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REPORT TO THE MARITIME SAFETY COMMITTEE

1 Attached is annex 4 to the report of the Sub-Committee on its forty-seventh session (SLF 47/17).

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ANNEX 4

DRAFT REVISED VOLUNTARY GUIDELINES FOR THE DESIGN, CONSTRUCTION AND EQUIPMENT OF SMALL FISHING VESSELS

Preface

1 A meeting of consultants on safety on board fishing vessels, jointly convened in 1974 by the Food and Agriculture Organization of the United Nations (FAO), the International Labour Organization (ILO) and the International Maritime Organization (IMO), for the purpose of finalizing the text of part B of the Code of Safety for Fishermen and Fishing Vessels, which applies to vessels of 24 metres in length and over, recommended that the three Organizations should continue to co-operate with a view to establishing voluntary guidelines for the design, construction and equipment of vessels of less than 24 metres in length.

2 Subsequently the Maritime Safety Committee (MSC) of IMO took note of the aforementioned recommendation and requested its Sub-Committee on Safety of Fishing Vessels to develop such guidelines in co-operation with FAO and ILO.

3 The International Conference on Safety of Fishing Vessels, 1977, recognizing that the 1977 Torremolinos Convention applies only to fishing vessels of 24 metres in length and over and being conscious that the vast majority of fishing vessels throughout the world are of less than 24 metres in length, adopted a resolution recommending that IMO continue to develop safety standards for design, construction and equipment of such fishing vessels with a view to promoting the safety of these vessels and their crews.

4 FAO, ILO and IMO finalized the original text of the Voluntary Guidelines at the twenty-first and twenty-second sessions of the IMO Sub-Committee on Stability and Load Lines and on Fishing Vessels Safety (SLF). The Guidelines were approved by the MSC at its forty-first session in October 1979 and by the FAO in November 1979 for circulation to governments. The ILO Governing Body was informed at its 211th session in November 1979 of the intention to publish this document.

5 It was pointed out, however, that some parts of the Guidelines required further development. These mainly concerned stability criteria, which were considered at that time as being only tentative. Bearing in mind that development of appropriate stability criteria for any type of fishing vessel is a very complex problem, which has not been entirely solved even for larger vessels, the International Conference on Safety of Fishing Vessels, 1977, adopted a resolution recommending that IMO continue studies with the aim of formulating detailed stability standards for fishing vessels.

6 Following the adoption of the Torremolinos Protocol of 1993 relating to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977, MSC undertook the review of the FAO/ILO/IMO Code of Safety for Fishermen and Fishing Vessels, Part A and Part B. At the same time, it also decided to review the Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels. In requesting the SLF Sub-Committee to review the Guidelines, the MSC recommended that the concerns expressed in paragraph 5 above, as well as, recent developments in fishing vessel design and fishing operations should be taken into consideration.

7 FAO, ILO and IMO completed the task of reviewing and revising the Voluntary Guidelines and the final text was adopted by MSC at its [seventy-ninth session in 2004, by the FAO Committee on Fisheries at its [...] session [date] and the Governing Body of ILO in [...]].

8 The purpose of the Voluntary Guidelines as revised has not changed it is to provide a generally applicable code of safe practice for design, construction and equipment of smaller fishing vessels. Nevertheless, discretion should be exercised in using provisions of the Voluntary Guidelines for the purpose of framing national safety requirements when local weather and sea conditions and special operational requirements should be given particular consideration. Furthermore, attention is drawn to the FAO/ILO/IMO Code of Safety for Fishermen and Fishing Vessels, Part A, Safety and Health and Practice, as revised.

9 Concerning the procedures for future amendments to the Code and the Voluntary Guidelines, the MSC considered that any amendments should be effected as expeditiously as possible. It was agreed that non-controversial amendments should be approved by correspondence, but joint meetings of experts might be necessary for other amendments for which no ready agreement by correspondence could be reached.

10 Recognizing that the majority of items covered by the Voluntary Guidelines are within the scope of IMO and noting the different working procedures within the three Organizations and also that the SLF Sub-Committee holds regular meetings, it was agreed that:

.1 IMO should act as a focal point for co-ordinating proposed amendments to the Code and in particular the IMO Secretariat should undertake to receive any proposed amendments, to distribute them to the Organizations and to collate their respective comments;

.2 any future joint FAO/ILO/IMO meeting should be held, whenever possible, in conjunction with a meeting of the SLF Sub-Committee; and

.3 any proposed amendments should always be subject to the final approval of the appropriate bodies of the three Organizations.

Parts A and B as revised, are published as two separate booklets [(Sales Numbers ……], respectively).

CHAPTER 1[264]

GENERAL PROVISIONS

1.1 Purpose and scope

1.1.1 The purpose of these guidelines is to provide information on design, construction, and equipment of small fishing vessels with a view to promoting the safety of the vessel and safety and health of the crew. They are not intended as a substitute for national laws and regulations but may serve as a guide to those concerned with framing such national laws and regulations. Each competent authority responsible for the safety of fishing vessels should ensure that the provisions of these guidelines are adapted to its specific requirements, having due regard to the size and type of vessels, their intended service and area of operation.

1.1.2 Unless otherwise stated, the provisions of these guidelines are intended to apply to new decked fishing vessels of 12 m in length and over, but less than 24 m in length. Nevertheless, even where not otherwise stated, the competent authority should as far as reasonable and practical give consideration to the application of these provisions to existing decked fishing vessels.

1.1.3 The provisions of these guidelines do not apply to fishing vessels for sport or recreation or to processing vessels.

1.2 Definitions

For the purpose of these guidelines unless expressly provided otherwise the following definitions apply:

1.2.1 *Amidships* means the mid-length of L.

1.2.2 *Approved* means approved by the competent authority.

1.2.3 *Baseline* is the horizontal line intersecting at amidships the keel line.[265]

1.2.4 *Bow height* is defined as the vertical distance at the forward perpendicular between the waterline corresponding to the maximum permissible draught and the designed trim and the top of the exposed deck at side.

1.2.5 *Breadth (B)*[*] is the maximum breadth of the vessel, measured amidships to the moulded line of the frame in a vessel with a metal shell and to the outer surface of the hull in a vessel with a shell of any other material.

1.2.6 *Collision bulkhead* is a watertight bulkhead up to the working deck in the fore part of the vessel as approved by the competent authority.[*]

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264 The text of chapter 1 is inserted from document FP 48/19, annex 5.
265 Drawn from the Protocol I.2 (14).
* Refer to regulation I/2(22) of the Protocol.

1.2.7 *Competent authority* is the government of the State whose flag the vessel is entitled to fly.

1.2.8 *Crew* means the skipper and all persons employed or engaged in any capacity on board a vessel on the business of that vessel.

1.2.9 *Decked vessel* is a vessel having a fixed structural deck covering the entire hull above the deepest operating waterline. Where open wells or cockpits are fitted in this deck the vessel is considered a decked vessel if flooding of the well or cockpit will not endanger the vessel.

1.2.10 *Deck erection* is any decked structure on the working deck.

1.2.11 *Deepest operating waterline* is the waterline related to the maximum permissible operating draft.

1.2.12 *Enclosed superstructure* is a superstructure with:

.1 enclosing bulkheads of efficient construction;

.2 access openings, if any, in those bulkheads fitted with permanently attached weathertight doors of a strength equivalent to the unpierced structure which can be operated from each side; and

.3 other openings in sides or ends of the superstructure fitted with efficient weathertight means of closing.

A raised quarter-deck is regarded as a superstructure.

A bridge or poop should not be regarded as enclosed unless access is provided for the crew to reach machinery and other working spaces inside those superstructures by alternative means which are available at all times when bulkhead openings are closed.

1.2.13 *Existing* vessel is a vessel which is not a new vessel.

1.2.14 *Fishing vessel* (hereto referred as vessel) means any vessel used commercially for catching fish, whales, seals, walrus or other living resources of the sea.

1.2.15 *Forward and after perpendiculars* should be taken at the forward and after ends of the length (L). The forward perpendicular should be coincident with the foreside of the stem on the waterline on which the length is measured.[266]

1.2.16 *Freeboard (f)* is the actual minimum freeboard and is the distance from the underside of the working deck at the side to a water-line, measured perpendicularly to the water-line, plus the minimum thickness of decking. When the working deck is stepped, the lowest line of the deck and the continuation of that line parallel to the upper part of the deck is to be taken as the working deck.

[266] Drawn from the Protocol I.2 (6).

1.2.17 *Height of a superstructure or other erection* is the least vertical distance measured at side from the top of the deck beams of a superstructure or an erection to the top of the working deck beams.

1.2.18 *Keel line* is the line parallel to the slope of keel passing amidships through:

.1 the top of the keel or line of intersection of the inside of shell plating with the keel where a bar keel extends above that line of a vessel with a metal shell; or

.2 the rabbet lower line of the keel of a vessel with a shell of wood or a composite material; or

.3 the intersection of a fair extension of the outside of the shell contour at the bottom with the centreline of a vessel with a shell of material other than wood and metal.[267]

1.2.19 *Least depth (D)*[*] is the depth measured from the keel line to the top of the working deck beam at side. Where the working deck is stepped and the raised part of the deck extends over the point at which the least depth is to be determined, the least depth should be measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part.

1.2.20 *Length (L)*[*] should be taken as 96% of the total length on a waterline at 85% of the least depth, or as the length from the foreside of the stem to the axis of the rudder stock on that waterline, if that length is greater. In vessels designed with rake of keel the waterline on which this length is measured should be parallel to the designed waterline.

