MARITIME SAFETY COMMITTEE
66th session
Agenda item 24

REPORT OF THE MARITIME SAFETY COMMITTEE
ON ITS SIXTY-SIXTH SESSION

Attached are annexes 1 to 11 to the report of the Maritime Safety Committee on its sixty-sixth session (MSC 66/24).
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AGENDA FOR THE SIXTY-SIXTH SESSION AND LIST OF DOCUMENTS

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MSC 66/INF.6 (E only)  IACS  Note regarding SOLAS regulation VI/6
MSC 66/WP.18  Drafting group  Report of the drafting group on Cargo Securing Manual

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MSC 66/10  Secretariat  Report of the 1st session of the Sub-Committee and outstanding matters from LSR 26
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MSC 66/10/1  United States  SAR Convention review
MSC 66/10/2  Inmarsat  Outcome of the 11th Inmarsat Assembly
MSC 66/WP.4  Secretariat  Draft MSC resolution on amendments to performance standards

11 Bulk liquids and gases

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MSC 66/12 and Add.1  Secretariat  Report of the 3rd session and urgent matters emanating from the 4th session of the Sub-Committee
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MSC 66/INF.10 Sweden Report on introduction of modern risk assessment into shipping (E only)

15 Technical assistance subprogramme in maritime safety

MSC 66/15 Secretariat Technical co-operation work plan in maritime safety and Add.1
MSC 66/15/1 Secretariat Technical co-operation projects related to maritime safety
MSC 66/15/2 Secretariat Periodical report on model courses

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MSC 66/15/4 Secretariat Technical co-operation work plan in maritime safety
MSC 66/INF.13 Secretariat List of projects and projects by region (E only)

16 Piracy and armed robbery against ships

MSC 66/16 Secretariat Summary of reports
MSC/Circs. 698, 701, 703, 708, 711-714, 716, 717, 719, 720 and 722
MSC 66/16/Add.1 Secretariat Analyses of reports
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17 Survey and certification

MSC 66/17 Secretariat Outcome of the 37th session of MEPC
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MSC 66/17/2 IACS Recommended revisions to resolution A.744(18)

18 Existing ships' safety standards
### 19 Implementation of instruments and related matters

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<td>Amendments to the Guidelines for emergency towing arrangements on tankers</td>
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<td>MSC 66/21/5</td>
<td>Denmark, Finland, Norway and Sweden</td>
<td>Proposal for interpretation and amendment of the HSC Code</td>
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<td>MSC 66/21/6</td>
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<td>MSC 66/21/8</td>
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MSC 66/21/9  SIGTTO  Amendments to the IGC and GC Codes
MSC 66/21/10  Denmark, Finland  Work programme items emanating from 1995 SOLAS Conference resolutions
MSC 66/21/11  Japan  Comments on working arrangements for correspondence groups

21 Work programme (continued)

MSC 66/21/12  ICHCA  Research information on ro-ro passenger vessels survivability, water on deck and drainage therefrom
MSC 66/21/13  SIGTTO  Amendments to the IGC and GC Codes
MSC 66/INF.5  Secretariat  List of IMO requirements and recommendations applicable to ships
MSC 66/INF.12  SIGTTO  Guidelines for automatic cargo tank overfill protection aboard gas carriers
MSC 66/WP.5  Secretariat  List of new items and activities
MSC 66/WP.6  Secretariat  Substantive items for inclusion in the agendas of MSC 67 and MSC 68
MSC 66/WP.7  Secretariat  Work programmes of the sub-committees
MSC 66/WP.9  Secretariat  Special Consultative Meeting (SCU) on the INF Code

22 Application of the Committee's Guidelines

MSC 66/22  Secretariat  Outcome of the 74th session of the Council
MSC 66/22/1  United Kingdom  Proposals for improving the establishment of priorities

23 Any other business

MSC 66/23  Corres. group  Report on ferry security (MSC/Circ.443)
MSC 66/23/1  Secretariat  Quality certification of IACS Member Societies
MSC 66/23/2  Secretariat  Manual of IMO requirements for seafarers
MSC 66/23/3  IACS  Emergency towing arrangements on tankers
MSC 66/23/4  IACS  Pilot transfer arrangements
MSC 66/23/5  United States  Draft amendments to MARPOL on double hull tanker intact stability requirements
MSC 66/23/6  IACS  Ro-ro ships safety - IACS UR on side shell doors and stern doors
MSC 66/23/7  United Kingdom  Emergency towing arrangements on tankers
Any other business (continued)

MSC 66/INF.21 Denmark, Finland, Norway, Sweden and United Kingdom Joint North West European R & D Project - "Safety of Passenger/RoRo Vessels"

MSC 66/INF.22 Denmark, Finland, Norway, Sweden and United Kingdom Joint North West European R & D Project - "Safety of Passenger/RoRo Vessels"

MSC 66/INF.27 IACS IACS UR on intact stability of double hull tankers during liquid transfer operations

MSC 66/INF.30 List of circulars approved by the Committee at its sixty-sixth session

Report of the sixty-sixth session of the Committee

MSC 66/WP.15 Draft report

and Adds.1 to 4

MSC 66/24 Report

* * *

MSC 66/INF.1 List of participants

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ANNEX 2

RESOLUTION MSC.47(66)
(adopted on 4 June 1996)

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 (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-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
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.
ANNEX

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

CHAPTER II-1

CONSTRUCTION - SUBDIVISION AND STABILITY, MACHINERY
AND ELECTRICAL INSTALLATIONS

1  The existing title of chapter II-1 is replaced by the following:

"Construction - Structure, subdivision and STABILITY, MACHINERY AND ELECTRICAL
installations"

2  The following new part A-1 is inserted between part A and part B:

"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, or with applicable national standards of the Administration
which provide an equivalent level of safety.

Regulation 3-2
Corrosion prevention of seawater ballast tanks

1  This regulation applies to oil tankers and bulk carriers constructed on or after 1 July 1998.

2  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."

*  Refer to the Guidelines for the selection, application and maintenance of corrosion
prevention systems of dedicated seawater ballast tanks, adopted by the Organization by
resolution A.798(19).
Regulation 8 - Stability of passenger ships in damaged condition

3 The following is added at the end of paragraph 2.3.1:

"This range may be reduced to a minimum of 10°, in the case where the area under the righting lever curve is that specified in paragraph 2.3.2, increased by the ratio:

\[
\frac{15}{\text{Range}}
\]

where the range is expressed in degrees."

4 The words "range specified in 2.3.1" in paragraph 2.3.3 are replaced by the words "range of positive stability".

Regulation 25-1 - Application

5 The following sentence is added at the end of existing paragraph 1:

"The requirements in this part shall also apply to cargo ships of 80 m in \( L_s \) and upwards but not exceeding 100 m in \( L_s \) constructed on or after 1 July 1998."

Regulation 25-3 - Required subdivision index \( R \)

6 Existing paragraph 2 is replaced by the following:

"2 The degree of subdivision to be provided shall be determined by the required subdivision index \( R \), as follows:

.1 for ships over 100 m in \( L_s \):

\[
R = (0.002 + 0.0009L_s)_{-}^{-},
\]

where \( L_s \) is in metres; and

.2 for ships of 80 m in \( L_s \) and upwards but not exceeding 100 m in length \( L_s \):

\[
R = 1 - \left[ \frac{1}{1 + \frac{L_s \cdot R_o}{100 \cdot (1 - R_o)}} \right],
\]

where \( R_o \) is the value \( R \) as calculated in accordance with the formula in subparagraph .1."

Regulation 45 - Precautions against shock, fire and other hazards of electrical origin

7 The words "55 V" in paragraph 1.1.1 are replaced by "50 V".
The existing text of chapter III is replaced by the following:

"CHAPTER III

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 1998.

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 1998; 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 1998, the Administration shall:

   .1 ensure that, subject to the provisions of paragraph 4.2, 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 1998 to new or existing ships as prescribed by that chapter are complied with; and
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 other than an inflatable liferaft 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.

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


Regulation 3

Definitions

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

1 Anti-exposure suit is a protective suit designed for use by rescue boat crews and marine evacuation system parties.

2 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.

3 Detection is the determination of the location of survivors or survival craft.

4 Embarkation ladder is the ladder provided at survival craft embarkation stations to permit
safe access to survival craft after launching.

5. **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.

6. **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.

7. **Immersion suit** is a protective suit which reduces the body heat loss of a person wearing it in cold water.

8. **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.

9. **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.

10. **International Life-Saving Appliance (LSA) Code** (referred to as "the Code" in this chapter) means the International Life-Saving Appliance (LSA) Code adopted by the Maritime Safety Committee of the Organization by resolution MSC.48(66), as it 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.

11. **Launching appliance or arrangement** is a means of transferring a survival craft or rescue boat from its stowed position safely to the water.

12. **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.

13. **Lightest sea-going condition** is the loading condition with the ship on even keel, without cargo, with 10% stores and fuel remaining and in the case of a passenger ship with the full number of passengers and crew and their luggage.

14. **Marine evacuation system** is an appliance for the rapid transfer of persons from the embarkation deck of a ship to a floating survival craft.

15. **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.

16 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 or the Code but which provides an equal or higher standard of safety.

17 Positive stability is the ability of a craft to return to its original position after the removal of a heeling moment.

18 Recovery time for a rescue boat is the time required to raise the boat to a position where persons on board can disembark to the deck of the ship. Recovery time includes the time required to make preparations for recovery on board the rescue boat such as passing and securing a painter, connecting the rescue boat to the launching appliance, and the time to raise the rescue boat. Recovery time does not include the time needed to lower the launching appliance into position to recover the rescue boat.

19 Rescue boat is a boat designed to rescue persons in distress and to marshal survival craft.

20 Retrieval is the safe recovery of survivors.

21 Ro-ro passenger ship means a passenger ship with ro-ro cargo spaces or special category spaces as defined in regulation II-2/3.

22 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.

23 Survival craft is a craft capable of sustaining the lives of persons in distress from the time of abandoning the ship.

24 Thermal protective aid is a bag or suit made of waterproof material with low thermal conductance.
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 and the Code, 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 the Code 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 and the Code.

6 Life-saving appliances required by this chapter for which detailed specifications are not

* Refer to the Recommendation on Testing of Life-Saving Appliances adopted by the Organization by resolution A.689(17), as it may be amended.

** Refer to the Code of Practice for the Evaluation, Testing and Acceptance or Prototype Novel Life-Saving Appliances and Arrangements adopted by the Organization by resolution A.520(13).
included in the Code 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.
PART B - REQUIREMENTS FOR SHIPS AND LIFE-SAVING APPLIANCES

SECTION I - PASSENGER SHIPS AND CARGO SHIPS

Regulation 6

Communications

1 Paragraph 2 applies to all passenger ships and to all cargo ships of 300 gross tonnage and upwards.

2 Radio life-saving appliances

2.1 Two-way VHF radiotelephone apparatus

2.1.1 At least three two-way VHF radiotelephone apparatus shall be provided on every passenger ship and on every cargo ship of 500 gross tonnage and upwards. At least two two-way VHF radiotelephone apparatus shall be provided on every cargo ship of 300 gross tonnage and upwards but less than 500 gross tonnage. Such apparatus shall conform to performance standards not inferior to those adopted by the Organization.* If a fixed two-way VHF radiotelephone apparatus is fitted in a survival craft it shall conform to performance standards not inferior to those adopted by Organization.*

2.1.2 Two-way VHF radiotelephone apparatus provided on board ships prior to 1 February 1992 and not complying fully with the performance standards adopted by the Organization may be accepted by the Administration until 1 February 1999 provided the Administration is satisfied that they are compatible with approved two-way VHF radiotelephone apparatus.

2.2 Radar transponders

* Refer to the Performance Standards for Survival Craft Two-Way VHF Radiotelephone Apparatus, adopted by the Organization by resolution A.809(19), as it may be amended, annex 1 or annex 2 as applicable.
At least one radar transponder shall be carried on each side of every passenger ship and of every cargo ship of 500 gross tonnage and upwards. At least one radar transponder shall be carried on every cargo ship of 300 gross tonnage and upwards but less than 500 gross tonnage. Such radar transponders shall conform to performance standards not inferior to those adopted by the Organization.** The radar transponders*** shall be stowed in such locations that they can be rapidly placed in any survival craft other than the liferaft or liferafts required by regulation 31.1.4. Alternatively one radar transponder shall be stowed in each survival craft other than those required by regulation 31.1.4. On ships carrying at least two radar transponders and equipped with free-fall lifeboats one of the radar transponders 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.

3 Distress flares

Not less than 12 rocket parachute flares, complying with the requirements of section 3.1 of the Code, shall be carried and be stowed on or near the navigation 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. A general emergency alarm system complying with the requirements of paragraph 7.2.1 of the Code 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 complying with the requirements of paragraph 7.2.2 of the Code or other suitable means of communication. Entertainment sound systems shall automatically be turned off when the general emergency alarm system is activated.

4.3 On passenger ships the general emergency alarm system shall be audible on all open decks.

4.4 On ships fitted with a marine evacuation system communication between the embarkation station and the platform or the survival craft shall be ensured.

5 Public address systems on passenger ships

5.1 In addition to the requirements of regulation II-2/40.5 or regulation II-2/41.2, as appropriate, and of paragraph 6.4.2, all passenger ships shall be fitted with a public address system. With respect to passenger ships constructed before 1 July 1997 the requirements of

** 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), as it may be amended.

*** One of these radar transponders may be the radar transponder required by regulation IV/7.1.3.
paragraphs 5.2 and 5.4, subject to the provisions of paragraph 5.5, shall apply not later than the date of the first periodical survey after 1 July 1997.

5.2 The public address system shall be clearly audible above the ambient noise in all spaces, prescribed by paragraph 7.2.2.1 of the Code, and shall be provided with an override function controlled from one location on the navigation bridge and such other places on board as the Administration deems necessary, so that all emergency messages will be broadcast if any loudspeaker in the spaces concerned has been switched off, its volume has been turned down or the public address system is used for other purposes.

5.3 On passenger ships constructed on or after 1 July 1997:

.1 the public address system shall have at least two loops which shall be sufficiently separated throughout their length and have two separate and independent amplifiers; and

.2 the public address system and its performance standards shall be approved by the Administration having regard to the recommendations adopted by the Organization. * **

5.4 The public address system shall be connected to the emergency source of electrical power required by regulation II-1/42.2.2.

5.5 Ships constructed before 1 July 1997 which are already fitted with the public address system approved by the Administration which complies substantially with those required by sections 5.2 and 5.4 and paragraph 7.2.2.1 of the Code are not required to change their system.

Regulation 7

Personal life-saving appliances

1 Lifebuoys

1.1 Lifebuoys complying with the requirements of paragraph 2.1.1 of the Code 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; and

.2 so stowed as to be capable of being rapidly cast loose, and not permanently secured in any way.

* Refer to the Code on Alarms and Indicators, 1995, adopted by the Organization by resolution A.830(19).

** Refer to performance standards for public address systems, to be developed by the Organization.
1.2 At least one lifebuoy on each side of the ship shall be fitted with a buoyant lifeline complying with the requirements of paragraph 2.1.4 of the Code 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 lifebuoy self-igniting lights complying with the requirements of paragraph 2.1.2 of the Code; not less than two of these shall also be provided with lifebuoy self-activating smoke signals complying with the requirements of paragraph 2.1.3 of the Code and be capable of quick release from the navigation 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 paragraph 2.2.1 or 2.2.2 of the Code shall be provided for every person on board the ship and, in addition:

- 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; and
- a sufficient number of lifejackets shall be carried for persons on watch and for use at remotely located survival craft stations. The lifejackets carried for persons on watch should be stowed on the bridge, in the engine control room and at any other manned watch station.

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.

2.3 The lifejackets used in totally enclosed lifeboats, except free-fall lifeboats, shall not impede entry into the lifeboat or seating, including operation of the seat belts in the lifeboat.

2.4 Lifejackets selected for free-fall lifeboats, and the manner in which they are carried or worn, shall not interfere with entry into the lifeboat, occupant safety or operation of the lifeboat.

3 Immersion suits and anti-exposure suits

An immersion suit, complying with the requirements of section 2.3 of the Code or an anti-exposure suit complying with section 2.4 of the Code, of an appropriate size, shall be provided for every person assigned to crew the rescue boat or assigned to the marine evacuation
system party. If the ship is constantly engaged in warm climates where, in the opinion of the Administration thermal protection is unnecessary, this protective clothing need not be carried.

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. In the case of passenger ships these instructions shall be drawn up in the language or languages required by the ship's flag State and in the English language.

3 Muster lists and emergency instructions complying with the requirements of regulation 37 shall be exhibited in conspicuous places throughout the ship including the navigation 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; and
   .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; and
   .3 use symbols in accordance with the recommendations of the Organization*.

* Refer to the Symbols Related to Life-Saving Appliances and Arrangements, adopted by the Organization by resolution A.760(18).
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 motorized survival craft shall have a person assigned who is capable of operating the engine and carrying out minor adjustments.

7 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 clear deck space to accommodate all persons assigned to muster at that station, but at least 0.35 m² per person.

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. In addition to and as part of the markings required under regulation II-2/28.1.10, routes to muster stations shall be indicated with the muster station symbol, intended for that purpose, in accordance with the recommendations of the Organization*.

6 Davit-launched and free-fall 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 paragraph 6.1.6 of the Code extending, in a single length, from the deck to the waterline in the lightest seagoing condition under unfavourable conditions of trim of up to 10° and a list of up to 20° either way shall be provided at each embarkation station or at every two adjacent embarkation stations for survival craft launched down the side of the ship. 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 enabling descent to the water in a controlled manner may be permitted for the liferafts required by regulation 31.1.4.

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.

* Refer to the Symbols Related to Life-Saving Appliances and Arrangements and Guidelines for the Evaluation, Testing and Application of Low-Location Lighting on Passenger Ships, adopted by the Organization by resolutions A.760(18) and A.752(18) respectively.
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 over board 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 of up to 10° and listed up to 20° either way, or to the angle at which the ship's weather deck 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 and the Code; and

.5 as far as practicable, in a secure and sheltered position and protected from damage by fire and explosion. In particular, survival craft on tankers, other than the liferafts required by regulation 31.1.4, shall not be stowed on or above a cargo tank, slop tank, or other tank containing explosive or hazardous cargoes.

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.

4.1 Every liferaft shall be stowed with its painter permanently attached to the ship.

4.2 Each liferaft or group of liferafts shall be stowed with a float-free arrangement complying with the requirements of paragraph 4.1.6 of the Code so that each floats free and, if inflatable, inflates automatically when the ship sinks.

4.3 Liferafts shall be so stowed as to permit manual release of one raft or container at a time
from their securing arrangements.

4.4 Paragraphs 4.1 and 4.2 do not apply to liferafts required by regulation 31.1.4.

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 Liferafts 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 31.1 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; and

.4 if it is also a lifeboat, in compliance with the requirements of regulation 13.

**Regulation 15**

**Stowage of marine evacuation systems**

1 The ship's side shall not have any openings between the embarkation station of the marine evacuation system and the waterline in the lightest seagoing condition and means shall be provided to protect the system from any projections.

2 Marine evacuation systems shall be in such positions as to ensure safe launching having particular regard to clearance from the propeller and steeply overhanging positions of the hull and so that, as far as practicable, the system can be launched down the straight side of the ship.

3 Each marine evacuation system shall be stowed so that neither the passage nor platform nor its stowage or operational arrangements will interfere with the operation of any other life-saving appliance at any other launching station.

4 Where appropriate, the ship shall be so arranged that the marine evacuation systems in their stowed positions are protected from damage by heavy seas.
Regulation 16

Survival craft launching and recovery arrangements

1. Unless expressly provided otherwise, launching and embarkation appliances complying with the requirements of section 6.1 of the Code shall be provided for all survival craft except those which are:
   
   .1 boarded from a position on deck less than 4.5 m above the waterline in the lightest seagoing condition and which have a mass of not more than 185 kg; or
   
   .2 boarded from a position on deck less than 4.5 m above the waterline in the lightest seagoing condition and which are stowed for launching directly from the stowed position under unfavourable conditions of trim of up to 10° and list of up to 20° either way; or
   
   .3 carried in excess of the survival craft for 200% of the total number of persons on board the ship and which have a mass of not more than 185 kg; or
   
   .4 carried in excess of the survival craft for 200% of the total number of persons on board the ship, are stowed for launching directly from the stowed position under unfavourable conditions of trim of up to 10° and list of up to 20° either way, or
   
   .5 provided for use in conjunction with a marine evacuation system, complying with the requirements of section 6.2 of the Code and stowed for launching directly from the stowed position under unfavourable conditions of trim of up to 10° and list of up to 20° either way.

2. Each lifeboat shall be provided with an appliance which is capable of launching and recovering the lifeboat. In addition there shall be provision for hanging-off the lifeboat to free the release gear for maintenance.

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 of up to 10° and list
of up to 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 partially enclosed lifeboats complying with the requirements of section 4.5 of the Code 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 of up to 10° and list of up 20° either way.

Regulation 17

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 16. 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 Recovery time of the rescue boat shall be not more than 5 min in moderate sea conditions when loaded with its full complement of persons and equipment. If the rescue boat is also a lifeboat, this recovery time shall be possible when loaded with its lifeboat equipment and the approved rescue boat complement of at least six persons.

5 Rescue boat embarkation and recovery arrangements shall allow for safe and efficient handling of a stretcher case. Foul weather recovery strops shall be provided for safety if heavy fall blocks constitute a danger.

Regulation 18

Line-throwing appliances
A line-throwing appliance complying with the requirements of section 7.1 of the Code shall be provided.

**Regulation 19**

**Emergency training and drills**

1. This regulation applies to all ships.

2. Familiarity with safety installations and practice musters

2.1 Every crew member with assigned emergency duties shall be familiar with these duties before the voyage begins.

2.2 On a ship engaged on a voyage where passengers are scheduled to be on board for more than 24 h, 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.

2.3 Whenever new passengers embark, a passenger safety briefing shall be given immediately before sailing, or immediately after sailing. The briefing shall include the instructions required by regulations 8.2 and 8.4, and shall be made by means of an announcement, in one or more languages likely to be understood by the passengers. The announcement shall be made on the ship's public address system, or by other equivalent means likely to be heard at least by the passengers who have not yet heard it during the voyage. The briefing may be included in the muster required by paragraph 2.2 if the muster is held immediately upon departure. Information cards or posters or video programmes displayed on ships video displays may be used to supplement the briefing, but may not be used to replace the announcement.

3. Drills

3.1 Drills shall, as far as practicable, be conducted as if there were an actual emergency.

3.2 Every crew member 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. When a ship enters service for the first time, after modification of a major character or when a new crew is engaged, these drills shall be held before sailing. The Administration may accept other arrangements that are at least equivalent for those classes of ships for which this is impracticable.

3.3 Abandon ship drill

3.3.1 Each abandon ship drill shall include:

.1 summoning of passengers and crew to muster stations with the alarm required by regulation 6.4.2 followed by drill announcement on the public address or other
communication system and ensuring that they are made aware of the order to abandon ship;

.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;

.8 a mock search and rescue of passengers trapped in their staterooms; and

.9 instruction in the use of radio life-saving appliances.

3.3.2 Different lifeboats shall, as far as practicable, be lowered in compliance with the requirements of paragraph 3.3.1.5 at successive drills.

3.3.3 Except as provided in paragraphs 3.3.4 and 3.3.5, 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.

3.3.4 Lowering into the water, rather than launching of a lifeboat arranged for free-fall launching, is acceptable where free-fall launching is impracticable provided the lifeboat is free-fall launched with its assigned operating crew aboard and manoeuvred in the water at least once every six months. However, in cases where it is impracticable, the Administration may extend this period to 12 months provided that arrangements are made for simulated launching which will take place at intervals of not more than 6 months.

