for cargo ships of less than 500 tons gross tonnage, the Administration, if it considers that the sheltered nature and conditions of voyage are such as to render the application of any specific requirements of part A or B of this chapter unreasonable or unnecessary, may take other effective measures to ensure the required safety for these ships.

2 To supplement the provisions of parts A and B of this chapter, each Contracting Government shall ensure that appropriate information on cargo and its stowage and securing is provided, specifying, in particular, precautions necessary for the safe carriage of such cargoes*.

* Reference is made to:

- .1 the Code of Safe Practice for Cargo Stowage and Securing adopted by the Organization;
- .2 the Code of Safe Practice for Ships Carrying Timber Deck Cargoes adopted by the Organization; and
- .3 the Code of Safe Practice for Solid Bulk Cargoes (BC Code) adopted by the Organization by resolution A.434(XI), as amended.

Regulation 2

Cargo information

1 The shipper shall provide the master or his representative with appropriate information on the cargo sufficiently in advance of loading to enable the precautions which may be necessary for proper stowage and safe carriage of the cargo to be put into effect. Such information shall be confirmed in writing* and by appropriate shipping documents prior to loading the cargo on the ship.

2 The cargo information shall include:

- .1 in the case of general cargo, and of cargo carried in cargo units, a general description of the cargo, the gross mass of the cargo or of the cargo units, and any relevant special properties of the cargo;
- .2 in the case of a bulk cargo, information on the stowage factor of the cargo, the trimming procedures and, in the case of a concentrate or other cargo which may liquefy, additional information in the form of a certificate on the moisture content of the cargo and its transportable moisture limit;
- .3 in the case of a bulk cargo not classified in accordance with the provisions of regulation VII/2, but which has chemical properties that may create a potential hazard, in addition to the information required by the preceding subparagraphs, information on its chemical properties.

3 Prior to loading cargo units on board ships, the shipper shall ensure that the gross mass of such units is in accordance with the gross mass declared on the shipping documents.

Regulation 3

Oxygen analysis and gas detection equipment

1 When transporting a bulk cargo which is liable to emit a toxic or flammable gas, or cause oxygen depletion in the cargo space, an appropriate instrument for measuring the concentration of gas or oxygen in the air shall be provided together with detailed instructions for its use. Such an instrument shall be to the satisfaction of the Administration.

2 The Administration shall take steps to ensure that crews of ships are trained in the use of such instruments.

* Reference to documents in this regulation does not preclude the use of electronic data processing (EDP) and electronic data interchange (EDI) transmission techniques as an aid to paper documentation.

Regulation 4

The use of pesticides in ships*

Appropriate precautions shall be taken in the use of pesticides in ships, in particular for the purposes of fumigation.

Regulation 5

Stowage and securing

1 Cargo and cargo units carried on or under deck shall be so loaded, stowed and secured as to prevent as far as is practicable, throughout the voyage, damage or hazard to the ship and the persons on board, and loss of cargo overboard.

2 Cargo carried in a cargo unit shall be so packed and secured within the unit as to prevent, throughout the voyage, damage or hazard to the ship and the persons on board.

3 Appropriate precautions shall be taken during loading and transport of heavy cargoes or cargoes with abnormal physical dimensions to ensure that no structural damage to the ship occurs and to maintain adequate stability throughout the voyage.

4 Appropriate precautions shall be taken during loading and transport of cargo units on board ro-ro ships, especially with regard to the securing arrangements on board such ships and on the cargo units and with regard to the strength of the securing points and lashings.

5 Containers shall not be loaded to more than the maximum gross weight indicated on the Safety Approval Plate under the International Convention for Safe Containers (CSC).

* Reference is made to the IMO Recommendation on the Safe Use of Pesticides in Ships, as amended.

PART B

SPECIAL PROVISIONS FOR BULK CARGOES OTHER THAN GRAIN

Regulation 6

Acceptability for shipment

- 1 Prior to loading a bulk cargo, the master shall be in possession of comprehensive information on the ship's stability and on the distribution of cargo for the standard loading conditions. The method of providing such information shall be to the satisfaction of the Administration*.
- 2 Concentrates or other cargoes which may liquefy shall only be accepted for loading when the actual moisture content of the cargo is less than its transportable moisture limit. However, such concentrates and other cargoes may be accepted for loading even when their moisture content exceeds the above limit, provided that safety arrangements to the satisfaction of the Administration are made to ensure adequate stability in the case of cargo shifting and further provided that the ship has adequate structural integrity.
- 3 Prior to loading a bulk cargo which is not a cargo classified in accordance with the provisions of regulation VII/2 but which has chemical properties that may create a potential hazard, special precautions for its safe carriage shall be taken.

* Reference is made to:

- .1 the Recommendation on Intact Stability for Passenger and Cargo Ships under 100 Metres in Length, adopted by the Organization by resolution A.167(ES.IV) and amendments to this Recommendation, adopted by the Organization by resolution A.206(VII); and
- .2 the Recommendation on a Severe Wind and Rolling Criterion (Weather Criterion) for the Intact Stability of Passenger and Cargo Ships of 24 Metres in Length and Over, adopted by the Organization by resolution A.562(14).

Regulation 7

Stowage of bulk cargo

1 Bulk cargoes shall be loaded and trimmed reasonably level, as necessary, to the boundaries of the cargo space so as to minimize the risk of shifting and to ensure that adequate stability will be maintained throughout the voyage.

2 When bulk cargoes are carried in 'tween-decks, the hatchways of such 'tween-decks shall be closed in those cases where the loading information indicates an unacceptable level of stress of the bottom structure if the hatchways are left open. The cargo shall be trimmed reasonably level and shall either extend from side to side or be secured by additional longitudinal divisions of sufficient strength. The safe load-carrying capacity of the 'tween-decks shall be observed to ensure that the deck-structure is not overloaded.

PART C

CARRIAGE OF GRAIN

Regulation 8

Definitions

For the purposes of this part, unless expressly provided otherwise:

1 "International Grain Code" means the International Code for the Safe Carriage of Grain in Bulk adopted by the Maritime Safety Committee of the Organization by resolution MSC.23(59) as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I.

2 The term "grain" includes wheat, maize (corn), oats, rye, barley, rice, pulses, seeds and processed forms thereof whose behaviour is similar to that of grain in its natural state.

Regulation 9

Requirements for cargo ships carrying grain

1 In addition to any other applicable requirements of the present regulations, a cargo ship carrying grain shall comply with the requirements of the International Grain Code, and hold a document of authorization as required by that Code. For the purpose of this regulation, the requirements of the Code shall be treated as mandatory.

2 A ship without such a document shall not load grain until the master satisfies the Administration, or the Contracting Government of the port of loading on behalf of the Administration, that the ship will comply with the requirements of the International Grain Code in its proposed loaded condition."

CHAPTER VII

CARRIAGE OF DANGEROUS GOODS

Regulation 5

Documents*

The existing text of of paragraph 3 of this regulation is replaced by the following paragraphs 3, 4, and 5:

"3 The persons responsible for the packing of dangerous goods in a freight container or road vehicle shall provide a signed container packing certificate or vehicle packing declaration stating that the cargo in the unit has been properly packed and secured and that all applicable transport requirements have been met. Such a certificate or declaration may be combined with the document referred to in paragraph 2.

4 Where there is due cause to suspect that a freight container or road vehicle in which dangerous goods are packed is not in compliance with the requirements of paragraph 2 or 3, or where a container packing certificate or vehicle packing declaration is not available, the freight container or vehicle shall not be accepted for shipment.

5 Each ship carrying dangerous goods shall have a special list or manifest setting forth, in accordance with the classification set out in regulation 2, the dangerous goods on board and the location thereof. A detailed stowage plan, which identifies by class and sets out the location of all dangerous goods on board, may be used in place of such a special list or manifest. A copy of one of these documents shall be made available before departure to the person or organization designated by the port State authority".

* Reference to documents in this regulation does not preclude the use of electronic data processing (EDP) and electronic data interchange (EDI) transmission techniques as an aid to paper documentation.

The following new regulation 7-1 is inserted after regulation 7:

"Regulation 7-1

Reporting of incidents involving dangerous goods

1 When an incident takes place involving the loss or likely loss overboard of packaged dangerous goods into the sea, the master, or other person having charge of the ship, shall report the particulars of such an incident without delay and to the fullest extent possible to the nearest coastal State. The report shall be based on the guidelines and general principles adopted by the Organization*.

2 In the event of the ship referred to in paragraph 1 being abandoned, or in the event of a report from such a ship being incomplete or unobtainable, the owner, charterer, manager or operator of the ship, or their agents shall, to the fullest extent possible, assume the obligations placed upon the master by this regulation.

* Reference is made to "General principles for ship reporting systems and ship reporting requirements, including guidelines for reporting incidents involving dangerous goods, harmful substances and/or marine pollutants" adopted by the Organization by resolution A.648(16)."

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THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea, 1974, hereinafter referred to as "the Convention", concerning the procedures for amending the Annex to the Convention, other than the provisions of chapter I thereof,

HAVING CONSIDERED, at its sixty-first session, amendments to the Convention proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, the amendments to the Convention, the text of which is set out in the annex to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 1 April 1994 unless, prior to the date, more than one third of the Contracting Governments to the Convention, or Contracting Governments the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;
3. INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 October 1994 upon their acceptance in accordance with paragraph 2 above;
4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;
5. FURTHER REQUESTS the Secretary-General to transmit copies of the resolution to Members of the Organization which are not Contracting Governments to the Convention.

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ANNEX

AMENDMENTS TO THE 1974 SOLAS CONVENTION

Access to spaces in the cargo area of oil tankers

- 1 Add the following after paragraph 11 of regulation II-1/2:

"12 An oil tanker is the oil tanker defined in regulation 1 of Annex I of the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973."

- 2 Add a new regulation II-1/12-2:

"Regulation 12-2

Access to spaces in the cargo area of oil tankers

- 1 This regulation applies to oil tankers constructed on or after 1 October 1994.

2 Access to cofferdams, ballast tanks, cargo tanks and other spaces in the cargo area shall be direct from the open deck and such as to ensure their complete inspection. Access to double bottom spaces may be through a cargo pump-room, pump-room, deep cofferdam, pipe tunnel or similar compartments, subject to consideration of ventilation aspects.

3 For access through horizontal openings, hatches or manholes, the dimensions shall be sufficient to allow a person wearing a self-contained air-breathing apparatus and protective equipment to ascend or descend any ladder without obstruction and also to provide a clear opening to facilitate the hoisting of an injured person from the bottom of the space. The minimum clear opening should be not less than 600 mm by 600 mm.

4 For access through vertical openings, or manholes providing passage through the length and breadth of the space, the minimum clear opening should be not less than 600 mm by 800 mm at a height of not more than 600 mm from the bottom shell plating unless gratings or other footholds are provided.

5 For oil tankers of less than 5,000 tonnes deadweight smaller dimensions may be approved by the Administration in special circumstances, if the ability to traverse such openings or to remove an injured person can be proved to the satisfaction of the Administration."

Regulation II-1/37 - Communication between navigating bridge and machinery space

- 3 Number the present paragraph as paragraph 1 and add the following:

"2. For ships constructed on or after 1 October 1994 the following requirements apply in lieu of the provisions of paragraph 1:

At least two independent means shall be provided for communicating orders from the navigating bridge to the position in the machinery space or in

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the control room from which the speed and direction of thrust of the propellers are normally controlled: one of these shall be an engine-room telegraph which provides visual indication of the orders and responses both in the machinery spaces and on the navigating bridge. Appropriate means of communication shall be provided from the navigating bridge and the engine-room to any other position from which the speed or direction of thrust of the propellers may be controlled."

Regulation II-1/42 - Emergency source of electric power in passenger ships

- 4 Insert the following paragraph after paragraph 3.2 of regulation II-1/42:

"3.3 The following provision in paragraph 3.1.2 shall not apply to ships constructed on or after 1 October 1994:

unless a second independent means of starting the emergency generating set is provided, the single source of stored energy shall be protected to preclude its complete depletion by the automatic starting system."

Regulation II-1/43 - Emergency source of electric power in cargo ships

- 5 Insert the following paragraph after paragraph 3.2 of regulation II-1/43:

"3.3 The following provision in paragraph 3.1.2 shall not apply to ships constructed on or after 1 October 1994:

unless a second independent means of starting the emergency generating set is provided, the single source of stored energy shall be protected to preclude its complete depletion by the automatic starting system."

Regulation II-1/44 - Starting arrangements for emergency generating sets

- 6 Insert the following paragraph after paragraph 2 of regulation II-1/44:

"2.1 Ships constructed on or after 1 October 1994, in lieu of the provision of the second sentence of paragraph 2, shall comply with the following requirements:

The source of stored energy shall be protected to preclude critical depletion by the automatic starting system, unless a second independent means of starting is provided. In addition, a second source of energy shall be provided for an additional three starts within 30 minutes unless manual starting can be demonstrated to be effective."

Regulation II-1/45 - Precautions against shock, fire and other hazards of electrical origin

- 7 Insert the following after paragraph 3.2 of regulation II-1/45:

"3.2-1 For ships constructed on or after 1 October 1994, the requirement of paragraph 3.1 does not preclude the use of limited and locally earthed systems, provided that any possible resulting current does not flow directly through any dangerous spaces."