1.2.21 *Machinery spaces of category A* are those spaces which contain internal combustion type machinery used either:

.1 for main propulsion; or

.2 for other purposes where such machinery has in the aggregate a total power output of not less than 750 kW,

or which contains any oil-fired boiler oil unit.

1.2.22 *Midship section* is that section of the hull defined by the intersection of the moulded surface of the hull with a vertical plane perpendicular to the waterline and centreline plane passing through amidships.[268]

1.2.23 *New vessel* is a vessel the keel of which is laid, or which is at a similar stage of construction, on or after the date of adoption of the present revision of these guidelines.

1.2.24 *Organization* means the International Maritime Organization.[269]

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[267] Drawn from the Protocol I.2 (13).

[*] Dimensions are illustrated in Annex I.

[268] Drawn from the Protocol I.2 (12).

[269] Drawn from Article 2 of the 1993 Torremolinos Protocol.

1.2.25 *Protocol* means the Torremolinos International Convention for the Safety of Fishing Vessels, 1977, as modified by the Torremolinos Protocol of 1993 relating thereto.

1.2.26 *Skipper* means the person having command of a fishing vessel.

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

1.2.28 *Superstructure deck* is that complete or partial deck forming the top of a deck erection situated at a height of not less than 1.8 m above the working deck. Where this height is less than 1.8 m, the top of such deck erections should be treated in the same way as the working deck.

1.2.29 Wa*tertight* means capable of preventing the passage of water through the structure in any direction under a head of water for which the surrounding structure is designed.

1.2.30 *Weathertight* means that in any sea conditions water will not penetrate into the vessel.

1.2.31 *Working deck* is generally the lowest complete deck above the deepest operating waterline from which fishing is undertaken. In vessels fitted with two or more complete decks, the competent authority may accept a lower deck as a working deck provided that that deck is situated above the deepest operating waterline.

1.3 Measurements

In these guidelines measurements are given in the metric system using the following abbreviations:

m	-	metre
cm	-	centimetre
mm	-	millimetre
t	-	tonne (1,000 kg)
kg	-	kilogram
mt	-	metre - tonne
º C	-	degree centigrade
sec	-	second
N	-	Newton
kW	-	Kilowatt kN∗m/sec

1.4 Maintenance, upkeep and surveys

1.4.1 The hull, machinery, equipment and radio installations as well as crew accommodation of every vessel should be constructed and installed so as to be capable of being regularly maintained to ensure that they are at all times, in all respects, satisfactory for the vessel's intended service.

1.4.2 Where practicable, the competent authority should arrange for appropriate surveys of a vessel during construction and, at regular intervals after completion, to ensure satisfactory condition of the vessel's hull, machinery, equipment, radio installations equipment and radio

installations as well as crew accommodation. An appropriate report of the survey should be entered in the record of the vessel.

1.4.3 After any survey has been completed no change should be made in the structural arrangements, machinery, equipment, and radio installations as well as crew accommodation etc., covered by the survey, without the approval of the competent authority.

1.4.4 Documentation relating to the safety of the vessel should cease to be valid upon transfer of the vessel to the flag of another State. New safety documentation should only be issued when the competent authority is fully satisfied that the vessel is in compliance with the requirements of the relevant provisions.

1.5 Equivalents

Where the present provisions require that a particular fitting, material, appliance or apparatus, or type thereof, should be fitted or carried in a vessel, or that any particular provision should be made, the competent authority may allow any other fitting, material, appliance or apparatus, or type thereof, to be fitted or carried, or any other provision to be made in that vessel, if it is satisfied by trial thereof or otherwise that such fitting, material, appliance or apparatus, or type thereof, or provision, is at least as effective as that required by the present provisions.[270]

[270] Refer to regulation I/4(1) of the Protocol.

CHAPTER 2

CONSTRUCTION, WATERTIGHT INTEGRITY AND EQUIPMENT

2.1 Construction

2.1.1 Strength and construction of hull, superstructures, deckhouses, machinery casings, companionways and any other structures and vessel's equipment should be sufficient to withstand all foreseeable conditions of the intended service and should be to the satisfaction of the competent authority.[271]

2.1.2 The hull of vessels intended for operation in ice should be strengthened in accordance with the anticipated conditions of navigation and area of operation. Wooden vessels, operating from harbours subject to freezing should have appropriate ice protection sheathing.[272]

2.1.3 Bulkheads, closing devices and closures of openings in these bulkheads, as well as methods for their testing, should be in accordance with the requirements of the competent authority. Vessels constructed of material other than wood should be fitted with a collision bulkhead and at least with watertight bulkheads bounding the main machinery space. Such bulkheads should be extended up to the working deck. In vessels constructed of wood such bulkheads, which as far as practicable should be watertight, should also be fitted.[273]

2.1.4 Pipes piercing the collision bulkhead should be fitted with suitable valves operable from above the working deck and the valve chest should be secured at the collision bulkhead inside the forepeak. No door, manhole, ventilation duct or any other opening should be fitted in the collision bulkhead below the working deck.[274]

2.1.5 The forepeak should not be used for carrying fuel oil, except where specially approved by the competent authority.[275]

2.2 Watertight doors

2.2.1 The number of openings in watertight bulkheads, as required by 2.1.3, should be reduced to the minimum compatible with the general arrangement and operational needs of the vessel; openings should be fitted with watertight closing appliances to the satisfaction of the competent authority. Watertight doors should be of an equivalent strength to the adjacent unpierced structure.[276]

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271 Please refer to the existing Guidelines (hereinafter called Guidelines in the footnotes) 2.1.1 and Protocol regulation II/1(1).

272 Please refer to Guidelines 2.1.2 and Protocol regulation II/1(2).

273 Please refer to Guidelines 2.1.3 and Protocol regulation II/1(3).

274 Please refer to Guidelines 2.1.4, 2.1.5 and Protocol regulation II/1(4).

275 Please refer to Guidelines 2.1.6.

276 Please refer to Guidelines 2.2.1 and Protocol regulation II/2(1).

2.2.2 Watertight doors may be of the hinged type, and should be capable of being operated locally from each side of the door. A notice should be attached to the door on each side stating that the door should be kept closed at sea.[277]

2.2.3 Sliding watertight doors should be capable of being operated when the vessel is listed up to 15º either way.[278]

2.3 Hull integrity

2.3.1 External openings should be capable of being closed so as to prevent water from entering the vessel. Deck openings which may be open during fishing operations should normally be arranged near to the vessel's centreline. However, the competent authority may approve different arrangements if satisfied that the safety of the vessel will not be impaired.[279]

2.3.2 Fish flaps on stern trawlers should be power-operated and capable of being controlled from any position which provides an unobstructed view of the operation of the flaps.[280]

2.4 Weathertight doors

2.4.1 All access openings in bulkheads of enclosed superstructures and other outer structures through which water could enter and endanger the vessel, should be fitted with doors permanently attached to the bulkhead, framed and stiffened so that the whole structure is of equivalent strength to the unpierced structure, and weathertight when closed. The means for securing these doors weathertight should consist of gaskets and clamping devices or other equivalent means and should be permanently attached to the bulkhead or to the doors themselves, and should be so arranged that they can be operated from each side of the bulkhead. The competent authority may, without prejudice to the safety of the crew, permit the doors to be opened from one side only for freezer rooms, provided that a suitable alarm device is fitted to prevent persons being trapped in those rooms.[281]

2.4.2 The height above deck of sills in those doorways, in companionways, erections and machinery casings which give direct access to parts of the deck exposed to the weather and sea should be at least 600 mm on the working deck and at least 300 mm on the superstructure deck. Where operating experience has shown justification and on approval by the competent authority, these heights, except in the doorways giving direct access to machinery spaces, may be reduced to not less than 380 mm and 150 mm, respectively.[282]

2.4.3 Where operating experience has shown justification and on approval of the competent authority, the height above deck of sills in the doorways specified in 2.4.2, except those giving direct access to machinery spaces, may be reduced to not less than 150 mm on superstructure decks and not less than 380 mm on the working deck for vessels 24 m in length, or not less than 150 mm on the working deck for vessels of 12 m in length. For vessels of intermediate length

277 Please refer to Guidelines 2.2.2 and Protocol regulation II/2(2).
278 Please refer to Protocol regulation II/2(4).
279 Please refer to Guidelines 2.4.1 and Protocol regulation II/3(1).
280 Please refer to Protocol regulation II/3(2).
281 Please refer to Guidelines 2.3 and Protocol regulation II/4(1).
282 Please refer to Guidelines 2.8.3 and Protocol regulation II/4(2).

the minimum acceptable reduced height for sills in doorways on the working deck should be obtained by linear interpolation.[283]

2.5 Hatchways closed by wood covers

2.5.1 The height above deck of hatchway coamings on exposed parts of the working deck should be at least 300 mm for vessels of 12 m in length and at least 600 mm for vessels 24 m in length. For vessels of intermediate length the, minimum height should be obtained by linear interpolation. The height above deck of hatchway coamings on exposed parts of the superstructure deck should be at least 300 mm.[284]

2.5.2 Where operating experience has shown justification and on approval of the competent authority the height of hatchway coamings, except those which give direct access to machinery spaces may be reduced from the height as specified in 2.5.1 or the coamings may be omitted entirely, provided that efficient watertight hatch covers other than wood are fitted. Such hatchways should be kept as small as practicable, and the covers should be permanently attached by hinges or equivalent means and be capable of being rapidly closed or battened down.[285]

2.5.3 The finished thickness of wood hatchway covers should include an allowance for abrasion due to rough handling. In any case, the finished thickness of these covers should be at least 4 mm for each 100 mm of unsupported span subject to a minimum of 40 mm and the width of their bearing surfaces should be at least 65 mm.[286]

2.5.4 The use of wooden hatchway covers is generally not recommended in view of the difficulty of rapidly securing their weathertightness. However, where fitted they should be capable of being secured weathertight. Arrangements for securing wood hatchway covers weathertight should be provided to the satisfaction of the competent authority.[287]

2.6 Hatchways closed by covers other than wood

2.6.1 The height above deck of hatchway coamings should be as specified in 2.5.1. Where operating experience has shown justification and on the approval by the competent authority the height of these coamings may be reduced, or the coamings omitted entirely, provided that the safety of vessels is not thereby impaired. In this case, the hatchway openings should be kept as small as practicable and the covers be permanently attached by hinges or equivalent means and be capable of being rapidly closed and battened down, or by equally effective arrangements to the satisfaction of the competent authority.[288]

2.6.2 For the purpose of strength calculations it should be assumed that hatchway covers are subjected to static loads of 10 kN/m^2 or the weight of cargo intended to be, carried on them, whichever is the greater.[289]

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283 Please refer to Guidelines 2.8.4.
284 Please refer to Guidelines 2.8.1 and Protocol regulation II/5(1).
285 Please refer to Guidelines 2.8.2.
286 Please refer to Guidelines 2.4.7 and Protocol regulation II/5(2).
287 Please refer to Guidelines 2.4.6 and Protocol regulation II/5(3).
288 Please refer to Protocol regulation II/6(1).
289 Please refer to Guidelines 2.4.2 and Protocol regulation II/6(2).