3.3.5 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.

3.3.6 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.

3.3.7 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.*

* Refer to the Guidelines on Training for the Purpose of Launching Lifeboats and Rescue
3.3.8 If a ship is fitted with marine evacuation systems, drills shall include exercising of the procedures required for the deployment of such a system up to the point immediately preceding actual deployment of the system. This aspect of drills should be augmented by regular instruction using the on-board training aids required by regulation 35.4. Additionally every system party member shall, as far as practicable, be further trained by participation in a full deployment of a similar system into water, either on board a ship or ashore, at intervals of not longer than 2 years, but in no case longer than 3 years. This training can be associated with the deployments required by regulation 20.8.2.

3.3.9 Emergency lighting for mustering and abandonment shall be tested at each abandon ship drill.

3.4 Fire drills

3.4.1 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 ships and the cargo.

3.4.2 Each fire drill shall include:

.1 reporting to stations and preparing for the duties described in the muster list required by regulation 8;
.2 starting of a fire pump, using at least the two required jets of water to show that the system is in proper working order;
.3 checking of fireman's outfit and other personal rescue equipment;
.4 checking of relevant communication equipment;
.5 checking the operation of watertight doors, fire doors, fire dampers and main inlets and outlets of ventilation systems in the drill area; and
.6 checking the necessary arrangements for subsequent abandoning of the ship.

3.4.3 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.

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, and in the use of the ship's fire-extinguishing appliances shall be given as soon as possible.
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. Instructions in the use of the ship's fire-extinguishing appliances, 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 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 Every crew member 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; and
   .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.

Regulation 20

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 36 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 36.

4 Maintenance of falls

4.1 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.

4.2 The Administration may accept in lieu of the "end for ending" required in paragraph 4.1, periodic inspection of the falls and their renewal whenever necessary due to deterioration or at intervals of not more than 4 years, whichever one is 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 for a total period of not less than 3 min provided the ambient temperature is above the minimum temperature required for starting and running the engine. During this period of time, it should be demonstrated that the gear box and gear box train are engaging satisfactorily. If the special characteristics of an outboard motor fitted to a rescue boat would not allow it to be run other than with its propeller submerged for a period of 3 min, it should be run for such period as prescribed in the manufacturer's handbook. In special cases the Administration may waive this requirement for ships constructed before 1 July 1986; and

.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 36.1 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, marine evacuation systems, and inflated rescue boats.

8.1 Every inflatable liferaft, inflatable lifejacket, and marine evacuation system shall be serviced:

.1 at intervals not exceeding 12 months, provided where in any case this is impracticable, the Administration may extend this period to 17 months; and

.2 at an approved servicing station which is competent to service them, maintains proper servicing facilities and uses only properly trained personnel.*

8.2 Rotational deployment of marine evacuation systems

In addition to or in conjunction with the servicing intervals of marine evacuation systems required by paragraph 8.1, each marine evacuation system should be deployed from the ship on a rotational basis at intervals to be agreed by the Administration provided that each system is to be deployed at least once every six years.

8.3 An Administration which approves new and novel inflatable liferaft arrangements pursuant to regulation 4 may allow for extended service intervals on the following conditions:

8.3.1 The new and novel liferaft arrangement has proved to maintain the same standard, as required by testing procedure, during extended service intervals.

8.3.2 The liferaft system shall be checked on board by certified personnel according to paragraph 8.1.1.

* Refer to the Recommendation on Conditions for the Approval of Servicing Stations for Inflatable Liferafts adopted by the Organization by resolution A.761(18).
8.3.3 Service at intervals not exceeding 5 years shall be carried out in accordance with the recommendations of the Organization.

8.4 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.

8.5 An Administration which permits extension of liferaft service intervals in accordance with paragraph 8.3 shall notify the Organization of such action in accordance with regulation I/5(b).

9 Periodic servicing of hydrostatic release units

Hydrostatic release units, other than disposable hydrostatic release units, shall be serviced:

.1 at intervals not exceeding 12 months, provided where in any case this is impracticable, the Administration may extend this period to 17 months; and

.2 at a servicing station which is competent to service them, maintains proper servicing facilities and uses only properly trained personnel.

10 Marking of stowage locations

* Refer to the Recommendation on Conditions for the Approval of Servicing Stations for Inflatable Liferafts, adopted by the Organization by resolution A.761(18).
Containers, brackets, racks, and other similar stowage locations for life-saving equipment shall be marked with symbols in accordance with the recommendations of the Organization*, indicating the devices stowed in that location for that purpose. If more than one device is stowed in that location, the number of devices shall also be indicated.

11 Periodic servicing of launching appliances and on-load release gear

11.1 Launching appliances:

.1 shall be serviced at recommended intervals in accordance with instructions for on-board maintenance as required by regulation 36;

.2 shall be subjected to a thorough examination at intervals not exceeding 5 years; and

.3 shall upon completion of the examination in .2 be subjected to a dynamic test of the winch brake in accordance with paragraph 6.1.2.5.2 of the Code.

11.2 Lifeboat on-load release gear shall be:

.1 serviced at recommended intervals in accordance with instructions for on-board maintenance as required by regulation 36;

.2 subjected to a thorough examination and test during the surveys required by regulation 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 lifeboat when loaded with its full complement of persons and equipment whenever the release gear is overhauled. Such overhauling and test shall be carried out at least once every 5 years.**

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* Refer to the Symbols Related to Life-Saving Appliances and Arrangements, adopted by the Organization by resolution A.760(18).

** Refer to the Recommendation on Testing of Life-Saving Appliances, adopted by the Organization by resolution A.689(17), as it may be amended.
SECTION II - PASSENGER SHIPS
(ADDITIONAL REQUIREMENTS)

Regulation 21

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 partially or totally enclosed lifeboats complying with the requirements of section 4.5 or 4.6 of the Code 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 inflatable or rigid liferafts shall comply with the requirements of section 4.2 or 4.3 of the Code and shall be served by launching appliances equally distributed on each side of the ship; and

.2 in addition, inflatable or rigid liferafts complying with the requirements of section 4.2 or 4.3 of the Code 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 partially or totally enclosed lifeboats complying with the requirements of section 4.5 or 4.6 of the Code of such aggregate capacity as will accommodate at least 30% of the total number of persons on board. The lifeboats shall, as far as practicable, be equally distributed on each side of the ship. In addition inflatable or rigid liferafts complying with the requirements of section 4.2 or 4.3 of the Code shall be carried 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, inflatable or rigid liferafts complying with the requirements of section 4.2 or 4.3 of the Code 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 standards 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 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, inflatable or rigid liferafts complying with the requirements of section 4.2 or 4.3 of the Code 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 are 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;

.3 if the rescue boat required by paragraph 2.2 is also a partially or totally enclosed lifeboat complying with the requirements of section 4.5 or 4.6 of the Code, 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; and

.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 those which are 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.

1.6 A marine evacuation system or systems complying with section 6.2 of the Code may be substituted for the equivalent capacity of liferafts and launching appliances required by paragraph 1.1.1 or 1.2.1.

2 Rescue boats

2.1 Passenger ships of 500 gross tonnage and over shall carry at least one rescue boat complying with the requirements of section 5.1 of the Code on each side of the ship.

2.2 Passenger ships of less than 500 gross tonnage shall carry at least one rescue boat complying with the requirements of section 5.1 of the Code.
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 22

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 regulation 7.1 and section 2.1 of the Code prescribed in the following table:

<table>
<thead>
<tr>
<th>Length of ship in metres</th>
<th>Minimum number of lifebuoys</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 60</td>
<td>8</td>
</tr>
<tr>
<td>60 and under 120</td>
<td>12</td>
</tr>
<tr>
<td>120 and under 180</td>
<td>18</td>
</tr>
<tr>
<td>180 and under 240</td>
<td>24</td>
</tr>
<tr>
<td>240 and over</td>
<td>30</td>
</tr>
</tbody>
</table>

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

2.1 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.

2.2 Where lifejackets for passengers are stowed in staterooms which are located remotely from direct routes between public spaces and muster stations, the additional lifejackets for these passengers required under regulation 7.2.2, shall be stowed either in the public spaces, the muster
stations, or on direct routes between them. The lifejackets shall be stowed so that their distribution and donning does not impede orderly movement to muster stations and survival craft embarkation stations.

3 Lifejacket lights

3.1 On all passenger ships each lifejacket shall be fitted with a light complying with the requirements of paragraph 2.2.3 of the Code.

3.2 Lights fitted on lifejackets on board passenger ships prior to 1 July 1998 and not complying fully with paragraph 2.2.3 of the Code may be accepted by the Administration until the lifejacket light would normally be replaced or until the first periodical survey after 1 July 2002, whichever is the earliest.

4 Immersion suits and thermal protective aids

4.1 All passenger ships shall carry for each lifeboat on the ship at least three immersion suits complying with the requirements of section 2.3 of the Code and, in addition, a thermal protective aid complying with the requirements of section 2.5 of the Code 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, they are unnecessary.

4.2 The provisions of paragraph 4.1.1 also apply to partially or totally enclosed lifeboats not complying with the requirements of section 4.5 or 4.6 of the Code, provided they are carried on ships constructed before 1 July 1986.

Regulation 23

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; and

.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 24**

**Stowage of survival craft**

The stowage height of a survival craft on a passenger ship shall take into account the requirements of regulation 13.1.2, the escape provisions of regulation II-2/28, the size of the ship, and the weather conditions likely to be encountered in its intended area of operation. For a davit-launched survival craft, the height of the davit head with the survival craft in embarkation position, shall, as far as practicable, not exceed 15 m to the waterline when the ship is in its lightest seagoing condition.

**Regulation 25**

**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; and

.2 have ample room for marshalling and instruction of the passengers, but at least 0.35 m² per passenger.

**Regulation 26**

**Additional requirements for ro-ro passenger ships**

1 This regulation applies to all ro-ro passenger ships. Ro-ro passenger ships constructed:

.1 on or after 1 July 1998 shall comply with the requirements of paragraphs 2.3, 2.4, 3.1, 3.2, 3.3, 4 and 5;

.2 on or after 1 July 1986 and before 1 July 1998 shall comply with the requirements of paragraph 5 not later than the first periodical survey after 1 July 1998 and with the requirements of paragraphs 2.3, 2.4, 3 and 4 not later than the first periodical survey after 1 July 2000; and

.3 before 1 July 1986 shall comply with the requirements of paragraph 5 not later than the first periodical survey after 1 July 1998 and with the requirements of paragraphs 2.1, 2.2, 2.3, 2.4, 3 and 4 not later than the first periodical survey after 1 July 2000.
2 Liferafts

2.1 The ro-ro passenger ship's liferafts shall be served by marine evacuation systems complying with the requirements of section 6.2 of the Code or launching appliances complying with the requirements of paragraph 6.1.5 of the Code, equally distributed on each side of the ship.

2.2 Every liferaft on ro-ro passenger ships shall be provided with float-free stowage arrangements complying with the requirements of regulation 13.4.

2.3 Every liferaft on ro-ro passenger ships shall be of a type fitted with a boarding ramp complying with the requirements of paragraph 4.2.4.1 or 4.3.4.1 of the Code, as appropriate.

2.4 Every liferaft on ro-ro passenger ships shall either be automatically self-righting or be a canopied reversible liferaft which is stable in a seaway and is capable of operating safely whichever way up it is floating. Alternatively, the ship shall carry automatically self-righting liferafts or canopied reversible liferafts, in addition to its normal complement of liferafts, of such aggregate capacity as will accommodate at least 50% of the persons not accommodated in lifeboats. This additional liferaft capacity shall be determined on the basis of the difference between the total number of persons on board and the number of persons accommodated in lifeboats. Every such liferaft shall be approved by the Administration having regard to the recommendations adopted by the Organization.*

3 Fast rescue boats

3.1 At least one of the rescue boats on a ro-ro passenger ship shall be a fast rescue boat approved by the Administration having regard to the recommendations adopted by the Organization.**

3.2 Each fast rescue boat shall be served by a suitable launching appliance approved by the Administration. When approving such launching appliances, the Administration shall take into account that the fast rescue boat is intended to be launched and retrieved even under severe adverse weather conditions, and also shall have regard to the recommendations adopted by the Organization.**

* Refer to the requirements for automatically self-righting liferafts and canopied reversible liferafts, to be developed by the Organization.

** Refer to recommendations to be adopted by the Organization.
3.3 At least two crews of each fast rescue boat shall be trained and drilled regularly having regard to the Seafarers Training, Certification and Watchkeeping (STCW) Code and recommendations adopted by the Organization, including all aspects of rescue, handling, manoeuvring, operating these craft in various conditions, and righting them after capsize.

3.4 In the case where the arrangement or size of a ro-ro passenger ship, constructed before 1 July 1997, is such as to prevent the installation of the fast rescue boat required by paragraph 3.1, the fast rescue boat may be installed in place of an existing lifeboat which is accepted as a rescue boat or, in the case of ships constructed prior to 1 July 1986, boats for use in an emergency, provided that all of the following conditions are met:

.1 the fast rescue boat installed is served by a launching appliance complying with the provisions of paragraph 3.2;

.2 the capacity of the survival craft lost by the above substitution is compensated by the installation of liferafts capable of carrying at least an equal number of persons served by the lifeboat replaced; and

.3 such liferafts are served by the existing launching appliances or marine evacuation systems.

4 Means of rescue

4.1 Each ro-ro passenger ship shall be equipped with efficient means for rapidly recovering survivors from the water and transferring survivors from rescue units or survival craft to the ship.

4.2 The means of transfer of survivors to the ship may be part of a marine evacuation system, or may be part of a system designed for rescue purposes.

4.3 If the slide of a marine evacuation system is intended to provide the means of transfer of survivors to the deck of the ship, the slide shall be equipped with handlines or ladders to aid in climbing up the slide.

5 Lifejackets

5.1 Notwithstanding the requirements of regulations 7.2 and 22.2, a sufficient number of lifejackets shall be stowed in the vicinity of the muster stations so that passengers do not have to return to their cabins to collect their lifejackets.

5.2 In ro-ro passenger ships, each lifejacket shall be fitted with a light complying with the

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*** Refer to the Recommendation on training requirements for crews of fast rescue boats, adopted by the Organization by resolution A.771(18) and section A-VI/2, table A-VI/2-2 "Specification of the minimum standard of competence in fast rescue boats" of the Seafarers' Training, Certification and Watchkeeping (STCW) Code.
requirements of paragraph 2.2.3 of the Code.

**Regulation 27**

**Information on passengers**

1 All persons on board all passenger ships shall be counted prior to departure.

2 Details of persons who have declared a need for special care or assistance in emergency situations shall be recorded and communicated to the master prior to departure.

3 In addition, not later than 1 January 1999, the names and gender of all persons on board, distinguishing between adults, children and infants shall be recorded for search and rescue purposes.

4 The information required by paragraphs 1, 2 and 3 shall be kept ashore and made readily available to search and rescue services when needed.

5 Administrations may exempt passenger ships from the requirements of paragraph 3, if the scheduled voyages of such ships render it impracticable for them to prepare such records.

**Regulation 28**

**Helicopter landing and pick-up areas**

1 All ro-ro passenger ships shall be provided with a helicopter pick-up area approved by the Administration having regard to the recommendations adopted by the Organization.*

2 Passenger ships of 130 m in length and upwards, constructed on or after 1 July 1999, shall be fitted with a helicopter landing area approved by the Administration having regard to the recommendations adopted by the Organization. **

**Regulation 29**

**Decision support system for masters of passenger ships**

1 This regulation applies to all passenger ships. Passenger ships constructed before 1 July 1997 shall comply with the requirements of this regulation not later than the date of the first periodical survey after 1 July 1999.

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* Refer to the Merchant Ship Search and Rescue Manual (MERSAR), adopted by the Organization by resolution A.229(VII), as amended and as it may be amended.

** Refer to recommendations to be developed by the Organization.
2 In all passenger ships, a decision support system for emergency management shall be provided on the navigation bridge.

3 The system shall, as a minimum, consist of a printed emergency plan or plans. All foreseeable emergency situations shall be identified in the emergency plan or plans, including, but not limited to, the following main groups of emergencies:

   .1 fire;
   .2 damage to ship;
   .3 pollution;
   .4 unlawful acts threatening the safety of the ship and the security of its passengers and crew;
   .5 personnel accidents;
   .6 cargo-related accidents; and
   .7 emergency assistance to other ships.

4 The emergency procedures established in the emergency plan or plans shall provide decision support to masters for handling any combination of emergency situations.

5 The emergency plan or plans shall have a uniform structure and be easy to use. Where applicable, the actual loading condition as calculated for the passenger ship's voyage stability shall be used for damage control purposes.

6 In addition to the printed emergency plan or plans, the Administration may also accept the use of a computer-based decision support system on the navigation bridge which provides all the information contained in the emergency plan or plans, procedures, checklists, etc., which is able to present a list of recommended actions to be carried out in foreseeable emergencies.

Regulation 30

*** Refer to the International Safety Management (ISM) Code, chapter 8 and the guidelines for a structure of an integrated system for shipboard emergency plans scheduled to be finalized in 1996.
Drills

1. This regulation applies to all passenger ships.

2. On passenger ships, an abandon ship drill and fire drill shall take place weekly. The entire crew need not be involved in every drill, but each crew member must participate in an abandon ship drill and a fire drill each month as required in regulation 19.3.2. Passengers shall be strongly encouraged to attend these drills.
SECTION III - CARGO SHIPS
(ADDITIONAL REQUIREMENTS)

Regulation 31

Survival craft and rescue boats

1 Survival craft

1.1 Cargo ships shall carry:

.1 one or more totally enclosed lifeboats complying with the requirements of section 4.6 of the Code of such aggregate capacity on each side of the ship as will accommodate the total number of persons on board; and

.2 in addition, one or more inflatable or rigid liferafts, complying with the requirements of section 4.2 or 4.3 of the Code, 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 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.

1.2 In lieu of meeting the requirements of paragraph 1.1, cargo ships may carry:

.1 one or more free-fall lifeboats, complying with the requirements of section 4.7 of the Code, 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 inflatable or rigid liferafts complying with the requirements of section 4.2 or 4.3 of the Code, 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 inflatable or rigid liferafts complying with the requirements of section 4.2 or 4.3 of the Code 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 are 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;
.3 if the rescue boat required by paragraph 2 is also a totally enclosed lifeboat complying with the requirements of section 4.6 of the Code, 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; and

.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 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.

1.4 Cargo ships where the horizontal distance from the extreme end of the stem or stern of the ship to the nearest end of the closest survival craft is more than 100 m 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. 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 16.1.1, 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 totally enclosed lifeboats complying with the requirements of section 4.6 of the Code, lifeboats with a self-contained air support system complying with the requirements of section 4.8 of the Code.

1.7 Oil tankers, chemical tankers and gas carriers carrying cargoes having a flashpoint not exceeding 60°C (closed cup test) shall carry, in lieu of totally enclosed lifeboats complying with the requirements of section 4.6 of the Code, fire-protected lifeboats complying with the requirements of section 4.9 of the Code.

2 Rescue boats

Cargo ships shall carry at least one rescue boat complying with the requirements of section 5.1 of the Code. 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, all cargo ships constructed before 1 July 1986 shall carry:

.1 one or more liferafts 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. 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; and

.2 where the horizontal distance from the extreme end of the stem or stern of the ship to the nearest end of the closest survival craft is more than 100 m, 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 32

Personal life-saving appliances

1 Lifebuoys

1.1 Cargo ships shall carry not less than the number of lifebuoys complying with the requirements of regulation 7.1 and section 2.1 of the Code prescribed in the following table:

<table>
<thead>
<tr>
<th>Length of ship in metres</th>
<th>Minimum number of lifebuoys</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 100</td>
<td>8</td>
</tr>
<tr>
<td>100 and under 150</td>
<td>10</td>
</tr>
<tr>
<td>150 and under 200</td>
<td>12</td>
</tr>
<tr>
<td>200 and over</td>
<td>14</td>
</tr>
</tbody>
</table>

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.

2.2 On cargo ships, each lifejacket shall be fitted with a lifejacket light complying with the requirements of paragraph 2.2.3 of the Code.
2.3 Lights fitted on lifejackets on board cargo ships prior to 1 July 1998 and not complying fully with paragraph 2.2.3 of the Code may be accepted by the Administration until the lifejacket light would normally be replaced or until the first periodical survey after 1 July 2001, whichever is the earliest.

3 Immersion suits and thermal protective aids

3.1 This paragraph applies to all cargo ships.

3.2 Cargo ships shall carry for each lifeboat on the ship at least three immersion suits complying with the requirements of section 2.3 of the Code or, if the Administration considers it necessary and practicable, one immersion suit complying with the requirements of section 2.3 of the Code for every person on board the ship; however, the ship shall carry in addition to the thermal protective aids required by paragraphs 4.1.5.1.24, 4.4.8.31 and 5.1.2.2.13 of the Code, thermal protective aids complying with the requirements of section 2.5 of the Code 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 31.1.3 shall carry immersion suits complying with the requirements of section 2.3 of the Code 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 section 4.6 of the
Code.

Regulation 33

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 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.

 SECTION IV - LIFE-SAVING APPLIANCES AND ARRANGEMENTS REQUIREMENTS

Regulation 34

All life-saving appliances and arrangements shall comply with the applicable requirements of the Code.

 SECTION V - MISCELLANEOUS

Regulation 35

Training manual and on-board training aids

1 This regulation applies to all ships.

2 A training manual complying with the requirements of paragraph 3 shall be provided in each crew mess room and recreation room or in each crew cabin.

3 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, immersion suits and anti-exposure suits, as appropriate;

   .2 muster at the assigned stations;
boarding, launching, and clearing the survival craft and rescue boats, including, where applicable, use of marine evacuation systems;

.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; and

.18 instructions for emergency repair of the life-saving appliances.

4 Every ship fitted with a marine evacuation system shall be provided with on-board training aids in the use of the system.

**Regulation 36**

**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 20.7;
.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; and
.7 log for records of inspections and maintenance.

**Regulation 37**

**Muster list and emergency instructions**

1 The muster list shall specify details of the general emergency alarm and public address system prescribed by section 7.2 of the Code 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 Each passenger ship shall have procedures in place for locating and rescuing passengers trapped in their staterooms.

3 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; and
   .8 special duties assigned in respect to the use of fire-fighting equipment and installations.

4 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.

5 The muster list shall specify substitutes for key persons who may become disabled, taking into account that different emergencies may call for different actions.

6 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; and
.5 ensuring that a supply of blankets is taken to the survival craft.

7 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.

8 The format of the muster list used on passenger ships shall be approved."

CHAPTER VI
CARRIAGE OF CARGOES

Regulation 2 - Cargo information

9 Existing subparagraph 2 of paragraph 2 is replaced by the following:

".2 in the case of bulk cargo, information on the stowage factor of the cargo, the trimming procedures, likelihood of shifting including angle of repose, if applicable, and any other relevant special properties. 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."

Regulation 7 - Stowage of bulk cargo

10 The existing text of regulation 7 is replaced by the following:

"Regulation 7
Loading, unloading and stowage of bulk cargoes"

* Refer to the Code of Practice for the Safe Loading and Unloading of Bulk Carriers to be developed for adoption by the twentieth session of the Assembly of the Organization.
1. For the purpose of this regulation, *terminal representative* means a person appointed by the terminal or other facility, where the ship is loading or unloading, who has responsibility for operations conducted by that terminal or facility with regard to the particular ship.