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8 Insert the following after paragraph 4.2:

"4.3 Ships constructed on or after 1 October 1994, in lieu of the provisions of paragraph 4.1, shall comply with the following requirements:

- .1 Except as permitted by paragraph 4.3.2, earthed distribution systems shall not be used in a tanker.
- .2 The requirement of paragraph 4.3.1 does not preclude the use of earthed intrinsically safe circuits and in addition, under conditions approved by the Administration, the use of the following earthed systems:
 - .2.1 power supplied, control circuits and instrumentation circuits where technical or safety reasons preclude the use of a system with no connection to earth, provided the current in the hull is limited to not more than 5 amps in both normal and fault conditions; or
 - .2.2 limited and locally earthed systems, provided that any possible resulting current does not flow directly through any of the dangerous spaces; or
 - .2.3 alternating current power networks of 1,000 V root mean square (line to line) and over, provided that any possible resulting current does not flow directly through any of the dangerous spaces."

Amendments to chapter II-2 dealing with fire-protection requirements of new ships

Regulation II-2/1 - Application

9 Amend paragraph 1.1 to read:

"1.1 Unless expressly provided otherwise, parts A, C and D of this chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 July 1986, and part B of this chapter shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 October 1994."

10 Add the following to the present sentence of paragraph 2:

"and for ships constructed before 1 October 1994 the Administration shall ensure that the requirements which are applicable under part B of chapter II-2 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolutions MSC.1(XLV), MSC.6(48), MSC.13(57), MSC.22(59) and MSC.24(60) are complied with."

Regulation II-2/3 - Definitions

11 Add a new paragraph 33 as follows:

"33 For ships constructed on or after 1 October 1994, in lieu of the definition of main vertical zones provided in paragraph 9, the following definition shall be applied:

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Main vertical zones are those sections into which the hull, superstructure and deckhouses are divided by "A" class divisions, the mean length and width of which on any deck does not in general exceed 40 m."

Fire main and fire pump sizing

Regulation II-2/4.4.2

- 12 Add the following after paragraph 4.2:

"4.2.1 Passenger ships constructed on or after 1 October 1994, in lieu of the provisions of paragraph 4.2, shall comply with the following requirements:

With the two pumps simultaneously delivering through the nozzles specified in paragraph 8 and sufficient hydrants to provide for the quantity of water specified in paragraph 4.1, a minimum pressure of 0.4 N/mm² for ships of 4,000 tons gross tonnage and above and 0.3 N/mm² for ships of less than 4,000 tons gross tonnage shall be maintained at all hydrants."

Regulation II-2/4.3.3.3

- 13 Add the following after paragraph 3.3.3:

"3.3.3.1 For ships constructed on or after 1 October 1994, the alternative means to be provided in accordance with the provisions of paragraph 3.3.3 shall be an independently driven, power-operated emergency fire pump and with its source of power and sea connection located outside the machinery space."

Regulation II-2/4.3.3.2.9

- 14 Add the following after paragraph 3.3.2.8:

"3.3.2.9 Ships constructed on or after 1 October 1994, in lieu of the provisions of paragraph 3.3.2.6, shall comply with the following requirements:

The space containing the fire pump shall not be contiguous to the boundaries of machinery spaces of category A or those spaces containing main fire pumps. Where this is not practicable, the common bulkhead between the two spaces shall be insulated to a standard of structural fire protection equivalent to that required for a control station in regulation 44."

Release mechanism of CO₂

- 15 The following paragraphs are added after paragraph 2.4 of regulation II-2/5:

"2.5 Carbon dioxide systems installed on or after 1 October 1994 shall comply with the following requirements:

- .1 Two separate controls shall be provided for releasing carbon dioxide into a protected space and to ensure the activities of the alarm.

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One control shall be used to discharge the gas from its storage containers. A second control shall be used for opening the valve of the piping which conveys the gas into the protected space.

- .2 The two controls shall be located inside a release box clearly identified for the particular space. If the box containing the controls is to be locked, a key to the box shall be in a break-glass type enclosure conspicuously located adjacent to the box."

Prohibition of new installations of halon system

- 16 Replace paragraph 3.1 of regulation II-2/5 by the following:

"3.1 The use of halogenated hydrocarbons as fire-extinguishing media is only permitted in machinery spaces, pump-rooms and in cargo spaces intended solely for the carriage of vehicles which are not carrying any cargo. New installations of halogenated hydrocarbon systems shall be prohibited on all ships."

Regulation II-2/13 - Fixed fire detection and fire alarm systems

- 17 Replace paragraph 1.6 by the following:

"1.6 Indicating units shall, as a minimum, denote the section in which a detector or manually operated call point has operated. At least one unit shall be so located that it is easily accessible to responsible members of the crew at all times, when at sea or in port, except when the ship is out of service. One indicating unit shall be located on the navigating bridge if the control panel is located in the main fire control station."

- 18 Replace paragraph 1.8 by the following:

"1.8 Where the fire detection system does not include means of remotely identifying each detector individually, no section covering more than one deck within accommodation, service and control stations shall normally be permitted except a section which covers an enclosed stairway. In order to avoid delay in identifying the source of fire, the number of enclosed spaces included in each section shall be limited as determined by the Administration. In no case shall more than fifty enclosed spaces be permitted in any section. If the detection system is fitted with remotely and individually identifiable fire detectors, the sections may cover several decks and serve any number of enclosed spaces."

- 19 Replace paragraph 1.9 by the following:

"1.9 In passenger ships, if there is no fire detection system capable of remotely and individually identifying each detector, a section of detectors shall not serve spaces on both sides of the ship nor on more than one deck and neither shall it be situated in more than one main vertical zone except that the Administration, if it is satisfied that the protection of the ship against fire will not thereby be reduced, may permit such a section of detectors to serve both sides of the ship and more than one deck. In passenger ships fitted with individually identifiable fire detectors, a section may serve spaces on both sides of the ship and on several decks but may not be situated in more than one main vertical zone."

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20 Add the following paragraph 1.15:

"1.15 Fire detection systems with a zone address identification capability fitted on or after 1 October 1994 shall be so arranged that:

- a loop cannot be damaged at more than one point by a fire;
- means are provided to ensure that any fault (e.g. power break; short circuit; earth) occurring in the loop will not render the whole loop ineffective;
- all arrangements are made to enable the initial configuration of the system to be restored in the event of failure (electrical, electronic, informatic);
- the first initiated fire alarm will not prevent any other detector from initiating further fire alarms."

Regulation 20

Fire control plans and fire drills

21 A new regulation 20.4 is added as follows:

"In ships carrying more than 36 passengers, plans and booklets required by this regulation shall provide the information regarding fire protection, fire detection and fire extinction based on the guidelines issued by the Organization".

Regulation II-2/24 - Main vertical zones and horizontal zones

22 Amend paragraph 1.1 to read:

"1.1 In ships carrying more than 36 passengers, the hull, superstructure and deckhouses shall be subdivided into main vertical zones by A-60 class divisions. Steps and recesses shall be kept to a minimum but where they are necessary they shall also be A-60 class divisions. Where a category 26.2.2(5), 26.2.2(9) or 26.2.2(10) space is on one side of the division the standard may be reduced to A-0."

23 Amend paragraph 2 to read:

"2 As far as practicable, the bulkheads forming the boundaries of the main vertical zones above the bulkhead deck shall be in line with watertight subdivision bulkheads situated immediately below the bulkhead deck. The length and width of main vertical zones may be extended to a maximum of 48 m in order to bring the ends of main vertical zones to coincide with subdivision watertight bulkheads or in order to accommodate a large public space extending for the whole length of the main vertical zone provided that the total area of the main vertical zone is not greater than 1,600 m² on any deck. The length or width of a main vertical zone is the maximum distance between the furthestmost points of the bulkheads bounding it."

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24 Delete the reference to table 26.3.

Regulation II-2/25 - Bulkheads within a main vertical zone

25 Add the following at the beginning of the first sentence of paragraph 2:

"In ships carrying not more than 36 passengers,".

26 Replace paragraph 3 by the following:

"3 All bulkheads required to be "B" class divisions, except corridor bulkheads prescribed in paragraph 2, shall extend from deck to deck and to the shell or other boundaries unless the continuous "B" class ceilings or linings fitted on both sides of the bulkheads are at least of the same fire resistance as the bulkhead, in which case the bulkhead may terminate at the continuous ceiling or lining."

Regulation II-2/26 - Fire integrity of bulkheads and decks in ships carrying more than 36 passengers

27 Amend paragraph 2.1 as follows:

"2.1 Table 26.1 shall apply to bulkheads not bounding either main vertical zones or horizontal zones. Table 26.2 shall apply to decks not forming steps in main vertical zones nor bounding horizontal zones."

28 In paragraph 2.2(3), delete the words "and lobbies".

29 Amend paragraph 2.2(4) to read:

"(4) Evacuation stations and external escape routes.

Survival craft stowage area.

Open deck spaces and enclosed promenades forming lifeboat and liferaft embarkation and lowering stations.

Muster stations, internal and external.

External stairs and open decks used for escape routes.

The ship's side to the waterline in the lightest seagoing condition, superstructure and deckhouse sides situated below and adjacent to the liferaft and evacuation slide embarkation areas."

30 In paragraph 2.2(7), add "Operating rooms" at the end.

31 Delete "Operating rooms" from paragraph 2.2(9).

32 In paragraph 2.2(11), delete the word "emergency" between "driving" and "generators", and delete reference to "special category spaces" on the first, second and twentieth lines.

33 Delete paragraph 2.4 and 2.5, and renumber the present paragraph 2.6 as new paragraph 2.4.

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34 Delete the present paragraph 2.7, and add a new paragraph 2.5 as follows:

"5 The Administration shall determine in respect of category (5) spaces whether the insulation values in table 26.1 shall apply to ends of deckhouses and superstructures, and whether the insulation values in table 26.2 shall apply to weather decks. In no case shall the requirements of category (5) of table 26.1 or 26.2 necessitate enclosure of spaces which in the opinion of the Administration need not be enclosed."

35 Replace tables 26.1 and 26.2 by the following:

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- a Where adjacent spaces are in the same numerical category and superscript ^a appears, a bulkhead or deck between such spaces need not be fitted if deemed unnecessary by the Administration. For example, in category (12) a bulkhead need not be required between a galley and its annexed pantries provided the pantry bulkhead and decks maintain the integrity of the galley boundaries. A bulkhead is, however, required between a galley and a machinery space even though both spaces are in category (12).
- b The ship's side, to the waterline in the lightest seagoing condition, superstructure and deckhouse sides situated below and adjacent to the liferafts and evacuation slides may be reduced to A-30.
- c Where public toilets are installed completely within the stairway enclosure, the public toilet bulkhead within the stairway enclosure can be of "B" class integrity."

36 Delete tables 26.3 and 26.4.

Regulation II-2/28 - Means of escape

37 Delete "accommodated or" from the last sentence of paragraph 1.1.

38 Replace paragraph 1.4 by the following:

"1.4 A corridor, lobby, or part of a corridor from which there is only one route of escape shall be prohibited."

39 Replace paragraph 1.5 by the following:

"1.5 At least one of the means of escape required by paragraphs 1.1 and 1.2 shall consist of a readily accessible enclosed stairway, which shall provide continuous fire shelter from the level of its origin to the appropriate lifeboat and liferaft embarkation decks, or to the uppermost weather deck if the embarkation deck does not extend to the main vertical zone being considered. In the latter case, direct access to the embarkation deck by way of external open stairways and passageways shall be provided and shall have emergency lighting in accordance with regulation III/11.5 and slip-free surfaces under foot. Boundaries facing external open stairways and passageways forming part of an escape route and boundaries in such a position that their failure during a fire would impede escape to the embarkation deck shall have fire integrity, including insulation values, in accordance with the tables in regulation II-2/26. The widths, number and continuity of escapes shall be as follows:

- .5.1 Stairways shall not be less than 900 mm in clear width. Stairways shall be fitted with handrails on each side. The minimum clear width of stairways shall be increased by 10 mm for every one person provided for in excess of 90 persons. The maximum clear width between handrails where stairways are wider than 900 mm shall be 1,800 mm. The total number of persons to be evacuated by such stairways shall be assumed to be two thirds of the crew and the total number of passengers in the areas served by such stairways. The width of the stairways

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shall conform to standards not inferior to those adopted by the Organization.

- .5.2 All stairways sized for more than 90 persons shall be aligned fore and aft.
 - .5.3 Doorways and corridors and intermediate landings included in means of escape shall be sized in the same manner as stairways.
 - .5.4 Stairways shall not exceed 3.5 m in vertical rise without the provision of a landing and shall not have an angle of inclination greater than 45°.
 - .5.5 Landings at each deck level shall be not less than 2 m² in area and shall increase by 1 m² for every 10 persons provided for in excess of 20 persons but need not exceed 16 m², except for those landings servicing public spaces having direct access onto the stairway enclosure.
- 40 Add new paragraphs 1.9 and 1.10 as follows:
- "1.9 Where the Administration has granted dispensation under the provisions of paragraph 1.1, the sole means of escape shall provide safe escape. However, stairways shall not be less than 800 mm in clear width with handrails on both sides.
 - 1.10 In addition to the emergency lighting required by regulations II-1/42 and III/11.5, the means of escape, including stairways and exits, shall be marked by lighting or photoluminescent strip indicators placed not more than 0.3 m above the deck at all points of the escape route including angles and intersections. The marking must enable passengers to identify all the routes of escape and readily identify the escape exits. If electric illumination is used, it shall be supplied by the emergency source of power and it shall be so arranged that the failure of any single light or cut in a lighting strip, will not result in the marking being ineffective. Additionally, all escape route signs and fire equipment location markings shall be of photoluminescent material or marked by lighting. The Administration shall ensure that such lighting or photoluminescent equipment have been evaluated, tested and applied in accordance with the guidelines developed by the Organization."
- 41 Add a new paragraph 3.3 as follows:

"3.3 Two means of escape shall be provided from a machinery control room located within a machinery space, at least one of which will provide continuous fire shelter to a safe position outside the machinery space."