2.6.3 Where covers are made of mild steel, the maximum stress calculated according to 2.6.2 and multiplied by 4.25 should not exceed the minimum ultimate strength of the material. Under these loads the deflections should not be more than 0.0028 times the span.[290]

2.6.4 Covers made of materials other than mild steel should be at least of equivalent strength to those made of mild steel and their construction should be of sufficient stiffness to ensure weathertightness under the loads specified in 2.6.2.[291]

2.6.5 Covers should be fitted with clamping devices and gaskets or other equivalent arrangements sufficient to ensure weathertightness to the satisfaction of the competent authority.[292]

2.7 Machinery space openings

2.7.1 Machinery space openings should be framed and enclosed by casings of sufficient strength. External access openings therein should be fitted with doors complying with 2.4 or with hatch covers other than wood complying with 2.6.[293]

2.7.2 Openings other than access openings should be fitted with covers of equivalent strength to the unpierced structure, permanently attached thereto and capable of being closed weathertight.[294]

2.8 Other deck openings

2.8.1 Where it is essential for fishing operations, flush deck scuttles of the screw, bayonet or equivalent type, and manhole covers may be fitted, provided these are capable of being closed watertight and such devices should be permanently attached to the adjacent structure. Having regard to the size and disposition of the openings and the design of the closing devices, metal-to-metal closures may be fitted if the competent authority is satisfied that they are effectively watertight.[295]

2.8.2 An efficient deck erection or companion-way, fitted with weathertight doors or their equivalent, should be provided to protect openings, other than hatchways, machinery space openings, manholes and flush scuttles in the working deck. Companion-ways should be situated as close as practicable to the vessel's centreline.[296]

2.9 Ventilators

2.9.1 The coamings of ventilators should be as high as practicable. On the working deck the height above deck of coamings of ventilators other than machinery space ventilators should be not less than 760 mm and on superstructure decks not less than 450 mm. When the height of such ventilators may interfere with the working of the vessel their coaming heights may be

290 Please refer to Guidelines 2.4.3 and Protocol regulation II/6(3).
291 Please refer to Guidelines 2.4.4 and Protocol regulation II/6(4).
292 Please refer to Guidelines 2.4.5 and Protocol regulation II/6(5).
293 Please refer to Guidelines 2.5.1 and Protocol regulation II/7(1).
294 Please refer to Guidelines 2.5.2 and Protocol regulation II/7(2).
295 Please refer to Guidelines 2.6.1 and Protocol regulation II/8(1).
296 Please refer to Guidelines 2.6.2 and Protocol regulation II/8(2).

reduced to the satisfaction of the competent authority. The height above deck of machinery space ventilator openings should be to the satisfaction of the competent authority.[297]

2.9.2 Coamings of ventilators should be of equivalent strength to the adjacent structure and capable of being closed weathertight by devices permanently attached to the ventilator or adjacent structure. Where the coaming of any ventilator exceeds 900 mm in height it should be specially supported. Ventilators should be arranged as close to the vessel's centreline as possible and, where practicable, should extend through the top of a deck erection or companion-way.[298]

2.9.3 Closing appliances need not be fitted to ventilators the coamings of which extend more than 2.5 m above the working deck or more than 1.0 m above a deckhouse top or superstructure deck.[299]

2.10 Air pipes

2.10.1 Where air pipes to tanks and void spaces below deck extend above the working or superstructure decks, the exposed parts of the pipes should be of strength equivalent to the adjacent structures and fitted with appropriate protection and, as far as is practicable, located close to the vessel's centreline and protected from damage by fishing or lifting gear. Openings of pipes should be provided with means of closing, permanently attached to the pipe or adjacent structure, except that where the competent authority is satisfied that they are protected against water trapped on deck, these means of closing may be omitted.[300]

2.10.2 The height of air pipes above deck to the point where water may have access below should be at least 760 mm on the working deck and at least 450 mm on the superstructure deck. The competent authority may accept reduction of the height of an air pipe to avoid interference with the fishing operations.[301]

2.11 Sounding devices

2.11.1 Sounding devices, to the satisfaction of the competent authority, should be fitted:

.1 to the bilges of those compartments which are not readily accessible at all times during the voyage; and

.2 to all tanks and cofferdams.[302]

2.11.2 Where sounding pipes are fitted, their upper ends should be extended to a readily accessible position and, where practicable, above the working deck. Their openings should be provided with permanently attached means of closing. Sounding pipes which are not extended above the working deck should be fitted with automatic self-closing devices.[303]

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297 Please refer to Guidelines 2.7.2 and Protocol regulation II/9(1).
298 Please refer to Guidelines 2.7.1 and Protocol regulation II/9(2).
299 Please refer to Guidelines 2.7.3.
300 Please refer to Guidelines 2.9.1 and Protocol regulation II/10(1).
301 Please refer to Protocol regulation II/10(2).
302 Please refer to Protocol regulation II/11(1).
303 Please refer to Protocol regulation II/11(2).

2.11.3 Sounding arrangements on fuel service tanks should be such that in the event of the tanks being overfilled, spillage through the means of sounding cannot occur.[304]

2.11.4 Fuel tank sounding pipe openings should not be located in crew accommodation.[305]

2.12 Sidescuttles and windows

2.12.1 Sidescuttles to spaces below the working deck and to enclosed spaces on the working deck should be fitted with hinged deadlights capable of being closed watertight.[306]

2.12.2 No sidescuttle should be fitted in such a position that its sill is less than 500 mm above the deepest operating waterline.[307]

2.12.3 Sidescuttles fitted less than 1,000 mm above the deepest operating waterline should be of the fixed type.[308]

2.12.4 Sidescuttles, together with their glasses and deadlights, should be of an approved construction. Those prone to be damaged by fishing gear should be suitably protected.[309]

2.12.5 Skylights leading to spaces below the working deck should be of substantial construction and capable of being closed and secured weathertight, and with provision for adequate means of closing in the event of damage to the inserts. Skylights leading to machinery spaces should be avoided as far as practicable.[310]

2.12.6 Toughened safety glass or suitably permanently transparent material of equivalent strength should be fitted in all wheelhouse windows exposed to the weather. The means of securing windows and the width of the bearing surfaces should be adequate, having regard to the window material used. Openings leading to spaces below deck from a wheelhouse whose windows are not provided with the protection required by 2.12.7 should be fitted with a weathertight closing appliance.[311]

2.12.7 Deadlights or a suitable number of storm shutters should be provided where there is no other method of preventing water from entering the hull through a broken window or sidescuttle.[312]

2.12.8 The competent authority may accept sidescuttles and windows without deadlights in side or aft bulkheads of deck erections located on or above the working deck if satisfied that the safety of the vessel will not be impaired.[313]

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304 Please refer to Guidelines 4.4.6.
305 Please refer to Guidelines 4.4.9.
306 Please refer to Guidelines 2.10.1 and Protocol regulation II/12(1).
307 Please refer to Protocol regulation II/12(2).
308 Please refer to Protocol regulation II/12(3).
309 Please refer to Guidelines 2.10.3 and Protocol regulation II/12(4).
310 Please refer to Guidelines 2.10.4.
311 Please refer to Guidelines 2.10.5 and Protocol regulation II/12(5).
312 Please refer to Guidelines 2.10.6.
313 Please refer to Guidelines 2.10.7 and Protocol regulation II/12(6).