2. To enable the master to prevent excessive stresses in the ship's structure, the ship shall be provided with a booklet, which shall be written in a language with which the ship's officers responsible for cargo operations are familiar. If this language is not English, the ship shall be provided with a booklet written also in the English language. The booklet shall, as a minimum, include:

   .1 stability data, as required by regulation II-1/22;
   .2 ballasting and deballasting rates and capacities;
   .3 maximum allowable load per unit surface area of the tank top plating;
   .4 maximum allowable load per hold;
   .5 general loading and unloading instructions with regard to the strength of the ship's structure including any limitations on the most adverse operating conditions during loading, unloading, ballasting operations and the voyage;
   .6 any special restrictions such as limitations on the most adverse operating conditions imposed by the Administration or organization recognised by it, if applicable; and
   .7 where strength calculations are required, maximum permissible forces and moments on the ship's hull during loading, unloading and the voyage.

3. Before a solid bulk cargo is loaded or unloaded, the master and the terminal representative shall agree on a plan* which shall ensure that the permissible forces and moments on the ship are not exceeded during loading or unloading, and shall include the sequence, quantity and rate of loading or unloading, taking into consideration the speed of loading or unloading, the number of pours and the deballasting or ballasting capability of the ship. The plan and any subsequent amendments thereto shall be lodged with the appropriate authority of the port State.

4. 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.

5. 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

* Refer to the Code of Practice for the Safe Loading and Unloading of Bulk Carriers to be developed for adoption by the twentieth session of the Assembly of the Organization.
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.

6 The master and terminal representative shall ensure that loading and unloading operations are conducted in accordance with the agreed plan.

7 If during loading or unloading any of the limits of the ship referred to in paragraph 2 are exceeded or are likely to become so if the loading or unloading continues, the master has the right to suspend operation and the obligation to notify accordingly the appropriate authority of the port State with which the plan has been lodged. The master and the terminal representative shall ensure that corrective action is taken. When unloading cargo, the master and terminal representative shall ensure that the unloading method does not damage the ship's structure.

8 The master shall ensure that ship's personnel continuously monitor cargo operations. Where possible, the ship's draught shall be checked regularly during loading or unloading to confirm the tonnage figures supplied. Each draught and tonnage observation shall be recorded in a cargo log-book. If significant deviations from the agreed plan are detected, cargo or ballast operations or both shall be adjusted to ensure that the deviations are corrected."

CHAPTER XI

SPECIAL MEASURES TO ENHANCE MARITIME SAFETY

Regulation 1 - Authorization of recognized organizations

11 The existing text of the regulation is replaced by the following:

"Organizations referred to in regulation I/6 shall comply with the Guidelines adopted by the Organization by resolution A.739(18), as may be amended by the Organization and the Specifications adopted by the Organization by resolution A.789(19), 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."

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ANNEX 3

RESOLUTION MSC.48(66)
(adopted on 4 June 1996)

ADOPTION OF THE INTERNATIONAL LIFE-SAVING APPLIANCE (LSA) CODE

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECOGNIZING the need to provide international standards for life-saving appliances required by chapter III of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended,

NOTING resolution MSC.47(66) by which it adopted, inter alia, amendments to chapter III of the SOLAS Convention to make the provisions of the International Life-Saving Appliance (LSA) Code mandatory under that Convention on or after 1 July 1998,

HAVING CONSIDERED, at its sixty-sixth session, the text of the proposed LSA Code,

1. ADOPTS the International Life-Saving Appliance (LSA) Code the text of which is set out in the Annex to the present resolution;

2. NOTES that under the amendments to chapter III of the 1974 SOLAS Convention, amendments to the LSA Code shall be adopted, brought into force and shall take effect in accordance with the provisions of article VIII of that Convention concerning the amendments procedure applicable to the Annex to the Convention other than chapter I;

3. REQUESTS the Secretary-General to transmit certified copies of the present resolution and the text of the LSA Code contained in the Annex to all Contracting Governments to the Convention;

4. 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

INTERNATIONAL LIFE-SAVING APPLIANCE (LSA) CODE

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THE INTERNATIONAL LIFE-SAVING APPLIANCE CODE

PREAMBLE

1 The purpose of this Code is to provide international standards for life-saving appliances required by chapter III of the International Convention for the Safety of Life at Sea (SOLAS), 1974.

2 On and after 1 July 1998, the requirements of this Code will be mandatory under the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended. Any future amendment to the Code will be adopted and brought into force in accordance with the procedure laid down in Article VIII of that Convention.
CHAPTER I - GENERAL

1.1 Definitions

1.1.1 Convention means the International Convention for the Safety of Life at Sea, 1974, as amended.

1.1.2 Effective clearing of the ship is the ability of the free-fall lifeboat to move away from the ship after free-fall launching without using its engine.

1.1.3 Free-fall acceleration is the rate of change of velocity experienced by the occupants during launching of a free-fall lifeboat.

1.1.4 Free-fall certification height is the greatest launching height for which the lifeboat is to be approved, measured from the still water surface to the lowest point on the lifeboat when the lifeboat is in the launch configuration.

1.1.5 Launching ramp angle is the angle between the horizontal and the launch rail of the lifeboat in its launching position with the ship on even keel.

1.1.6 Launching ramp length is the distance between the stern of the lifeboat and the lower end of the launching ramp.

1.1.7 Regulation means a regulation contained in the Annex to the Convention.

1.1.8 Required free-fall height is the greatest distance measured from the still water surface to the lowest point on the lifeboat when the lifeboat is in the launch configuration and the ship is in its lightest seagoing condition.

1.1.9 Retro-reflective material is a material which reflects in the opposite direction a beam of light directed on it.

1.1.10 Water-entry angle is the angle between the horizontal and the launch rail of the lifeboat when it first enters the water.

1.1.11 The terms used in this Code have the same meaning as those defined in regulation III/3.

1.2 General requirements for life-saving appliances

1.2.1 Paragraph 1.2.2.7 applies to life-saving appliances on all ships.

1.2.2 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°C;
if they are likely to be immersed in seawater during their use, operate throughout the seawater temperature range -1°C to +30°C;

where applicable, be rot-proof, corrosion-resistant, and not be unduly affected by seawater, oil or fungal attack;

where exposed to sunlight, be resistant to deterioration;

be of a highly visible colour on all parts where this will assist detection;

be fitted with retro-reflective material where it will assist in detection and in accordance with the recommendations of the Organization*;

if they are to be used in a seaway, be capable of satisfactory operation in that environment;

be clearly marked with approval information including the Administration which approved it, and any operational restrictions; and

where applicable, be provided with electrical short circuit protection to prevent damage or injury.

1.2.3 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. Permanent marking with a date of expiry is the preferred method of establishing the period of acceptability. Batteries not marked with an expiration date may be used if they are replaced annually, or in the case of a secondary battery (accumulator), if the condition of the electrolyte can be readily checked.

* Refer to the Recommendation on the Use and Fitting of Retro-Reflective Material on Life-saving Appliances, adopted by the Organization by resolution A.658(16), as it may be amended.
CHAPTER II - PERSONAL LIFE-SAVING APPLIANCES

2.1 Lifebuoys

2.1.1 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 h;

.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; and

.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.

2.1.2 Lifebuoy self-igniting lights

Self-igniting lights required by regulation III/7.1.3 shall:

.1 be such that they cannot be extinguished by water;

.2 be of white colour and 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 and not more than 70 flashes per min with at least the corresponding effective luminous intensity;

.3 be provided with a source of energy capable of meeting the requirement of paragraph 2.1.2.2 for a period of at least 2 h; and
2.1.3 **Lifebuoy self-activating smoke signals**

Self-activating smoke signals required by regulation III/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; and

.5 be capable of withstanding the drop test required by paragraph 2.1.1.6.

2.1.4 **Buoyant lifelines**

Buoyant lifelines required by regulation III/7.1.2 shall:

.1 be non-kinking;

.2 have a diameter of not less than 8 mm; and

.3 have a breaking strength of not less than 5 kN.

2.2 **Lifejackets**

2.2.1 **General requirements for lifejackets**

2.2.1.1 A lifejacket shall not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s.

2.2.1.2 An adult lifejacket shall be so constructed that:

.1 at least 75% of persons, who are completely unfamiliar with the lifejacket, can correctly don it within a period of one min without assistance, guidance or prior demonstration;

.2 after demonstration, all persons can correctly don it within a period of one min without assistance;

.3 it is clearly capable of being worn in only one way or, as far as is practicable, cannot be donned incorrectly;

.4 it is comfortable to wear; and
.5 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.

2.2.1.3 An adult 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° from the vertical position; and

.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.

2.2.1.4 An adult lifejacket shall allow the person wearing it to swim a short distance and to board a survival craft.

2.2.1.5 A child lifejacket shall be constructed and perform the same as an adult lifejacket except as follows:

.1 donning assistance is permitted for small children;

.2 it shall only be required to lift the mouth of an exhausted or unconscious wearer clear of the water a distance appropriate to the size of the intended wearer; and

.3 assistance may be given to board a survival craft, but wearer mobility shall not be significantly reduced.

2.2.1.6 In addition to the markings required by paragraph 1.2.2.9, a child lifejacket shall be marked with:

.1 the height or weight range for which the lifejacket will meet the testing and evaluation criteria recommended by the Organization;* and

.2 a "child" symbol as shown in the "child's lifejacket" symbol adopted by the Organization.**

2.2.1.7 A lifejacket shall have buoyancy which is not reduced by more than 5% after 24h submersion in fresh water.

* Refer to the Recommendation on Testing of Life-saving Appliances adopted by the Organization by resolution A.689.(17), as it may be amended.

** Refer to Symbols related to Life-saving Appliances and Arrangements adopted by the Organization by resolution A.760(18).
2.2.1.8 Each lifejacket shall be fitted with a whistle firmly secured by a cord.

2.2.2 **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 2.2.1 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 2.2.1.2, 2.2.1.3 and 2.2.1.4; and

.3 comply with the requirements of paragraph 2.2.1.7 after inflation by means of the automatic mechanism.

2.2.3 **Lifejacket lights**

2.2.3.1 Each lifejacket light shall:

.1 have a luminous intensity of not less than 0.75 cd in all directions of the upper hemisphere;

.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; and

.4 be of white colour.

2.2.3.2 If the light referred to in paragraph 2.2.3.1 is a flashing light it shall, in addition:

.1 be provided with a manually operated switch; and

.2 flash at a rate of not less than 50 flashes and not more than 70 flashes per min with an effective luminous intensity of at least 0.75 cd.

2.3 **Immersion suits**

2.3.1 **General requirements for immersion suits**

2.3.1.1 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.

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* Refer to paragraph 3.1.3 of the Recommendation on Testing of Life-saving Appliances
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; and

adopted by the Organization by resolution A.689(17), as it may be amended.
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.

2.3.1.2 An immersion suit which also complies with the requirements of section 2.2 may be classified as a lifejacket.

2.3.1.3 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 associated with 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.

2.3.1.4 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 paragraph 2.2.3 and the whistle prescribed by paragraph 2.2.1.8.

2.3.1.5 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.

2.3.2 Thermal performance requirements for immersion suits

2.3.2.1 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; and
.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 1h in calm circulating water at a temperature of 5°C, the wearer's body core temperature does not fall more than 2°C.

2.3.2.2 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 6h immersion in calm circulating water at a temperature of between 0°C and 2°C.

2.3.3 Buoyancy requirements

A person in fresh water wearing either an immersion suit 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.
2.4 Anti-exposure suits

2.4.1 General requirements for anti-exposure suits

2.4.1.1 The anti-exposure suit shall be constructed with waterproof materials such that it:

1. provides inherent buoyancy of at least 70 N;
2. is made of material which reduces the risk of heat stress during rescue and evacuation operations;
3. covers the whole body with the exception of the head and hands and, where the Administration so permits, feet; gloves and a hood shall be provided in such a manner as to remain available for use with the anti-exposure suits;
4. can be unpacked and donned without assistance within 2 min;
5. does not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s;
6. is equipped with a pocket for a portable VHF telephone; and
7. has a lateral field of vision of at least 120°.

2.4.1.2 An anti-exposure suit which also complies with the requirements of section 2.2 may be classified as a lifejacket.

2.4.1.3 An anti-exposure suit shall permit the person wearing it, to:

1. climb up and down a vertical ladder of at least 5 m in length;
2. jump from a height of not less than 4.5 m into the water with feet first, without damaging or dislodging the suit, or being injured;
3. swim through the water at least 25 m and board a survival craft;
4. don a lifejacket without assistance; and
5. perform all duties associated with abandonment, assist others and operate a rescue boat.

2.4.1.4 An anti-exposure suit shall be fitted with a light complying with the requirements of paragraph 2.2.3 and the whistle prescribed by paragraph 2.2.1.8.
2.4.2 Thermal performance requirements for anti-exposure suits

2.4.2.1 An anti-exposure suit shall:

.1 if made of material which has no inherent insulation, be marked with instructions that it must be worn in conjunction with warm clothing; and

.2 be so constructed, that when worn as marked, the suit continues to provide sufficient thermal protection following one jump into the water which totally submerges the wearer and shall ensure that when it is worn in calm circulating water at a temperature of 5°C, the wearer's body core temperature does not fall at a rate of more than 1.5°C per hour, after the first 0.5 h.

2.4.3 Stability requirements

A person in fresh water wearing an anti-exposure suit complying with the requirements of this section shall be able to turn from a face-down to a face-up position in not more than 5 s and shall be stable face-up. The suit shall have no tendency to turn the wearer face-down in moderate sea condition.

2.5 Thermal protective aids

2.5.1 A thermal protective aid shall be made of waterproof material having a thermal conductance of not more than 7800 W/(m²·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.

2.5.2 The thermal protective aid shall:

.1 cover the whole body of persons of all sizes 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; and

.3 permit the wearer to remove it in the water in not more than 2 min, if it impairs ability to swim.

2.5.3 The thermal protective aid shall function properly throughout an air temperature range -30°C to +20°C.
CHAPTER III - VISUAL SIGNALS

3.1 Rocket parachute flares

3.1.1 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; and

.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.

3.1.2 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; and

.5 not damage its parachute or attachments while burning.

3.2 Hand flares

3.2.1 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; and

.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.

3.2.2 The hand flare shall:

.1 burn with a bright red colour;
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; and

.4 continue to burn after having been immersed for a period of 10s under 100 mm of water.

3.3 Buoyant smoke signals

3.3.1 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; and

.3 have brief instructions or diagrams clearly illustrating the use of the buoyant smoke signal printed on its casing.

3.3.2 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; and

.4 continue to emit smoke when submerged in water for a period of 10 s under 100 mm of water.

CHAPTER IV - SURVIVAL CRAFT

4.1 General requirements for liferafts

4.1.1 Construction of liferafts

4.1.1.1 Every liferaft shall be so constructed as to be capable of withstanding exposure for 30 days afloat in all sea conditions.

4.1.1.2 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.

4.1.1.3 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.
4.1.1.4 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.

4.1.1.5 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 by persons clothed in immersion suits from inside and outside, and closed from inside, 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 be provided with means to mount a survival craft radar transponder at a height of at least 1 m above the sea; and

8. it shall have sufficient headroom for sitting occupants under all parts of the canopy.

4.1.2 Minimum carrying capacity and mass of liferafts

4.1.2.1 No liferaft shall be approved which has a carrying capacity of less than six persons calculated in accordance with the requirements of paragraph 4.2.3 or 4.3.3, as appropriate.

4.1.2.2 Unless the liferaft is to be launched by an approved launching appliance complying with the requirements of section 6.1 or is not required to be stowed in a position providing for easy side-to-side transfer, the total mass of the liferaft, its container and its equipment shall not be more than 185 kg.

4.1.3 Liferaft fittings

4.1.3.1 Lifelines shall be securely becketed around the inside and outside of the liferaft.

4.1.3.2 The liferaft shall be fitted with an efficient painter of length equal to not less than 10 m plus the distance from the stowed position to the waterline in the lightest seagoing condition or 15 m whichever is the greater. The breaking strength of the painter system, including its means of attachment to the liferaft, except the weak link required by paragraph 4.1.6, shall be not less than 15.0 kN for liferafts permitted to
accommodate more than 25 persons, not less than 10.0 kN for liferafts permitted to accommodate 9 to 25 persons and not less than 7.5 kN for any other liferaft.

4.1.3.3 A manually controlled lamp shall be fitted to the top of the liferaft canopy. The light shall be white and be capable of operating continuously for at least 12 h with a luminous intensity of not less than 4.3 cd in all directions of the upper hemisphere. However, if the light is a flashing light it shall flash at a rate of not less than 50 flashes and not more than 70 flashes per min for the 12 h operating period with an equivalent effective luminous intensity. The lamp shall light automatically when the canopy is erected. Batteries shall be of a type that does not deteriorate due to dampness or humidity in the stowed liferaft.

4.1.3.4 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 erected and be of sufficient intensity to permit reading of survival and equipment instructions. Batteries shall be of a type that does not deteriorate due to damp or humidity in the stowed liferaft.

4.1.4 Davit-launched liferafts

4.1.4.1 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.

4.1.4.2 Every passenger ship davit-launched liferaft shall be so arranged that it can be rapidly boarded by its full complement of persons.

4.1.4.3 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.

4.1.5 Equipment

4.1.5.1 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 nonfolding 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 nonfolding 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 if fitted, 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 if fitted shall be adequate in all sea conditions. The sea-anchors shall have means to prevent twisting of the line and shall be of a type which is unlikely to turn inside out between its shroud lines. The sea-anchor permanently attached to davit-launched liferafts and liferafts fitted on passenger ships shall be arranged for manual deployment only. All other liferafts are to have the sea-anchor deployed automatically when the liferaft inflates;

6 two buoyant paddles;

7 three tin-openers and a pair of scissors. 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 section 3.1;

11 six hand flares complying with the requirements of section 3.2;

12 two buoyant smoke signals complying with the requirements of section 3.3;

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, unless a survival craft radar transponder is stowed in the liferaft;

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 should be palatable, edible throughout the recommended shelf life, and packed in a manner which can be readily divided and easily opened. The 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 either 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 or 1 l per person may be replaced by a manually powered reverse osmosis desalinator, as described in paragraph 4.4.7.5, capable of producing an equal amount of fresh water in 2 days;

.20 one rustproof graduated drinking vessel;

.21 anti-seasickness medicine sufficient for at least 48 h and one seasickness bag for each person the liferaft is permitted to accommodate;

.22 instructions on how to survive*;

.23 instructions for immediate action; and

.24 thermal protective aids complying with the requirements of section 2.5 sufficient for 10% of the number of persons the liferaft is permitted to accommodate or two, whichever is the greater.

4.1.5.2 The marking required by paragraphs 4.2.6.3.5 and 4.3.6.7 on liferafts equipped in accordance with paragraph 4.1.5.1 shall be "SOLAS A PACK" in block capitals of the Roman alphabet.

4.1.5.3 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 4.1.5.1 are necessary, the Administration may allow the liferafts carried on any such ships to be provided with the equipment specified in paragraphs 4.1.5.1.1 to 4.1.5.1.6 inclusive, 4.1.5.1.8, 4.1.5.1.9, 4.1.5.1.13 to 4.1.5.1.16 inclusive and 4.1.5.1.21 to 4.1.5.1.24 inclusive and one half of the equipment specified in paragraphs 4.1.5.1.10 to 4.1.5.1.12 inclusive. The marking required by paragraphs 4.2.6.3.5 and 4.3.6.7 on such liferafts shall be "SOLAS B PACK" in block capitals of the Roman alphabet.

4.1.5.4 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.

4.1.6 Float-free arrangements for liferafts

4.1.6.1 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.

* Refer to the Instructions for Action in Survival Craft, adopted by the Organization by resolution A.657(16)
4.1.6.2 **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; and

.3 break under a strain of $2.2 \pm 0.4$ kN.

4.1.6.3 **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 permanently marked on the unit or identification plate securely attached to the unit, with the date of manufacture, type and serial number and whether the unit is suitable for use with a liferaft with a capacity of more than 25 persons;

.7 be such that each part connected to the painter system has a strength of not less than that required for the painter; and

.8 if disposable, in lieu of the requirement in paragraph 4.1.6.3.6 be marked with a means of determining its date of expiry.

4.2 **Inflatable liferafts**

4.2.1 Inflatable liferafts shall comply with the requirements of section 4.1 and, in addition, shall comply with the requirements of this section.

4.2.2 **Construction of inflatable liferafts**

4.2.2.1 The main buoyancy chamber shall be divided into not less than two separate compartments, each inflated through a nonreturn 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.

4.2.2.2 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.

4.2.2.3 The liferaft shall be capable of being inflated by one person. The liferaft shall be inflated with a nontoxic 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.

4.2.2.4 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 4.2.9.1.2 so that the working pressure can be maintained.

4.2.3 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 either immersion suits and lifejackets or, in the case of davit-launched liferafts, lifejackets, that can be seated with sufficient comfort and headroom without interfering with the operation of any of the liferaft's equipment.

4.2.4 Access into inflatable liferafts

4.2.4.1 At least one entrance shall be fitted with a semi-rigid boarding ramp capable of supporting a person weighing 100 kg, to enable persons to board the liferaft from the sea. The boarding ramp shall be 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.
4.2.4.2 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.

4.2.4.3 There shall be means inside the liferaft to assist persons to pull themselves into the liferaft from the ladder.

4.2.5 **Stability of inflatable liferafts**

4.2.5.1 Every inflatable liferaft shall be so constructed that, when fully inflated and floating with the canopy uppermost, it is stable in a seaway.

4.2.5.2 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.

4.2.5.3 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.

4.2.5.4 The liferaft shall be fitted with water pockets complying with the following requirements:

.1 the water pockets shall be of a highly visible colour;

.2 the design shall be such that the pockets fill to at least 60% of their capacity within 25 s of deployment;

.3 the pockets shall have an aggregate capacity of at least 220 l for liferafts up to 10 persons;

.4 the pockets for liferafts certified to carry more than 10 persons shall have an aggregate capacity of not less than 20 N·l, where N = number of persons carried; and

.5 the pockets shall be positioned symmetrically round the circumference of the liferaft. Means shall be provided to enable air to readily escape from underneath the liferaft.

4.2.6 **Containers for inflatable liferafts**

4.2.6.1 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; and

.3 as far as practicable watertight, except for drain holes in the container bottom.

4.2.6.2 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.

4.2.6.3 The container shall be marked with:
Markings on inflatable liferafts

4.2.7.1 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; and
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.

4.2.7.2 Provision shall be made for marking each liferaft with the name and port of registry of the ship to which it is to be fitted, in such a form that the ship identification can be changed at any time without opening the container.

Davit-launched inflatable liferafts

4.2.8.1 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 ± 3°C with all relief valves inoperative; and
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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.

4.2.8.2 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.

4.2.9 Additional equipment for inflatable liferafts

4.2.9.1 In addition to the equipment required by paragraph 4.1.5, every inflatable liferaft shall be provided with:

1. one repair outfit for repairing punctures in buoyancy compartments; and
2. one topping-up pump or bellows.

4.2.9.2 The knives required by paragraph 4.1.5.1.2 shall be safety knives, and the tin openers and scissors required by paragraph 4.1.5.1.7 shall be of the safety type.

4.3 Rigid liferafts

4.3.1 Rigid liferafts shall comply with the requirements of section 4.1 and, in addition, shall comply with the requirements of this section.

4.3.2 Construction of rigid liferafts

4.3.2.1 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.

4.3.2.2 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.