Regulation II-2/29 - Protection of stairways and lifts in accommodation and service spaces

- 42 Replace paragraph 2 by the following:

"2 Stairway enclosures shall have direct access to the corridors and be of a sufficient area to prevent congestion, having in view the number of persons likely to use them in an emergency. Within the perimeter of

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such stairway enclosures, only public toilets, lockers of non-combustible material providing storage for safety equipment and open information counters are permitted. Only public spaces, corridors, public toilets, special category spaces, other escape stairways required by 28.1.5 and external areas are permitted to have direct access to these stairway enclosures."

Regulation II-2/30 - Openings in "A" class division

43 Replace paragraph 4 by the following:

"4 Fire doors in main vertical zone bulkheads and stairway enclosures shall satisfy the following requirements:

- .1 The doors shall be self-closing and be capable of closing with an angle of inclination of up to 3.5° opposing closure, and shall have an approximately uniform rate of closure of no more than 40 s and no less than 10 s with the ship in the upright position.
- .2 Remote-controlled sliding or power-operated doors shall be equipped with an alarm that sounds at least 5 s but no more than 10 s before the door begins to move and continue sounding until the door is completely closed. Doors designed to reopen upon contacting an object in its path shall reopen sufficiently to allow a clear passage of at least 0.75 m, but no more than 1 m.
- .3 All doors shall be capable of remote and automatic release from a continuously manned central control station, either simultaneously or in groups, and also individually from a position at both sides of the door. Indication must be provided at the fire control panel in the continuously manned central control station whether each of the remote-controlled doors are closed. The release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system or central power supply. Release switches shall have an on-off function to prevent automatic resetting of the system. Hold-back hooks not subject to central control station release are prohibited.
- .4 Local power accumulators for power-operated doors shall be provided in the immediate vicinity of the doors to enable the doors to be operated at least ten times (fully opened and closed) using the local controls.
- .5 Double-leaf doors equipped with a latch necessary to their fire integrity shall have a latch that is automatically activated by the operation of the doors when released by the system.
- .6 Doors giving direct access to special category spaces which are power-operated and automatically closed need not be equipped with alarms and remote-release mechanisms required in .2 and .3."

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- 44 In paragraph 5, add the following words at the beginning:
"In ships carrying not more than 36 passengers,".
- 45 In paragraph 6, add the following words at the end of the first sentence:
"provided that there is no requirement for such boundaries to have "A"
class integrity in regulation 33.3".
- 46 Insert a new paragraph 7 as follows:
"7 All "A" class doors located in stairways, public spaces and main
vertical zone bulkheads in escape routes shall be equipped with a
self-closing hose port of material, construction and fire resistance
which is equivalent to the door into which it is fitted, and shall be a
150 mm square clear opening with the door closed and shall be inset into
the lower edge of the door, opposite the door hinges, or in the case of
sliding doors, nearest the opening."

Regulation II-2/31 - Openings in "B" class division

- 47 Renumber paragraph 1 as paragraph 1.1 and amend the first sentence to
read:
"Doors and door frames in "B" class divisions and means of securing them
shall provide a method of closure which shall have resistance to fire
equivalent to that of the divisions* except that ventilation openings may
be permitted in the lower portion of such doors."
- * Reference is made to the Recommendation on Fire Test Procedures for
"A", "B" and "F" class divisions, adopted by resolution A.517(13)."
- 48 Add a new paragraph 1.2 to read:
"1.2 Cabin doors in "B" class divisions shall be of a self-closing
type. Hold-backs are not permitted."
- 49 In paragraph 3, add the following at the beginning:
"In ships carrying not more than 36 passengers".

Regulation II-2/32 - Ventilation systems

- Paragraph 1.1 is revised by deleting "16.2 to 16.9" at the end of the
sentence and replacing it with "16.2 to 16.6, 16.8 and 16.9".
- 50 Replace paragraph 1.5 by the following:
"1.5 Stairway enclosures shall be ventilated and shall be served only by
an independent fan and duct system which shall not serve any other spaces
in the ventilation system."

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The following new paragraphs 1.8 and 1.9 are inserted:

- "1.8 Ventilation ducts shall be provided with suitably located hatches for inspection and cleaning, where reasonable and practicable.
- 1.9 Exhaust ducts from galley ranges in which grease or fat is likely to accumulate shall meet requirements of regulation II-2/16.3.2.1 and 16.3.2.2 and shall be fitted with:
- .1 a grease trap readily removable for cleaning unless an alternative approved grease removal system is fitted;
 - .2 a fire damper located in the lower end of the duct which is automatically and remotely operated, and in addition a remotely operated fire damper located in the upper end of the duct;
 - .3 a fixed means for extinguishing a fire within the duct;
 - .4 remote control arrangements for shutting off the exhaust fans and supply fans, for operating the fire dampers mentioned in .2 and for operating the fire-extinguishing system, which shall be placed in a position close to the entrance to the galley. Where a multi-branch system is installed, means shall be provided to close all branches exhausting through the same main duct before an extinguishing medium is released into the system; and
 - .5 suitably located hatches for inspection and cleaning."

Regulation II-2/33 - Windows and sidescuttles

51 Amend paragraph 2 to read:

"2 Notwithstanding the requirements of the tables in regulations 26 and 27, all windows and sidescuttles in bulkheads separating accommodation and service spaces and control stations from weather shall be constructed with frames of steel or other suitable material. The glass shall be retained by a metal glazing bead or angle."

52 Add new paragraph 3 as follows:

"3 Windows facing life-saving appliances, embarkation and muster areas, external stairs and open decks used for escape routes, and windows situated below liferaft and escape slide embarkation areas shall have the fire integrity as required in the tables in regulation II-2/26. Where automatic dedicated sprinkler heads are provided for windows, A-0 windows may be accepted as equivalent. Windows located in the ship's side below the lifeboat embarkation areas shall have the fire integrity at least equal to "A-0" class."

Regulation II-2/34 - Restricted use of combustibile material

53 Insert the words "draught stops" between "grounds" and "ceilings" in the first sentence of paragraph 1.

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54 Amend paragraph 6 to read:

"6 Furniture in stairway enclosures shall be limited to seating. It shall be fixed, limited to six seats on each deck in each stairway enclosure, be of restricted fire risk, and shall not restrict the passenger escape route. The Administration may permit additional seating in the main reception area within a stairway enclosure if it is fixed, non-combustible and does not restrict the passenger escape route. Furniture shall not be permitted in passenger and crew corridors forming escape routes in cabin areas". In addition to the above, lockers of non-combustible material, providing storage for safety equipment required by regulations, may be permitted.

Regulation II-2/36 - Fixed fire detection and fire alarm systems, automatic sprinkler, fire detection and fire alarm systems

55 Replace regulation 36 by the following:

"Fixed fire detection and fire alarm systems and automatic
sprinkler, fire detection and fire alarm systems

1 In passenger ships carrying not more than 36 passengers there shall be installed throughout each separate zone, whether vertical or horizontal, in all accommodation and service spaces and, where it is considered necessary by the Administration, in control stations, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc., either:

- .1 a fixed fire detection and fire alarm system of an approved type and complying with the requirements of regulation 13 and so installed and arranged as to detect the presence of fire in such spaces; or
- .2 an automatic sprinkler, fire detection and fire alarm system of an approved type and complying with the requirements of regulation 12 or the guidelines developed by the Organization for an approved equivalent sprinkler system and so installed and arranged as to protect such spaces and, in addition, a fixed fire detection and fire alarm system of an approved type complying with the requirements of regulation 13 so installed and arranged as to provide smoke detection in corridors, stairways and escape routes within accommodation spaces.

2 Passenger ships carrying more than 36 passengers shall be equipped with an automatic sprinkler, fire detection and fire alarm system of an approved type complying with the requirements of regulation 12, or the guidelines developed by the Organization for an approved equivalent sprinkler system in all service spaces, control stations and accommodation spaces, including corridors and stairways. Alternatively, control stations where water may cause damage to essential equipment may be fitted with an approved fixed fire-extinguishing system of another type. A fixed fire detection and fire alarm system of an approved type shall be installed, complying with the requirements of regulation 13 so

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installed and arranged as to provide smoke detection in service spaces, control stations and accommodation spaces, including corridors and stairways. Smoke detectors need not be fitted in private bathrooms and galleys. Spaces having little or no fire risk such as voids, public toilets and similar spaces need not be fitted with an automatic sprinkler system, or fixed fire detection and alarm system."

Regulation II-2/37 - Protection of special category spaces

56 Amend paragraph 1.2.1 as follows:

"1.2.1 In passenger ships carrying more than 36 passengers the boundary bulkheads and decks of special category spaces shall be insulated to A-60 class standard. However, where a category 26.2.2(5), 26.2.2(9) or 26.2.2(10) space is on one side of the division the standard may be reduced to A-0.

57 Renumber existing paragraph 1.2.2 as 1.2.3 and insert a new paragraph 1.2.2 to read:

"1.2.2 In passenger ships carrying not more than 36 passengers the boundary bulkheads of special category spaces shall be insulated as required for category (11) spaces in table 27.1 and the horizontal boundaries as required for category (11) spaces in table 27.2."

Regulation II-2/40 - Fire patrols, detection, alarms and public address systems

58 Add the words "and open decks" at the end of paragraph 5.

59 Paragraph 5 is amended to add after the last sentence:

"Each member of the fire patrol shall be provided with a two-way portable radio telephone apparatus".

60 Add new paragraphs 7.1 to 7.2:

"7.1 Passenger ships carrying more than 36 passengers shall have the detection alarms for the systems required by regulation 36.2 centralized in a continuously manned central control station. In addition, controls for remote closing of the fire doors and shutting down the ventilation fans, shall be centralized in the same location. The ventilation fans shall be capable of reactivation by the crew at the continuously manned control station. The control panels in the central control station shall be capable of indicating open or closed positions of fire doors, closed or off status of the detectors, alarms and fans. The control panel shall be continuously powered and should have an automatic change-over to stand-by power supply in case of loss of normal power supply. The control panel shall be powered from the main source of electrical power and the emergency source of electrical power defined by regulation II-1/42 unless other arrangements are permitted by the regulations, as applicable.

7.2 The control panel shall be designed on the fail-safe principle, e.g. an open detector circuit shall cause an alarm condition, as noted in regulations II-2/13.1.3 and II-1/51.1.4."

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Regulation 59 - Venting, purging, gas-freeing and ventilation

60-1 The following new paragraph 4 should be inserted after the existing paragraph 3:

"4 Inerting, Ventilation and gas measurement

- 4.1 This paragraph shall apply to oil tankers constructed on or after 1 October 1994.
- 4.2 Double hull and double bottom spaces shall be fitted with suitable connections for the supply of air.
- 4.3 On tankers required to be fitted with inert gas systems:
- .1 double hull spaces shall be fitted with suitable connections for the supply of inert gas;
 - .2 where hull spaces are connected to a permanently fitted inert gas distribution system, means shall be provided to prevent hydrocarbon gases from the cargo tanks entering the double hull spaces through the system;
 - .3 where such spaces are not permanently connected to an inert gas distribution system, appropriate means shall be provided to allow connection to the inert gas main.
- 4.4.1 Suitable portable instruments for measuring oxygen and flammable vapour concentrations shall be provided. In selecting these instruments, due attention shall be given for their use in combination with the fixed gas sampling line systems referred to in paragraph 4.4.2.
- 4.4.2 Where atmosphere in double hull spaces cannot be reliably measured using flexible gas sampling hoses, such spaces shall be fitted with permanent gas sampling lines. The configuration of such line systems shall be adapted to the design of such spaces.
- 4.4.3 The materials of construction and the dimensions of gas sampling lines shall be such as to prevent restriction. Where plastic materials are used, they should be electrically conductive."

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Chapter III

Regulation 50

General emergency alarm system

61 Delete the full stop at the end of the regulation and add the following:

"and open decks, and its sound pressure level shall comply with the standard developed by the Organization. The alarm shall continue to function after it has been triggered until it is manually turned off or is temporarily interrupted by a message on the public address system".

Approved amendments to chapter IV

Regulation IV/13 - Sources of energy

62 Replace the existing text of paragraphs 2.1 to 2.3 by:

.1 one hour on ships provided with an emergency source of electrical power, if such source of power complies fully with all relevant provisions of regulation II-1/42 or 43, including the supply of such power to the radio installations; and

.2 six hours on ships not provided with an emergency source of electrical power complying fully with all relevant provisions of regulation II-1/42 or 43, including the supply of such power to the radio installations."

63 Delete the reference in regulation IV/13.4 to paragraph 2.3.

Regulation IV/14 - Performance standards

64 Replace "by prescribed" in regulation IV/14.2 by "prescribed by".

RESOLUTION MSC.27(61)
(adopted on 11 December 1992)
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ANEXO 2**RESOLUCIÓN MSC.69(69)
(aprobada el 18 de mayo de 1998)****APROBACIÓN DE ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA
SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO ADEMÁS el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar (SOLAS), 1974, en adelante llamado "el Convenio", relativo a los procedimientos de enmienda del Anexo del Convenio, con excepción del capítulo I,

HABIENDO EXAMINADO en su 69º periodo de sesiones las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del mismo,

1. APRUEBA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;
2. DECIDE, de conformidad con el artículo VIII b) vi) 2) bb) del Convenio, que las enmiendas se considerarán aceptadas el 1 de enero de 2002, a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio SOLAS, o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50% del tonelaje bruto de la flota mercante mundial, hayan notificado que recusan las enmiendas;
3. INVITA a los Gobiernos Contratantes a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de julio de 2002, una vez que hayan sido aceptadas con arreglo a lo dispuesto en el párrafo 2 anterior;
4. PIDE al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;
5. PIDE ADEMÁS al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no sean Gobiernos Contratantes del Convenio.