2.12.9 The number of openings in the sides of the vessel below the working deck should be the minimum compatible with the design and proper working of the vessel and such openings should be provided with closing arrangements of adequate strength to ensure watertightness and the structural integrity of the surrounding structure.[314]

2.13 Inlets and discharges

2.13.1 Discharges led through the shell either from spaces below the working deck or from within enclosed superstructures or deckhouses on the working deck fitted with doors complying with the requirements of 2.4 should be fitted with means for preventing water from passing inboard. Normally each separate discharge should have an automatic non-return valve with a positive means of closing it from a readily accessible position. Such a valve is not required if the competent authority considers that the entry of water into the vessel through the opening is not likely to lead to dangerous flooding and that the thickness of the pipe is sufficient. The means for operating the valve with a positive means of closing should be provided with an indicator, showing whether the valve is open or closed. The open inboard end of any discharge system should be above the deepest operating waterline at an angle of heel satisfactory to the competent authority.[315]

2.13.2 In machinery spaces main and auxiliary sea inlets and discharges essential for the operation of machinery should be controlled locally. Controls should be readily accessible and should be provided with indicators showing whether the valves are open or closed.[316]

2.13.3 Fittings attached to the shell and all valves referred to in 2.13 should be of steel, bronze or other ductile material. All pipes between the shell and the valves should be of steel, except that in spaces other than machinery spaces of vessels constructed of material other than steel the competent authority may approve the use of other materials.[317]

2.14 Freeing ports

2.14.1 Where bulwarks on weather parts of the working deck form wells, the minimum freeing port area (A) in m^2, on each side of the vessel for each well on the working deck should be determined in relation to the length (l) and height of bulwark in this well as follows:

.1 $A = K \cdot l$

where: $K = 0.07$ for vessels of 24 m in length
$K = 0.05$ for vessels of 12 m in length

for intermediate lengths the value of K should be obtained by linear interpolation (l need not be taken as greater than 70% of the length of a vessel).

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314 Please refer to Guidelines 2.10.8.
315 Please refer to Guidelines 2.11.1 and Protocol regulation II/13(1).
316 Please refer to Guidelines 2.11.2 and Protocol regulation II/13(2), text deleted see Protocol regulation IV/20.
317 Please refer to Guidelines 2.11.3 and Protocol regulation II/13(3).

.2 Where the bulwark is more than 1.2 m in average height, the required area in .1 should be increased by 0.004 m^2 per metre of length of well for each 100 mm difference in height.

.3 Where the bulwark is less than 900 mm in average height, the required area may be decreased by 0.004 m^2 per metre of length of well for each 100 mm difference in height.[318]

2.14.2 The freeing port area calculated according to 2.14.1 should be increased where the competent authority considers that the vessel's sheer is not sufficient to ensure rapid and effective freeing of the deck of water.[319]

2.14.3 Subject to the approval of the competent authority the minimum freeing port area for each well on the superstructure deck should be not less than one half the area (A) given in 2.14.1 except that where the superstructure deck forms a working deck for fishing operations the minimum area each side should be not less than 75% of the area (A).[320]

2.14.4 Freeing ports should be so arranged along the length of bulwarks as to provide the most rapid and effective freeing of the deck from water. Lower edges of freeing ports should be as near the deck as practicable.[321] Two thirds of the total freeing port area per side should be provided in the half of the well nearest the lower point of the sheer curve, and some freeing port area should be placed as near the ends of the well as practicable.

2.14.5 Poundboards and means for stowage and working the fishing gear should be arranged so that the effectiveness of the freeing ports will not be impaired or water trapped on deck and prevented from easily reaching the freeing ports. Poundboards should be so constructed that they can be locked in position when in use and will not hamper the discharge of shipped water.[322]

2.14.6 Freeing ports over 300 mm in depth should be fitted with bars spaced not more than 230 mm nor less than 150 mm apart or provided with other suitable protective arrangements. Freeing port covers, if fitted, should be of approved construction.[323] It should not be possible to lock freeing ports, but they may be fitted with external top-hinged flaps/shutter and internal gratings. Such arrangements may, however, not lead to a considerable reduction of the effective freeing port area. Any shutter or external rubber flaps in freeing ports should be fastened with hinges in the upper edge. The shutter should fit freely so that they cannot get stuck. The hinges should be made of materials that are not susceptible to corrosion. There should not be any arrangements for the locking of freeing port shutters.

2.14.7 In vessels intended to operate in areas subject to icing, covers and protective arrangements from freeing ports should be capable of being easily removed to restrict ice accumulation. The size of opening and means provided for removal of these protective arrangements should be to the satisfaction of the competent authority.[324]

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318 Please refer to Guidelines 2.13.1 and Protocol regulation II/14(1).
319 Please refer to Guidelines 2.13.2 and Protocol regulation II/14(2).
320 Please refer to Guidelines 2.13.3 and Protocol regulation II/14(3).
321 Please refer to Guidelines 2.13.4 and Protocol regulation II/14(4).
322 Please refer to Guidelines 2.13.5 and Protocol regulation II/14(5).
323 Please refer to Guidelines 2.13.6 and Protocol regulation II/14(6).
324 Please refer to Guidelines 2.13.7 and Protocol regulation II/14(7).

2.14.8 Where wells or cockpits are fitted in the working deck or superstructure deck with their bottoms above the deepest operating waterline, efficient non-return means of drainage overboard should be provided. Where bottoms of such wells or cockpits are below the deepest operating waterline, drainage to the bilges should be provided.[325] Alternatively, the drainage of the wells could be by pumps to the satisfaction of the competent authority.

2.15 Anchor and mooring equipment

Anchor equipment designed for quick and safe operation should be provided which should consist of anchoring equipment, anchor chains or wire ropes, stoppers and a windlass or other arrangements for dropping and hoisting the anchor and for holding the vessel at anchor in all foreseeable service conditions. Vessels should also be provided with adequate mooring equipment for safe mooring in all operating conditions. Anchor and mooring equipment should be to the satisfaction of the competent authority. Recommended practice for Anchor and Mooring Equipment is given in annex II.[326]

2.16 Working decks within an enclosed superstructure

2.16.1 Such decks should be fitted with an efficient drainage system having an appropriate drainage capacity to dispose of water or fish waste which may occur from deck washing, fish processing or from the sea through openings that may be open during fishing operations, to the satisfaction of the competent authority.

2.16.2 All openings necessary for fishing operations should be provided with means for quick and efficient closures by one person, to the satisfaction of the competent authority.

2.16.3 Where the catch is brought on to such decks for handling and processing, the catch should be placed in a pound, to the satisfaction of the competent authority. An efficient drainage system should be fitted. Adequate protection against inadvertent influx of water to the working deck should be provided.

2.16.4 At least two exits from such decks should be provided.

2.16.5 The clear headroom in the working space should at all points be to the satisfaction of the competent authority.

2.16.6 A fixed ventilation system providing sufficient changes of air per hour should be provided.

2.17 Tanks for fish in refrigerated (RSW) or chilled (CSW) sea water

2.17.1 If RSW- or CSW-tanks or similar tank systems are used, such tanks should be provided with a separate permanently fitted arrangement for the filling and emptying of sea water.

2.17.2 If such tanks are to be used also for carrying dry cargo, the tanks should be arranged with a bilge system and provided with adequate means to avoid ingress of water from the bilge system into the tanks.

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325 Please refer to Guidelines 2.13.8.

326 Please refer to reg. II/15 of the Protocol.

CHAPTER 3

STABILITY AND ASSOCIATED SEAWORTHINESS

3.1 General

3.1.1 Vessels should be so designed and constructed that the requirements of this chapter will be satisfied in the operating conditions referred to in 3.7. Calculations of the righting lever curves should be to the satisfaction of the competent authority.[327*]

3.1.2 Wherever practicable, guidance should be provided for an approximate determination of the vessel's stability by means of the rolling period test including values of rolling coefficients particular to the vessel.[**328]

3.2 Stability criteria

3.2.1 The following minimum stability criteria should be met unless the competent authority is satisfied that operating experience justifies departure therefrom:

.1 The area under the righting lever curve (GZ curve) should not be less than 0.055 m-rad up to 30° angle of heel and not less than 0.090 m-rad up to 40° or the angle of flooding θ_f if this angle is less than 40°. Additionally, the area under the righting lever curve (GZ curve) between the angles of heel of 30° and 40° or between 30° and θ_f, if this angle is less than 40° should not be less than 0.030 m-rad. θ_f is the angle of heel at which openings in the hull, superstructures or deckhouses which cannot rapidly be closed watertight commence to immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open;

.2 the righting lever GZ should be at least 200 mm at an angle of heel equal to or greater than 30°. The righting lever GZ may be reduced to the satisfaction of the competent authority but in no case by more than 2(24-L)%, where L in m is as defined in 1.2.1.6;

.3 the maximum righting lever GZmax should occur at an angle of heel preferably exceeding 30° but not less than 25°; and

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327 Please refer to regulation III/1 of the Protocol.

* See the Calculation of stability curves and the Effect of free surfaces of liquids in tanks contained in paragraphs 3.6 and 3.3 respectively of the Code on Intact Stability adopted by the Organization by resolution A.749(18) as amended and the Code of Practice concerning the Accuracy of Stability Information for Fishing Vessels adopted by the Organization by resolution A.267(VIII).

** See an Approximate Determination of vessel's stability by means of rolling period test (for vessels up to 70 m in length) contained in Appendix 7 of Part A of the Code of Safety for Fishermen and Fishing Vessels.

328 Please refer to paragraph 3.1.3 of the existing Guidelines and to the references in the footnote linked to this paragraph.

.4 the initial metacentric height GM_0 should not be less than 350 mm for single deck vessels. In vessels with complete superstructure the metacentric height may be reduced to the satisfaction of the competent authority but in no case should be less than 150 mm.[329]

3.2.2 Where arrangements other than bilge keels are provided to limit the angles of roll, the competent authority should be satisfied that the stability criteria given in 3.2.1 are maintained in all operating conditions.[330]

3.2.3 Where ballast is provided to ensure compliance with 3.2.1, its nature and arrangement should be to the satisfaction of the competent authority.[331]

3.2.4 It should be ensured that stability characteristics of the vessel will not produce acceleration forces which could be prejudicial to the safety of the vessel and crew.[332]

3.2.5 For decked vessels for which, by reason of insufficient stability data, 3.2.1 cannot be applied, the following appoximate formula for the minimum metacentric height GM_{min} (in metres) for all operating conditions should be used as the criterion:

$$GM\ \min = 0.53 + 2B\left[0.075 - 0.37\left(\frac{f}{B}\right) + 0.82\left(\frac{f}{B}\right)^2 - 0.014\left(\frac{B}{D}\right) - 0.032\left(\frac{l_s}{L}\right)\right]$$

where:

L, B, D and f in m are as defined in 1.2.1.7, 1.2.1.9, 1.2.1.10 and 1.2.1.11; and

l_s is the actual length of enclosed superstucture extending from side to side of the vessel (m), as defined in 1.2.1.19.