4.3.3 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 immersion suits and lifejackets, that can be seated with sufficient comfort and headroom without interfering with the operation of any of the liferaft's equipment.
4.3.4 **Access into rigid liferafts**

4.3.4.1 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 bowsing and embarkation facilities.

4.3.4.2 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.

4.3.4.3 There shall be means inside the liferaft to assist persons to pull themselves into the liferaft from the ladder.

4.3.5 **Stability of rigid liferafts**

4.3.5.1 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.

4.3.5.2 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.

4.3.6 **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); and
10. launching instructions.
4.3.7 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.

4.4 General requirements for lifeboats

4.4.1 Construction of lifeboats

4.4.1.1 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.

4.4.1.2 Each lifeboat shall be fitted with a certificate of approval, endorsed by the Administration, containing at least the following items:

- manufacturer's name and address;
- lifeboat model and serial number;
- month and year of manufacture;
- number of persons the lifeboat is approved to carry; and
- the approval information required under paragraph 1.2.2.9.

The certifying organization shall provide the lifeboat with a certificate of approval which, in addition to the above items, specifies:

- number of the certificate of approval;
- material of hull construction, in such detail as to ensure that compatibility problems in repair should not occur;
- total mass fully equipped and fully manned; and
- statement of approval as to sections 4.5, 4.6, 4.7, 4.8 or 4.9.

4.4.1.3 All lifeboats shall be of sufficient strength to:

1. enable them to be safely launched into the water when loaded with their full complement of persons and equipment; and
be capable of being launched and towed when the ship is making headway at a speed of 5 knots in calm water.

4.4.1.4 Hulls and rigid covers shall be fire-retardant or non-combustible.

4.4.1.5 Seating shall be provided on thwarts, benches or fixed chairs which are constructed so as to be capable of supporting:

.1 a static load equivalent to the number of persons each weighing 100 kg for which spaces are provided in compliance with the requirements of paragraph 4.4.2.2.2;

.2 a load of 100 kg in any single seat location when a lifeboat to be launched by falls is dropped into the water from a height of at least 3 m; and

.3 a load of 100 kg in any single seat location when a free-fall lifeboat is launched from a height of at least 1.3 times its free-fall certification height.

4.4.1.6 Except for free-fall lifeboats, each lifeboat to be launched by falls 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.

4.4.1.7 Except for free-fall lifeboats, each lifeboat to be launched by falls 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.

4.4.1.8 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; and

.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.

4.4.2 Carrying capacity of lifeboats

4.4.2.1 No lifeboat shall be approved to accommodate more than 150 persons.

4.4.2.2 The number of persons which a lifeboat to be launched by falls 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 lifejackets, 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.
4.4.2.3 Each seating position shall be clearly indicated in the lifeboat.

4.4.3 Access into lifeboats

4.4.3.1 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.

4.4.3.2 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.

4.4.3.3 Lifeboats shall have a boarding ladder that can be used at any boarding entrance 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.

4.4.3.4 The lifeboat shall be so arranged that helpless people can be brought on board either from the sea or on stretchers.

4.4.3.5 All surfaces on which persons might walk shall have a non-skid finish.

4.4.4 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.

4.4.5 Lifeboat freeboard and stability

4.4.5.1 All lifeboats shall be stable and have a positive GM value when loaded with 50% of the number of persons the lifeboat is permitted to accommodate in their normal positions to one side of the centreline.

4.4.5.2 Under the condition of loading in paragraph 4.4.5.1:

.1 each lifeboat with side openings near the gunwale 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; and

.2 each lifeboat without side openings near the gunwale shall not exceed an angle of heel of 20° and 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.

4.4.6 Lifeboat propulsion

4.4.6.1 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).

4.4.6.2 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, seating or other obstructions.

4.4.6.3 The engine shall be capable of operating for not less than 5 min after starting from cold with the lifeboat out of the water.

4.4.6.4 The engine shall be capable of operating when the lifeboat is flooded up to the centreline of the crank shaft.

4.4.6.5 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.

4.4.6.6 The exhaust pipe shall be so arranged as to prevent water from entering the engine in normal operation.

4.4.6.7 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.

4.4.6.8 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.

4.4.6.9 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 so that a shouted order can be heard. 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.

4.4.6.10 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.

4.4.6.11 Means shall be provided for recharging all engine starting, radio and searchlight 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 50 V which can be

* Refer to IEC 92-101
disconnected at the lifeboat embarkation station, or by means of a solar battery charger.

4.4.6.12 Water-resistant instructions for starting and operating the engine shall be provided and mounted in a conspicuous place near the engine starting controls.

4.4.7 **Lifeboat fittings**

4.4.7.1 All lifeboats except free-fall 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.

4.4.7.2 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.

4.4.7.3 Except in the vicinity of the rudder and propeller, suitable handholds shall be provided or a buoyant lifeline shall be becketed around the outside of the lifeboat above the waterline and within reach of a person in the water.

4.4.7.4 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.

4.4.7.5 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 4.4.8. The lifeboat shall be equipped with a means for collecting rain water, and in addition if required by the Administration means for producing drinking water from seawater with a manually powered desalinator. The desalinator must not be dependent upon solar heat, nor on chemicals other than seawater. Means shall be provided for the storage of collected water.

4.4.7.6 Every lifeboat to be launched by a fall or falls, except a free-fall lifeboat, shall be fitted with a release mechanism complying with the following requirements subject to paragraph .5 below:

   .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; and

   .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. Adequate protection shall include special mechanical protection not normally required for offload release, in addition to a danger sign. To prevent an accidental release during recovery of the boat, the mechanical protection (interlock) should only engage when the release mechanism is properly and completely reset. To prevent a premature on-load release, on-load operation of the release mechanism should require a deliberate and sustained action by the operator. The release mechanism shall be so designed that crew members in the lifeboat can clearly observe when the release mechanism is properly and completely reset and ready for lifting. Clear operating instructions should be provided with a suitably worded warning notice;

.3 the release control shall be clearly marked in a colour that contrasts with its surroundings;

.4 the fixed structural connections of the release mechanism in the lifeboat shall be designed with a calculated 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; and

.5 where a single fall and hook system is used for launching a lifeboat or rescue boat in combination with a suitable painter, the requirements of paragraph 4.4.7.6.2 need not be applicable; in such an arrangement a single capability to release the lifeboat or rescue boat, only when it is fully waterborne, will be adequate.

4.4.7.7 Every lifeboat shall be fitted with a device to secure a painter near its bow. The device shall be such that the lifeboat does not exhibit unsafe or unstable characteristics when being towed by the ship making headway at speeds up to 5 knots in calm water. Except for free-fall lifeboats, the painter securing device shall include a release device to enable the painter to be released from inside the lifeboat, with the ship making headway at speeds up to 5 knots in calm water.

4.4.7.8 Every lifeboat which is fitted with a fixed two-way VHF radiotelephone apparatus with an antenna which is separately mounted shall be provided with arrangements for siting and securing the antenna effectively in its operating position.

4.4.7.9 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.

4.4.7.10 A manually controlled lamp shall be fitted. The light shall be white and be capable of operating continuously for at least 12 h with a luminous intensity of not less than 4.3 cd in all directions of the upper hemisphere. However if the light is a flashing light it shall flash at a rate of not less than 50 flashes and not more than 70 flashes per min for the 12 h operating period with an equivalent effective luminous intensity.

4.4.7.11 A manually controlled lamp or source of light shall be fitted inside the lifeboat to provide illumination for not less than 12 h to permit reading of survival and equipment instructions; however, oil lamps shall not be permitted for this purpose.
4.4.7.12 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.

4.4.8 Lifeboat equipment

All items of lifeboat equipment, whether required by this paragraph or elsewhere in section 4.4, shall be secured within the lifeboat by lashings, storage in lockers or compartments, storage in brackets or similar mounting arrangements or other suitable means. However, in the case of a lifeboat to be launched by falls the boat-hooks shall be kept free for fending off purposes. 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 except for free-fall lifeboats, 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 an operational compass which is luminous or provided with suitable means of illumination. In a totally enclosed lifeboat, the compass shall be permanently fitted at the steering position; in any other lifeboat, it shall be provided with a binnacle if necessary to protect it from the weather, and suitable mounting arrangements;

.6 a sea-anchor of adequate size fitted with a shock-resistant hawser which provides a firm hand grip when wet. The strength of the sea-anchor, hawser and tripping line if fitted 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. On lifeboats to be launched by free-fall launching, both painters shall be stowed near the bow ready for use. On other lifeboats, one painter attached to the release device required by paragraph 4.4.7.7 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;

* Refer to Instructions for Action in Survival Craft, adopted by the Organization by resolution A.657(16).
watertight receptacles containing a total of 3 t of fresh water for each person the lifeboat is permitted to accommodate, of which either 1 t per person may be replaced by a desalting apparatus capable of producing an equal amount of fresh water in 2 days, or 2 t per person may be replaced by a manually powered reverse osmosis desalinator as described in paragraph 4.4.7.5 capable of producing an equal amount of fresh water in 2 days;

a rustproof dipper with lanyard;

a rustproof graduated drinking vessel;

a food ration as described in paragraph 4.1.5.1.18 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;

four rocket parachute flares complying with the requirements of section 3.1;

six hand flares complying with the requirements of section 3.2;

two buoyant smoke signals complying with the requirements of section 3.3;

one waterproof electric torch suitable for Morse signalling together with one spare set of batteries and one spare bulb in a waterproof container;

one daylight signalling mirror with instructions for its use for signalling to ships and aircraft;

one copy of the life-saving signals prescribed by regulation V/16 on a waterproof card or in a waterproof container;

one whistle or equivalent sound signal;

a first-aid outfit in a waterproof case capable of being closed tightly after use;

anti-seasickness medicine sufficient for at least 48 h and one seasickness bag for each person;

a jack-knife to be kept attached to the boat by a lanyard;

three tin openers;

two buoyant rescue quoits, attached to not less than 30 m of buoyant line;

if the lifeboat is not automatically self-bailing, a manual pump suitable for effective bailing;

one set of fishing tackle;
.27 sufficient tools for minor adjustments to the engine and its accessories;

.28 portable fire-extinguishing equipment of an approved type suitable for extinguishing oil fires;*

.29 a searchlight with a horizontal and vertical sector of at least 6° and a measured luminous intensity of 2500 cd which can work continuously for not less than 3 h;

.30 an efficient radar reflector, unless a survival craft radar transponder is stowed in the lifeboat;

.31 thermal protective aids complying with the requirements of section 2.5 sufficient for 10% of the number of persons the lifeboat is permitted to accommodate or two, whichever is the greater; and

.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 4.4.8.12 and 4.4.8.26 are unnecessary, the Administration may allow these items to be dispensed with.

4.4.9 Lifeboat markings

4.4.9.1 The number of persons for which the lifeboat is approved shall be clearly marked on it in clear permanent characters.

4.4.9.2 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.

4.4.9.3 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.

4.5 Partially enclosed lifeboats

4.5.1 Partially enclosed lifeboats shall comply with the requirements of section 4.4 and in addition shall comply with the requirements of this section.

4.5.2 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 lifeboat shall have entrances at both ends and on each side. Entrances in the rigid covers shall be weathertight when closed. The canopy shall be so arranged that:

.1 it is provided with adequate rigid sections or battens to permit erection of the canopy;

* Refer to the Revised Guidelines for Marine Portable Fire Extinguishers, adopted by the Organization by resolution A.602(15).
.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 entrances in the canopy are 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; and
.8 the occupants can escape in the event of the lifeboat capsizing.

4.5.3 The interior of the lifeboat shall be of a highly visible colour.

4.5.4 If a fixed two-way VHF radiotelephone apparatus is fitted in the lifeboat, it 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.

4.6 Totally enclosed lifeboats

4.6.1 Totally enclosed lifeboats shall comply with the requirements of section 4.4 and in addition shall comply with the requirements of this section.

4.6.2 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 provides shelter for the occupants;
.2 access to the lifeboat is provided by hatches which can be closed to make the lifeboat watertight;
.3 except for free-fall lifeboats, 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;
except for a free-fall lifeboat, it is possible to row the lifeboat;

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;

it includes windows or translucent panels which admit sufficient daylight to the inside of the lifeboat with the hatches closed to make artificial light unnecessary;

its exterior is of a highly visible colour and its interior of a colour which does not cause discomfort to the occupants;

handrails provide a secure handhold for persons moving about the exterior of the lifeboat, and aid embarkation and disembarkation;

persons have access to their seats from an entrance without having to climb over thwarts or other obstructions; and

during operation of the engine with the enclosure closed, the atmospheric pressure inside the lifeboat shall never be above or below the outside atmospheric pressure by more than 20 hPa.

4.6.3 Capsizing and re-righting

4.6.3.1 Except in free-fall lifeboats, a safety belt shall be fitted at each indicated seating position. The safety belt shall be designed to hold a person with a mass of 100 kg securely in place when the lifeboat is in a capsized position. Each set of safety belts for a seat shall be of a colour which contrasts with the belts for seats immediately adjacent. Free-fall lifeboats shall be fitted with a safety harness at each seat in contrasting colour designed to hold a person with a mass of 100 kg securely in place during a free-fall launch as well as with the lifeboat in capsized position.

4.6.3.2 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.

4.6.3.3 The lifeboat shall be capable of supporting its full complement of persons and equipment when the lifeboat is in the damaged condition prescribed in paragraph 4.4.1.1 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. When the lifeboat is in the stable flooded condition, the water level inside the lifeboat, measured along the seatback, shall not be more than 500 mm above the seat pan at any occupant seating position.

4.6.3.4 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.

4.6.4 Propulsion

4.6.4.1 The engine and transmission shall be controlled from the helmsman's position.
4.6.4.2 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 m$^3$ of lubricating oil from the engine during capsize.

4.6.4.3 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.

4.6.5 Protection against acceleration

Notwithstanding paragraph 4.4.1.7, a totally enclosed lifeboat, except a free-fall lifeboat, shall be so constructed and fendered such 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.

4.7 Free-fall lifeboats

4.7.1 General requirements

Free-fall lifeboats shall comply with the requirements of section 4.6 and in addition shall comply with the requirements of this section.

4.7.2 Carrying capacity of a free-fall lifeboat

The carrying capacity of a free-fall lifeboat is the number of persons that can be provided with a seat without interfering with the means of propulsion or the operation of any of the lifeboat's equipment. The width of the seat shall be at least 430 mm. Free clearance in front of the backrest shall be at least 635 mm. The backrest shall extend at least 1,000 mm above the seatpan.

4.7.3 Performance requirements

4.7.3.1 Each free-fall lifeboat shall make positive headway immediately after water entry and shall not come into contact with the ship after a free-fall launching against a trim of up to 10° and a list of up to 20° either way from the certification height when fully equipped and loaded with:

1. its full complement of persons;
2. occupants so as to cause the centre of gravity to be in the most forward position;
3. occupants so as to cause the centre of gravity to be in the most aft position; and
4. its operating crew only.

4.7.3.2 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 Protocol of 1978 relating thereto and the recommendations of the Organization*, as applicable, a lifeboat shall be capable of being free-fall launched at the final angle of heel and on the base of the final waterline of that calculation.

4.7.3.3 The required free-fall height shall never exceed the free-fall certification height.

4.7.4 Construction

Each free-fall lifeboat shall be of sufficient strength to withstand, when loaded with its full complement of persons and equipment, a free-fall launch from a height of at least 1.3 times the free-fall certification height.

4.7.5 Protection against harmful acceleration

Each free-fall lifeboat shall be so constructed as to ensure that the lifeboat is capable of rendering protection against harmful accelerations resulting from being launched from the height for which it is to be certified in calm water under unfavourable conditions of trim of up to 10° and list of up to 20° either way when it is fully equipped and loaded with:

1. its full complement of persons;
2. occupants so as to cause the centre of gravity to be in the most forward position;
3. occupants so as to cause the centre of gravity to be in the most aft position; and
4. the operating crew only.

4.7.6 Lifeboat fittings

Each free-fall lifeboat shall be fitted with a release system which shall:

1. have two independent activation systems for the release mechanisms which may only be operated from inside the lifeboat and be marked in a colour that contrasts with its surroundings;
2. be so arranged as to release the boat under any condition of loading from no load up to at least 200% of the normal load caused by the fully equipped lifeboat when loaded with the number of persons for which it is to be approved;

be adequately protected against accidental or premature use;

be designed to test the release system without launching the lifeboat; and

be designed with a factor of safety of 6 based on the ultimate strength of the materials used.

4.7.7 Certificate of approval

In addition to the requirements of paragraph 4.4.1.2 the certificate of approval for a free-fall lifeboat shall also state:

- free-fall certification height;

- required launching ramp length; and

- launching ramp angle for the free-fall certification height.

4.8 Lifeboats with a self-contained air support system

In addition to complying with the requirements of section 4.6 or 4.7, as applicable, 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 hPa. The system shall have visual indicators to indicate the pressure of the air supply at all times.

4.9 Fire-protected lifeboats

4.9.1 In addition to complying with the requirements of section 4.8, 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.

4.9.2 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; and

.3 the system shall be arranged for flushing with fresh water and allowing complete drainage.
CHAPTER V - RESCUE BOATS

5.1 Rescue boats

5.1.1 General requirements

5.1.1.1 Except as provided by this section, all rescue boats shall comply with the requirements of paragraphs 4.4.1 to 4.4.7.4 inclusive and 4.4.7.6, 4.4.7.7, 4.4.7.9, 4.4.7.10 and 4.4.9. A lifeboat may be approved and used as a rescue boat if it meets all of the requirements of this section, if it successfully completes the testing for a rescue boat required in regulation III/4.2, and if its stowage, launching and recovery arrangements on the ship meet all of the requirements for a rescue boat.

5.1.1.2 Notwithstanding the requirements of paragraph 4.4.4 required buoyant material for rescue boats may be installed external to the hull, provided it is adequately protected against damage and is capable of withstanding exposure as specified in paragraph 5.1.3.3.

5.1.1.3 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; and

.2 be capable of carrying at least five seated persons and a person lying on a stretcher. Notwithstanding paragraph 4.4.1.5, seating, except for the helmsman, may be provided on the floor, provided that the seating space analysis in accordance with paragraph 4.4.2.2.2 uses shapes similar to figure 1, but altered to an overall length of 1190 mm to provide for extended legs. No part of a seating space shall be on the gunwale, transom, or on inflated buoyancy at the sides of the boat.

5.1.1.4 Rescue boats which are a combination of rigid and inflated construction shall comply with the appropriate requirements of this section to the satisfaction of the Administration.

5.1.1.5 Unless the rescue boat has adequate sheer, it shall be provided with a bow cover extending for not less than 15% of its length.

5.1.1.6 Rescue boats shall be capable of manoeuvring at a speed of at least 6 knots and maintaining that speed for a period of at least 4 h.

5.1.1.7 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.

5.1.1.8 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 paragraph 4.4.6.1, 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.

5.1.1.9 Arrangements for towing shall be permanently fitted in rescue boats and shall be sufficiently strong to marshal or tow liferafts as required by paragraph 5.1.1.7.
5.1.1.10 Unless expressly provided otherwise, every rescue boat shall be provided with effective means of bailing or be automatically self-bailing.

5.1.1.11 Rescue boats shall be fitted with weathertight stowage for small items of equipment.

5.1.2 **Rescue boat equipment**

5.1.2.1 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.

5.1.2.2 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 if fitted 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 paragraph 4.4.7.7 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 5.1.1.7;

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 with a horizontal and vertical sector of at least 6° and a measured luminous intensity of 2500 cd which can work continuously for not less than 3 h;

12. an efficient radar reflector;
.13 thermal protective aids complying with the requirements of section 2.5 sufficient for 10% of the number of persons the rescue boat is permitted to accommodate or two, whichever is the greater; and

.14 portable fire-extinguishing equipment of an approved type suitable for extinguishing oil fires.*

5.1.2.3 In addition to the equipment required by paragraph 5.1.2.2, the normal equipment of every rigid rescue boat shall include:

.1 a boat-hook;
.2 a bucket; and
.3 a knife or hatchet.

5.1.2.4 In addition to the equipment required by paragraph 5.1.2.2, 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; and
.5 a safety boat-hook.

5.1.3 Additional requirements for inflated rescue boats

5.1.3.1 The requirements of paragraphs 4.4.1.4 and 4.4.1.6 do not apply to inflated rescue boats.

5.1.3.2 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 ± 3°C, with all relief valves inoperative; and

* Refer to the Revised Guidelines for Marine Portable Fire Extinguishers, adopted by the Organization by resolution A.602(15).
.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.

5.1.3.3 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.

5.1.3.4 In addition to complying with the requirements of paragraph 4.4.9, inflated rescue boats shall be marked with a serial number, the maker's name or trade mark and the date of manufacture.

5.1.3.5 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 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 under the following conditions:

.1 with the forward buoyancy compartment deflated;

.2 with the entire buoyancy on one side of the rescue boat deflated; and

.3 with the entire buoyancy on one side and the bow compartment deflated.

5.1.3.6 The buoyancy tubes forming the boundary of the inflated rescue boat shall on inflation provide a volume of not less than 0.17 m³ for each person the rescue boat is permitted to accommodate.

5.1.3.7 Each buoyancy compartment shall be fitted with a nonreturn 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.

5.1.3.8 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.

5.1.3.9 Where a transom is fitted it shall not be inset by more than 20% of the overall length of the rescue boat.

5.1.3.10 Suitable patches shall be provided for securing the painters fore and aft and the becketed lifelines inside and outside the boat.

5.1.3.11 The inflated rescue boat shall be maintained at all times in a fully inflated condition.
CHAPTER VI - LAUNCHING AND EMBARKATION APPLIANCES

6.1 Launching and embarkation appliances

6.1.1 General requirements

6.1.1.1 With the exception of the secondary means of launching for free-fall lifeboats, each launching appliance shall be so arranged that the fully equipped survival craft or rescue boat it serves can be safely launched against unfavourable conditions of trim of up to 10° and list of up to 20° either way:

.1 when boarded, as required by regulation III/23 or III/33, by its full complement of persons; and

.2 with not more than the required operating crew on board.

6.1.1.2 Notwithstanding the requirements of paragraph 6.1.1.1, 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 Protocol of 1978 relating 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 taking into consideration the final damaged waterline of the ship.

6.1.1.3 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.

6.1.1.4 Each launching appliance shall be so constructed that only 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.

6.1.1.5 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.

6.1.1.6 Structural members and all blocks, falls, padeyes, links, fastenings and all other fittings used in connection with launching equipment shall be designed with a factor of safety on the basis of the maximum working load assigned and the ultimate strengths of the materials used for construction. A

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minimum factor of safety of 4.5 shall be applied to all structural members, and a minimum factor of safety of 6 shall be applied to falls, suspension chains, links and blocks.

6.1.1.7 Each launching appliance shall, as far as practicable, remain effective under conditions of icing.

6.1.1.8 A lifeboat launching appliance shall be capable of recovering the lifeboat with its crew.

6.1.1.9 Each rescue boat launching appliance shall be fitted with a powered winch motor capable of raising the rescue boat from the water with its full rescue boat complement of persons and equipment at a rate of not less than 0.3 m/s.

6.1.1.10 The arrangements of the launching appliance shall be such as to enable safe boarding of the survival craft in accordance with the requirements of paragraphs 4.1.4.2, 4.1.4.3, 4.4.3.1 and 4.4.3.2.