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO II-1

CONSTRUCCIÓN - ESTRUCTURA, COMPARTIMENTADO Y ESTABILIDAD, INSTALACIONES DE MÁQUINAS E INSTALACIONES ELÉCTRICAS

PARTE B - COMPARTIMENTADO Y ESTABILIDAD

Regla 14 - Construcción y pruebas iniciales de mamparos estancos, etc., en los buques de pasaje y en los buques de carga

1 Se sustituye el texto existente del párrafo 3 por el siguiente:

"3 La prueba consistente en llenar de agua los compartimientos principales no es obligatoria. Cuando no se efectúe esa prueba, se llevará a cabo, siempre que sea posible, una prueba con manguera. Ésta se efectuará en la fase más avanzada de instalación del equipo en el buque. Cuando no sea posible realizar una prueba con manguera debido a los daños que pueda ocasionar a las máquinas, el equipo eléctrico, el aislamiento o los elementos de equipo, ésta podrá sustituirse por una inspección visual meticulosa de las uniones soldadas, respaldada cuando se considere necesario por medios tales como una prueba con tinte penetrante, una prueba ultrasónica de estanquidad u otra prueba equivalente. En todo caso, se efectuará una inspección minuciosa de los mamparos estancos."

CAPÍTULO IV

RADIOCOMUNICACIONES

Regla 1 - Ámbito de aplicación

2 En el párrafo 1, se insertan las palabras "Salvo disposición expresa en otro sentido," antes de las palabras "el presente capítulo".

Regla 2 - Expresiones y definiciones

3 En el párrafo 1, después del apartado .15 existente, se añade el nuevo apartado .16 siguiente:

".16 *Identities del Sistema mundial de socorro y seguridad marítimos (SMSSM):* identidades del servicio móvil marítimo, distintivo de llamada del buque, identidades de Inmarsat o identidad del número de serie que pueden ser transmitidas por el equipo del buque y que sirven para identificar a dicho buque."

4 El párrafo 2 existente se sustituye por el siguiente:

"2 Todas las demás expresiones y abreviaturas utilizadas en el presente capítulo que estén definidas en el Reglamento de radiocomunicaciones y en el Convenio internacional sobre búsqueda y salvamento marítimos (Convenio SAR), 1979, tal como se enmiende, tendrán el significado que se les da en dicho Reglamento y en el Convenio SAR."

5 Después de la regla 5 existente, se añade la nueva regla 5-1 siguiente:

"Regla 5-1

Identidades del Sistema mundial de socorro y seguridad marítimos

1 La presente regla es aplicable a todos los buques en todos los viajes.

2 Todo Gobierno Contratante se compromete a garantizar que se toman medidas adecuadas para registrar las identidades del Sistema de socorro y seguridad marítimos (SMSSM) y para que los centros coordinadores de salvamento puedan obtener información sobre dichas identidades durante las 24 horas del día. Cuando proceda, el Gobierno Contratante notificará a las organizaciones internacionales que lleven un registro de esas identidades."

Regla 13 - Fuentes de energía

6 En el párrafo 8, después de la palabra "capítulo," se insertan las palabras "incluido el receptor de navegación a que se refiere la regla 18,".

Regla 15 - Prescripciones relativas al mantenimiento

7 Después del párrafo 8 existente se añade el nuevo párrafo 9 siguiente:

"9 Las RLS por satélite se someterán a prueba a intervalos que no excedan de 12 meses para verificar todos los aspectos relativos a su eficacia operacional, prestándose especial atención a la estabilidad de la frecuencia, la potencia de la señal y la codificación. No obstante, en los casos en que resulte adecuado y razonable, la Administración podrá ampliar este periodo a 17 meses. La prueba se podrá efectuar a bordo del buque o en una estación aprobada de prueba o de servicio."

8 Después de la regla 17 existente, se añade la nueva regla 18 siguiente:

"Regla 18

Actualización de la situación

Todo equipo bidireccional de comunicaciones que se lleve a bordo de un buque al que es aplicable el presente capítulo y que sea capaz de incluir automáticamente la situación del buque en el alerta de socorro, recibirá automáticamente esta información de un receptor de navegación interno o externo, en caso de que lo haya. Si no se ha instalado tal receptor, la situación y la hora en que se determinó dicha situación se actualizarán manualmente a intervalos que no excedan de cuatro horas cuando el buque esté navegando, de modo que dicha información esté siempre lista para ser transmitida por el equipo."

CAPÍTULO VI

TRANSPORTE DE CARGA

Regla 5 - Estiba y sujeción

9 El texto actual que figura en el párrafo 6 se sustituye por el siguiente:

"6 Todas las cargas, salvo las sólidas y líquidas a granel, se embarcarán, estibarán y sujetarán durante todo el viaje de conformidad con lo dispuesto en el Manual de sujeción de la carga aprobado por la Administración. En los buques con espacios de carga rodada, según se definen éstos en la regla II-2/3.14, la sujeción de dichas cargas, conforme a lo estipulado en el Manual de sujeción de la carga, se llevará a cabo antes de que el buque salga del puesto de atraque. Las normas del Manual de sujeción de la carga serán, como mínimo, equivalentes a las directrices pertinentes elaboradas por la Organización*."

CAPÍTULO VII

TRANSPORTE DE MERCANCÍAS PELIGROSAS

Regla 5 - Documentos

10 Se suprime el texto actual del párrafo 6.

Regla 6 - Prescripciones de estiba

11 Se sustituye el título de esta regla por "Estiba y sujeción".

12 Se agrega el siguiente nuevo párrafo 6 a continuación del actual párrafo 5:

"6 Todas las cargas, salvo las sólidas y líquidas a granel, se embarcarán, estibarán y sujetarán durante todo el viaje de conformidad con lo dispuesto en el Manual de sujeción de la carga aprobado por la Administración. En los buques con espacios de carga rodada, según se definen éstos en la regla II-2/3.14, la sujeción de dichas cargas, conforme a lo estipulado en el Manual de sujeción de la carga, se llevará a cabo antes de que el buque salga del puesto de atraque. Las normas del Manual de sujeción de la carga serán, como mínimo, equivalentes a las directrices pertinentes elaboradas por la Organización*."

* Véanse las Directrices para la elaboración del Manual de sujeción de la carga, aprobadas por el Comité de Seguridad Marítima de la Organización y difundidas mediante la circular MSC/Circ.745.

RESOLUTION MSC.123(75)
(adopted on 24 May 2002)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

RESOLUTION MSC.123(75)
(adopted on 24 May 2002)

**ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION
FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as "the Convention"), concerning the amendment procedure applicable to the Annex to the Convention, other than to the provisions of chapter I thereof,

HAVING CONSIDERED, at its seventy-fifth session, amendments to the Convention, proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the Convention, the text of which is set out in the Annex to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the said amendments shall be deemed to have been accepted on 1 July 2003, unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;
3. INVITES SOLAS Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2004 upon their acceptance in accordance with paragraph 2 above;
4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annex to all Contracting Governments to the Convention;
5. FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its Annex to Members of the Organization, which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

CHAPTER IV

RADIOCOMMUNICATIONS

Regulation 1 - Application

- 1 Paragraphs 3, 4, 5, 6 and 7 are deleted.
- 2 Existing paragraph 8 is renumbered as paragraph 3.

Regulation 3 - Exemptions

- 3 The word "; or" at the end of paragraph 2.2 is replaced by full stop(.).
- 4 Paragraph 2.3 is deleted.

Regulation 4 - Functional requirements

- 5 In paragraph 1.6, the reference to "V/12(g) and (h)" is replaced by "V/19.2.3.2".

Regulation 7 - Radio equipment: General

- 6 Paragraphs 2, 3 and 4 are deleted.
- 7 Existing paragraph 5 is renumbered as paragraph 2.

Regulation 12 - Watches

- 8 Paragraph 4 is deleted.

Regulation 14 - Performance standards

- 9 In paragraph 1, in the second sentence, the words "Subject to paragraph 2," are deleted.
- 10 Paragraph 2 is deleted.

CHAPTER V

SAFETY OF NAVIGATION

Regulation 21 – International Code of Signals

11 The title of the regulation is replaced by the following:

“International Code of Signals and IAMSAR Manual”

12 The existing paragraph is numbered as paragraph 1.

13 A new paragraph 2 is added as follows:

“2 All ships shall carry an up-to-date copy of Volume III of the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual.”

CHAPTER VI

CARRIAGE OF CARGOES

Regulation 2 - Cargo information

14 In existing paragraph 2.3, the words “regulation VII/2” are replaced by the words “the IMDG Code, as defined in regulation VII/1.1”.

Regulation 5 – Stowage and securing

15 In existing paragraph 1, the words “Cargo and cargo units” are replaced by the words “Cargo, cargo units and cargo transport units”.

16 In existing paragraph 2, the words “cargo carried in cargo unit” are replaced by the words “cargo, cargo units and cargo transport units”.

17 In existing paragraph 4, the words “cargo units” are replaced by the words “cargo units and cargo transport units” (in two places).

18 In existing paragraph 5, the word "Containers" is replaced by the words "Freight containers" and in the last line, after "(CSC)", at the end of the sentence, the words ",as amended" are added.

19 Existing paragraph 6 is replaced by the following:

"All cargoes, other than solid and liquid bulk cargoes, cargo units and cargo transport units shall be loaded, stowed and secured throughout the voyage in accordance with the Cargo Securing Manual approved by the Administration. In ships with ro-ro spaces, as defined in regulation II-2/3.41, all securing of such cargoes, cargo units and cargo transport units, in accordance with the Cargo Securing Manual, shall be completed before the ship leaves the berth. The Cargo Securing Manual shall be drawn up to a standard at least equivalent to relevant guidelines developed by the Organization."

Regulation 6 – Acceptability for shipment

20 In existing paragraph 3, the words “regulation VII/2” are replaced by the words “the IMDG Code, as defined in regulation VII/1.1”.

CHAPTER VII

CARRIAGE OF DANGEROUS GOODS

21 Existing part A is replaced by the following new part A and part A-1:

“PART A

CARRIAGE OF DANGEROUS GOODS IN PACKAGED FORM

Regulation 1

Definitions

For the purpose of this chapter, unless expressly provided otherwise:

1 *IMDG Code* means the International Maritime Dangerous Goods (IMDG) Code adopted by the Maritime Safety Committee of the Organization by resolution MSC.122(75), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the annex other than chapter I.

2 *Dangerous goods* mean the substances, materials and articles covered by the IMDG Code.

3 *Packaged form* means the form of containment specified in the IMDG Code.

Regulation 2

Application

1 Unless expressly provided otherwise, this part applies to the carriage of dangerous goods in packaged form in all ships to which the present regulations apply and in cargo ships of less than 500 gross tonnage.

2 The provisions of this part do not apply to ships' stores and equipment.

3 The carriage of dangerous goods in packaged form is prohibited except in accordance with the provisions of this chapter.

4 To supplement the provisions of this part, each Contracting Government shall issue, or cause to be issued, detailed instructions on emergency response and medical first aid relevant to incidents involving dangerous goods in packaged form, taking into account the guidelines developed by the Organization.

Regulation 3

Requirements for the carriage of dangerous goods

The carriage of dangerous goods in packaged form shall be in compliance with the relevant provisions of the IMDG Code.

Regulation 4

Documents

1 In all documents relating to the carriage of dangerous goods in packaged form by sea, the proper shipping name of the goods shall be used (trade names alone shall not be used) and the correct description given in accordance with the classification set out in the IMDG Code.

2 The transport documents prepared by the shipper shall include, or be accompanied by, a signed certificate or a declaration that the consignment, as offered for carriage, is properly packaged, marked, labelled or placarded, as appropriate, and in proper condition for carriage.

3 The person(s) responsible for the packing/loading of dangerous goods in a cargo transport unit shall provide a signed container/vehicle packing certificate stating that the cargo in the unit has been properly packed and secured and that all applicable transport requirements have been met. Such a certificate may be combined with the document referred to in paragraph 2.

4 Where there is due cause to suspect that a cargo transport unit in which dangerous goods are packed is not in compliance with the requirements of paragraph 2 or 3, or where a container/vehicle packing certificate is not available, the cargo transport unit shall not be accepted for carriage.

5 Each ship carrying dangerous goods in packaged form shall have a special list or manifest setting forth, in accordance with the classification set out in the IMDG Code, the dangerous goods on board and the location thereof. A detailed stowage plan, which identifies by class and sets out the location of all dangerous goods on board, may be used in place of such a special list or manifest. A copy of one of these documents shall be made available before departure to the person or organization designated by the port State authority.

Regulation 5

Cargo Securing Manual

Cargo, cargo units and cargo transport units, shall be loaded, stowed and secured throughout the voyage in accordance with the Cargo Securing Manual approved by the Administration. The Cargo Securing Manual shall be drawn up to a standard at least equivalent to the guidelines developed by the Organization.

Regulation 6

Reporting of incidents involving dangerous goods

1 When an incident takes place involving the loss or likely loss overboard of dangerous goods in packaged form into the sea, the master, or other person having charge of the ship, shall report the particulars of such an incident without delay and to the fullest extent possible to the nearest coastal State. The report shall be drawn up based on general principles and guidelines developed by the Organization.