The formula is applicable for vessels having:

.1 $\frac{\mathrm{f}}{\mathrm{B}}$ between 0.02 and 0.20;

.2 $\frac{\ell_s}{L}$ smaller than 0.60;

.3 $\frac{B}{D}$ between 1.75 and 2.15;

.4 sheer fore and aft at least equal to or exceeding the standard sheer prescribed in Regulation 38(8) of the International convention on Load Lines, 1966; and

329 Please refer to regulation III/2(1) of the Protocol.
330 Please refer to regulation III/2(2) of the Protocol.
331 Please refer to regulation III/2(3) of the Protocol.
332 Please refer to paragraph 4.2.2 of the existing Part B of the Code.

.5 height of superstructure included in the calculation not less than 1.8 m.

For vessels with parameters outside of the above limits the formula should be applied with special care.[333]

3.2.6 The above formula is not intended as a replacement for the basic criteria given in 3.2.1 and 3.5 but is to be used only if circumstances are such that cross-curves of stability, KM curve and subsequent GZ curves are not and cannot be made available for judging a particular vessel's stability.[334]

3.2.7 The calculated value of GM_{min} should be compared with actual GM values of the vessel in all loading conditions. If a rolling test[*], an inclining experiment based on estimated displacement, or another approximate method of determining the actual GM is used, a safety margin should be added to the calculated GM_{min}.[335]

3.3 Flooding of fish-holds

The angle of heel at which progressive flooding of fish-holds could occur through hatches which remain open during fishing operations and which cannot rapidly be closed should be at least 20° unless the stability criteria of 3.2.1 can be satisfied with the respective fish-holds partially or completely flooded.[336]

3.4 Particular fishing methods

Vessels engaged in particular fishing methods where additional external forces are imposed on the vessel during fishing operations, should meet the stability criteria of 3.2.1 increased, if necessary, to the satisfaction of the competent authority.[337]

3.5 Severe wind and rolling

For vessels intended for operation in areas where exceptionally adverse weather condition may be experienced, special attention should be given to the capability to withstand the capsizing effects of breaking waves. In order to demonstrate ability to withstand such effects, the competent authority should give consideration to the benefits of enclosed deck erections which may provide an improved range of positive stability to larger angels of heel with openings assumed closed weathertight. A positive range of stability up to an angle of 80° may be used as a criterion. Alternatively, the Severe wind and rolling criterion (weather criterion) for fishing vessels[**] may be used.[338]

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333 Please refer to paragraph 4.2.6.1 of the IS Code.

334 Please refer to paragraph 4.2.6.2 of the IS Code.

* See Appendix 7 of Part A of the Code of Safety for Fishermen and Fishing Vessels.

335 Please refer to paragraph 4.2.6.3 of the IS Code.

336 (Please refer to regulation III/3 of the Protocol).

337 (and to regulation III/4 of the Protocol).

** See the Severe wind and rolling criterion (weather criterion) for fishing vessels contained in paragraph 4.2.4 of the Code on Intact Stability adopted by the Organization by resolution A.749(18) as amended.

338 Please refer to the footnote related to the heading of section 3.2 of the existing Guidelines and to regulation III/4 of the Protocol.

3.6 Water on deck

Vessels should be able to withstand, to the satisfaction of the competent authority, the effect of water on deck, taking account of the seasonal weather conditions, the sea states in which the vessel will operate, the type of vessel and its mode of operation. The Guidance on a Method of Calculation of the Effect of Water on Deck* may be used.[339]

3.7 Operating conditions

3.7.1 The number and type of operating conditions to be considered should be to the satisfaction of the competent authority and should include the following as appropriate:

.1 departure for the fishing grounds with full fuel, stores, ice, fishing gear, etc.;

.2 departure from the fishing grounds with full catch;

.3 arrival at home port with full catch and 10% stores, fuel, etc.; and

.4 arrival at home port with 10% stores, fuel, etc. and a minimum catch, which should normally be 20% of full catch but may be up to 40% provided the competent authority is satisfied that operating patterns justify such a value.[340]

3.7.2 In addition to the specific operating conditions given in 3.7.1 the competent authority should also be satisfied that the minimum stability criteria given in 3.2 are met under all other actual operating conditions including those which produce the lowest values of the stability parameters contained in these criteria. The competent authority should also be satisfied that those special conditions associated with a change in the vessel's mode or areas of operation which affect the stability considerations of this chapter are taken into account.[341]

3.7.3 Concerning the conditions referred to in 3.7.1, the calculations should include the following:

.1 allowance for the weight of the wet fishing nets and tackle, etc. on deck;

.2 allowance for ice accretion, if anticipated, in accordance with 3.8;

.3 homogeneous distribution of the catch, unless this is inconsistent with practice;

.4 catch on deck, if anticipated, in operating conditions referred to in 3.7.1.2, 3.7.1.3 and 3.7.2;

.5 water ballast if carried either in tanks which are especially provided for this purpose or in other tanks also equipped for carrying water ballast; and

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* See the Guidance on a Method of Calculation of the Effect of Water on Deck contained in recommendation 1 of attachment 3 to the Final Act of the Conference.

339 Please refer to regulation III/6 of the Protocol.

340 Please refer to regulation III/7(1) of the Protocol.

341 Please refer to regulation III/7(2) of the Protocol.

.6 allowance for the free surface effect of liquids and, if applicable, catch carried.[342]

3.8 Ice accretion

3.8.1 For vessels operating in areas where ice accretion is likely to occur the following icing allowance should be made in the stability calculations:[*]

.1 30 kg/m^2 on exposed weather decks and gangways;

.2 7.5 kg/m^2 for the projected lateral area of each side of the vessel above the water-plane; and

.3 the projected lateral area of discontinuous surfaces of rail, spars (except masts) and rigging of vessels having no sails and the projected lateral area of other small objects should be computed by increasing the total projected area of continuous surfaces by 5% and the static moments of this area by 10%.[343]

3.8.2 The height of the centre of gravity of ice accretion should be calculated according to the position of corresponding parts of the decks and gangways and other continuous surfaces on which ice can accumulate.[344]

3.8.3 Vessels intended for operation in areas where ice accretion is known to occur should be:

.1 designed to minimize the accretion of ice; and

.2 equipped with such means for removing ice as the competent authority may require.[345] [**]

3.9 Inclining test

3.9.1 Every vessel should undergo an inclining test upon its completion and the actual displacement and position of the centre of gravity should be determined for the light ship condition.[346]

3.9.2 Where alterations are made to a vessel affecting its light ship condition and the position of the centre of gravity, the vessel should, if the competent authority considers this necessary, be re-inclined and the stability information revised.[347]

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342 Please refer to regulation III/7(3) of the Protocol.

* For sea areas where ice accretion may occur and modifications of the icing allowance are suggested, see the Guidance Relating to Ice Accretion contained in recommendation 2 of attachment 3 to the Final Act of the Conference. See also the Icing consideration and the Recommendation for skippers of fishing vessels on ensuring a vessel's endurance in conditions of ice formation contained in Appendix 10 in Part A of the Code of Safety for Fishermen and Fishing Vessels.

343 Please refer to regulation III/8(1) of the Protocol.

344 Please refer to paragraph 4.7.3 of the existing Code.

345 Please refer to regulation III/8(2) of the Protocol.

** See Paragraph 2.4 of Appendix 10 in Part A of the Code of Safety for Fishermen and Fishing Vessels on a typical list of equipment and hand tool required for combating ice formation.

346 Please refer to regulation III/9(1) of the Protocol.

347 Please refer to regulation III/9(2) of the Protocol.

3.9.3 The inclining test of an individual vessel may be omitted provided basic stability data are available from the inclining test of a sister ship, and it is demonstrated, to the satisfaction of the competent authority, that reliable stability information for the vessel can be obtained from such basic data.

3.10 Stability information

3.10.1 Suitable stability information, to the satisfaction of the competent authority, should be supplied to enable the skipper to assess with ease and certainty the stability of the vessel under various operating conditions.* Such information should include specific instructions to the skipper warning him of those operating conditions which could adversely affect either the stability or the trim of the vessel.**[348]

3.10.2 The stability information, referred to in 3.10.1, should be kept on board, readily accessible at all times and inspected at the periodical surveys of the vessel to ensure that it has been approved for the actual operating conditions.[349]

3.10.3 Where alterations are made to a vessel affecting its stability, revised stability calculations should be undertaken to the satisfaction of the competent authority. If the competent authority requires that the stability information should be revised, the new information should be supplied to the skipper and the superseded information removed.[350]

3.10.4 Scales indicating the vessel's draught should be permanently marked on both sides of the stem and stern. These scales should be measured perpendicularly from a datum line which will lie along, or be a projection of, the lower extremity of the keel or other appendage. Numbers 0.10 m in the vertical plane should be marked on the scale, the lower edge of each number indicating the draught in metres. Between the numbers lines should be marked, parallel to the datum, at intervals of 0.10 m. The skipper should be provided with information defining the position of the datum line and instructions regarding the use of observed draughts.[351]

3.11 Portable fish-hold divisions

The catch should be properly secured against shifting which could cause dangerous trim or heel of the vessel. The scantlings of portable fish-hold divisions, if fitted, should be to the satisfaction of the competent authority. The scantlings of portable fish-hold divisions, if fitted, should be in accordance with the Recommended practice on portable fish-hold divisions set out in annex IV.[352]

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* See the Guidance on Stability Information contained in recommendation 3 of attachment 3 to the Final Act of the Conference. See also the General provisions against capsizing and information for the master contained in chapter 2 of the Code on Intact Stability adopted by the Organization by resolution A.749(18) as amended.