6.1.2 Launching appliances using falls and a winch

6.1.2.1 Every launching appliance using falls and a winch, except for secondary launching appliances for free-fall lifeboats, shall comply with the requirements of paragraph 6.1.1 and in addition shall comply with the requirements of this paragraph:

6.1.2.2 The launching mechanism shall be so arranged that it may be actuated by one person from a position on the ship's deck and, except for secondary launching appliances for free-fall lifeboats, from a position within the survival craft or rescue boat. When launched by a person on the deck, the survival craft or rescue boat shall be visible to that person.

6.1.2.3 Falls shall be of rotation resistant and corrosion resistant steel wire rope.

6.1.2.4 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.

6.1.2.5 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.

6.1.2.6 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.

6.1.2.7 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 prevent overstressing the falls or davits, unless the motor is designed to prevent such overstressing.

6.1.2.8 The speed at which the fully loaded survival craft or rescue boat is lowered to the water shall not be less than that obtained from the formula:
S = 0.4 + 0.02H

where S is the lowering speed in metres per second and H is the height in metres from the davit head to the waterline with the ship at the lightest sea-going condition.

6.1.2.9 The lowering speed of a fully equipped liferaft without persons onboard shall be to the satisfaction of the Administration. The lowering speed of other survival craft, fully equipped but without persons on board, shall be at least 70% of that required by paragraph 6.1.2.8.

6.1.2.10 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.

6.1.2.11 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.

6.1.2.12 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.

6.1.3 **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.

6.1.4 **Launching appliances for free-fall lifeboats**

6.1.4.1 Every free-fall launching appliance shall comply with the applicable requirements of paragraph 6.1.1 and, in addition, shall comply with the requirements of this paragraph.

6.1.4.2 The launching appliance shall be designed and installed so that it and the lifeboat it serves operate as a system to protect the occupants from harmful acceleration forces as required by paragraph 4.7.5, and to ensure effective clearing of the ship as required by paragraphs 4.7.3.1 and 4.7.3.2.

6.1.4.3 The launching appliance shall be constructed so as to prevent sparking and incendiary friction during the launching of the lifeboat.

6.1.4.4 The launching appliance shall be designed and arranged so that in its ready to launch position, the distance from the lowest point on the lifeboat it serves to the water surface with the ship in its lightest seagoing condition does not exceed the lifeboat's free-fall certification height, taking into consideration the requirements of paragraph 4.7.3.

6.1.4.5 The launching appliance shall be arranged so as to preclude accidental release of the lifeboat in its unattended stowed position. If the means provided to secure the lifeboat cannot be released from inside the lifeboat, it shall be so arranged as to preclude boarding the lifeboat without first releasing it.
6.1.4.6 The release mechanism shall be arranged so that at least two independent actions from inside the lifeboat are required in order to launch the lifeboat.

6.1.4.7 Each launching appliance shall be provided with a secondary means to launch the lifeboat by falls. Such means shall comply with the requirements of paragraph 6.1.1 (except 6.1.1.3) and paragraph 6.1.2 (except 6.1.2.6). It must be capable of launching the lifeboat against unfavourable conditions of trim of up to only 2° and list of up to only 5° either way and it need not comply with the speed requirements of paragraphs 6.1.2.8 and 6.1.2.9. If the secondary launching appliance is not dependent on gravity, stored mechanical power or other manual means, the launching appliance shall be connected both to the ship's main and emergency power supplies.

6.1.4.8 The secondary means of launching shall be equipped with at least a single off-load capability to release the lifeboat.

6.1.5 Liferaft launching appliances

Every liferaft launching appliance shall comply with the requirements of paragraphs 6.1.1 and 6.1.2, except with regard to embarkation in the stowed position, recovery of the loaded liferaft and that manual operation is permitted for turning out the appliance. The launching appliance shall include an automatic release hook arranged so as to prevent premature release during lowering and shall release the liferaft when waterborne. The release hook shall include a capability to release the hook under load. The on-load release control shall:

.1 be clearly differentiated from the control which activates the automatic release function;

.2 require at least two separate actions to operate;

.3 with a load of 150 kg on the hook, require a force of at least 600 and not more than 700 N to release the load, or provide equivalent adequate protection against inadvertent release of the hook; and

.4 be designed such that the crew members on deck can clearly observe when the release mechanism is properly and completely set.

6.1.6 Embarkation ladders

6.1.6.1 Handholds shall be provided to ensure a safe passage from the deck to the head of the ladder and vice versa.

6.1.6.2 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 nonslip surface either by longitudinal grooving or by the application of an approved nonslip coating;

.3 not less than 480 mm long, 115 mm wide and 25 mm in depth, excluding any nonslip
surface or coating; and

.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.

6.1.6.3 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.

6.2 Marine evacuation systems

6.2.1 Construction of the marine evacuation systems

6.2.1.1 The passage of the marine evacuation system shall provide for safe descent of persons of various ages, sizes and physical capabilities wearing approved lifejackets from the embarkation station to the floating platform or survival craft.

6.2.1.2 Strength and construction of the passage and platform shall be to the satisfaction of the Administration.

6.2.1.3 The platform if fitted shall be:

.1 such that sufficient buoyancy will be provided for the working load. In the case of an inflatable platform, the main buoyancy chambers, which for this purpose shall include any thwart or floor inflatable structural members are to meet the requirements of section 4.2 based upon the platform capacity except that the capacity shall be obtained by dividing by 0.25 the usable area given in paragraph 6.2.1.3.3;

.2 stable in a seaway and provide a safe working area for the system operators;

.3 of sufficient area that will provide for the securing of at least two liferafts for boarding and to accommodate at least the number of persons that at any time are expected to be on the platform. This usable platform area shall be at least equal to:

\[
\frac{20\% \text{ of total number of persons that the Marine Evacuation System is certificated for}}{4} \text{ m}^2
\]

or 10 m\(^2\), whichever is the greater. However, Administrations may approve alternate arrangements which are demonstrated to comply with all the prescribed performance requirements*.

* Refer to the Recommendation on Testing of Life-saving appliances adopted by the Organization by resolution A.689(17), as it may be amended.
.4 self draining;

.5 sub-divided in such a way that the loss of gas from any one compartment will not restrict its operational use as a means of evacuation. The buoyancy tubes shall be sub-divided or protected against damage occurring from contact with the ship's side;

.6 fitted with a stabilizing system to the satisfaction of the Administration;

.7 restrained by a bowsing line or other positioning systems which are designed to deploy automatically and if necessary, to be capable of being adjusted to the position required for evacuation; and

.8 provided with mooring and bowsing line patches of sufficient strength to securely attach the largest inflatable liferaft associated with the system.

6.2.1.4 If the passage gives direct access to the survival craft, it should be provided with a quick release arrangement.

6.2.2 **Performance of the marine evacuation system**

6.2.2.1 A marine evacuation system shall be:

.1 capable of deployment by one person;

.2 such as to enable the total number of persons for which it is designed, to be transferred from the ship into the inflated liferafts within a period of 30 min in the case of a passenger ship and of 10 min in the case of a cargo ship from the time abandon ship signal is given;

.3 arranged such that liferafts may be securely attached to the platform and released from the platform by a person either in the liferaft or on the platform;

.4 capable of being deployed from the ship under unfavourable conditions of trim of up to $10^\circ$ and list of up to $20^\circ$ either way;

.5 in the case of being fitted with an inclined slide, such that the angle of the slide to the horizontal is:

.1 within a range of $30^\circ$ to $35^\circ$ when the ship is upright and in the lightest sea-going condition; and

.2 in the case of a passenger ship, a maximum of $55^\circ$ in the final stage of flooding set by the requirements in regulation II-1/8;

.6 evaluated for capacity by means of timed evacuation deployments conducted in harbour;

.7 capable of providing a satisfactory means of evacuation in a sea state associated with a wind of force 6 on the Beaufort scale;
.8 designed to, as far as practicable, remain effective under conditions of icing; and

.9 so constructed that only a minimum amount of routine maintenance is necessary. Any part requiring maintenance by the ship's crews shall be readily accessible and easily maintained.

6.2.2.2 Where one or more marine evacuation systems are provided on a ship, at least 50% of such systems shall be subjected to a trial deployment after installation. Subject to these deployments being satisfactory, the untried systems are to be deployed within 12 months of installation.

6.2.3 **Inflatable liferafts associated with marine evacuation systems**

Any inflatable liferaft used in conjunction with the marine evacuation system shall:

.1 conform with the requirements of section 4.2;

.2 be sited close to the system container but be capable of dropping clear of the deployed system and boarding platform;

.3 be capable of release one at a time from its stowage rack with arrangements which will enable it to be moored alongside the platform;

.4 be stowed in accordance with regulation III/13.4; and

.5 be provided with pre-connected or easily connected retrieving lines to the platform.

6.2.4 **Containers for marine evacuation systems**

6.2.4.1 The evacuation passage and platform shall be packed in a container that is:

.1 so constructed as to withstand hard wear under conditions encountered at sea; and

.2 as far as practicable watertight, except for drain holes in the container bottom.

6.2.4.2 The container shall be marked with:

.1 maker's name or trade mark;

.2 serial number;

.3 name of approval authority and the capacity of the system;

.4 SOLAS;

.5 date of manufacture (month and year);

.6 date and place of last service;
.7  maximum permitted height of stowage above waterline; and

.8  stowage position on board.

6.2.4.3 Launching and operating instructions shall be marked on or in the vicinity of the container.

6.2.5 **Marking on marine evacuation systems**

   The marine evacuation system 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, along with the date of
        servicing; and
   
   .6  the capacity of the system.
CHAPTER VII - OTHER LIFE-SAVING APPLIANCES

7.1 Line-throwing appliances

7.1.1 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; and

4. have brief instructions or diagrams clearly illustrating the use of the line-throwing appliance.

7.1.2 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.

7.2 General alarm and public address system

7.2.1 General emergency alarm system

7.2.1.1 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 navigation 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. 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.

7.2.1.2 The minimum sound pressure levels for the emergency alarm tone in interior and exterior spaces shall be 80 dB (A) and at least 10 dB (A) above ambient noise levels existing during normal equipment operation with the ship underway in moderate weather. In cabins without a loudspeaker installation, an electronic alarm transducer shall be installed, e.g. a buzzer or similar.

7.2.1.3 The sound pressure levels at the sleeping position in cabins and in cabin bathrooms shall be at least 75 dB (A) and at least 10 dB (A) above ambient noise levels.*

* Refer to the Code on Alarms and Indicators, 1995, adopted by the Organization by resolution A.830(19).
7.2.2 Public address system

7.2.2.1 The public address system shall be a loudspeaker installation enabling the broadcast of messages into all spaces where crew members or passengers, or both, are normally present, and to muster stations. It shall allow for the broadcast of messages from the navigation bridge and such other places on board the ship as the Administration deems necessary. It shall be installed with regard to acoustically marginal conditions and not require any action from the addressee. It shall be protected against unauthorized use.

7.2.2.2 With the ship underway in normal conditions, the minimum sound pressure levels for broadcasting emergency announcements shall be:

.1 in interior spaces 75 dB (A) and at least 20 dB (A) above the speech interference level; and

.2 in exterior spaces 80 dB (A) and at least 15 dB (A) above the speech interference level.

***
ANNEX 4

RESOLUTION MSC.49(66)
(adopted on 4 June 1996)

ADOPTION OF AMENDMENTS TO THE GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS (RESOLUTION A.744(18))

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution A.744(18) by which the Assembly adopted Guidelines on the enhanced programme of inspections during surveys of bulk carriers and oil tankers,

RECALLING FURTHER article VIII(b) and regulation XI/2 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, concerning the procedure for amending the aforementioned Guidelines,

NOTING that the Assembly, at its eighteenth session, when adopting resolution A.744(18), requested the Maritime Safety Committee and the Marine Environment Protection Committee to keep the Guidelines under review and update them as necessary, in the light of experience gained in their application,

HAVING CONSIDERED, at its sixty-sixth session, amendments to the Guidelines proposed and circulated in accordance with article VIII(b)(i) of the SOLAS Convention,

1. ADOPTS, in accordance with article VIII(b)(iv) of the SOLAS Convention, amendments to the Guidelines 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 SOLAS 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 SOLAS 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 SOLAS 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 SOLAS 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 SOLAS Convention.
ANNEX

AMENDMENTS TO THE GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS
(RESOLUTION A.744(18))

GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS (resolution A.744(18), Annex A)

1 In the contents, "5.1 Planning" is replaced by "5.1 Survey programme."

2 In the contents, the following text is added at the end:

"Annex 9 - Guidelines for technical assessment in conjunction with the planning of enhanced surveys for bulk carriers".

3 In paragraph 5.1, sub-heading "Planning" is replaced by "Survey programme".

4 The following sentence is added to paragraph 5.1.1:

"The survey programme should be in a written format."

5 Existing paragraph 5.1.2 is replaced by the following text:

"5.1.2 In developing the survey programme, the following documentation should be collected and consulted with a view to selecting tanks, holds, areas and structural elements to be examined:

- survey status and basic ship information;
- documentation on board, as described in 6.2 and 6.3;
- main structural plans (scantlings drawings), including information regarding use of high tensile steels (HTS);
- relevant previous survey and inspection reports from both the classification society and the owner;
- information regarding the use of the ship's holds and tanks, typical cargoes and other relevant data;
- information regarding corrosion protection level on the new building; and
- information regarding the relevant maintenance level during operation."

6 Existing paragraph 5.1.3 is renumbered as a new paragraph 5.1.4.
7 Existing paragraph 5.1.4 is deleted.

8 The following new paragraph 5.1.3 is added:

"5.1.3 The submitted survey programme is to account for and comply, as a minimum, with the requirements of annexes 1 and 2 and paragraph 2.7 for close-up survey, thickness measurement and tank testing, respectively, and is to include relevant information including at least:

- basic ship information and particulars;
- main structural plans (scantling drawings), including information regarding use of high tensile steels (HTS);
- plan of holds and tanks;
- list of holds and tanks with information on use, protection and condition of coating;
- conditions for survey (e.g., information regarding tank cleaning, gas freeing, ventilation, lighting, etc.);
- provisions and methods for access to structures;
- equipment for surveys;
- nomination of holds and tanks and areas for close-up survey (per annex 1);
- nomination of sections for thickness measurement (per annex 2);
- nomination of tanks for tank testing (per paragraph 2.7); and
- damage experience related to the ship in question."

9 The following new paragraphs 5.1.5 and 5.1.6 are added:

"5.1.5 The Administration will advise the owner of the maximum acceptable structural corrosion diminution levels applicable to the ship.

5.1.6 Use may also be made of the Guidelines for technical assessment in conjunction with the planning of enhanced surveys for bulk carriers, contained in annex 9. These guidelines are a recommended tool which may be invoked at the discretion of the Administration, when considered necessary and appropriate, in conjunction with the preparation of the required survey programme."
10 The following new annex 9 is added:

"ANNEX 9

GUIDELINES FOR TECHNICAL ASSESSMENT IN CONJUNCTION WITH THE PLANNING OF ENHANCED SURVEYS FOR BULK CARRIERS

PERIODICAL SURVEY

1 INTRODUCTION

These guidelines contain information and suggestions concerning technical assessments which may be of use in conjunction with the planning of enhanced special surveys of bulk carriers. As indicated in paragraph 5.1.6 of annex A, the guidelines are a recommended tool which may be invoked at the discretion of an Administration, when considered necessary and appropriate, in conjunction with the preparation of the required survey programme.

2 PURPOSE AND PRINCIPLES

2.1 Purpose

The purpose of the technical assessments described in these guidelines is to assist in identifying critical structural areas, nominating suspect areas and in focusing attention on structural elements or areas of structural elements which may be particularly susceptible to, or evidence a history of, wastage or damage. This information may be useful in nominating locations, areas, holds and tanks for thickness measurement, close-up survey and tank testing.

2.2 Minimum requirements

These guidelines may not be used to reduce the requirements of annexes 1 and 2 and paragraph 2.7 of annex A for close-up survey, thickness measurement and tank testing, respectively, which are, in all cases, to be complied with as a minimum.

2.3 Timing

As with other aspects of survey planning, the technical assessments described in these guidelines should be completed out by the owner or operator in co-operation with the Administration well in advance of the commencement of the periodical survey, i.e. prior to commencing the survey and normally at least 12 to 15 months before the survey's completion due date.
2.4 Aspects to be considered

Technical assessments, which may include quantitative or qualitative evaluation of relative risks of possible deterioration, of the following aspects of a particular ship may be used as a basis for the nomination of holds, tanks and areas for survey:

- design features such as stress levels on various structural elements, design details and extent of use of high tensile steel;
- former history with respect to corrosion, cracking, buckling, indents and repairs for the particular ship as well as similar vessels, where available; and
- information with respect to types of cargo carried, protection of tanks, and condition of coating, if any, of holds and tanks.

Technical assessments of the relative risks of susceptibility to damage or deterioration of various structural elements and areas should be judged and decided on the basis of recognized principles and practices, such as may be found in reference 3.

3 TECHNICAL ASSESSMENT

3.1 General

There are three basic types of possible failure which may be the subject of technical assessment in connection with planning of surveys; corrosion, cracks and buckling. Contact damages are not normally covered by the survey plan since indents are usually noted in memoranda and assumed to be dealt with as a normal routine by surveyors.

Technical assessments performed in conjunction with the survey planning process should, in principle, be as shown schematically in figure 1 which depicts, schematically, how technical assessments can be carried out in conjunction with the survey planning process. The approach is based on an evaluation of experience and knowledge basically related to:

.1 design; and
.2 corrosion.

The design should be considered with respect to structural details which may be susceptible to buckling or cracking as a result of vibration, high stress levels or fatigue.

Corrosion is related to the ageing process, and is closely connected with the quality of corrosion protection at newbuilding, and subsequent maintenance during the service life. Corrosion may also lead to cracking and/or buckling.
3.2  Methods

3.2.1  Design details

Damage experience related to the ship in question and similar ships, where available, is the main source of information to be used in the process of planning. In addition, a selection of structural details from the design drawings should be included.

Typical damage experience to be considered will consist of:

- number, extent, location and frequency of cracks; and
- location of buckles.

This information may be found in the survey reports and/or the owner's files, including the results of the owner's own inspections. The defects should be analysed, noted and marked on sketches.

In addition, general experience should be utilized. For example, figure 2 shows typical locations in bulk carriers which experience has shown may be susceptible to structural damage. Also, reference should be made to reference 3 which contains a catalogue of typical damages and proposed repair methods for various bulk carrier structural details.

Such figures should be used together with a review of the main drawings, in order to compare with the actual structure and search for similar details which may be susceptible to damage. An example is shown in figure 3.

The review of the main structural drawings, in addition to using the above-mentioned figures, should include checking typical design details where cracking has been experienced. The factors contributing to damage should be carefully considered.

The use of high tensile steel (HTS) is an important factor. Details showing good service experience where ordinary, mild steel has been used may be more susceptible to damage when HTS, and its higher associated stresses, are utilized. There is extensive and, in general, good experience, with the use of HTS for longitudinal material in deck and bottom structures. Experience in other locations, where the dynamic stresses may be higher, is less favourable, e.g. side structures.

In this respect, stress calculations of typical and important components and details, in accordance with relevant methods, may prove useful and should be considered.

The selected areas of the structure identified during this process should be recorded and marked on the structural drawings to be included in the survey programme.
3.2.2 Corrosion

In order to evaluate relative corrosion risks, the following information is generally to be considered:

- usage of tanks, holds and spaces
- condition of coatings
- condition of anodes
- cleaning procedures
- previous corrosion damage
- ballast use and time for cargo holds
- risk of corrosion in cargo holds and ballast tanks
- location of ballast tanks adjacent to heated fuel oil tanks

Reference 2 gives definitive examples which can be used for judging and describing coating condition, using typical pictures of conditions.

For bulk carriers, reference 3 should be used as the basis for the evaluation, together with the age of the ship and relevant information on the anticipated condition of the ship as derived from the information collected in order to prepare the survey programme.

The various tanks, holds and spaces should be listed with the corrosion risks nominated accordingly.

3.2.3 Locations for close-up survey and thickness measurement

On the basis of the table of corrosion risks and the evaluation of design experience, the locations for initial close-up survey and thickness measurement (sections) may be nominated.

The sections subject to thickness measurement should normally be nominated in tanks, holds and spaces where corrosion risk is judged to be the highest.

The nomination of tanks, holds and spaces for close-up survey should, initially, be based on highest corrosion risk, and should always include ballast tanks. The principle for the selection should be that the extent is increased by age or where information is insufficient or unreliable.

REFERENCES


2. TSCF "Condition Evaluation and Maintenance of Tanker Structures, 1992."

Technical Assessment & The Survey
Planning Process

Input:
- Drawings
- Reports
- Acceptable Corrosion Allowance
- Design Related Risk

Collection of Information

Coating Condition
- Anode Condition
- Usage of Tanks

Corrosion Risk

Analyze:
- Hull Damage This Ship

Analyze Hull Damage for Similar Ships where Available

Hull Damage:
- General Experience

Present Areas where Damage has been Found and Risks Considered
- High Mark Sketches or Drawings

Locations for Thickness Measurement and Close-up Survey

Survey Programme

Acceptance by Administration

Survey
Figure 2: Typical locations susceptible to structural damage or corrosion
### AREA 1

<table>
<thead>
<tr>
<th>Structural item</th>
<th>Side shell frames and end brackets (Separate bracket configuration)</th>
<th>EXAMPLE 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detail of damage</td>
<td>Fractures on brackets at termination of frame</td>
<td></td>
</tr>
</tbody>
</table>

**Sketch of damage**

![Sketch of damage]

**Sketch of repair**

![Sketch of repair]

**Notes on possible cause of damage/repair**

1. This type of damage is due to stress concentration.
2. For small fractures, e.g. hairline fractures, the fracture can be 'veed' out, welded up, ground
and examined by NDT for fractures

3 For larger/significant fractures consideration is to be given to cropping and partly renewing/renewing the frame brackets. If renewing the brackets, ends of frames can be shaped to soften them.

4 If felt prudent, soft toes are to be incorporated at the boundaries of the bracket to the wing tanks.

5 Attention to be given to the structure in wing tanks in way of the extended bracket arm i.e. reinforcement provided in line with the bracket arm.

Figure 3: Typical damage and repair example (reproduced from ref.3)."
GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF OIL TANKERS (resolution A.744(18), annex B)

11 In the contents, "5.1 Planning" is replaced by "5.1 Survey programme."

12 In the contents, the following text is added at the end:

"Annex 11 - Guidelines for technical assessment in conjunction with the planning of enhanced surveys for oil tankers".

13 In paragraph 5.1, sub-heading "Planning" is replaced by "Survey programme".

14 The following sentence is added to paragraph 5.1.1:

"The survey programme should be in a written format."

15 Existing paragraph 5.1.2 is replaced by the following text:

"5.1.2 In developing the survey programme, the following documentation should be collected and consulted with a view to selecting tanks, areas, and structural elements to be examined:

- survey status and basic ship information;
- documentation on board, as described in 6.2 and 6.3;
- main structural plans (scantlings drawings), including information regarding use of high tensile steels (HTS);
- relevant previous survey and inspection reports from both the classification society and the owner;
- information regarding the use of the ship's tanks, typical cargoes and other relevant data;
- information regarding corrosion protection level on the new building; and
- information regarding the relevant maintenance level during operation."