2 In the event of the ship referred to in paragraph 1 being abandoned, or in the event of a report from such a ship being incomplete or unobtainable, the company, as defined in regulation IX/1.2, shall, to the fullest extent possible, assume the obligations placed upon the master by this regulation.

PART A-1

CARRIAGE OF DANGEROUS GOODS IN SOLID FORM IN BULK

Regulation 7

Definitions

Dangerous goods in solid form in bulk means any material, other than liquid or gas, consisting of a combination of particles, granules or any larger pieces of material, generally uniform in composition, which is covered by the IMDG Code and is loaded directly into the cargo spaces of a ship without any intermediate form of containment, and includes such materials loaded in a barge on a barge-carrying ship.

Regulation 7-1

Application

1 Unless expressly provided otherwise, this part applies to the carriage of dangerous goods in solid form in bulk in all ships, to which the present regulations apply and in cargo ships of less than 500 gross tonnage.

2 The carriage of dangerous goods in solid form in bulk is prohibited except in accordance with the provisions of this part.

3 To supplement the provisions of this part, each Contracting Government shall issue, or cause to be issued, detailed instructions on the safe carriage of dangerous goods in solid form in bulk which shall include instructions on emergency response and medical first aid relevant to incidents involving dangerous goods in solid form in bulk, taking into account the guidelines developed by the Organization.

Regulation 7-2

Documents

1 In all documents relating to the carriage of dangerous goods in solid form in bulk by sea, the bulk cargo shipping name of the goods shall be used (trade names alone shall not be used).

2 Each ship carrying dangerous goods in solid form in bulk shall have a special list or manifest setting forth the dangerous goods on board and the location thereof. A detailed stowage plan, which identifies by class and sets out the location of all dangerous goods on board, may be used in place of such a special list or manifest. A copy of one of these documents shall be made available before departure to the person or organization designated by the port State authority.

Regulation 7-3

Stowage and segregation requirements

1 Dangerous goods in solid form in bulk shall be loaded and stowed safely and appropriately in accordance with the nature of the goods. Incompatible goods shall be segregated from one another.

2 Dangerous goods in solid form in bulk, which are liable to spontaneous heating or combustion, shall not be carried unless adequate precautions have been taken to minimize the likelihood of the outbreak of fire.

3 Dangerous goods in solid form in bulk, which give off dangerous vapours, shall be stowed in a well ventilated cargo space.

Regulation 7-4

Reporting of incidents involving dangerous goods

1 When an incident takes place involving the loss or likely loss overboard of dangerous goods in solid form in bulk into the sea, the master, or other person having charge of the ship, shall report the particulars of such an incident without delay and to the fullest extent possible to the nearest coastal State. The report shall be drawn up based on general principles and guidelines developed by the Organization.

2 In the event of the ship referred to in paragraph 1 being abandoned, or in the event of a report from such a ship being incomplete or unobtainable, the company, as defined in regulation IX/1.2, shall, to the fullest extent possible, assume the obligations placed upon the master by this regulation.”

PART D

SPECIAL REQUIREMENTS FOR THE CARRIAGE OF PACKAGED IRRADIATED NUCLEAR FUEL, PLUTONIUM AND HIGH-LEVEL RADIOACTIVE WASTES ON BOARD SHIPS

Regulation 14 - Definitions

22 Existing paragraph 2 is replaced by the following:

"INF cargo means packaged irradiated nuclear fuel, plutonium and high-level radioactive wastes carried as cargo in accordance with class 7 of the IMDG Code."

23 Existing paragraph 6 is deleted.

APPENDIX

CERTIFICATES

Record of Equipment for the Passenger Ship Safety Certificate (Form P)

24 In section 3, items 7 and 8 and related footnotes are deleted.

Record of Equipment for the Cargo Ship Safety Radio Certificate (Form R)

25 In section 2, items 7 and 8 and related footnotes are deleted.

26 Section 4 is deleted.

RESOLUTION MSC.123(75)
(adopted on 24 May 2002)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

ANEXO 2

**RESOLUCIÓN MSC.152(78)
(adoptada el 20 de mayo de 2004)**

**ADOPCIÓN DE ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA
SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO ASIMISMO el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar (Convenio SOLAS), 1974 (en adelante denominado "el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, con excepción de las disposiciones del capítulo I,

HABIENDO EXAMINADO en su 78º periodo de sesiones enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del mismo,

1. ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;
2. DECIDE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que las enmiendas se considerarán aceptadas el 1 de enero de 2006, a menos que, antes de dicha fecha, más de un tercio de los Gobiernos Contratantes del Convenio, o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50% del tonelaje bruto de la flota mercante mundial, hayan notificado que recusan las enmiendas;
3. INVITA a los Gobiernos Contratantes del Convenio a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de julio de 2006, una vez que hayan sido aceptadas con arreglo a lo dispuesto en el párrafo 2 anterior;
4. PIDE al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;
5. PIDE ADEMÁS al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no sean Gobiernos Contratantes del Convenio.

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO III
DISPOSITIVOS Y MEDIOS DE SALVAMENTO

Regla 19 - Formación y ejercicios periódicos para casos de emergencia

1 El texto actual del párrafo 3.3.3 se sustituye por el siguiente:

"3.3.3 Salvo lo dispuesto en los párrafos 3.3.4 y 3.3.5, cada uno de los botes salvavidas será puesto a flote y maniobrado en el agua por la tripulación asignada para su manejo al menos una vez cada tres meses durante un ejercicio de abandono del buque."

Regla 20 - Disponibilidad funcional, mantenimiento e inspección

2 En la segunda frase del párrafo 1 las palabras "los párrafos 3 y 6.2" se sustituyen por "los párrafos 3.2, 3.3 y 6.2".

3 El texto actual del párrafo 3 se sustituye por el siguiente:

"3 Mantenimiento

3.1 El mantenimiento, prueba e inspección de los dispositivos de salvamento se efectuarán basándose en las directrices elaboradas por la Organización* y de forma tal que se tome debidamente en consideración el garantizar la fiabilidad de tales dispositivos.

3.2 Se proveerán instrucciones que cumplan lo prescrito en la regla 36 para el mantenimiento a bordo de los dispositivos de salvamento y las operaciones de mantenimiento se realizarán de acuerdo con ellas.

3.3 La Administración podrá aceptar, en cumplimiento de las prescripciones del párrafo 3.2, un programa planificado de mantenimiento a bordo que incluya lo prescrito en la regla 36."

4 El texto actual del párrafo 6 se sustituye por el siguiente:

"6 Inspección semanal

Cada semana se efectuarán las pruebas e inspecciones siguientes y el informe correspondiente a la inspección se incluirá en el diario de navegación:

* Véanse las Directrices sobre el servicio y mantenimiento periódicos de los botes salvavidas, dispositivos de puesta a flote y aparejos de suelta con carga (MSC/Circ.1093).

- .1 todas las embarcaciones de supervivencia y todos los botes de rescate y dispositivos de puesta a flote serán objeto de una inspección ocular a fin de verificar que están listos para ser utilizados. Esa inspección incluirá, sin que esta enumeración sea exhaustiva, el estado de los ganchos, su sujeción a los botes salvavidas y que el mecanismo de suelta con carga está debida y completamente ajustado;
 - .2 se harán funcionar todos los motores de los botes salvavidas y de los botes de rescate durante un periodo total de al menos tres minutos, a condición de que la temperatura ambiente sea superior a la temperatura mínima necesaria para poner en marcha el motor. Durante dicho periodo se comprobará que la caja y el tren de engranajes embragan de forma satisfactoria. Si las características especiales del motor fueraborda instalado en un bote de rescate no le permiten funcionar durante un periodo de tres minutos a menos que tenga la hélice sumergida, se le hará funcionar durante el periodo que prescriba el manual del fabricante. En casos especiales, la Administración podrá eximir de esta prescripción a los buques construidos antes del 1 de julio de 1986;
 - .3 los botes salvavidas, excepto los botes salvavidas de caída libre, de los buques de carga se moverán de su posición de estiba, sin nadie a bordo, hasta donde sea necesario para demostrar el funcionamiento satisfactorio de los dispositivos de puesta a flote, siempre que las condiciones meteorológicas y el estado de la mar lo permitan; y
 - .4 se ensayará el sistema de alarma general de emergencia."
- 5 En el párrafo 7 el texto actual pasa a ser el párrafo 7.2 y se añade el nuevo párrafo 7.1 siguiente:
- "7.1 Todos los botes salvavidas, excepto los de caída libre, se sacarán de su posición de estiba, sin nadie a bordo, siempre que las condiciones meteorológicas y el estado de la mar lo permitan."
- 6 El texto actual del párrafo 11 se sustituye por el siguiente:
- "11 Servicio periódico de los dispositivos de puesta a flote y de los mecanismos de suelta con carga**
- 11.1 Los dispositivos de puesta a flote:
- .1 serán objeto de mantenimiento de conformidad con las instrucciones para el mantenimiento a bordo prescritas en la regla 36;
 - .2 serán objeto de un examen minucioso durante los reconocimientos anuales prescritos en las reglas I/7 o I/8, según corresponda; y
 - .3 al término del examen indicado en .2, se someterán a una prueba dinámica del freno del chigre a la máxima velocidad de arriado. La carga que se aplique será igual a la masa del bote salvavidas sin nadie a bordo, con la

excepción de que al menos una vez cada cinco años la prueba se realizará con una carga de prueba equivalente a 1,1 veces la carga máxima de trabajo del chigre.

11.2 Los mecanismos de suelta con carga de los botes salvavidas:

- .1 serán objeto de mantenimiento de conformidad con las instrucciones para el mantenimiento a bordo prescritas en la regla 36;
- .2 serán objeto de un examen minucioso y de una prueba operacional durante las inspecciones anuales prescritas en las reglas I/7 y I/8, por personal debidamente capacitado y familiarizado con el sistema; y
- .3 se someterán a una prueba de funcionamiento con una carga equivalente a 1,1 veces la masa total del bote salvavidas con su asignación completa de personas y equipo cada vez que se examine el mecanismo de suelta. El examen y la prueba se llevarán a cabo como mínimo una vez cada cinco años.* "

Regla 32 - Dispositivos individuales de salvamento

7 El texto actual del párrafo 3 se sustituye por el siguiente:

"3 Trajes de inmersión

3.1 El presente párrafo es aplicable a todos los buques de carga. No obstante, con respecto a los buques de carga construidos antes del 1 de julio de 2006 se cumplirá lo prescrito en los párrafos 3.2 a 3.5 a más tardar al efectuarse el primer reconocimiento del equipo de seguridad el 1 de julio de 2006 o posteriormente.

3.2 Se proveerá un traje de inmersión que cumpla las prescripciones de la sección 2.3 del Código a cada persona a bordo del buque. No obstante, en el caso de los buques que no sean graneleros, según la definición de la regla IX/1, no será necesario llevar tales trajes de inmersión cuando el buque esté destinado continuamente a efectuar viajes en zonas de clima cálido** en las que, a juicio de la Administración, no sean necesarios los trajes de inmersión.

3.3 Si un buque tiene puestos de guardia o de operaciones que están situados en un lugar alejado de donde normalmente se estiban los trajes de inmersión, en dichos lugares se proveerán trajes de inmersión adicionales para el número de personas que habitualmente estén de guardia o trabajen allí en cualquier momento dado.

* Véase la Recomendación sobre las pruebas de los dispositivos de salvamento, adoptada por la Organización mediante la resolución A.689(17). Para los dispositivos de salvamento instalados a bordo el 1 de julio de 1999 o posteriormente, véase la Recomendación revisada sobre las pruebas de los dispositivos de salvamento, adoptada por la Organización mediante la resolución MSC.81(70).

** Véanse las Directrices para evaluar la protección térmica (MSC/Circ.1046).

3.4 Los trajes de inmersión estarán ubicados de modo que sean fácilmente accesibles, y esa ubicación se indicará claramente.

3.5 Los trajes de inmersión prescritos en la presente regla podrán utilizarse para cumplir lo prescrito en la regla 7.3."

CAPÍTULO IV RADIOCOMUNICACIONES

Regla 15 - Prescripciones relativas a mantenimiento

8 El texto actual del párrafo 9 se sustituye por el siguiente:

"9 Las RLS por satélite:

.1 se someterán a prueba anualmente para verificar todos los aspectos relativos a su eficacia operacional, prestándose especialmente atención a la comprobación de la emisión en frecuencias operacionales, la codificación y el registro, en los plazos que se indican a continuación:

.1 en los buques de pasaje, dentro de los 3 meses anteriores a la fecha de expiración del Certificado de seguridad para buque de pasaje; y

.2 en los buques de carga, dentro de los 3 meses anteriores a la fecha de expiración, o dentro de los 3 meses anteriores o posteriores a la fecha de vencimiento anual, del Certificado de seguridad radioeléctrica para buque de carga.

La prueba se podrá efectuar a bordo del buque o en un centro aprobado de prueba; y

.2 serán objeto de mantenimiento a intervalos que no excedan de cinco años, en una instalación de mantenimiento en tierra aprobada."

APÉNDICE CERTIFICADOS

Inventario del equipo adjunto al Certificado de seguridad del equipo para buque de carga (Modelo E)

9 En la sección 2, se suprime el apartado 9 y los apartados 10, 10.1 y 10.2 pasan a ser los apartados 9, 9.1 y 9.2, respectivamente.