** See the Code of Practice concerning the Accuracy of Stability Information for Fishing Vessels adopted by the Organization by resolution A.267(VIII).

348 Please refer to paragraph 3.2.1 of the existing Guidelines and to regulation III/10(1) of the Protocol and to the references in the footnotes linked to this paragraph.

349 Please refer to regulation III/10(2) of the Protocol.

350 Please refer to regulation III/10(3) of the Protocol.

351 Please refer to paragraph 4.4.3 of the existing Part B of the Code.

352 Please refer to regulation III/11 of the Protocol and to the references in the footnote linked to this paragraph.

3.12 Bow height

The bow height should be sufficient, to the satisfaction of the competent authority, to prevent the excessive shipping of water and should be determined taking account of the seasonal weather conditions, the sea states in which the vessel will operate, the type of vessel and its mode of operation.[353]

3.13 Maximum permissible operating draught

3.13.1 A maximum permissible operating draught should be to the satisfaction of the competent authority and should be such that, in the associated operating condition, the stability criteria of this chapter and the requirements of chapters 2 and 6, as appropriate, are satisfied.[354]

3.13.2 The maximum permissible operating draught should be marked on each side of the vessel. The location of the maximum permissible operating draught should be indicated in the documentation for the vessel.[355]

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353 Please refer to regulation III/12 of the Protocol.
354 Please refer to regulation III/13 of the Protocol.
355 Change made by SLF 44.

CHAPTER 4

MACHINERY AND ELECTRICAL INSTALLATIONS

PART A - GENERAL

4.1 General

4.1.1 Machinery and electrical installations should be designed, constructed and installed in accordance with good engineering practice applying, where applicable, the requirements of the competent authority or rules of recognized classification societies or other equivalent standards as appropriate. Equipment should be so installed, protected and maintained as not to constitute a danger to persons and the vessel.[356]

4.1.2 Machinery spaces should be so designed as to provide safe and free access to all machinery and its controls as well as to any other parts which may require servicing. Such spaces should be adequately ventilated.[357]

4.1.3 Means should be provided whereby the machinery can be brought into operation from dead vessel condition without external aid.

4.1.4 All controls for operating the machinery and equipment, such as measuring devices, pumping systems and arrangements, valves, cocks, air pipes, inlets, sounders, switches, should be permanently marked with appropriate inscriptions clearly showing their purpose. Pipes should preferably be marked by appropriate colours to indicate their purpose. All valves should have indicators showing whether they are open or closed and should have handwheels so marked as to indicate the direction of turning which should generally be clockwise for closing.[358]

4.1.5 Exhaust pipes and other hot surfaces within reach of personnel should be properly insulated or otherwise protected to prevent accidents or burns. Likewise, hot surfaces which could cause ignition should be protected from all possible contacts with combustible materials.[359]

4.1.6 Plastic piping should not be used for any purpose in the machinery spaces where its destruction by fire would present a safety hazard.

4.1.7 Moving external parts of engines and mechanical and electrical equipment should be suitably protected to prevent injury to attendant personnel.[360]

4.1.8 Platforms and gratings in machinery spaces and openings to machinery space bilges should be provided with adequate handrails or handholds and toeboards.[361]

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356 Please refer to 4.1.1 of existing Guidelines.
357 Please refer to 2.1.2 of the Guidelines for the safety of fishing vessels of 24 m and over but less than 45 m in length, operating in the East and South-East Asia region (hereinafter called the Asian Guidelines).
358 Please refer to 4.1.3 of existing Guidelines.
359 Please refer to 4.1.4 of existing Guidelines.
360 Please refer to 4.1.5 of existing Guidelines.
361 Please refer to 4.1.6 of existing Guidelines.

4.1.9 Walking surfaces should be properly fitted and secured in place and should have a non-slip surface.[362]

4.1.10 Machinery space ladders should be fitted with non-slip treads.[363]

4.1.11 Machinery spaces require extensive ventilation and due regard should be given to climatic conditions in the area of intended service and the air requirements of internal combustion engines installed.[364]

4.1.12 Where air cooled internal combustion engines are installed special consideration should be given to the provision of adequate volumes of cooling air and to the removal of hot air from the machinery spaces.[365]

4.1.13 Where water cooled internal combustion engines are installed provision should be made for an emergency means of supplying cooling water. Strainers should be capable of being cleaned without interrupting the flow of cooling water. Where keel coolers are installed, provision should be made to isolate them by fitting valves inside the hull at the inlet and outlet connections.[366]

4.1.14 Tools, spare parts and spare gear required for routine maintenance and simple repairs should be provided for main and auxiliary machinery, mechanical and electrical equipment and installations, and should be securely stowed in an easily accessible space.[367]

4.1.15 Information on operation and maintenance of machinery, usage of fuel and lubricating oils should be provided.[368]

4.1.16 Measuring devices should be so installed as to be readily visible.[369]

PART B - MACHINERY INSTALLATIONS
(See also section 4.1)

4.2 Machinery

4.2.1 Bars used on flywheels to turn machinery over by hand should be so constructed as to facilitate easy withdrawal from the flywheels recess if the engine should recoil. Hand cranks for engines should be designed to be thrown out instantly when the engine starts.[370]

4.2.2 Where a forward power take-off is fitted to an engine for auxiliary drives, the power to be taken off should not exceed the engine manufacturer's limits for forward end drives.[371]

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362 Please refer to 4.1.7 of existing Guidelines.
363 Please refer to 4.1.8 of existing Guidelines.
364 Please refer to 4.1.9 of existing Guidelines.
365 Please refer to 4.1.10 of existing Guidelines.
366 Please refer to 4.1.11 of existing Guidelines.
367 Please refer to 4.1.12 of existing Guidelines.
368 Please refer to 4.2.2 of existing Guidelines.
369 Please refer to 4.2.4 of existing Guidelines.
370 Please refer to 4.2.3 of existing Guidelines.
371 Please refer to 4.2.5 of existing Guidelines.

4.2.3 Where a layshaft is driven from the power take-off shaft by either pulley or chain, the shaft should be fitted with a bearing on both sides of the pulley or chain sprocket.[372]

4.2.4 Hydraulic installations for fishing equipment should have a means of disengaging the hydraulic pump from the driving engine.[373]

4.2.5 Belt drives should be arranged with a method of tensioning in order that each belt drive can be adjusted individually.[374]

4.2.6 The main engine instrument panel should, where applicable, have the following gauges:

.1 engine revolution counter;

.2 engine lubricating oil pressure gauge;

.3 engine reverse/reduction gear box oil pressure gauge;

.4 engine cooling water temperature gauge;

.5 ammeters for batteries; and

.6 exhaust temperature gauge (on engines of 250 kW and above).[375]

4.2.7 Audible and visual alarms should be fitted for low lubricating oil pressure and high cooling water temperatures.[376] Taking into consideration the configuration of the vessel and the mode of operation, the competent authority may require the alarms to be visible and heard in the machinery space and in the wheelhouse.

4.2.8 Outboard engines should be capable of being easily and securely fastened to the hull, and be provided with a safety chain or cable.[377]

4.2.9 Where outboard engines are fitted in a well, this should be fitted with a drain pipe of not less than 50 mm in diameter; the well should be long enough to allow for the engine to be tilted up; remote control and fuel hoses should be led into the well through a hole provided with an effective bushing.[378]

4.2.10 Auxiliary engines should be securely mounted in rigid seats and should be fully independent of all other systems.[379]

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372 Please refer to 4.2.6 of existing Guidelines.
373 Please refer to 4.2.7 of existing Guidelines.
374 Please refer to 4.2.8 of existing Guidelines.
375 Please refer to 4.2.9 of existing Guidelines.
376 Please refer to 4.2.10 of existing Guidelines.
377 Please refer to 4.2.11 of existing Guidelines.
378 Please refer to 4.2.12 of existing Guidelines.
379 Please refer to 4.2.13 of existing Guidelines.

4.3 Means of going astern

Vessels should have sufficient power for going astern to secure proper control of the vessel in all normal circumstances.[380]

4.4 Air pressure systems

4.4.1 Air intakes for air compressors should be so located that the air is as pure and clean as possible and free from flammable or toxic gases or fumes. Air filters should be fitted. Air discharge pipes of compressors should, where necessary, be insulated to protect personnel from burns.[381]

4.4.2 All discharge pipes from starting air compressors should lead directly to the starting air receivers and all starting pipes from the air receivers to main or auxiliary engines should be entirely separate from the compressor discharge pipe system.[382]

4.4.3 Means to drain oil and water should be fitted to the lowest part of air receivers.

4.5 Arrangements for fuel oil, lubricating oil and other flammable oils[383]

4.5.1 Fuel tanks, their filling systems, valves and associated piping should be carefully installed and be maintained so as to prevent the leakage of fuel or fumes within the hull.[384]

4.5.2 Vents and filling connections of fuel tanks should be located in a safe, open-air position and remote from any ventilation intake. The cross sectional area of vents should be determined having regard to the filling arrangements. Vent openings should be fitted with suitable wire gauze screens or equivalent protective devices.[385]

4.5.3 A valve capable of shutting off the supply to the engine should be mounted on or adjacent to the fuel tank and control of this valve should be accessible from outside the machinery space.[386]

4.5.4 Wherever fuel might escape and come into contact with hot surfaces, suitable guards or screens should be installed.[387]

4.5.5 Fuel storage tanks should be located remote from heated surfaces and should not be situated above stairways and ladders, boilers, hot surfaces and electrical equipment. Tanks and piping should be arranged so as to eliminate in the event of overflow and to minimize in the event of leakage or rupture the possibility that fuel will come into contact with hot surfaces or electrical components which may cause ignition of the fuel.[388]

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380 Please refer to 2.3.1 of Asian Guidelines.
381 Please refer to 4.10 of existing Guidelines.
382 Please refer to 2.7.3 of Asian Guidelines.
383 Please refer to 4.4 and 4.5 of existing Guidelines.
384 Please refer to 4.4.1 of existing Guidelines.
385 Please refer to 4.4.2 of existing Guidelines.
386 Please refer to 4.4.3 of existing Guidelines.
387 Please refer to 4.4.4 of existing Guidelines.
388 Please refer to 4.4.5 of existing Guidelines.