16 Existing paragraph 5.1.3 is renumbered as a new paragraph 5.1.4.

17 Existing paragraph 5.1.4 is deleted.
18 The following new paragraph 5.1.3 is added:

"5.1.3 The submitted survey programme is to account for and comply, as a minimum, with the requirements of annexes 1, 2 and 3 for close-up survey, thickness measurement and tank testing, respectively, and is to include relevant information including at least:

- basic ship information and particulars;
- main structural plans (scantling drawings), including information regarding use of high tensile steels (HTS);
- plan of tanks;
- list of tanks with information on use, protection and condition of coating;
- conditions for survey (e.g., information regarding tank cleaning, gas freeing, ventilation, lighting, etc.);
- provisions and methods for access to structures;
- equipment for surveys;
- nomination of tanks and areas for close-up survey (per annex 1);
- nomination of sections for thickness measurement (per annex 2);
- nomination of tanks for tank testing (per annex 3); and
- damage experience related to the ship in question."

19 The following new paragraphs 5.1.5 and 5.1.6 are added:

"5.1.5 The Administration will advise the owner of the maximum acceptable structural corrosion diminution levels applicable to the ship.

5.1.6 Use may also be made of the Guidelines for technical assessment in conjunction with the planning of enhanced surveys for tankers, contained in annex 11. These guidelines are a recommended tool which may be invoked at the discretion of the Administration, when considered necessary and appropriate, in conjunction with the preparation of the required survey programme."

20 The following new annex 11 is added:
"ANNEX 11

GUIDELINES FOR TECHNICAL ASSESSMENT IN CONJUNCTION WITH THE PLANNING OF ENHANCED SURVEYS FOR OIL TANKERS

PERIODICAL SURVEY

1 INTRODUCTION

These guidelines contain information and suggestions concerning technical assessments which may be of use in conjunction with the planning of enhanced special surveys of oil tankers. As indicated in paragraph 5.1.6 of annex B, the guidelines are a recommended tool which may be invoked at the discretion of an Administration, when considered necessary and appropriate, in conjunction with the preparation of the required survey programme.

2 PURPOSE AND PRINCIPLES

2.1 Purpose

The purpose of the technical assessments described in these guidelines is to assist in identifying critical structural areas, nominating suspect areas and in focusing attention on structural elements or areas of structural elements which may be particularly susceptible to, or evidence a history of, wastage or damage. This information may be useful in nominating locations, areas and tanks for thickness measurement, close-up survey and tank testing.

2.2 Minimum requirements

These guidelines may not be used to reduce the requirements of annexes 1, 2 and 3 for close-up survey, thickness measurement and tank testing, respectively, which are, in all cases, to be complied with as a minimum.

2.3 Timing

As with other aspects of survey planning, the technical assessments described in these guidelines should be completed out by the owner or operator in co-operation with the Administration well in advance of the commencement of the periodical survey, i.e., prior to commencing the survey and normally at least 12 to 15 months before the survey's completion due date.

2.4 Aspects to be considered

Technical assessments, which may include quantitative or qualitative evaluation of relative risks of possible deterioration, of the following aspects of a particular ship may be used as a basis for the nomination of tanks and areas for survey:

- design features such as stress levels on various structural elements, design details and extent of use of high tensile steel;
- former history with respect to corrosion, cracking, buckling, indents and repairs for the particular ship as well as similar vessels, where available; and

- information with respect to types of cargo carried, use of different tanks for cargo/ballast, protection of tanks and condition of coating, if any.

Technical assessments of the relative risks of susceptibility to damage or deterioration of various structural elements and areas should be judged and decided on the basis of recognized principles and practices, such as may be found in references 1 and 2.

3 TECHNICAL ASSESSMENT

3.1 General

There are three basic types of possible failure which may be the subject of technical assessment in connection with planning of surveys; corrosion, cracks and buckling. Contact damages are not normally covered by the survey plan since indents are usually noted in memoranda and assumed to be dealt with as a normal routine by surveyors.

Technical assessments performed in conjunction with the survey planning process should, in principle be as shown schematically in figure 1 which depicts, schematically, how technical assessments can be carried out in conjunction with the survey planning process. The approach is based on an evaluation of experience and knowledge basically related to:

.1 design; and

.2 corrosion.

The design should be considered with respect to structural details which may be susceptible to buckling or cracking as a result of vibration, high stress levels or fatigue.

Corrosion is related to the ageing process, and is closely connected with the quality of corrosion protection at newbuilding, and subsequent maintenance during the service life. Corrosion may also lead to cracking and/or buckling.

3.2 Methods

3.2.1 Design details

Damage experience related to the ship in question and similar ships, where available, is the main source of information to be used in the process of planning. In addition, a selection of structural details from the design drawings should be included.

Typical damage experience to be considered will consist of:

- number, extent, location and frequency of cracks; and
In addition, general experience should be utilized. For example, reference should be made to reference 1, which contains a catalogue of typical damages and proposed repair methods for various tanker structural details.

Such figures should be used together with a review of the main drawings, in order to compare with the actual structure and search for similar details which may be susceptible to damage. An example is shown in figure 2.

The review of the main structural drawings, in addition to using the above-mentioned figures, should include checking for typical design details where cracking has been experienced. The factors contributing to damage should be carefully considered.

The use of high tensile steel (HTS) is an important factor. Details showing good service experience where ordinary, mild steel has been used may be more susceptible to damage when HTS, and its higher associated stresses, are utilized. There is extensive and, in general, good experience, with the use of HTS for longitudinal material in deck and bottom structures. Experience in other locations, where the dynamic stresses may be higher, is less favourable, e.g. side structures.

In this respect, stress calculations of typical and important components and details, in accordance with relevant methods, may prove useful and should be considered.

The selected areas of the structure identified during this process should be recorded and marked on the structural drawings to be included in the survey programme.

### 3.2.2 Corrosion

In order to evaluate relative corrosion risks, the following information is generally to be considered:

- usage of tanks and spaces
- condition of coatings
- condition of anodes
- cleaning procedures
- previous corrosion damage
- ballast use and time for cargo tanks
- corrosion risk scheme (see reference 2, table 3.1)
- location of heated tanks.

Reference 2 gives definitive examples which can be used for judging and describing coating
condition, using typical pictures of conditions. The evaluation of corrosion risks should be based on information in reference 2, together with the age of the ship and relevant information on the anticipated condition as derived from the information collected in order to prepare the survey programme.

The various tanks and spaces should be listed with the corrosion risks nominated accordingly.

3.2.3 Locations for close-up survey and thickness measurement

On the basis of the table of corrosion risks and the evaluation of design experience, the locations for initial close-up survey and thickness measurement (sections) may be nominated.

The sections subject to thickness measurement should normally be nominated in tanks and spaces where corrosion risk is judged to be the highest.

The nomination of tanks and spaces for close-up survey should, initially, be based on highest corrosion risk, and should always include ballast tanks. The principle for the selection should be that the extent is increased by age or where information is insufficient or unreliable.

REFERENCES


2. TSCF, "Condition Evaluation and Maintenance of Tanker Structures, 1992."
**LOCATION:** Connection of longitudinals to transverse webs

**EXAMPLE NO.1** Web and flat bar fractures at cut-outs for longitudinal stiffener connections

<table>
<thead>
<tr>
<th>TYPICAL DAMAGE</th>
<th>PROPOSED REPAIR</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Diagram" /></td>
<td><img src="image2" alt="Diagram" /></td>
</tr>
</tbody>
</table>

**FACTORS CONTRIBUTING TO DAMAGE**

1. Asymmetrical connection of flat bar stiffener resulting in high peak stresses at the heel of the stiffener under fatigue loading.

2. Insufficient area of connection of longitudinal to web plate.

3. Defective weld at return around the plate thickness.

4. High localized corrosion at areas of stress concentration such as flat bar stiffener connections, corners of cut-out for the longitudinal and connection of web to shell at cut-outs.

5. High shear stress in the web of the transverse.


**FIGURE 1**

SUBJECT: CATALOGUE OF STRUCTURAL DETAILS

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Figure 2: Typical damage and repair example
(reproduced from ref.1)".

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ANNEX 5

RESOLUTION MSC.50(66)
(adopted on 4 June 1996)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CODE FOR
THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING
DANGEROUS CHEMICALS IN BULK (IBC CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization
concerning the functions of the Committee,

RECALLING ALSO resolution MSC.4(48) by which it adopted the International Code for the
Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code),

RECALLING FURTHER article VIII(b) and regulation VII/8.1 of the International Convention
for the Safety of Life at Sea (SOLAS), 1974, as amended, concerning the procedure for amending the IBC
Code,

BEING DESIROUS of keeping the IBC Code up to date,

HAVING CONSIDERED, at its sixty-sixth session, amendments to the Code proposed and
circulated in accordance with article VIII(b)(i) of the SOLAS Convention,

CONSIDERING that it is highly desirable for the provisions of the IBC Code, which are
mandatory under both the International Convention for the Prevention of Pollution from Ships, 1973, as
modified by the Protocol of 1978 relating thereto (MARPOL 73/78) and the 1974 SOLAS Convention, to
remain identical,

1. ADOPTS, in accordance with article VIII(b)(iv) of the SOLAS Convention, amendments to the
Code 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 SOLAS 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
SOLAS 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 SOLAS 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 SOLAS 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 SOLAS Convention.
ANNEX

AMENDMENTS TO THE INTERNATIONAL CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (IBC CODE)

1 New paragraph 16.6.4 is added to chapter 16 of the Code as follows:

“16.6.4 In order to avoid elevated temperatures, this cargo should not be carried in deck tanks.”

2 The following new entries are added to chapter 17 of the Code:

<table>
<thead>
<tr>
<th>Product Name</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>i</th>
<th>j</th>
<th>k</th>
<th>l</th>
<th>m</th>
<th>n</th>
<th>o</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetochlor</td>
<td></td>
<td>A</td>
<td>P</td>
<td>2</td>
<td>2G</td>
<td>Open</td>
<td>No</td>
<td>Yes</td>
<td>O</td>
<td>No</td>
<td>A</td>
<td>No</td>
<td></td>
<td>15.19.6</td>
<td></td>
</tr>
<tr>
<td>Alkyl(C7-C11)phenol poly(4-12) ethoxylate</td>
<td></td>
<td>B</td>
<td>P</td>
<td>3</td>
<td>2G</td>
<td>Open</td>
<td>No</td>
<td>Yes</td>
<td>O</td>
<td>No</td>
<td>A</td>
<td>No</td>
<td></td>
<td>15.19.6, 16.2.6, 16.2.9</td>
<td></td>
</tr>
<tr>
<td>Ammonium bisulphite solution (70% or less)</td>
<td></td>
<td>D</td>
<td>S</td>
<td>3</td>
<td>2G</td>
<td>Cont</td>
<td>No</td>
<td>NF</td>
<td>R</td>
<td>T</td>
<td>No</td>
<td>Y5</td>
<td>No</td>
<td>15.16.1, 16.6.1 to 16.6.3</td>
<td></td>
</tr>
<tr>
<td>Bromochloromethane</td>
<td></td>
<td>D</td>
<td>S</td>
<td>3</td>
<td>2G</td>
<td>Cont</td>
<td>No</td>
<td>NF</td>
<td>R</td>
<td>T</td>
<td>No</td>
<td>N3</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iso-Propylamine(70% or less) solution</td>
<td></td>
<td>C</td>
<td>S/P</td>
<td>2</td>
<td>2G</td>
<td>Cont</td>
<td>No</td>
<td>No</td>
<td>C</td>
<td>FT</td>
<td>CD</td>
<td>N1</td>
<td>E</td>
<td>15.12, 15.19</td>
<td></td>
</tr>
<tr>
<td>Dibromomethane</td>
<td></td>
<td>C</td>
<td>S/P</td>
<td>2</td>
<td>2G</td>
<td>Cont</td>
<td>No</td>
<td>NF</td>
<td>R</td>
<td>T</td>
<td>No</td>
<td>N3</td>
<td>No</td>
<td>15.12.3, 15.19</td>
<td></td>
</tr>
<tr>
<td>3,4-Dichloro-1-butene</td>
<td></td>
<td>B</td>
<td>S/P</td>
<td>3</td>
<td>2G</td>
<td>Cont</td>
<td>No</td>
<td>No</td>
<td>C</td>
<td>FT</td>
<td>ABC</td>
<td>E</td>
<td>15.12.3, 15.17, 15.19.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Icosa(oxypropane-2,3-diyl)</td>
<td></td>
<td>B</td>
<td>P</td>
<td>3</td>
<td>2G</td>
<td>Open</td>
<td>No</td>
<td>Yes</td>
<td>O</td>
<td>No</td>
<td>A</td>
<td>No</td>
<td></td>
<td>16.2.6, 16.19.6</td>
<td></td>
</tr>
<tr>
<td>N-(2-Methoxy-1-methyl ethyl)-2-ethyl-6-methyl chloroacetanilide</td>
<td></td>
<td>B</td>
<td>P</td>
<td>3</td>
<td>2G</td>
<td>Open</td>
<td>No</td>
<td>Yes</td>
<td>O</td>
<td>No</td>
<td>A</td>
<td>No</td>
<td></td>
<td>15.19.6</td>
<td></td>
</tr>
<tr>
<td>Nitroethane</td>
<td></td>
<td>(D)</td>
<td>S</td>
<td>3</td>
<td>2G</td>
<td>Cont</td>
<td>No</td>
<td>IIB</td>
<td>No</td>
<td>R</td>
<td>FT</td>
<td>A(u)</td>
<td>N4</td>
<td>No</td>
<td>15.16.1, 15.19.6, 16.6.1, 16.6.2, 16.6.4</td>
</tr>
<tr>
<td>Nitroethane(80%)/ Nitropropane(20%)</td>
<td></td>
<td>D</td>
<td>S</td>
<td>3</td>
<td>2G</td>
<td>Cont</td>
<td>No</td>
<td>IIB</td>
<td>No</td>
<td>R</td>
<td>FT</td>
<td>A(u)</td>
<td>N4</td>
<td>No</td>
<td>15.16.1, 15.19.6, 16.6.1 to 16.6.3</td>
</tr>
</tbody>
</table>

3 "16.6" in column "o" of chapter 17 of the Code is replaced by "16.6.1 to 16.6.3".
4 The existing entries of the following products are amended:

.1 Nonyl phenol poly(4-12) ethoxylate: the product name is amended to read “Nonyl phenol poly(4+) ethoxylate”; and

.2 Sodium silicate solution: the entry in column “i” is amended to read “NF” and "A" in column “l” is replaced by “No”.

5 The following new entries are added to chapter 18 of the Code:

<table>
<thead>
<tr>
<th>Product name</th>
<th>UN number</th>
<th>Pollution category for operational discharge (regulation 3 of Annex II)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium lignosulphonate solutions</td>
<td></td>
<td>III</td>
</tr>
<tr>
<td>Calcium lignosulphonate solutions</td>
<td></td>
<td>III</td>
</tr>
<tr>
<td>Caramel solutions</td>
<td></td>
<td>III</td>
</tr>
<tr>
<td>2-Ethyl-2-(hydroxymethyl) propane-1,3-diol, C8-C10 ester</td>
<td></td>
<td>D</td>
</tr>
<tr>
<td>Glycerol monooleate</td>
<td></td>
<td>D</td>
</tr>
<tr>
<td>N-Methylglucamine solution (70% or less)</td>
<td></td>
<td>III</td>
</tr>
<tr>
<td>Polybutenyl succinimide</td>
<td></td>
<td>D</td>
</tr>
<tr>
<td>Zinc alkenyl carboxamide</td>
<td></td>
<td>D</td>
</tr>
<tr>
<td>Ditridecyl Adipate</td>
<td></td>
<td>III</td>
</tr>
</tbody>
</table>

***
ANNEX 6

RESOLUTION MSC.51(66)
(adopted on 4 June 1966)

ADOPTION OF AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution A.212(VII), by which the Assembly, at its seventh session, adopted the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code), which provides safety requirements for chemical tankers supplementary to the provisions of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended,

RECALLING FURTHER resolution MSC.29(61), by which the Committee, at its sixty-first session, adopted the revised BCH Code,

NOTING resolution MSC.50(66), by which the Committee adopted amendments to the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code),

RECOGNIZING the need to bring the corresponding amendments to the BCH Code in force on the date on which the corresponding amendments to the IBC Code enter into force,

1. ADOPTS amendments to the BCH Code the text of which is given in the Annex to the present resolution;

2. DETERMINES that the amendments shall become effective on 1 July 1998 upon acceptance and entry into force of the corresponding amendments to the IBC Code adopted by resolution MSC.50(66).
ANNEX

AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)

Chapter IV - Special requirements

1. New paragraph 4.18.4 is added to chapter IV as follows:

"4.18.4 In order to avoid elevated temperatures, this cargo should not be carried in deck tanks."

Chapter VI - Summary of minimum requirements

2. The cross-reference between 16.6 of the IBC Code and 4.18 of the BCH Code is replaced by the following:

<table>
<thead>
<tr>
<th>IBC Code reference</th>
<th>BCH Code reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.6.1</td>
<td>4.18.1</td>
</tr>
<tr>
<td>16.6.2</td>
<td>4.18.2</td>
</tr>
<tr>
<td>16.6.3</td>
<td>4.18.3</td>
</tr>
<tr>
<td>16.6.4</td>
<td>4.18.4</td>
</tr>
</tbody>
</table>

***
ANNEX 7

PROPOSED AMENDMENTS TO CHAPTER II-2 OF THE 1974 SOLAS CONVENTION

CHAPTER II-2

CONSTRUCTION - FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

PART A - GENERAL

Regulation 1 - Application

1 Paragraph 1.1 is amended to read:

"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]."

2 Paragraph 1.3.2 is amended to read:

"2.2 the expression \textit{all ships} means ships constructed before, on or after [1 July 1998]."

3 Paragraph 2 is amended to read:

"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.

4 In paragraph 3.1, the expression "1 July 1986" is replaced by "[1 July 1998]."

Regulation 3 - Definitions

5 The existing text of paragraph 1 is replaced by the following:

"1 \textit{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\degree C, this being determined in accordance with the Fire Test Procedures Code. Any other material is a combustible material."

6 The existing text of paragraph 2 is replaced by the following:

"2 \textit{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."
7  In paragraph 3.4, replace "139°C" by "140°C", as follows:

".4 they shall be 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:"

8  The existing text of 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."

9  In paragraph 4.2, replace "139°C" by "140°C", as follows:

".2 they shall 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:"

10 The existing text of 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."

11 The existing text of 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."

12 The existing text of 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 microphone to public address systems.

13 The existing text of 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 in accordance
with the Fire Test Procedures Code."

14 The existing text of paragraph 23.4 is replaced by the following:

"4 all floor coverings have low flame spread characteristics."

15 The existing text of paragraph 23.6 is replaced by the following:

"6 all upholstered furniture have qualities of resistance to the ignition and propagation of
flame in accordance with the Fire Test Procedures Code."

16 The following new paragraph 23.7 is added:

"7 all bedding components have qualities of resistance to the ignition and propagation of
flame in accordance with the Fire Test Procedures Code."

17 A 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 [ ](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 amendments procedures applicable to the Annex other
than chapter I."

Regulation 12 - Automatic sprinkler, fire detection and fire alarm systems

18 At the end of paragraph 1.2 the text of the existing paragraph 1.2.2, is added and the words
"In cargo ships" are deleted, as follows:

"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 placed in a
position other than on the navigation bridge, so as to ensure that the indication of fire is
immediately received by the crew."

19 Delete paragraphs 1.2.1 and 1.2.2.
Regulation 16 - Ventilation systems in ships other than passenger ships carrying more than 36 passengers

20 The 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."

21 Add a new paragraph 11 to regulation 16 to read as follows:

"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 to "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

22 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

23 In the parentheses below the title of the regulation, delete "and 8" in the first sentence and add a third sentence to read as follows:

"Paragraph 8 of this regulation applies to ships constructed on or after [1 July 1998]."

24 The existing paragraph 8 is replaced by the following:

"8 Provisions for helicopter facilities shall be in accordance with the standards developed by the Organization*."

__________

* Refer to the standards to be developed by the Organization."
PART B - FIRE SAFETY MEASURES FOR PASSENGER SHIPS

Regulation 24 - Main vertical zones and horizontal zones

25 The existing text of the third sentence of 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

26 Replace "26.1 to 26.4" in paragraph 1 by "26.1 and 26.2" and add in table 26.1 a superscript "d" in the fourth row under columns 6, 7, 8 and 9 and add a note "d" to read as follows:

"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 a part of the muster station."

Regulation 28 - Means of escape

27 At the end of paragraph 1.10, replace "." by "; and".

28 Add to paragraph 1 a new sub-paragraph .11 to read as follows:

".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."

Regulation 30 - Openings in "A" class divisions

29 The first sentence of 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:"

30 The existing text of paragraph 4.1 is replaced by the following:

".1 The doors shall be self-closing and be capable of closing with an angle of inclination of up to 3.5° opposing closure."

31 The existing text of paragraph 4.2 is replaced by the following:

".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 upright position."

32 The existing text of paragraph 4.3 is replaced by the following:

".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."

33 The existing text of paragraph 4.4 is replaced by the following:

".4 Hold-back hooks not subject to central control station release are prohibited."

34 The existing text of paragraph 4.5 is replaced by the following:

".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."

35 The existing text of paragraph 4.6 is replaced by the following:

".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."

36 Renumber the third sentence of existing paragraph 4.3 as 4.7:

".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."

37 Renumber paragraph 4.4 as 4.8, with the following amendments:

".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."

38 Add the following new paragraph 4.9:

".9 Disruption of the control system or central power supply at one door shall not impair the safe functioning of the other doors."

39 Renumber the first sentence of paragraph 4.2 as 4.10 with the following amendments:

".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 continue sounding until the door is completely closed."
40 Renumber the last sentence of existing paragraph 4.2 as 4.11 as follows:

".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."

41 Renumber existing paragraph 4.5 as 4.12:

".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 system."

42 Renumber existing paragraph 4.6 as 4.13, with the following amendments:

".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."

43 Add the following new paragraph 4.14:

".14 The components of the local control system shall be accessible for maintenance and adjusting."

44 Add a new paragraph 4.15 to read as follows:

".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."

45 Replace second sentence of existing paragraph 6 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 lifesaving appliances, embarkation and external muster station areas, external stairs and open decks used for escape routes. Stairway doors need not meet this requirement."

**Regulation 32 - Ventilation systems**

46 Amend paragraph 1.1 to read:

"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 16.6, 16.8, 16.9 and 16.11."
47 Amend paragraph 1.4.3.1 to read:

"3.1 the duct is constructed of a material which has low flame spread characteristics;"

**Regulation 34 - Restricted use of combustible materials**

48 The existing text of paragraph 2 is amended as follows:

"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."

49 In paragraph 5, an asterisk is added to the expression "calorific value", together with the following footnote:

"___________

* The gross calorific value measured in accordance with ISO standard 1716 - "Building Materials - Determination of Calorific Potential" should be quoted."

50 The existing text of paragraph 7 is amended as follows:

"7 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke and toxic products and shall be in accordance with the Fire Test Procedures Code."

51 The existing text of paragraph 8 is amended as follows:

"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, and be in accordance with the Fire Test Procedures Code."

**Regulation 37 - Protection of special category spaces**

52 In paragraph 1.2.1 add a third sentence to read as follows:

"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."

53 Add a new paragraph 4 to read as follows:

"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**

54 Add a new paragraph 5 to read as follows:

"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."

55 Add a new regulation 38-1 to read as follows:

"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-O" 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 ro-ro cargo spaces 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 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**

56 The existing text of paragraph 2 is amended as follows:

"2 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke and toxic products and shall be in accordance with the Fire Test Procedures Code."

57 The existing text of paragraph 3 is amended as follows:

"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, and be in accordance with the Fire Test Procedures Code."

**Regulation 50 - Details of construction**

58 The existing text of paragraph 3.1 is amended as follows:

"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."