ANEXO 1

**RESOLUCIÓN MSC.201 (81)
(adoptada el 18 de mayo de 2006)**

**ADOPCIÓN DE ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA
SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO TAMBIÉN el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar (SOLAS), 1974 (en adelante denominado "el Convenio"), relativo a los procedimientos para enmendar el Anexo del Convenio, con excepción de las disposiciones del capítulo I,

HABIENDO EXAMINADO en su 81º periodo de sesiones enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del Convenio,

1. ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;
2. DECIDE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de enero de 2010, a menos que, con anterioridad a esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50% del tonelaje bruto de la flota mercante mundial, hayan notificado que recusan las enmiendas;
3. INVITA a los Gobiernos Contratantes del Convenio a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de julio de 2010, una vez aceptadas de conformidad con lo dispuesto en el párrafo 2 anterior;
4. PIDE al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, envíe copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;
5. PIDE ADEMÁS al Secretario General que envíe copias de la presente resolución y de su anexo a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO II-2

CONSTRUCCIÓN - PREVENCIÓN, DETECCIÓN Y EXTINCIÓN DE INCENDIOS

Regla 9 - Contención del incendio

- 1 En el apartado 2 del párrafo 4.1.3.3, se sustituye "." por "; o".
- 2 En el párrafo 4.1.3.3, se añade el nuevo apartado .3 siguiente a continuación del apartado.2 existente:
 - .3 boquillas de nebulización de agua que se hayan sometido a ensayo y aprobado de conformidad con las directrices aprobadas por la Organización*.

Regla 15 - Medidas relativas al combustible líquido, aceite lubricante y otros aceites inflamables

- 3 En la regla II-2/15 enmendada por la resolución MSC.31(63), el texto que figura a continuación del título se sustituye por el siguiente:

"(Los párrafos 2.9 a 2.12 de la presente regla son aplicables a los buques construidos el 1 de febrero de 1992 o posteriormente, con la salvedad de que las referencias a los párrafos 2.10 y 2.11 en los párrafos 3 y 4 se aplican a los buques construidos el 1 de julio de 1998 o posteriormente)".

CAPÍTULO III

DISPOSITIVOS Y MEDIOS DE SALVAMENTO

Regla 7 - Dispositivos individuales de salvamento

- 4 En el párrafo 2.1, se añaden los nuevos apartados .1 y.2 siguientes:
 - .1 en los buques de pasaje que realicen viajes de menos de 24 h, se proveerá un número de chalecos salvavidas para bebés igual, por lo menos, al 2,5% del total de pasajeros que vayan a bordo;

* Véanse las Directrices revisadas para la aprobación de sistemas de rociadores equivalentes a los especificados en la regla II-2/12 del Convenio SOLAS (resolución A.800(19)).

- .2 en los buques de pasaje que realicen viajes de 24 h o más, se proveerán chalecos salvavidas de bebé para todos los bebés que haya a bordo;"

y los apartados existentes vuelven a numerarse, de modo que .1 y .2 pasan a ser .3 y .4, respectivamente. La palabra "y" se traslada del final del nuevo apartado .3 al final del nuevo apartado .4.

5 En el párrafo 2.1, se añade el nuevo apartado .5 siguiente a continuación del apartado .4 existente:

- ".5 si los chalecos salvavidas provistos para adultos no están proyectados para personas con un peso de hasta 140 kg y un contorno de pecho de hasta 1 750 mm, se proveerá a bordo un número suficiente de accesorios adecuados para que tales personas puedan ponerse esos chalecos salvavidas."

CAPÍTULO IV

RADIOCOMUNICACIONES

Regla 7 - Equipo radioeléctrico: Generalidades

6 El texto actual del apartado 6.1 del párrafo 1 se sustituye por el siguiente:

- "6.1 tenga capacidad para transmitir una alerta de socorro a través del servicio de satélites de órbita polar que trabaja en la banda de 406 MHz;"

Regla 9 - Equipo radioeléctrico: Zonas marítimas A1 y A2

7 El texto actual del apartado .3.3 del párrafo 1 se sustituye por el siguiente :

- ".3.3 a través del servicio de satélites geoestacionarios de Inmarsat mediante una estación terrena de buque."

Regla 10 - Equipo radioeléctrico: Zonas marítimas A1, A2 y A3

8 El texto actual del apartado .4.3 del párrafo 1 se sustituye por el siguiente:

- ".4.3 a través del servicio de satélites geoestacionarios de Inmarsat mediante una estación terrena de buque adicional."

9 El texto actual del apartado .3.2 del párrafo 2 se sustituye por el siguiente:

- ".3.2 a través del servicio de satélites geoestacionarios de Inmarsat mediante una estación terrena de buque; y"

CAPÍTULO V

SEGURIDAD DE LA NAVEGACIÓN

Regla 22 - Visibilidad desde el puente de navegación

10 Se añade el nuevo párrafo 4 siguiente a continuación del párrafo 3 existente:

"4 No obstante lo prescrito en los párrafos 1.1, 1.3, 1.4 y 1.5, el cambio de agua de lastre podrá efectuarse siempre y cuando:

- .1 el capitán haya determinado que es seguro efectuar el cambio y tenga en cuenta todo aumento de sectores ciegos o toda reducción del campo de visión horizontal derivados de la operación a fin de garantizar que en todo momento se mantiene una vigilancia adecuada;
- .2 la operación se lleve a cabo de conformidad con el plan de gestión del agua de lastre del buque, teniendo en cuenta las recomendaciones sobre el cambio de agua de lastre adoptadas por la Organización; y
- .3 el comienzo y el fin de la operación se anoten en el registro de las actividades relacionadas con la navegación del buque, con arreglo a lo dispuesto en la regla 28."

ANEXO 1**RESOLUCIÓN MSC.239(83)
(adoptada el 12 de octubre de 2007)****ADOPCIÓN DE ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA
SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO ADEMÁS el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar (SOLAS), 1974 (en adelante denominado "el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, con excepción de las disposiciones del capítulo I,

HABIENDO EXAMINADO en su 83º periodo de sesiones enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del Convenio,

1. ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;
2. DECIDE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que las enmiendas se considerarán aceptadas el 1 de enero 2009 a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50% del tonelaje bruto de la flota mercante mundial, hayan notificado que recusan las enmiendas;
3. INVITA a los Gobiernos Contratantes del Convenio a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de julio de 2009, una vez aceptadas de conformidad con lo dispuesto en el párrafo 2 anterior;
4. PIDE al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, envíe copias certificadas de la presente resolución y del texto de las enmiendas que figura en su anexo a todos los Gobiernos Contratantes del Convenio;
5. PIDE ADEMÁS al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

Por economía, del presente documento no se ha hecho más que una tirada limitada. Se ruega a los señores delegados que traigan sus respectivos ejemplares a las reuniones y que se abstengan de pedir otros.

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

**CAPÍTULO IV
RADIOCOMUNICACIONES**

**PARTE A
GENERALIDADES**

- 1 A continuación de la regla 4 existente se añade la nueva regla 4-1 siguiente:

**"Regla 4-1
Proveedores de servicios por satélite del SMSSM**

El Comité de Seguridad Marítima determinará los criterios, procedimientos y medios para la evaluación, reconocimiento, examen y supervisión de la provisión de servicios de comunicaciones móviles por satélite en el Sistema mundial de socorro y seguridad marítimos (SMSSM), de conformidad con lo dispuesto en el presente capítulo."

**CAPÍTULO VI
TRANSPORTE DE CARGAS**

- 2 A continuación de la regla 5 existente se añade la nueva regla 5-1 siguiente:

**"Regla 5-1
Hojas informativas sobre la seguridad de los materiales**

Los buques que transporten cargas a las que se aplica el Anexo I del MARPOL, según se definen éstas en el apéndice I del Anexo I del Protocolo de 1978 relativo al Convenio internacional para prevenir la contaminación por los buques, 1973, y fueloil para usos marinos, deberán disponer, previamente al embarque de dichas cargas, de una hoja informativa sobre la seguridad de los materiales basada en las recomendaciones elaboradas por la Organización*.

* Véase la Recomendación relativa a las hojas informativas sobre la seguridad de los materiales para las cargas que figuran en el Anexo I del Convenio MARPOL y el fueloil para usos marinos, adoptada mediante la resolución MSC.150(77)."

APÉNDICE

CERTIFICADOS

Modelo de Certificado de seguridad para buques nucleares de pasaje

3 En el cuadro del párrafo 2.1.3 de la sección que comienza con las palabras "SE CERTIFICA", la referencia a la "regla II-1/13" se sustituye por una referencia a la "regla II-1/18³", las notaciones "C.1, C.2, C.3" se substituyen por "P.1, P.2, P.3", y se añade la siguiente nota:

³ Para los buques construidos antes del 1 de enero de 2009, se utilizara la anotación de compartimentado "C.1, C.2 y C.3" aplicable."

4 Al final del párrafo 2.10 existente de la sección que comienza con las palabras "SE CERTIFICA", se añaden los dos nuevos párrafos 2.11 y 2.12 siguientes:

"2.11 el buque cuenta/no cuenta/¹ con un proyecto y disposiciones alternativos en virtud de la regla II-2/17 del Convenio;

2.12 se adjunta/no se adjunta/¹ al presente certificado un Documento de aprobación de proyectos y disposiciones alternativos de seguridad contra incendios.

¹ Táchese según proceda."

Modelo de Certificado de seguridad para buques nucleares de carga

5 Al final del párrafo 2.9 existente de la sección que comienza con las palabras "SE CERTIFICA", se añaden los dos nuevos párrafos 2.10 y 2.11 siguientes:

"2.10 el buque cuenta/no cuenta/³ con un proyecto y disposiciones alternativos en virtud de la regla II-2/17 del Convenio;

2.11 se adjunta/no se adjunta/³ al presente certificado un Documento de aprobación de proyectos y disposiciones alternativos de seguridad contra incendios.

³ Táchese según proceda."

ANEXO 2**RESOLUCIÓN MSC.256(84)
(adoptada el 16 de mayo de 2008)****ADOPCIÓN DE ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA
SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO ADEMÁS el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar (SOLAS), 1974 (en adelante denominado "el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, con excepción de las disposiciones del capítulo I,

HABIENDO EXAMINADO, en su 84º periodo de sesiones, enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del mismo,

1. ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;
2. DECIDE, de conformidad con lo dispuesto en el artículo VIII b) vi) 2) bb) del Convenio, que las enmiendas se considerarán aceptadas el 1 de julio de 2009, a menos que, antes de dicha fecha, más de un tercio de los Gobiernos Contratantes del Convenio o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del tonelaje bruto de la flota mercante mundial hayan notificado que recusan las enmiendas;
3. INVITA a los Gobiernos Contratantes del Convenio a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del Convenio, las enmiendas entrarán en vigor el 1 de enero de 2010, una vez aceptadas de conformidad con lo dispuesto en el párrafo 2 anterior;
4. RECOMIENDA a los Gobiernos Contratantes interesados que expidan certificados acordes con las enmiendas que figuran en el anexo en el primer reconocimiento de renovación que se efectúe el 1 de enero de 2010, o posteriormente;
5. PIDE al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;
6. PIDE ADEMÁS al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no sean Gobiernos Contratantes del Convenio.

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA
VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO II-1

**CONSTRUCCIÓN – ESTRUCTURA, COMPARTIMENTADO Y ESTABILIDAD,
INSTALACIONES DE MÁQUINAS E INSTALACIONES ELÉCTRICAS**

Regla 3-4 – Medios de remolque de emergencia de los buques tanque

1 La regla 3-4 actual se sustituye por la siguiente:

**"Regla 3-4
Procedimientos y medios de remolque de emergencia**

1 Medios de remolque de emergencia en los buques tanque

1.1 Se instalarán medios de remolque de emergencia a proa y popa en los buques tanque de peso muerto no inferior a 20 000 toneladas.

1.2 En el caso de los buques tanque construidos el 1 de julio de 2002, o posteriormente:

- .1 los medios de remolque de emergencia podrán montarse rápidamente en todo momento, aun cuando falte el suministro principal de energía en el buque que vaya a ser remolcado, y conectarse fácilmente al buque remolcador. Al menos uno de los medios de remolque de emergencia estará preparado de antemano de modo que pueda montarse rápidamente; y
- .2 los medios de remolque de emergencia a proa y popa tendrán la resistencia adecuada, habida cuenta del tamaño y el peso muerto del buque y de las fuerzas previstas en condiciones meteorológicas desfavorables. La Administración aprobará el proyecto, la construcción y las pruebas de homologación de dichos medios de remolque, basándose en las directrices elaboradas por la Organización*.

1.3 En el caso de los buques tanque construidos antes del 1 de julio de 2002, la Administración aprobará el proyecto y la construcción de los medios de remolque de emergencia basándose en las directrices elaboradas por la Organización.

2 Procedimientos de remolque de emergencia en los buques

2.1 El presente párrafo se aplica a:

- .1 todos los buques de pasaje, a más tardar el 1 de enero de 2010;
- .2 los buques de carga construidos el 1 de enero de 2010, o posteriormente; y
- .3 los buques de carga construidos antes del 1 de enero de 2010, a más tardar el 1 de enero de 2012.

2.2 Los buques contarán con un procedimiento de remolque de emergencia específico. El procedimiento se llevará a bordo para utilizarlo en situaciones de emergencia, y se basará tanto en los medios existentes como en el equipo de a bordo.

2.3 El procedimiento^{**} incluirá:

- .1 dibujos de los sectores proel y popel de la cubierta en los que se muestren los posibles medios de remolque de emergencia;
- .2 un inventario del equipo de a bordo que puede utilizarse para el remolque de emergencia;
- .3 medios y métodos de comunicación; y
- .4 ejemplos de procedimientos para facilitar la preparación y la realización de las operaciones de remolque de emergencia.

* Véanse las Directrices relativas a los medios de remolque de emergencia de los buques tanque, adoptadas por el Comité de Seguridad Marítima mediante la resolución MSC.35(63), enmendada.