4.5.6 Safe and efficient means of ascertaining the amount of fuel oil contained in any oil tank should be provided. If sounding pipes are installed, their upper ends should terminate in safe positions and should be fitted with suitable means of closure. Gauges made of glass of substantial thickness and protected with a metal case may be used, provided that automatic closing valves are fitted. Other means of ascertaining the amount of fuel oil contained in any fuel oil tank may be permitted providing their failure or overfilling of the tanks will not permit release of fuel.[389]

4.5.7 Where practicable, fuel oil piping should not be led through accommodation spaces.[390]

4.5.8 Fuel tank sounding pipe openings should not be located in crew accommodation.[391]

4.5.9 Fuel return pipes should be connected to the fuel oil service tank in use or to the suction side of the fuel pump.

4.5.10 Fuel pipes of internal combustion engines should be of steel or other equivalent material and preferably of a jacketed design. All fuel pipes should be adequately secured and protected.

4.5.11 Fuel oil pipes and their valves and fittings should be of steel or other equivalent material, provided that restricted use of flexible pipes may be permitted in positions where the competent authority is satisfied that they are necessary. Such flexible pipes and end attachments should be of adequate strength and should, to the satisfaction of the competent authority, be constructed of approved fire-resistant materials or have fire-resistant coatings. Where necessary, fuel oil and lubricating oil pipelines should be screened or otherwise suitably protected to avoid, as far as practicable, oil spray or oil leakage on heated surfaces or into machinery air intakes. The number of joints in piping systems should be kept to a minimum.[392]

4.5.12 Where the competent authority has permitted the use of a petrol engine which is installed within a closed, decked compartment, such compartment should be ventilated with a mechanical exhaust and a natural supply system. Exhaust ventilation trunks from compartments containing petrol engines or other sources of concentrated petrol fumes should be isolated from other ventilation systems. The mechanical exhaust system should include an intake located as close as practicable to a position beneath the engine it serves or where petrol fumes are most likely to accumulate, and it should be above normal bilge water levels. Mechanical exhaust fans and trunks fitted in accordance with the requirements of this section should be suitable for use in an atmosphere containing petrol fumes.[393]

4.5.13 There should be a permanent notice at each petrol engine starting position requiring:

.1 that the ventilation system be operated for at least 2 min before an engine is started; and

.2 that during fuelling all windows and doors are closed and smoking is prohibited.[394]

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389 4.4.6 and 4.4.7 of existing Guidelines are to be replaced by 2.8.2 of Asian Guidelines.
390 Please refer to 4.4.8 of existing Guidelines.
391 Please refer to 4.4.9 of existing Guidelines.
392 Please refer to regulation IV/10(7)(a) and (b) of the Protocol.
393 Please refer to 4.4.13 of existing Guidelines.
394 Please refer to 4.4.14 of existing Guidelines.

4.5.14 Petrol tanks should not be integral with the hull structure. An efficient system should be installed to ensure that petrol does not spill into the hull of the vessel when tanks are being filled.[395] *

4.5.15 Portable petrol tanks for outboard motors should be taken ashore for filling.[396]

4.5.16 Petrol filling systems should be effectively bonded or earthed.[397]

4.5.17 Emergency controls should be provided, preferably on deck outside machinery and accommodation spaces, for stopping every fuel pressure pump and every fan supplying air to machinery spaces and for closing all suctions from fuel tanks above double bottom. Such controls should be at positions not likely to be cut off in the event of a fire in the machinery spaces.

4.5.18 Where fuel of a flashpoint of less than 60°C (closed cup test) is used, the temperature of the space in which such fuel is stored should not rise to within 10°C below the flashpoint of the fuel.[398]

4.5.19 Lubricating oil tanks, their associated piping and valves should be carefully installed and maintained so as to prevent leakage of lubricating oil within the hull.[399]

4.5.20 Adequate means should be provided for indicating failure of the lubricating oil system.[400]

4.5.21 Where tubular gauge glasses are fitted to lubricating oil tanks they should be of substantial construction, adequately protected and fitted with self-closing arrangements on the tank.[401]

4.5.22 Lubricating oil pipes should be of steel or other equivalent material and should be adequately secured and protected.[402]

4.6 Bilge and ballast systems[403]

4.6.1 Arrangements should be provided for draining any watertight compartment (other than small buoyancy compartments) under all service conditions.

4.6.2 Valves and cocks not forming part of a piping system should not normally be permitted in watertight bulkheads.

4.6.3 Bilge suctions should be fitted with suitable strainers.

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395 Please refer to 4.4.15 of existing Guidelines.

* Attention is drawn to the use of aluminum mesh inside petrol tanks to reduce the risk of explosion.

396 Please refer to 4.4.16 of existing Guidelines.

397 Please refer to 4.4.17 of existing Guidelines.

398 Please refer to 4.4.19 of existing Guidelines.

399 Please refer to 4.5.1 of existing Guidelines.

400 Please refer to 4.5.2 of existing Guidelines.

401 Please refer to 4.5.3 of existing Guidelines.

402 Please refer to 4.5.4 of existing Guidelines, 2.8.7.1 of Asian Guidelines and 4.7.3 of draft revised Code B.

403 Please refer to 4.6 of existing Guidelines.

4.6.4 Bilge and ballast pumping systems should be arranged so as to prevent water passing from the sea or from water ballast spaces into holds or into machinery spaces or from one watertight compartment to another. The bilge connection to any pump which draws from the sea or from water ballast spaces should be fitted with either a non-return valve or a cock which cannot be opened simultaneously either to the bilges and to the sea or to the bilges and water ballast spaces. Valves in bilge distribution boxes should be of a non-return type.[404]

4.6.5 At least two bilge pumps should be provided, one of which should be manually operated. A ballast pump or other general service pump of sufficient capacity may be used as a power driven bilge pump. Power bilge pumps should be capable of giving a speed of water of at least 2 m per second through the main bilge pipe which should have an internal diameter of at least:

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

where d is the internal diameter in mm, and L, B and D are in metres.

However, the actual internal diameter of the bilge main may be rounded off to the nearest standard size acceptable to the competent authority. The manually operated pump should be fitted outside the machinery space.[405] In no case should the capacity of the bilge pump(s) be less than the capacity of the installed fire pump(s).

4.6.6 The inside diameter of the bilge main and bilge suction pipe directly connected to the pump should be not less than the inside diameter of the bilge pump suction inlet.

4.6.7 Bilges in machinery spaces should be provided with a high level alarm in such a way that the accumulation of liquids is detected at normal angles of trim and heel. The detection system should initiate an audible and visual alarm in the places where continuous watch is maintained.[406]

4.7 Exhaust systems[407]

4.7.1 Exhaust pipes from engines and from heating and cooking appliances should be permanently mounted and lead to the open air through the uppermost deck or canopy or through the hull. Where exhaust pipes pass through the uppermost deck or canopy, they should be of sufficient height to ensure that no exhaust gases can pass back into the vessel. Where an exhaust pipe passes through the hull of the vessel, the hull connection should be watertight and provision be made so that the engine cannot be flooded.

4.7.2 All exhaust pipes should be assembled with the minimum number of bends and of a diameter as specified by the engine manufacturers. All joints should be gastight, the pipes well secured and supported by hangers or brackets and fitted with a section of flexible pipe or a bellows pipe; exhaust pipes should be led clear of all woodwork and other combustible material and where necessary they should be effectively insulated.

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404 Please refer to 2.9.6 of Asian Guidelines.
405 This paragraph is drawn from regulation IV/11(2)(b) and (c) of the Protocol.
406 Drawn from the Protocol: regulation IV/20(1).
407 4.7 of existing Guidelines is retained.

4.7.3 Where exhaust pipes pass through a wooden deck or other structures of wood or other combustible material, suitable protection should be provided to the structure to avoid the risk of fire.

4.7.4 Where a wet exhaust system is fitted, water from the engine cooling system should be introduced into the exhaust pipe near to the manifold and a "U" bend or other suitable water trap should be incorporated in the exhaust line to avoid the flow-back of water into the engine.

4.8 Steering gear[408]

4.8.1 The steering arrangements including the rudder and associated fittings should be of adequate strength and capable of steering the vessel at maximum speed and should be so designed and constructed that they are not damaged at maximum astern speed or by manoeuvring during fishing operations.

4.8.2 Where the main steering device is mechanically operated an emergency means of steering should be provided which should be easily accessible.

4.8.3 Where a steering device other than a rudder is fitted, its construction and operation should be adequate and suitable for its intended purpose and should comply with the provisions of 4.3.

4.8.4 Where the steering device is remotely operated, a rudder angle indicator should be provided at the steering position. The rudder angle indicator for power operated steering gear should be independent of the steering gear control system.