59 In paragraph 3.2, an asterisk is added to the expression "calorific value", together with the following footnote:

"*

The gross calorific value measured in accordance with ISO standard 1716 - "Building Materials - Determination of Calorific Potential" should be quoted."

**Regulation 53 - Fire protection arrangements in cargo spaces**

60 Replace paragraphs 1.2 and 1.3 with 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 1/12(a) (vi), and shall ensure that the list of cargoes the ship is permitted to carry is attached to the Exemption Certificate.

* For cargoes for which a fixed gas fire-extinguishing system will be ineffective, reference is made to the list of cargoes in table 2 of MSC/Circ.671

** For cargoes considered to be non-combustible or which constitute a low fire risk, reference is made to the list of cargoes in table 1 of MSC/Circ.671

*** Reference is made to the Code of Safe Practice for Solid Bulk Cargoes - Emergency schedule B 14, entry for coal.

61 Add a new paragraph 2.5 to read as follows:

"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

62 Add the following footnote to the heading of this regulation:

"__________

* Reference is made to the International Maritime Dangerous Goods Code (resolution A.81(VI) as amended) and the Code of Safe Practice for Solid Bulk Cargoes (resolution A.434(XI) as amended).

63 Insert the following paragraph after paragraph 2.4.2:

"2.4.3 At least natural ventilation is required in enclosed cargo spaces intended for the carriage of solid dangerous goods in bulk."

64 Add new paragraphs 2.10 and 2.11 to read as follows:
"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

65 Existing table 54.1 is substituted 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.

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Weather decks .1 to .5 inclusive</th>
<th>Not specifically designed</th>
<th>Container cargo spaces</th>
<th>Closed ro-ro cargo spaces</th>
<th>Open ro-ro cargo spaces</th>
<th>Solid dangerous goods in bulk</th>
<th>Shipborne barges</th>
</tr>
</thead>
<tbody>
<tr>
<td>.1.1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>For applying requirement 54 to different dangerous goods in bulk</td>
<td>X</td>
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<td>.2</td>
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<td>.3</td>
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<td>.4.1</td>
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<td>X¹</td>
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<td>.4.2</td>
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<td>X¹</td>
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<tr>
<td>.6.1</td>
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<td>.6.2</td>
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<tr>
<td>.8</td>
<td>X</td>
<td>X</td>
<td>X²</td>
<td>X</td>
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<td>.9</td>
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<td>X³</td>
<td>X</td>
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</tbody>
</table>

### 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

Existing table 54.2 is substituted by the following:

<table>
<thead>
<tr>
<th>Class</th>
<th>4.1</th>
<th>4.2</th>
<th>4.3⁵</th>
<th>5.1</th>
<th>6.1</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
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<tr>
<td>Regulation</td>
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<tr>
<td>54.2.1.1</td>
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<td>X</td>
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<td>54.2.2</td>
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<td>X⁷</td>
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<td>X⁸</td>
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<td>54.2.4.1</td>
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<td>X⁷</td>
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<td>54.2.4.2</td>
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<td>X⁷</td>
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<td>X⁷⁹</td>
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<td>X⁷⁹</td>
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<td>54.2.6</td>
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<td>54.2.8</td>
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<td>X⁷</td>
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<td>X¹⁰</td>
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</tbody>
</table>

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

Existing table 54.3 is substituted by the following:

<table>
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<th>Class</th>
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<th>2.2</th>
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<th>3.2</th>
<th>4.1</th>
<th>4.2</th>
<th>4.3</th>
<th>5.1</th>
<th>5.2</th>
<th>6.1 liquids</th>
<th>6.1 liquids ≤23°C</th>
<th>6.1 liquids &gt;23°C ≤61°C</th>
<th>6.1 solids</th>
<th>8 liquids</th>
<th>8 liquids ≤23°C</th>
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</tbody>
</table>

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 Reference is made to the International Maritime Dangerous Goods Code.
As appropriate to the goods being carried."
PART D - FIRE SAFETY MEASURES FOR TANKERS

Regulation 56 - Location and separation of spaces

68 Amend existing paragraph 7 to read:

"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."

69 The existing text of the second sentence in paragraph 8.3 is replaced by the following:

"Such windows and sidescuttles, except wheelhouse windows, shall be constructed to "A-60" class standard."

Regulation 59 - Venting, purging, gas-freeing and ventilation

70 Add the following new paragraph 5:

"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."

***
ANNEX 8
NEW AND AMENDED TRAFFIC SEPARATION SCHEMES

OFF TUSKAR ROCK (Amended scheme)

(Reference chart: British Admiralty 1787, 1984 edition. 
Note: This chart is based on Ordnance Survey of Ireland Datum.)

Description of the traffic separation scheme

(a) A separation zone, two miles wide, is centred upon the following geographical positions:

\[ (1) \ 52°14'.0 \ N, \ 6°00'.8 \ W (3) 52°04'.7 \ N, \ 6°11'.5 \ W \]
\[ (2) \ 52°08'.5 \ N, \ 6°03'.8 \ W \]

(b) A traffic lane, three miles wide, is established on each side of the separation zone.

Inshore traffic zone

The area bounded between the landward boundary of the traffic separation scheme and lines connecting Tuskar Rock Lighthouse (52°12'.2N, 6°12'.4W) and the following geographical positions is designated an inshore traffic zone:

\[ (4) \ 52°15'.2 \ N, \ 6°97'.0 \ W \ (northerly \ corner \ of \ the \ scheme) \]
\[ (5) \ 52°07'.8 \ N, \ 6°15'.6 \ W \ (westerly \ corner \ of \ the \ scheme) \]

OFF FASTNET ROCK (Amended scheme)

Note: This chart is based on Ordnance Survey of Ireland Datum.)

Description of the traffic separation scheme

(a) A separation zone, two miles wide, is centred upon the following geographical positions:

\[ (1) \ 51°20'.0 \ N, \ 9°25'.8 \ W \]
\[ (2) \ 51°18'.2 \ N, \ 9°35'.2 \ W \]

(b) A traffic lane, two miles wide, is established on each side of the separation zone.

Inshore traffic zone

The area between the landward boundary of the traffic separation scheme and lines connecting Fastnet Rock Lighthouse (51°23'.3 N, 9°36'.2 W) and the following geographical positions is designated an inshore traffic zone:

\[ (3) \ 51°22'.9N, \ 9°27'.3 \ W \ (easterly \ corner \ of \ the \ scheme) \]
\[ (4) \ 51°21'.1 \ N, \ 9°36'.6 \ W \ (westerly \ corner \ of \ the \ scheme) \]
IN THE APPROACHES TO THE PORT OF VERACRUZ (New scheme)


Note: This chart is based on World Geodetic System 84 Datum.

Description of the traffic separation scheme

The traffic separation scheme in the approaches to Veracruz, Mexico, consists of two parts:

Part I: East Approach: Recommended for vessels entering or leaving the port of Veracruz.

(a) A separation zone bounded by a line connecting the following geographical positions:

   (1) 19º14'.00 N,  95º45'.00 W
   (2) 19º14'.00 N,  95º53'.43 W
   (3) 19º12'.50 N,  95º53'.43 W
   (4) 19º12'.50 N,  95º45'.00 W

(b) A separation zone bounded by a line connecting the following geographical positions:

   (5) 19º11'.50 N,  95º45'.00 W
   (6) 19º11'.50 N,  95º53'.43 W
   (7) 19º10'.90 N,  95º53'.43 W
   (8) 19º10'.90 N,  95º46'.60 W

(c) A traffic lane for westbound traffic is established between separation zone (a) and a line connecting the following geographical positions:

   (9) 19º15'.00 N,  95º45'.00 W
   (10) 19º15'.00 N,  95º53'.43 W

(d) A traffic lane for eastbound traffic is established between separation zone (a) and separation zone (b).

Part II: North Approach: Recommended for vessels entering or leaving the port of Veracruz.

(a) A separation zone bounded by a line connecting the following geographical positions:

   (11) 19º19'.00 N,  95º59'.62 W
   (12) 19º15'.00 N,  95º59'.62 W
   (13) 19º15'.00 N,  95º58'.05 W
   (14) 19º19'.00 N,  95º58'.05 W

(b) A traffic lane for southbound traffic is established between the separation zone and a line connecting the following geographic positions:

   (15) 19º19'.00 N,  96º00'.65 W
   (16) 19º15'.00 N,  96º00'.65 W

(c) A traffic lane for northbound traffic is established between the separation zone and a line connecting the following geographic positions:
Part III: A precautionary area is established bounded by a line connecting the following geographical positions:

(10) 19º15'.00 N, 95º53'.43 W  
(17) 19º15'.00 N, 95º57'.00 W  
(16) 19º15'.00 N, 96º00'.65 W  
(21) 19º12'.07 N, 96º01'.77 W  
(23) 19º07'.65 N, 95º58'.92 W  
( 7) 19º10'.90 N, 95º53'.43 W

back to position (10).

Note:

Masters of all appropriately equipped ships should have continual access to highly accurate information on the position of their ships in the traffic lane, using the radar beacons of:

- Sacrificios Island, identified on the radar by morse letter "Z", and located in geographical position:

  (21) 19º10'.49 N, 96º05'.53 W.

- Santiaguillo Island, identified on the radar by morse letter "O" and located in geographical position:

  (22) 19º08'.52 N, 95º48'.47 W

***
Annex 9

Routing Measures Other Than Traffic Separation Schemes

Area to be Avoided in the Approaches to the Port of Veracruz


Note: This chart is based on World Geodetic System 84 Datum.

Description of the area to be avoided

With the aim of protecting the National Marine Park from the risk of pollution, which may be caused by the grounding of ships in the area, given the magnitude of the topographical obstacles which make navigation within the area hazardous, all ships of more than 500 gross tonnage and ships of less than 500 gross tonnage transporting oil, chemical, toxic or nuclear waste, should avoid the area bounded by a line connecting the following geographical positions:

1. 19°02'.20 N, 95°58'.10 W (on the coast)
2. 19°02'.20 N, 95°46'.60 W
3. 19°10'.90 N, 95°46'.60 W
4. 19°10'.90 N, 95°53'.43 W
5. 19°05'.80 N, 96°02'.04 W
6. 19°03'.40 N, 96°02'.04 W (on the coast)

Precautionary Area in the Approaches to the Port of Veracruz


Note: This chart is based on World Geodetic System 84 Datum.

Description of the precautionary area

A precautionary area is established comprising the islands and reefs where the approach channels to the Port of Veracruz are situated. This area is bounded by an area of a circle with a radius of 4.7 miles, centred on the lighthouse on the Island of Sacrificios, located in geographical position:

1. 19°10'.49 N, 96°05'.53 W
starting on the coast in geographical position:

(2)  19º12'.93 N,  96º09'.70 W
to geographical position:

(3)  19º13'.03 N,  96º01'.39 W

thence bounded by a line connecting geographical position (3) and the following geographical positions:

(4)  19º12'.07 N,  96º01'.77 W
(5)  19º09'.57 N,  96º06'.00 W (on the coast)

DEEP-WATER ROUTE WEST OF THE HEBRIDES

Description of the deep-water route

The deep-water route lies between the Outer Hebrides Isles on its south-east side and the Flannan Islands and St. Kilda to the north-west and is bounded by lines connecting the following geographical positions:

(1)  56º46.75 N 7º54.00 W  (5)  58º40.50 N 6º30.75 W
(2)  57º39.50 N 7º54.00 W  (6)  58º24.10 N 7º13.50 W
(3)  58º20.70 N 7º03.50 W  (7)  57º41.25 N 8º06.10 W
(4)  58º35.80 N 6º23.70 W  (8)  56º46.75 N 8º06.10 W

Notes:
1  The depths in the route, as confirmed by detailed hydrographic surveys, are nowhere less than 28.5 metres.
2  Laden tankers of over 10,000 gross tonnage are recommended, weather conditions permitting, to use this route in preference to sailing through the restricted waters of the Minches.

RULES FOR NAVIGATION OF LADEN TANKERS OFF THE SOUTH AFRICAN COAST

1  Laden* tankers, westbound, when off the South African coast, should adhere to the following:
   .1  Laden tankers should maintain a minimum distance of 20 (twenty) nautical miles off the following points:
       .1  South Sand Bluff (International No. D6446)

*  Definition:  "laden tanker" means any tanker other than a tanker in ballast having in its cargo
tanks residual cargo only.

.2 Bashee River (Mbashe Point) (D6438)

.3 Hood Point (D6420)

.4 Cape Receife (D6390).

.2 They should then steer to pass at least 10 (ten) nautical miles south of Alphard Banks (35°02'S, 20°52'E) and then maintain a minimum distance of 20 (twenty) nautical miles from:

.1 Cape Agulhas (D6370)

.2 Quoin Point (D6322)

.3 Cape Point (D6120)

.4 Slangkop Point (D6110)

.5 Cape Columbine (D5810).

2 Laden tankers, eastbound, should also adhere to maintaining a minimum distance of 25 (twenty-five) nautical miles off, when passing the points listed in 1.1 and 1.2 and at least 15 (fifteen) nautical miles South of Alphard Banks.

3 During the winter season tankers should maintain the recommended route until the boundary line with the winter zone is reached and then stay as close to that line as possible (but staying well clear of Alphard Banks).

4 Exemptions

.1 Vessels calling at Cape Town (Table Bay) to rendezvous with service craft or helicopters should follow the recommended routes until, in the case of laden tankers, following the Summer Season Route, Cape Point Light bears 000° (T) x 25 nautical miles, thence altering course to position, Slangkop Point Light 250°(T) x 14 nautical miles. From this position course may be altered to the rendezvous area 5 nautical miles westward of Green Point Light (D5900) (replenishment area shown on chart SAN 1013). When following the Winter Season Route, course may be altered when Cape Point Light bears 025°(T) x 10 nautical miles, thence altering course to a position 270°(T), Slangkop Point Light x 10 nautical miles. From this position course may then be shaped to the rendezvous position 5 nautical miles to the westward of Green Point Light.

.2 Laden tankers engaged solely between points in the Republic of South Africa are exempted from the provisions in paragraphs 1, 2 and 3 of these regulations and are to maintain a distance of 10 (ten) nautical miles off salient points of the coast subject to weather, sea and current conditions, when setting courses to their ports of loading and discharging.
ANNEX 10
RESOLUTION MSC.52(66)
(adopted on 30 May 1996)
MANDATORY SHIP REPORTING SYSTEMS

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO regulation V/8-1 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, concerning the adoption by the Organization of ship reporting systems,

RECALLING FURTHER resolution A.826(19) which authorizes the Committee to perform the function of adopting ship reporting systems on behalf of the Organization,

TAKING INTO ACCOUNT the Guidelines and criteria for ship reporting systems adopted by resolution MSC.43(64),

HAVING CONSIDERED the recommendations of the Sub-Committee on Safety of Navigation at its forty-first session,

1. ADOPTS, in accordance with SOLAS regulation V/8-1, mandatory ship reporting systems:
   - "In the Torres Strait region and the Inner route of the Great Barrier Reef" described in Annex 1 to the present resolution; and
   - "Off Ushant" described in Annex 2 to the present resolution;

2. DECIDES that the mandatory ship reporting system:
   - "In the Torres Strait and the Inner route of the Great Barrier Reef" will enter into force at 0000 UTC hours on 1 January 1997; and
   - "Off Ushant" will enter into force at 0000 UTC hours on [30 November 1996];

3. REQUESTS the Secretary-General to bring this resolution and its Annexes to the attention of Members of the Organization and Contracting Governments to the 1974 SOLAS Convention.
MANDATORY SHIP REPORTING SYSTEM "THE TORRES STRAIT REGION AND
THE INNER ROUTE OF THE GREAT BARRIER REEF"

1 CATEGORIES OF SHIPS REQUIRED TO PARTICIPATE IN THE SYSTEM

Ships of the following general categories are required to participate in the reporting system:

.1 All ships of 50 m or greater in overall length;

.2 All ships, regardless of length, carrying in bulk hazardous and/or potentially polluting cargo, in accordance with the definitions at resolution MSC.43(64), paragraph 1.4;

.3 Ships engaged in towing or pushing where either the towing or pushing vessel or the towed or pushed vessel is a vessel prescribed within the categories in subparagraphs .1 and .2.

2 GEOGRAPHICAL COVERAGE OF THE SYSTEM AND THE NUMBER AND EDITION
OF THE REFERENCE CHART USED FOR THE DELINEATION OF THE SYSTEM

2.1 The reporting system will cover the general area, as shown in the chartlet at appendix 1, covering the Torres Strait between longitude 141° 45'E and 143°45'E, centred on 10°S latitude, including the Endeavour Strait, and the waters of the Great Barrier Reef (GBR) between the Australian coast and the outer edge of the GBR, from the latitude of Cape York (10°40'S) southwards to 22°S.

2.2 Charts AUS 376 (Torres/Endeavour Straits) and AUS 367, AUS 370-375 (Queensland coast) provide large-scale coverage of the operational area; also international series small scale charts AUS 4602 and 4603.

3 FORMAT AND CONTENT OF REPORT TIMES AND GEOGRAPHICAL POSITIONS
FOR SUBMITTING REPORTS, AUTHORITY TO WHOM REPORTS SHOULD BE
SENT AND AVAILABLE SERVICES

The ship report short title "REEFREP", will be made to the ship reporting centre located at Hay Point in Queensland. Examples of the format and content of all required reports are shown at appendix 2. A ship may elect, for reasons of commercial confidentiality, to communicate that section of the REEFREP ENTRY report which provides information on cargo (line P) by non-verbal means prior to entering the system. This can be achieved by including cargo information in the AUSREP Sailing Plan (SP) message.

.1 Entry and Exit Reports: Ships will be required to provide a full REEFREP Position Report (PR) when passing the first designated reporting point on entering the REEFREP operational area, unless an AUSREP Sailing Plan (SP) message has been sent well in advance in which case an abbreviated REEFREP PR will suffice. When finally departing the REEFREP area, or entering a port within the area, the REEFREP system will associate the required PR and the designated reporting point and automatically recognize this report.
as an exit message.

.2 **Intermediate Position Reports:** Ships transiting the operational area will also be required to provide brief position reports at defined reporting points using normal PR formats.

The intermediate reporting positions will be generally about 100-120 nautical miles apart. Position reports will be limited to the identity of the ship, position, any variation to the last reported speed and any further information the master considers to be of value to the system.

.3 **Defect Reports:** Ships within the reporting area suffering damage, failure or breakdown affecting the safety of the ship will be required to provide a defect report using field "0" within the prescribed PR message format.

4 **INFORMATION TO BE PROVIDED TO PARTICIPATING SHIPS AND PROCEDURES TO BE FOLLOWED**

4.1 The ship reporting centre will provide information to shipping on potentially conflicting traffic movements resulting from the analysis of incoming reports.

4.2 Certain sections of the route in the Torres Strait and the far northern sector of the inner route of the GBR present a particular navigational hazard in situations where large ships might be passing or overtaking, especially deeper draught ships. When the ship reporting centre considers that ships are approaching such sections, any relevant traffic information held by the centre will be passed to them. Because of the extensive size of the REEFREP area it is not be intended to routinely broadcast traffic information across the whole area but to advise individual ships as necessary.

4.3 Traffic information, including other advice received from ships or local maritime authorities which impacts on navigational safety will be passed to ships in relevant areas. Examples include concentrations of fishing vessels, unusual weather conditions, etc.

4.4 Normal maritime safety information (MSI) in the form of navigational warnings (AUSCOAST Warnings) will continue to be issued in the appropriate broadcasts from MRCC AUSTRALIA. The ship reporting centre will maintain details of MSI for the REEFREP area for the information of participating ships.

5 **COMMUNICATION REQUIRED FOR THE SYSTEM, FREQUENCIES ON WHICH REPORTS SHOULD BE TRANSMITTED AND INFORMATION TO BE REPORTED**

5.1 The system will be based on VHF voice communications and will be interactive with an interchange of data between ships and the ship reporting centre.

5.2 VHF channels 5, 18 and 19 in the international maritime mobile band have been allocated for the reporting points in the system.

5.3 Information of commercial confidentiality may be transmitted by non-verbal means.

5.4 The language used for reports in the system will be English, using the IMO *Standard Marine Communications Phrases* where necessary.
5.5 Communications associated with reporting in accordance with the requirements of this system will be free of charge.

6 RULES AND REGULATIONS IN FORCE IN THE AREA OF THE SYSTEM

Compulsory pilotage rules apply in the northern section of the inner route (Cape York to Cairns) and in Hydrographers Passage. Other regulations apply domestic law in accordance with the terms of international conventions.

7 SHORE-BASED FACILITIES TO SUPPORT OPERATION OF THE SYSTEM

7.1 The existing port information centre at Hay Point, on the central Queensland coast, close to the main shipping route through the inner route of the GBR and Hydrographer's Passage, has been designated as the ship reporting centre for the system.

7.2 The system will include radar coverage at certain focal areas in the Torres Strait and inner route of the GBR. Radar will be installed in the Torres Strait, in the vicinity of Cairns and in the Whitsunday Islands area.

7.3 All VHF communications and radar data will be relayed into the ship reporting centre, which will be equipped to provide a high standard of service to meet the system requirements and will be operated by trained and experienced personnel. Operator standards will be in accordance with "Guidelines on the Recruitment, Qualification and Training of Vessel Traffic Service (VTS) Operators" (MSC/Circ.578).

7.4 The hardware and software for the system is being developed.

7.5 The system will be operated to quality standards with service levels being constantly monitored.

7.6 Measures are in hand to install DGPS Broadcast Stations operating in the MF band (285-325 kHz) on Horn Island (Torres Strait) by the end of 1995 and further stations in the inner route of the GBR during 1996/98. The DGPS service will provide additional high accuracy navigational assistance throughout the reporting area.

7.7 The REEFREP ship reporting system information will be interfaced with the AUSREP system operated by MRCC AUSTRALIA.

8 ALTERNATIVE COMMUNICATION IF THE COMMUNICATION FACILITIES OF THE SHORE-BASED AUTHORITY FAIL

In the event of failure of the system VHF communications, a report from a participating ship can be passed by any of the following methods:

1 Seaphone through the commercial VHF coastal network;

2 SATCOM; and

3 HF Radio through Townsville Radio (VIT).
PROPOSED SHIP REPORTING SYSTEM TORRES STRAIT AND GREAT BARRIER REEF AREAS
APPENDIX 2

REEFREP ENTRY (Full Report)

EXAMPLE 1: Ship sailing from a port within the reporting area, routeing through the area and departing the area through Grafton Passage bound for Pusan via Jomard Entrance.

Format

Example

A. Ships name and call sign

A. MERIDIAN /VIPM

B. Date/Time of position (UTC)

B. 020200Z

C. Name of Reporting Point

C. TOWNSVILLE

E. Course (normally various)

E. VARIOUS

F. Speed

F. 15

G. Departed (port if outside reporting area)

G. --

H. Date/Time of entry in system and point of entry (not required if advised at C)

J. Pilot embarked or ordered

J. NO*

L. Intended route

L. INNER ROUTE TO GRAFTON

O. Draft

O. 10

P. Cargo

P. COAL

Q. Defects/deficiencies (only if relevant)

Q. NIL

U. Ship type and length (metres)

U. BULK CARRIER/250

X. Remarks

X. JOINING INNER ROUTE AT BREWER 020400Z

___________

* Pilot not mandatory for this area of the GBR.
EXAMPLE 2: Ship entering the reporting area north bound for Port Moresby using inner route and Great North East Channel.