** Véanse las Directrices para propietarios/armadores sobre la preparación para los procedimientos de remolque de emergencia (MSC.1/Circ.1255)."

2 A continuación de la regla 3-8 actual se añade la nueva regla 3-9 siguiente:

"Regla 3-9 Medios de embarco y desembarco de los buques

1 Los buques construidos el 1 de enero de 2010, o posteriormente, estarán provistos de medios de embarco y desembarco para su utilización en puerto y en las operaciones portuarias, tales como planchas de desembarco y escalas reales, de conformidad con lo dispuesto en el párrafo 2, a menos que la Administración juzgue que el cumplimiento de alguna disposición no es razonable o práctico^{*}.

2 Los medios de embarco y desembarco prescritos en el párrafo 1 se construirán e instalarán de conformidad con las directrices elaboradas por la Organización^{**}.

3 En todos los buques, los medios de embarco y desembarco se inspeccionarán y mantendrán^{**} en buen estado para el uso al que están destinados, teniendo en cuenta cualquier restricción relacionada con la seguridad de la carga. El mantenimiento de todos los cables que se utilicen para sostener los medios de embarco y desembarco deberá realizarse según lo especificado en la regla III/20.4.

* El cumplimiento podrá considerarse no razonable o poco práctico en circunstancias en las que el buque:

- .1 tenga un francobordo pequeño y esté dotado de rampas de acceso; o
- .2 realice viajes entre puertos designados en los que se disponga de escalas reales o escalas (o plataformas) adecuadas para embarcar desde tierra.

** Véanse las Directrices para la construcción, instalación, mantenimiento e inspección/reconocimiento de las escalas reales y planchas de desembarco, que elaborará la Organización."

CAPÍTULO II-2

CONSTRUCCIÓN – PREVENCIÓN, DETECCIÓN Y EXTINCIÓN DE INCENDIOS

Regla 10 – Lucha contra incendios

3 Se añade el nuevo párrafo 4.1.5 siguiente a continuación del párrafo 4.1.4 existente:

"4.1.5 Para la fecha de la primera entrada programada del buque en dique seco posterior al 1 de enero de 2010, los sistemas fijos de extinción de incendios a base de anhídrido carbónico para la protección de los espacios de máquinas y las cámaras de bombas de carga instalados en los buques construidos antes del 1 de julio de 2002 cumplirán lo dispuesto en el párrafo 2.2.2 del capítulo 5 del Código de Sistemas de Seguridad contra Incendios."

Regla 19 – Transporte de mercancías peligrosas

4 En el párrafo 4 se suprime la expresión "definidas en la regla VII/2".

Regla 20 – Protección de los espacios para vehículos, espacios de categoría especial y espacios de carga rodada

5 El párrafo 6.1.4 existente se sustituye por el siguiente y se añade un párrafo nuevo 6.1.5:

"6.1.4 Las prescripciones del presente párrafo se aplicarán a los buques construidos el 1 de enero de 2010, o posteriormente. Los buques construidos el 1 de julio de 2002 o posteriormente y antes del 1 de enero de 2010 deberán cumplir las prescripciones previamente aplicables del párrafo 6.1.4, enmendadas por la resolución MSC.99(73). Cuando se hayan instalado sistemas fijos de extinción de incendios por aspersión de agua a presión, se adoptarán las siguientes medidas, dada la grave pérdida de estabilidad que podría originar la acumulación de una gran cantidad de agua en la cubierta o cubiertas cuando estén funcionando tales sistemas:

- .1 en los buques de pasaje:
 - .1.1 en los espacios situados por encima de la cubierta de cierre se instalarán imbornales que aseguren una rápida descarga de agua al exterior, teniendo en cuenta las directrices elaboradas por la Organización* ;
 - .1.2.1 en los buques de pasaje de transbordo rodado, las válvulas de descarga de los imbornales provistas de medios directos de cierre que se puedan accionar desde un lugar situado por encima de la cubierta de cierre, de conformidad con las disposiciones del Convenio internacional sobre líneas de carga en vigor, se mantendrán abiertas mientras el buque esté en la mar;
 - .1.2.2 todo accionamiento de las válvulas a que se refiere el párrafo 6.1.4.1.2.1 se anotará en el diario de navegación;
 - .1.3 en los espacios situados por debajo de la cubierta de cierre, la Administración podrá exigir que se instalen medios de achique y desagüe, además de lo prescrito en la regla II-1/35-1. En ese caso, el sistema de desagüe tendrá las dimensiones necesarias para eliminar, como mínimo, el 125 % de la capacidad combinada de las bombas del sistema de aspersión de agua y del número requerido de lanzas de manguera contra incendios, teniendo en cuenta las directrices elaboradas por la Organización*. Las válvulas del sistema de desagüe podrán accionarse desde el exterior del espacio protegido, en un lugar cercano a los mandos del sistema extintor. Los pozos de sentina tendrán capacidad suficiente y estarán dispuestos en el forro exterior del costado del buque, guardando una distancia entre uno y otro que no sea superior a 40 m en cada compartimiento estanco;
- .2 en los buques de carga, los medios de desagüe y achique serán tales que impidan la formación de superficies libres. En ese caso, el sistema de desagüe tendrá las dimensiones necesarias para eliminar, como mínimo, el 125 % de la capacidad combinada de las bombas del sistema de aspersión de agua y del número requerido de lanzas de manguera contra incendios, teniendo en cuenta las directrices elaboradas por la Organización*. Las válvulas del sistema de desagüe podrán accionarse desde el exterior del espacio protegido, en un lugar cercano a los mandos del sistema extintor. Los pozos de sentina tendrán capacidad suficiente y estarán dispuestos en el forro exterior del costado del buque, guardando una distancia entre uno y otro que no sea superior a 40 m en cada compartimiento estanco. Si esto no es posible, la Administración tendrá en cuenta, en la medida que estime necesaria para dar su aprobación a la información sobre estabilidad, el efecto negativo que puedan tener para la estabilidad el peso adicional y la superficie libre del agua**. Esta información se incluirá en la información sobre estabilidad que se facilite al capitán según lo dispuesto en la regla II-1/5-1.

6.1.5 En todos los buques, en los espacios cerrados para vehículos, los espacios de carga rodada cerrados y los espacios de categoría especial que tengan instalados sistemas fijos de extinción de incendios por aspersión de agua a presión, se dispondrán medios para evitar el bloqueo del sistema de desagüe, teniendo en cuenta las directrices elaboradas por la Organización*. Los buques construidos antes del 1 de enero de 2010 cumplirán las prescripciones del presente párrafo a más tardar en el primer reconocimiento posterior al 1 de enero de 2010.

* Véanse las Directrices para los sistemas de desagüe de los espacios cerrados para vehículos, espacios de carga rodada cerrados y espacios de categoría especial (que elaborará la Organización).

** Véase la Recomendación sobre sistemas fijos de extinción de incendios para espacios de categoría especial, adoptada por la Organización mediante la resolución A.123(V)."

CAPÍTULO III

DISPOSITIVOS Y MEDIOS DE SALVAMENTO

Regla 6 – Comunicaciones

6 Se sustituye el párrafo 2.2 por el siguiente:

"2.2 Dispositivos de localización de búsqueda y salvamento

Todo buque de pasaje y todo buque de carga de arqueo bruto igual o superior a 500 llevará por lo menos un dispositivo de localización de búsqueda y salvamento a cada banda. Todo buque de carga de arqueo bruto igual o superior a 300 pero inferior a 500 llevará por lo menos un dispositivo de localización de búsqueda y salvamento. Dichos dispositivos de localización de búsqueda y salvamento se ajustarán a las normas de funcionamiento aplicables, no inferiores a las aprobadas por la Organización*. Los dispositivos de localización de búsqueda y salvamento** irán estibados en lugares desde los que puedan colocarse rápidamente en cualquier embarcación de supervivencia que no sea la balsa o las balsas salvavidas prescritas en la regla 31.1.4. Otra posibilidad es estibar un dispositivo de localización de búsqueda y salvamento en cada una de las embarcaciones de supervivencia que no sean las prescritas en la regla 31.1.4. En los buques que lleven por lo menos dos dispositivos de localización de búsqueda y salvamento y que estén equipados con botes salvavidas de caída libre, uno de los dispositivos de localización de búsqueda y salvamento irá estibado en un bote salvavidas de caída libre y el otro estará situado en las proximidades inmediatas del puente de navegación de modo que pueda utilizarse a bordo y esté listo para trasladarlo rápidamente a cualquiera de las otras embarcaciones de supervivencia.

* Véanse la Recomendación sobre normas de funcionamiento de los respondedores de radar para embarcaciones de supervivencia destinados a operaciones de búsqueda y salvamento, adoptada por la Organización mediante la resolución MSC.247(83) (A.802(19), enmendada) y la Recomendación sobre las normas de funcionamiento de los transmisores de búsqueda y salvamento del SIA (AIS-SART) para embarcaciones de supervivencia, adoptada por la Organización mediante la resolución MSC.246(83).

** Uno de estos dispositivos de localización de búsqueda y salvamento puede ser el prescrito en la regla IV/7.1.3."

Regla 26 – Prescripciones complementarias aplicables a los buques de pasaje de transbordo rodado

7 Se sustituye el párrafo 2.5 por el siguiente:

"2.5 Las balsas salvavidas transportadas a bordo de los buques de pasaje de transbordo rodado irán provistas de un dispositivo de localización de búsqueda y salvamento a razón de un dispositivo por cada cuatro balsas salvavidas. El dispositivo de localización de búsqueda y salvamento estará instalado en el interior de la balsa de modo que su antena se encuentre a más de un metro sobre el nivel del mar cuando la balsa salvavidas esté desplegada, con la excepción de que para las balsas salvavidas reversibles con capota el dispositivo estará dispuesto de modo que los supervivientes puedan acceder al mismo e instalarlo fácilmente. Cada dispositivo de localización de búsqueda y salvamento estará dispuesto de modo que sea posible instalarlo manualmente cuando la balsa salvavidas esté desplegada. Las envolturas de las balsas salvavidas provistas de dispositivos de localización de búsqueda y salvamento estarán claramente marcadas."

CAPÍTULO IV

RADIOCOMUNICACIONES

Regla 7 – Equipo radioeléctrico: generalidades

8 En el párrafo 1, se sustituye el subpárrafo .3 por el siguiente:

".3 un dispositivo de localización de búsqueda y salvamento que pueda funcionar en la banda de 9 GHz o en frecuencias reservadas para el SIA, el cual:"

APÉNDICE

CERTIFICADOS

Inventario del equipo adjunto al Certificado de seguridad para buque de pasaje (Modelo P)

9 Se sustituye el punto 11.1 de la sección 2 del Inventario del equipo adjunto al Certificado de seguridad para buque de pasaje (Modelo P) por el texto siguiente:

"11.1 Número de dispositivos de localización de búsqueda y salvamento
11.1.1 Respondedores de radar de búsqueda y salvamento (RESAR)
11.1.2 Transmisores de búsqueda y salvamento del SIA (AIS-SART)",

y en la sección 3 se sustituye el punto 6 por el texto siguiente:

"6 Dispositivo de localización de búsqueda y salvamento del buque
6.1 Responder de radar de búsqueda y salvamento (RESAR)
6.2 Transmisor de búsqueda y salvamento del SIA (AIS-SART)".

Inventario del equipo adjunto al Certificado de seguridad del equipo para buque de carga (Modelo E)

10 Se sustituye el punto 9.1 de la sección 2 del Inventario del equipo adjunto al Certificado de seguridad del equipo para buque de carga (Modelo E) por el texto siguiente:

- "9.1 Número de dispositivos de localización de búsqueda y salvamento
- 9.1.1 Respondedores de radar de búsqueda y salvamento (RESAR)
- 9.1.2 Transmisores de búsqueda y salvamento del SIA (AIS-SART)".

Inventario del equipo adjunto al Certificado de seguridad radioeléctrica para buque de carga (Modelo R)

11 Se sustituye el punto 6 de la sección 2 del Inventario del equipo adjunto al Certificado de seguridad radioeléctrica para buque de carga (Modelo R) por el texto siguiente:

- "6 Dispositivo de localización de búsqueda y salvamento del buque
- 6.1 Respondedor de radar de búsqueda y salvamento (RESAR)
- 6.2 Transmisor de búsqueda y salvamento del SIA (AIS-SART)".

Inventario del equipo adjunto al Certificado de seguridad para buque nuclear de pasaje (Modelo PNUC)

12 Se sustituye el punto 11.1 de la sección 2 del Inventario del equipo adjunto al Certificado de seguridad para buque nuclear de pasaje (Modelo PNUC) por el texto siguiente:

- "11.1 Número de dispositivos de localización de búsqueda y salvamento
- 11.1.1 Respondedores de radar de búsqueda y salvamento (RESAR)
- 11.1.2 Transmisores de búsqueda y salvamento del SIA (AIS-SART)",

y en la sección 3 se sustituye el punto 6 por el texto siguiente:

- "6 Dispositivo de localización de búsqueda y salvamento del buque
- 6.1 Respondedor de radar de búsqueda y salvamento (RESAR)
- 6.2 Transmisor de búsqueda y salvamento del SIA (AIS-SART)".