Format | Example
--- | ---
REEFREP ENTRY | 
A. Ships name and call sign | A. MERIDIAN /VIPM
B. Date/Time of position (UTC) | B. 020200Z
C. Name of Reporting Point | C. HIGH PEAK
E. Course (normally various) | E. VARIOUS
F. Speed | F. 15
G. Departed (port if outside reporting area) | G. BRISBANE
H. Date/Time of entry in system and point of entry (not required if advised at C) | 
J. Pilot embarked or ordered | J. PILOT EMBARKED
L. Intended route | L. INNER ROUTE AND GREAT NORTH EAST CHANNEL
O. Draft | O. 10
P. Cargo | P. GENERAL CARGO
Q. Defects/deficiencies (only if relevant) | 
U. Ship type and length (metres) | U. RESEARCH/65
X. Remarks | X. CONDUCTING RESEARCH ON PASSAGE
REEFREP REPORT

EXAMPLE: Ship reporting at an intermediate reporting point within reporting area.

Format

A. Ships name and call sign
B. Name of Reporting Point
F. Speed (if change from last report)
X. Remarks

Example

REEFREP REPORT
A. ENTERPRISE/VIPM
B. CHARLOTTE
F. SPEED NOW 11.5
X. LARGE CONCENTRATION OF FISHING VESSELS VICINITY HANNAH ISLAND

REEFREP DEFECT

EXAMPLE: Ship reporting defect within reporting area.

Format

A. Ships name and call sign
B. Date/Time position
C. Latitude/Longitude or Reporting Point
Q. Nature of defect/damage
X. Remarks

Example

REEFREP DEFECT
A. ENTERPRISE/VIPM
B. 030205Z
C. 1400S 14400E
Q. BOTH RADARS UNSERVICEABLE IN HEAVY RAIN SQUALLS; ALSO MINOR STEERING DEFECT
X. PROCEEDING TO ANCHOR 180 HANNAH ISLAND LT 1.0 TO EFFECT REPAIRS
EXAMPLE 2: Ship defect repaired.

Format

A. Ships name and call sign
B. Date/Time position
C. Latitude/Longitude or Reporting Point
F. Speed
X. Remarks

Example

REEFREP DEFECT
A. ENTERPRISE/VIPM
B. 030215Z
C. 1401S 14001E
F. 8.5
X. DEFECT REPAIRED, REJOINING ROUTE

REEFREP EXIT

EXAMPLE 1: Ship westbound reporting exit from reporting area at Torres Strait.

Format

A. Ships name and call sign
K. Point of exit
I. Destination (via route)
X. Remarks

Example

REEFREP EXIT
A. MITSUBISHI/XUGT
K. COOK
I. SINGAPORE VIA LOMBOK
X. FINAL REPORT

EXAMPLE 2: Ship reporting exit from reporting area at Palm Passage.

Format

A. Ships name and call sign
K. Point of exit
I. Destination (via route)

Example

REEFREP EXIT
A. IRON MAIDEN/RXTP
K. PALM
I. PUSAN VIA ROSSEL ISLAND
EXAMPLE 3: Ship reporting arrival at a port within reporting area (after transiting from another port also within the area).

Format

A. Ships name and call sign
K. Point of exit
I. Destination (via route) if outside REEFREP area
X. Remarks (must include FINAL REPORT)

Example

REEFREP EXIT

A. NORTHERN STAR/CPIM
K. CAIRNS
X. ARRIVED CAIRNS, FINAL REPORT

EXAMPLE 4: Ship eastbound reporting exit from reporting area at Great North East Channel.

Format

A. Ships name and call sign
K. Point of exit
I. Destination (via route)
X. Remarks (must include FINAL REPORT)

Example

REEFREP EXIT

A. ENTERPRISE/VIPM
K. DARNLEY
I. PORT MORESBY DIRECT
X. FINAL REPORT
ANNEX 2

MANDATORY SHIP REPORTING SYSTEM “OFF USHANT”

1 CATEGORIES OF SHIPS REQUIRED TO PARTICIPATE IN THE SYSTEM

Ships of more than 300 grt are required to participate in the system. This threshold is that used within the framework of the MAREP system, recently amended with regard to the categories of ships included (IMO document SN/Circ.167, annex, page 4).


The reporting system covers a circular area 35 miles in radius centred on the Ile d’Ouesant (Stiff radar tower). The TSS covers the entire area. However, the Corsen/Ouessant vessel traffic service gathers all information relating to traffic within the area for which the MRCC Corsen is responsible, bounded as follows:

- to the south: parallel 47º47.9’N (via the Pointe de Penmarc’h)
- to the west: meridian 008º W
- to the north: a line connecting the positions
  - 48º50’N - 008º00’ W
  - 49º30’N - 004º00’ W
  - 48º53’N - 002º20’ W
  - 48º49’ N - 001º49’ W
  - 48º37’.5N - 001º34’W (Baie de Mont St. Michel)

The reference chart which includes all the area of coverage for the system is the French chart No. 6989 of the Navy Hydrographic and Oceanographic Service.

3 FORMAT AND CONTENTS OF REPORT, TIMES AND GEOGRAPHICAL POSITIONS FOR SUBMITTING REPORT, AUTHORITY TO WHOM REPORTS SHOULD BE SENT AND AVAILABLE SERVICES

The reports required from ships entering the area covered by the system are position reports similar to the MAREP POSREP type reports sent to the VTS by ships reporting within the scheme.

A ship may elect, for reasons of commercial confidentiality, to communicate that section of the report which provides information on cargo by non-verbal means prior to entering the system.

The information given below is derived from the format-type given in paragraph 2 of the appendix to resolution A.648(16) of IMO.
3.1 Content

The report required should include:

.1 information considered to be essential:

- the name of the ship, its call sign or IMO identification number, its position (letters A and C or D);
- information considered necessary;
- the course and speed of the ship (letters E and F). When they receive a position report message, the VTS operators attempt to correlate the position of the ship with the information at their disposal:
  - radar echo at the position indicated
  - direction-finder readings
  - description of the surroundings given by the ship's watch - position in relation to other ships (in the event of heavy traffic)
  - course and speed.

Information on course and speed are therefore additional elements allowing the VTS operators to correlate the position announced and, if necessary, to identify one ship among a group of ships;

- access to the north-eastbound lane of the “Off Ushant” traffic separation scheme is prohibited to certain cargoes (oils, noxious liquid substances MARPOL A and B in particular). In order to allow the VTS operators to monitor application of the traffic regulations within the TSS approved by IMO, ships requiring to transit in the north-eastbound lane must confirm that they are not transporting a cargo for which passage in this area is prohibited; and

.2 in addition, in accordance with the provisions of the SOLAS and MARPOL Conventions, the ships must report information relating to defects, damage, deficiencies or other limitations as well as, if necessary, information relating to pollution incidents or loss of cargo.

3.2 Recipient of report

The shore-based authority is the Corsen/Ouessant vessel traffic service (voice communication sign "Ushant Traffic") installed at the CROSS CORSEN site. The Regional Centre for Surveillance and Rescue Operations - CROSS CORSEN is a service provided by the Department of Maritime Affairs, a department of the Ministry of Equipment, Transport and Tourism. It combines the maritime rescue coordination centre (MRCC) and the VTS as well as carrying out functions for the French Administration (monitoring fishing, monitoring pollution).
The VTS broadcasts a regular information bulletin at H + 10 mn and H + 40 mn. This bulletin includes:

- information on traffic
- urgent warnings to mariners concerning the area
- special weather bulletins

In addition, a regular weather bulletin is broadcast every three hours from 01H50 UTC.

This information is broadcast in French and in English on VHF channel 79 after a call on channel 16.

If necessary, the VTS is capable of providing individual information to a ship, in particular with regard to positioning and navigational assistance.

4 INFORMATION TO BE PROVIDED TO PARTICIPATING SHIPS AND PROCEDURES TO BE FOLLOWED

The VTS processes the requests for anchoring made by the ships in the area for which the MRCC Corsen is responsible.

Detected and identified ships are monitored by radar which in no way releases the masters from responsibility for their navigation.

The vessel traffic services in the Channel inform each other of the transit of ships, in particular those having hazardous cargoes. First, the identification for a southbound ship which has reported in accordance with the MAREP recommendations to the VTS at Jobourg are transmitted to the VTS at Corsen/Ouessant which then sets up an HPA at the north-east RACON radio beacon of the Ushant traffic separation scheme.

5 COMMUNICATION REQUIREMENTS FOR THE SYSTEM, FREQUENCIES ON WHICH REPORTS SHOULD BE TRANSMITTED AND INFORMATION TO BE REPORTED

The radiocommunications equipment required for the system is that defined in the GMDSS for sea area A1.

The ship reports will be made by voice on VHF radio. The channels defined are channel 13, monitored permanently by the VTS, as well as channel 79 and 80 which are also used to broadcast safety information. However, information of commercial confidentiality may be transmitted by non-verbal means.

The frequencies mentioned above will be used pending modifications made necessary by the use of an automatic identification system for which the draft definition of operational standards is under review.

In some cases, it could be decided to use the medium frequency band for communication with
ships, according to procedures which will be specified subsequently.

6 RELEVANT RULES AND REGULATIONS IN FORCE IN THE AREA OF THE SYSTEM

The international regulations for preventing collisions at sea are applicable throughout the area of coverage of the proposed system.

The “Off Ushant” traffic separation scheme has been approved by IMO and therefore rule 10 applies (document MSC XXXVIII/22, annex 7, pages 7 and 8).

In addition to the international regulatory scheme there are national regulations regarding vessel traffic and ship reporting. These are specifically:

- decree No. 84/93 of the port-admiral for the Atlantic of 11 October 1993 regulating navigation in the “Off Ushant” TSS, the associated inshore traffic area and the fairways and waters of Fromveur, Four, Helle and Raz de Sein. Repealing a previous decree of 14 December 1978, it makes reporting mandatory for ships intending to use the north-eastbound lane of the TSS (situated in territorial waters), as well as inshore fairways. This decree repeats the provisions of the MSC document concerning the conditions for entry to the north-eastbound lane.

The conditions for entry to the fairways and waterways are also specified.

- joint prefectorial decree 326 Cherbourg/18/81 Brest of 13 May 1981 regulating navigation in the approaches to the French coast in the Channel and the Atlantic in order to prevent accidental marine pollution.

This decree, concerning ships having hazardous cargoes, stipulates in particular:

- for ships intending to enter French territorial waters, mandatory ship reporting with a six-hour advance warning. In addition to information concerning the identity of the ship, the report must specify the place and time of entry into French waters, the port arrived from and the destination, the cargo and the state of manoeuvrability and navigational capacities,

- a mandatory 16 VHF watch while travelling through territorial waters,

- navigation at less than 7 miles from the coast is forbidden for ships of more than 1,600 gross tonnage,

- mandatory reporting to the French shipping authorities of any damage occurring at less than 50 miles from the French coast.

Within the area of applicability of the proposed system, the provisions of this decree apply more specifically in the following cases:

- transit, via the north-eastbound lane of the TSS, of a ship having a cargo which is
not prohibited in this lane but which comes under the decree,
- traffic coming from or going towards the Port de Brest with hazardous cargoes.
- Decree No. 54/84 of the port-admiral for the Atlantic of 31 July 1984 regulating entry, movement and berthing of foreign ships in the internal waters of the second maritime region.

In addition to these provisions of a regulatory nature, also relevant are the Franco-British MAREP recommendations regarding ships of more than 300 tons gross tonnage and in particular those facing specific difficulties.

Application of these recommendations for the Ouessant area is as follows for the VTS:
- for northbound traffic, taking account of the information transmitted by ships approaching the TSS, plotting and radar monitoring and sending to the Jobourg VTS of MAREP information for ships having hazardous cargoes or facing specific difficulties in order to allow this VTS to set up an arrival forecast for the ship at the Casquets TSS;
- for southbound traffic, prior receipt, by the Jobourg VTS, of MAREP information concerning hazardous shipping or shipping facing specific difficulties and which have reported to Les Casquets. Plotting and radar monitoring of the ships identified.

7 SHORE-BASED FACILITIES TO SUPPORT OPERATION OF THE SYSTEM

The Corsen/Ouessant vehicle traffic service is set up at the Regional Centre for surveillance and rescue operations at Corsen. This service has radar and radio facilities.

7.1 Radar facilities

The surveillance radar type THOMSON TRS 3405 is installed at the Stiff tower at Ouessant. The installation includes three transmitter receivers, a main antenna and a stand-by antenna. The nominal range of the radar is 64 miles. The antenna is positioned at 110 metres above the chart zero. Technical staff are permanently on duty at the tower. Radar messages are sent to the centre at Corsen via a radio-relay system where they are processed and then used by the staff on watch. The watch is carried out using visual display screens. The operators work using synthetic radar display. Each ship detected in the area of applicability has its echo noted as an automatically referenced radar track. Additional information is collected by the operators for each track identified. The vessel traffic service is equipped with a system for processing and storing radar data that allows statistics and course calculations to be printed. A complete reorganization of the processing and display chain will be carried out in the near future. The extraction and follow-up performances of the new system will be improved. Aids for the operators will form part of the new equipment. The operator will be alerted automatically as soon as violations or unusual behaviour is detected. It is also intended to add the Lloyds file, on CD ROM, to the "ships" file. It will be possible to obtain the record of a ship's track rapidly, to print texts and courses automatically and to write messages. Other databases will be used on office-type computers.

7.2 Radiocommunications facilities
Surveillance staff use the radio equipment installed at the Stiff tower in the Corsen centre. The vessel traffic service has the use of four single-channel VHF transmitter receivers. If necessary, the VTS may, from time to time, use the VHF and MHF radio equipment belonging to the MRCC. These are VHF installations at Stiff, at the Pointe du Raz and at the Corsen site.

The VTS is also equipped with VHF air and UHF installations allowing links with aircraft carrying out surveillance missions.

A renovation of the equipment is being undertaken. With regard to radio facilities, it will include the installation of channel 70 digital selective calling VHF equipment at Stiff and at the Pointe du Raz.

The vessel traffic service operators use VHF radio direction-finding equipment precise to within 0.5º. One is installed at the Pointe du Raz, the other at the Ihare de Creac’h lighthouse. On each radio direction-finder it is possible to select two different tracks.

8 ALTERNATIVE COMMUNICATION IF THE COMMUNICATION FACILITIES OF THE SHORE-BASED AUTHORITY FAIL

The vessel traffic service VHF radiocommunications equipment is installed at Ouessant. It includes four single-channel transmitter/receivers plus a multi-channel transmitter/receiver on standby. A multi-channel transmitter/receiver normally dedicated to the MRCC Corsen completes the installation.

In the event that the radio-relay system between Stiff and Corsen breaks down, two emergency multi-channel VHF transmitter/receivers installed at the Corsen site can be used.

If none of the VTS VHF equipment is operational at the Corsen Centre, it would still be possible for the naval staff on watch at Stiff to intervene, as that staff has its own radio equipment and would be able to maintain contact with the ships. It should be noted that in the event that the surveillance radar breaks down, this watch would take over temporarily from the vessel traffic service at Corsen/Ushant, pending the arrival, by the most rapid means (helicopter), of the VTS staff on Ile d’Ouessant island. A breakdown involving several of the VTS VHF radios would not remove all possibility of contact between the VTS and the ships.

There is therefore no reason to provide for a specific procedure in this event.

If it became necessary to establish an MHF link, in the event of a breakdown at the MHF installation at the Corsen Centre, the inshore radio station, Le Conquet Radio, would be called upon.
SUMMARY

1 General

1.1 Vessels concerned: all vessels having a gross registered tonnage equal to or exceeding 300 tons.

1.2 Area on entering which the vessels should report:
   - on entering a circular area 35 miles in radius centred on the Ile d’Ouessant (Stiff radar tower).

1.3 Reference chart: chart No. 6989 of the French Navy Hydrographic and Oceanographic Department.

1.4 Reporting format (in accordance with resolution A.648(16) on General principles for ship reporting systems and ship reporting requirements, including guidelines for reporting incidents involving dangerous goods, harmful substances and/or marine pollutants).

   Name of system: OUESSREP
   Data to be transmitted:
   Heading: Information
   A Name + call sign + IMO number
   C or D Position
   E Course
   F Speed
   P Cargo if presence on board of potentially dangerous cargoes (for vessels in the north-eastbound lane).
   Q Defects (if relevant)
   R Pollution/dangerous goods lost overboard (if relevant)

   In the event of defect, pollution or goods lost overboard, additional information may be requested.

1.5 Authority to whom the report should be sent:

   Regional Centre for Surveillance and Rescue Operations at Corsen/Ouessant (CROSS Corsen), call sign USHANT TRAFFIC.

   (In addition to the vessel traffic service (VTS), the Centre carries out the functions of a rescue co-ordination centre (RCC), call sign CROSS CORSEN).

1.6 Communication facilities

   The reports will be transmitted by radio telephone in VHF on channel 13 or, in the event of failure, on channel 79, according to the information given by the Centre.

   It is proposed that the reports be transmitted in the future by automatic means when the relevant standards have been put in place by the Organization.

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ANNEX 11

RESOLUTION MSC.53(66)
(adopted on 30 May 1996)

PERFORMANCE STANDARDS FOR SHIPBORNE
GLONASS RECEIVER EQUIPMENT

THE MARITIME SAFETY COMMITTEE,

RECALLING resolution A.825(19) by which the Assembly resolved that the functions of adopting performance standards for radio and navigational equipment, as well as amendments thereto, shall be performed by the Maritime Safety Committee on behalf of the Organization,

NOTING resolution A.815(19) by which the Assembly adopted the IMO policy for the recognition and acceptance of suitable radionavigation systems intended for international use to provide ships with navigational position-fixing throughout their voyages,

HAVING IDENTIFIED that the Global Navigation Satellite System (GLONASS) may be a component of the world-wide radionavigation system,

NOTING ALSO that shipborne receiving equipment for the world-wide radio navigation system should be designed to satisfy the detailed requirements of the particular system concerned,

1. ADOPTS the Recommendation on Performance Standards for Shipborne GLONASS Receiver Equipment set out in the Annex to the present resolution;

2. INVITES Governments to ensure that GLONASS receiver equipment carried on ships of their flags conforms to performance standards not inferior to those set out in the Annex to the present resolution.
ANNEX

RECOMMENDATION ON PERFORMANCE STANDARDS FOR SHIPBORNE GLONASS RECEIVER EQUIPMENT

1 INTRODUCTION

1.1 The Global Navigation Satellite System (GLONASS) is a space-based positioning, velocity, and time system that has three major segments: Space, Control and User. The GLONASS Space Segment, will normally be composed of 24 satellites placed in three orbital planes with eight satellites in each plane. The satellites operate in circular 19100 km orbits at an inclination angle of 64.8° and with an 11 h and 15 min period. The spacing of satellites in orbit will be arranged so that a minimum of four satellites will be in view to users world-wide, with a position dilution of precision (PDOP) of ≤ 6. Satellites of the system transmit signals on “L” band frequencies. Each satellite has separate lettered frequencies L1 (1602, 5625-1615.5 MHz).

1.2 Each L1 frequency carries a code standard accuracy (C), which is used in shipborne GLONASS receiver equipment. A navigation data message is super-imposed on this code.

1.3 Receiver equipment for the GLONASS intended for navigational purposes on ships with maximum speeds not exceeding 50 knots should, in addition to the general requirements contained in resolution A.694(17), comply with the following minimum performance requirements.

1.4 These standards cover the basic requirements of position-fixing for navigation purposes only and does not cover other computational facilities which may be in the equipment.

2 GLONASS RECEIVER EQUIPMENT

2.1 The words "GLONASS receiver equipment" as used in these performance standards include all the components and units necessary for the system to properly perform its intended functions. The equipment should include the following minimum facilities:

1. antenna capable of receiving GLONASS signals;
2. GLONASS receiver and processor;
3. means of accessing the computed latitude/longitude position;
4. data control and interface; and
5. position display and, if required, other forms of output.

2.2 The antenna design should be suitable for fitting at a position on the ship which ensures a clear view of the satellite constellation.
3 PERFORMANCE STANDARDS FOR GLONASS RECEIVER EQUIPMENT

The GLONASS receiver equipment should:

.1 be capable of receiving and processing the Standard Positioning Service (SPS) signals of the GLONASS system and provide position information in latitude and longitude SGS-90 co-ordinates in degrees, minutes and thousandths of minutes and time of solution referenced to UTC (SU). Means should be provided to transform the computed position based upon SGS-90 into WGS 84 or into data compatible with the datum of the navigational chart in use. Where this facility exists, the display should indicate that the co-ordinate conversion is being performed and should identify the co-ordinate system in which the position is expressed;

.2 operate on the Standard Positioning Service (on lettered L1 frequencies and C code);

.3 be provided with at least one output from which position information can be supplied to other equipment. The output of position information based upon SGS-90 or WGS 84, should be in accordance with IEC Publication 1162;

.4 have static accuracy such that the position of the antenna is determined to within 100 m (95%) with horizontal dilution of position (HDOP) $\leq 4$ (PDOP $\leq 6$);

.5 have dynamic accuracy such that the position of the antenna is determined to within 100 m (95%) with horizontal dilution of position (HDOP) $\leq 4$ (PDOP $\leq 6$) under the conditions of sea states and ship’s motion likely to be experienced in ships;*

.6 be capable of selecting automatically the appropriate satellite transmitted signals for determination of the ship's position with the required accuracy and update rate;

.7 be capable of acquiring satellite signals with input signals having carrier levels in the range of -130 dBm to -120 dBm. Once the satellite signals have been acquired the equipment should continue to operate satisfactorily with satellite signal having carrier levels down to -133 dBm;

.8 be capable of acquiring position to the required accuracy, within 30 min, when there is no valid almanac data;

.9 be capable of acquiring position to the required accuracy, within 5 min, when there is valid almanac data;

.10 be capable of re-acquiring position to the required accuracy, within 5 min when the GLONASS signals are interrupted for a period of at least 24 h, but there is no loss of power;

.11 be capable of re-acquiring position to the required accuracy, within 2 min, when subjected to a power interruption of 60 s;
* Resolution A.694(17), Publications IEC 721-3-6, IEC 945 and IEC 1108-2.
  .12 generate and output a new position solution at least once every 2 s;
  .13 the minimum resolution of position, i.e. latitude and longitude should be 0.001 min; and
  .14 have the facilities to receive and process differential GLONASS (DGLONASS) data fed
to it in accordance with the standards of Recommendation ITU-R M.823. When a
GLONASS receiver is equipped with a differential receiver, performance standards for
static and dynamic accuracies (.4 and .5 above) should be 10 m (95%).*

4   PROTECTION

Precautions should be taken to ensure that no permanent damage can result from an accidental
short circuit or grounding of the antenna or any of its input or output connections or any of the
GLONASS receiver equipment inputs or outputs for a duration of 5 min.

5   FAILURE WARNINGS AND STATUS INDICATIONS

5.1 The equipment should provide an indication if the position calculated is likely to be outside of the
requirements of these performance standards.

5.2 The GLONASS receiver equipment should provide as a minimum:
  .1 an indication within 5 s if either:
    .1.1 the specified HDOP has been exceeded; or
    .1.2 a new position has not been calculated for more than 2 s.

Under such conditions the last known position and the time of the last valid fix, with
explicit indication of this state, so that no ambiguity can exist, should be output until
normal operation is resumed;

.2 a warning of loss of position; and

.3 differential GLONASS status indication of:
  .3.1 the receipt of DGLONASS signals; and
  .3.2 whether DGLONASS corrections are being applied to the indicated ship's
position.

* Refer to resolution A.815(19) on the World-wide Radionavigation System, adopted by the
Organization.