Inventario del equipo adjunto al Certificado de seguridad para buque nuclear de carga (Modelo CNUC)

13 En la sección 2 del Inventario del equipo adjunto al Certificado de seguridad para buque nuclear de carga (Modelo CNUC) se suprime el punto 9 y se cambia la numeración de los puntos 10, 10.1 y 10.2 por 9, 9.1 y 9.2, respectivamente, y el punto 9.1 de la nueva numeración se sustituye por el texto siguiente:

- "9.1 Número de dispositivos de localización de búsqueda y salvamento
- 9.1.1 Respondedores de radar de búsqueda y salvamento (RESAR)
- 9.1.2 Transmisores de búsqueda y salvamento del SIA (AIS-SART)",

y en la sección 3 se sustituye el punto 6 por el texto siguiente:

- "6 Dispositivo de localización de búsqueda y salvamento del buque
- 6.1 Respondedor de radar de búsqueda y salvamento (RESAR)
- 6.2 Transmisor de búsqueda y salvamento del SIA (AIS-SART)".

ANEXO 1

**RESOLUCIÓN MSC.436(99)
(adoptada el 24 de mayo de 2018)**

**ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD
DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO**

EL COMITÉ DE SEGURIDAD MARÍTIMA,

RECORDANDO el artículo 28 b) del Convenio constitutivo de la Organización Marítima Internacional, artículo que trata de las funciones del Comité,

RECORDANDO TAMBIÉN el artículo VIII b) del Convenio internacional para la seguridad de la vida humana en el mar, 1974 ("el Convenio"), relativo al procedimiento de enmienda aplicable al anexo del Convenio, con excepción de las disposiciones de su capítulo I,

RECORDANDO ADEMÁS la resolución MSC.421(98), mediante la cual adoptó, entre otras, enmiendas a las reglas II-1/1 and II-1/8-1 del Convenio,

HABIENDO EXAMINADO, en su 99º periodo de sesiones, las enmiendas al Convenio propuestas y distribuidas de conformidad con lo dispuesto en el artículo VIII b) i) del mismo,

1 ADOPTA, de conformidad con lo dispuesto en el artículo VIII b) iv) del Convenio, las enmiendas al Convenio cuyo texto figura en el anexo de la presente resolución;

2 ACUERDA que las enmiendas a las reglas II-1/1 and II-1/8-1 del Convenio, adoptadas mediante la resolución MSC.421(98), serán sustituidas por las enmiendas a las reglas II-1/1 and II-1/8-1 del Convenio que figuran en el anexo de la presente resolución;

3 DISPONE, de conformidad con lo estipulado en el artículo VIII b) vi) 2) bb) del Convenio, que dichas enmiendas se considerarán aceptadas el 1 de julio de 2019, a menos que, antes de esa fecha, más de un tercio de los Gobiernos Contratantes del Convenio, o un número de Gobiernos Contratantes cuyas flotas mercantes combinadas representen como mínimo el 50 % del tonelaje bruto de la flota mercante mundial, hayan notificado al Secretario General que recusan las enmiendas;

4 INVITA a los Gobiernos Contratantes del Convenio a que tomen nota de que, de conformidad con lo dispuesto en el artículo VIII b) vii) 2) del mismo, las enmiendas entrarán en vigor el 1 de enero de 2020, una vez aceptadas con arreglo a lo dispuesto en el párrafo 2 anterior;

5 PIDE al Secretario General que, de conformidad con lo dispuesto en el artículo VIII b) v) del Convenio, remita copias certificadas de la presente resolución y del texto de las enmiendas que figura en el anexo a todos los Gobiernos Contratantes del Convenio;

6 PIDE TAMBIÉN al Secretario General que remita copias de la presente resolución y de su anexo a los Miembros de la Organización que no son Gobiernos Contratantes del Convenio.

ANEXO

ENMIENDAS AL CONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR, 1974, ENMENDADO

CAPÍTULO II-1 CONSTRUCCIÓN – ESTRUCTURA, COMPARTIMENTADO Y ESTABILIDAD, INSTALACIONES DE MÁQUINAS E INSTALACIONES ELÉCTRICAS

PARTE A GENERALIDADES

Regla 1 – Ámbito de aplicación

1 Se insertan los siguientes párrafos nuevos 1.1.1 y 1.1.2 a continuación del párrafo 1.1 existente:

"1.1.1 Salvo disposición expresa en otro sentido, las partes B, B-1, B-2 y B-4 del presente capítulo solo se aplicarán a los buques:

- .1 cuyo contrato de construcción se adjudique el 1 de enero de 2020 o posteriormente; o
- .2 en ausencia de un contrato de construcción, cuya quilla se coloque o cuya construcción se halle en una fase equivalente el 1 de julio de 2020 o posteriormente; o
- .3 cuya entrega tenga lugar el 1 de enero de 2024 o posteriormente.

1.1.2 Salvo disposición expresa en otro sentido, la Administración se cerciorará de que los buques que no estén regidos por lo dispuesto en el párrafo 1.1.1, pero que se hayan construido el 1 de enero de 2009 o posteriormente:

- .1 cumplan las prescripciones que figuran en las partes B, B-1, B-2 y B-4 que sean aplicables en virtud de lo dispuesto en el capítulo II-1 del Convenio internacional para la seguridad de la vida humana en el mar, 1974, enmendado por las resoluciones MSC.216(82), MSC.269(85) y MSC.325(90); y
- .2 cumplan las prescripciones de las reglas 8-1.3 y 19-1."

2 Se suprime el párrafo 1.3.4 actual.

3 El texto actual del párrafo 2 se sustituye por el siguiente:

"2 Salvo disposición expresa en otro sentido, la Administración se cerciorará de que los buques construidos antes del 1 de enero de 2009:

- .1 cumplan las prescripciones que sean aplicables en virtud de lo dispuesto en el capítulo II-1 del Convenio internacional para la seguridad de la vida humana en el mar, 1974, enmendado por las resoluciones MSC.1(XLV), MSC.6(48), MSC.11(55), MSC.12(56), MSC.13(57), MSC.19(58), MSC.26(60), MSC.27(61), resolución 1

de la Conferencia SOLAS de 1995, MSC.47(66), MSC.57(67), MSC.65(68), MSC.69(69), MSC.99(73), MSC.134(76), MSC.151(78), y MSC.170(79); y

- .2 cumplan las prescripciones de las reglas 8-1.3 y 19-1."

PARTE B-1 ESTABILIDAD

Regla 8-1 – Información operacional y capacidad de los sistemas de los buques de pasaje tras un siniestro por inundación

- 4 Se enmienda el texto actual de la regla 8-1 de modo que diga lo siguiente:

"1 Ámbito de aplicación

Los buques de pasaje que tengan una eslora igual o superior a 120 m, según se define esta en la regla II-1/2.5, o que tengan tres o más zonas verticales principales cumplirán las disposiciones de la presente regla.

2 Disponibilidad de los sistemas esenciales en caso de daños por inundación*

Todo buque de pasaje estará proyectado de modo que los sistemas estipulados en la regla II-2/21.4 permanezcan operacionales cuando el buque sufra inundación en un solo compartimiento estanco.

3 Información operacional tras un siniestro por inundación

3.1 A los efectos de facilitar información operacional al capitán para el regreso a puerto en condiciones de seguridad tras un siniestro por inundación, los buques de pasaje que se especifican en el párrafo 1 contarán con:

- .1 computador de estabilidad de a bordo; o
.2 apoyo en tierra,

basándose en las directrices que elabore la Organización.**

3.2 Los buques de pasaje construidos antes del 1 de enero de 2014 cumplirán las disposiciones del párrafo 3.1 a más tardar en la fecha del primer reconocimiento de renovación después del 1 de enero de 2025.

* Véanse las Notas explicativas provisionales para la evaluación de la capacidad de los sistemas de los buques de pasaje tras un siniestro por incendio o por inundación (circular MSC.1/Circ.1369).

** Véanse las Directrices sobre la información operacional facilitada a los capitanes de buques de pasaje para el regreso a puerto del buque en condiciones de seguridad por su propia propulsión o mediante remolque (MSC.1/Circ.1400) para los buques construidos el 1 de enero de 2014 o posteriormente pero antes del 13 de mayo de 2016, o las Directrices revisadas sobre la información operacional facilitada a los capitanes de buques de pasaje para el regreso a puerto del buque en condiciones de seguridad (MSC.1/Circ.1532/Rev.1) para los buques construidos el 13 de mayo de 2016 o posteriormente, o las Directrices sobre la información operacional destinada a los capitanes en caso de inundación para los buques de pasaje construidos antes del 1 de enero de 2014 (MSC.1/Circ.1589)."

CAPÍTULO IV RADIOCOMUNICACIONES

PARTE A GENERALIDADES

Regla 2 – Expresiones y definiciones

5 En el párrafo 1, se enmienda el apartado .16 actual y se añade el nuevo apartado .17 siguiente:

- " .16 *Identities del Sistema mundial de socorro y seguridad marítimos (SMSSM):* identidades del servicio móvil marítimo, distintivo de llamada del buque, identidades del servicio móvil por satélite reconocido e identidad del número de serie que pueden ser transmitidos por el equipo del buque y que sirven para identificar a dicho buque.
- .17 *Servicio móvil por satélite reconocido:* todo servicio que funciona mediante un sistema por satélite y que está reconocido por la Organización para su uso en el Sistema mundial de socorro y seguridad marítimos (SMSSM)."

PARTE C EQUIPO PRESCRITO PARA LOS BUQUES

Regla 7 – Equipo radioeléctrico: Generalidades

6 En el párrafo 1, se enmienda el apartado .5 de modo que diga lo siguiente:

- " .5 una instalación radioeléctrica para la recepción de información sobre seguridad marítima por un sistema de llamada intensificada a grupos de un servicio móvil por satélite reconocido, si el buque se dedica a efectuar viajes en las zonas marítimas A1, A2 o A3 en las que, sin embargo, no se preste un servicio internacional NAVTEX. No obstante, los buques dedicados exclusivamente a efectuar viajes en zonas en las que se preste un servicio de información sobre seguridad marítima por telegrafía de impresión directa en ondas decamétricas, y que lleven instalado equipo capaz de recibir tal servicio, podrán quedar exentos del cumplimiento de esta prescripción.*

* Véase la "Recomendación acerca de la difusión de información sobre seguridad marítima", adoptada por la Organización mediante la resolución A.705(17), enmendada."

Regla 8 – Equipo radioeléctrico: zona marítima A1

7 En el párrafo 1, se enmienda el apartado .5 actual de modo que diga lo siguiente:

- " .5 a través de un servicio móvil por satélite reconocido; esta prescripción se puede satisfacer mediante:
- .5.1 una estación terrena de buque* ; o
- .5.2 la RLS satelitaria prescrita en la regla 7.1.6, bien instalándola próxima al puesto habitual de gobierno del buque, bien teleactivándola desde el mismo.

* Esta prescripción se puede satisfacer mediante una estación terrena de buque de un servicio móvil por satélite reconocido apta para comunicaciones bidireccionales, como son las estaciones terrenas de buque Fleet-77 (resoluciones A.808(19) y MSC.130(75)), o de Inmarsat-C (resolución A.807(19), enmendada). Salvo disposición expresa en otro sentido, esta nota a pie de página se refiere a todas las prescripciones relativas a una estación terrena de buque de un servicio móvil por satélite reconocido estipuladas en el presente capítulo."

Regla 9 – Equipo radioeléctrico: zonas marítimas A1 y A2

- 8 En el párrafo 1, se enmienda el apartado .3.3 actual de modo que diga lo siguiente:
- "3.3 a través de un servicio móvil por satélite reconocido por una estación terrena de buque."
- 9 En el párrafo 3, se enmienda el apartado .2 actual de modo que diga lo siguiente:
- ".2 una estación terrena de buque de un servicio móvil por satélite reconocido."

Regla 10 – Equipo radioeléctrico: zonas marítimas A1, A2 y A3

- 10 En el párrafo 1, se enmienda el encabezamiento actual del apartado .1 de modo que diga lo siguiente:
- ".1 una estación terrena de buque de un servicio móvil por satélite reconocido que pueda:"
- 11 En el párrafo 1, se enmienda el apartado .4.3 actual de modo que diga lo siguiente:
- ".4.3 a través de un servicio móvil por satélite reconocido por una estación terrena de buque adicional."
- 12 En el párrafo 2, se enmienda el apartado .3.2 actual de modo que diga lo siguiente:
- ".3.2 a través de un servicio móvil por satélite reconocido por una estación terrena de buque; y"

Regla 12 – Servicios de escucha

- 13 En el párrafo 1, se enmienda el apartado .4 actual de modo que diga lo siguiente:
- ".4 de los alertas de socorro costera-buque por satélite, si el buque, de conformidad con la regla 10.1.1, está equipado con una estación terrena de buque de un servicio móvil por satélite reconocido."

Regla 13 – Fuentes de energía

- 14 En el párrafo 2, se suprimen las palabras "de Inmarsat" de la segunda oración.

APÉNDICE CERTIFICADOS

INVENTARIO DEL EQUIPO DE SEGURIDAD PARA BUQUE DE PASAJE (MODELO P)

- 15 En la sección 3, se enmienda la descripción actual del punto 1.4 de modo que diga lo siguiente:

"Estación terrena de buque de un servicio móvil por satélite reconocido"

INVENTARIO DEL EQUIPO DE SEGURIDAD RADIOELÉCTRICA PARA BUQUE DE CARGA (MODELO R)

- 16 En la sección 2, se enmienda la descripción actual del punto 1.4 de modo que diga lo siguiente:

"Estación terrena de buque de un servicio móvil por satélite reconocido"

INVENTARIO DEL EQUIPO DE SEGURIDAD PARA BUQUE DE CARGA (MODELO C)

- 17 En la sección 3, se enmienda la descripción actual del punto 1.4 de modo que diga lo siguiente:

"Estación terrena de buque de un servicio móvil por satélite reconocido".