4.8.5 The wheelhouse should be so arranged that the person steering the vessel has clear view ahead and that as far as practicable an all-round vision is possible from within the wheelhouse.

4.9 Refrigeration systems for the preservation of the catch[409]

4.9.1 Refrigeration systems should be so designed, constructed, tested and installed as to take account of the safety of the system and also the emission of refrigerants held in quantities or concentrations which are hazardous to human health or to the environment, and should be to the satisfaction of the competent authority.

4.9.2 Refrigerants to be used in refrigeration systems should be to the satisfaction of the competent authority. However, methylchloride or CFCs whose ozone-depleting potential is higher than 5% of CFC-11 should not be used as refrigerants.

4.9.3 If ammonia is to be used as the refrigerant gas, the refrigerating plant should be at least arranged so as to take account of the recommended practice at annex III.

4.9.4 Refrigerating installations should be adequately protected against vibration, shock, expansion, shrinkage, etc. and should be provided with an automatic safety control device to prevent a dangerous rise in temperature and pressure.

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[408] 4.3 of existing Guidelines is retained except renumbering.

[409] Please refer to 4.9 of existing Guidelines.

4.9.5 Refrigeration systems in which toxic or flammable refrigerants are used should be provided with drainage devices leading to a place where the refrigerant presents no danger to the vessels or to persons on board.

4.9.6 Any space containing refrigerating machinery including condensers and gas tanks utilizing toxic refrigerants should be separated from any adjacent space by gastight bulkheads. Any space containing the refrigerating machinery including condensers and gas tanks should be fitted with a leak detection system having an indicator outside the space adjacent to the entrance and should be provided with an independent ventilation system.

4.9.7 Spaces containing condensers, gas tanks and refrigeration machinery utilizing toxic refrigerants, such as ammonia, should be provided with a water spray system.

4.9.8 When it is not practicable to contain refrigeration machinery in a separate place due to the size of the vessel, the refrigeration system may be installed in the machinery space provided that the quantity of refrigerant used will not cause danger to persons in the machinery space, should all the gas escape, and provided that an alarm is fitted to give warning of a dangerous concentration of gas should any leakage occur in the compartment.

4.9.9 In refrigerating machinery spaces and refrigerating rooms, alarms should be connected to the wheelhouse or control stations or escape exits to prevent persons being trapped. At least one exit from each such space should be capable of being opened from the inside. Where practicable, exits from the spaces containing refrigerating machinery using toxic or flammable gas should not lead directly into any accommodation spaces.

4.9.10 Where any refrigerant harmful to persons is used in a refrigeration system, at least two sets of breathing apparatus should be provided, one of which should be placed in a position not likely to become inaccessible in the event of leakage of refrigerant. Breathing apparatus provided as part of the vessel's fire-fighting equipment may be considered as meeting all or part of this provision provided its location meets both purposes. Where self-contained breathing apparatus is used, spare cylinders should be provided.

4.9.11 Adequate guidance for the safe operation and emergency procedures for the refrigeration system should be provided by suitable notices displayed on board the vessel.

PART C - ELECTRICAL INSTALLATIONS

4.10 Main source of electrical power

Where electrical power constitutes the only means of maintaining auxiliary services essential for the propulsion and safety of the vessel, a main source of electric power should be provided which should, as far practicable, include two generating sets, one of which may be driven by the main engine. The competent authority may accept other arrangements having equivalent electrical capacity.

4.11 Emergency source of electrical power

4.11.1 A self-contained emergency source of electrical power should be located outside the machinery spaces above the main deck. It should be so arranged as to ensure that it would function in the event of fire or other causes of failure of the main electrical installations.

4.11.2 The emergency source of electrical power, which may be either a generator or an accumulator battery, should be capable, having regard to starting current and the transitory nature of certain loads, of serving simultaneously, for a period of at least three hours:

.1 a VHF radio installation or an MF radio installation or a ship-earth station or an MF/HF radio installation depending on the sea area for which the vessel is to be equipped;

.2 internal communication equipment, fire detecting systems and signals, which may be required in an emergency; and

.3 the navigational lights if solely electrical and the emergency lights:

.1 at launching stations and over the side of the vessel;

.2 in all alleyways, stairways and exits;

.3 in spaces containing machinery or the emergency source of power;

.4 in control stations; and

.5 in fish handling and fish processing spaces.

4.11.3 The arrangements for the emergency source of electrical power should comply with the following:

.1 Where the emergency source of electrical power is a generator, it should be provided with an independent fuel supply and with efficient starting arrangements. Unless a second independent means of starting the emergency generator is provided, the single source of stored energy should be protected to preclude its complete depletion by the automatic starting system.

.2 Where the emergency source of electrical power is an accumulator battery, it should be capable of carrying the emergency load without recharging whilst maintaining the voltage of the battery throughout the discharge period within plus or minus 12% of its nominal voltage. In the event of failure of the main power supply, this accumulator battery should be automatically connected to the emergency switchboard and should immediately supply at least those services specified in 4.11.2. The emergency switchboard should be provided with an auxiliary switch allowing the battery to be connected manually in case of failure of the automatic connection system.

4.11.4 The emergency switchboard should be installed as near as is practicable to the emergency source of power and should be located in accordance with 4.11.1. Where the emergency source of power is a generator, the emergency switchboard should be located in the same place unless the operation of the emergency switchboard would thereby be impaired.

4.11.5 Any accumulator battery should be installed in a well-ventilated space, but not in the space containing the emergency switchboard. An indicator should be mounted in a suitable space on the main switchboard or in the machinery control room to indicate when the battery constituting the emergency source of power is being discharged. The emergency switchboard should be supplied in normal operation from the main switchboard by an inter-connector feeder protected at the main switchboard against overload and short circuit. The arrangement at the emergency switchboard should be such that in the event of a failure of the main power supply an automatic connection of emergency supply would be provided. When the system is arranged for feed back operation, the inter-connector feeder should also be protected at the emergency switchboard against short circuit.

4.11.6 An emergency generator and its prime mover and any accumulator battery should be so arranged as to ensure that they will function at full rated power when the vessel is upright and when rolling up to an angle of 22.5° either way and simultaneously pitching 10° by bow or stern, or is in any combination of angles within those limits.

4.11.7 Battery level indicators should be mounted in a highly visible position on the on the main switchboard or in the machinery control room to facilitate monitoring of the condition of batteries constituting the emergency source of supply as well as any batteries required for the starting of an independent, power driven emergency generator.

4.11.8 The emergency source of electrical power and automatic starting equipment should be so constructed and arranged as to enable adequate testing to be carried out by the crew while the vessel is in operating condition.

4.12 Precautions against shock, fire and other hazards of electrical origin

4.12.1 Electrical equipment and installations should be such that the vessel and all persons on board are protected against electrical hazards.

4.12.2 Cable systems and electrical equipment should be so installed as to avoid or reduce interference with radio operation.

4.12.3 Cables are to be capable of carrying the maximum rated current for the circuit. The cross sectional area should be sufficient to ensure that the voltage drop will not exceed 6% of the nominal rating under maximum rated load for the circuit. Electrical wiring should be of marine grade multi-strand tinned copper wire cores with an approved insulated cover.

4.12.4 All electrical cables should be at least of a flame-retardant type and should be so installed as not to impair their original flame-retarding properties. The competent authority may permit the use of special types of cables when necessary for particular applications, such as radio cables, which do not comply with the foregoing.

4.12.5 Electric cables should be supported in such a manner as to avoid chafing or other damage and should not be located close to hot surfaces such as engine exhausts. Except as permitted by the competent authority in exceptional circumstances, all metal sheaths and armour of cables should be electrically continuous and should be earthed.

4.12.6 Where cables are not metal sheathed or armoured and there might be a risk of fire in case of an electrical fault, special precautions should be taken to the satisfaction of the competent authority.

4.12.7 Electrical wiring and electrical equipment installed in fishing vessels should be of marine grade materials only and should conform to the best marine practices of installation and workmanship. Electrical equipment exposed to the weather should be protected from dampness and corrosion as well as mechanical damage.

4.12.8 Lighting fittings should be arranged to prevent temperature rises which could damage the wiring and to prevent surrounding material from becoming excessively hot.

4.12.9 In spaces where flammable mixtures are liable to collect, and in any compartment assigned principally to the containment of an accumulator battery, no electrical equipment should be installed unless the competent authority is satisfied that it is:

.1 essential for operational purposes;

.2 of a type which will not ignite the mixture concerned;

.3 appropriate to the space concerned; and

.4 appropriately certified for safe usage in the dusts, vapours or gases likely to be encountered.

4.12.10 Where a potential explosion risk exists in or near any space, all electrical equipment and fittings installed in those spaces should be either explosion-proof or intrinsically safe to the satisfaction of the competent authority.

4.13 Electrical systems

4.13.1 Direct current installations should be wired as insulated return systems. The hull should not be used to carry current.

4.13.2 Main and emergency switchboards should be so arranged as to give easy access as may be needed to apparatus and equipment, without danger to attendants. The sides and backs and, where necessary, the fronts of switchboards, should be suitably guarded. Exposed "live" parts having voltages to earth exceeding a voltage to be specified by the competent authority should not be installed on the front of such switchboards. There should be non-conducting mats or gratings at the front and rear.

4.13.3 All outgoing circuits from the switchboards should be double pole and open circuit protected. Lighting circuits should be separate from power circuits. Secondary distribution boards should be fitted with double pole switches and open circuit protection whereas final sub-circuits may be fitted with single pole switches.

4.13.4 Main switchboards should be fitted with voltmeters and ammeters for each generator and with earth lamps. The emergency switchboard should also be fitted with a voltmeter, ammeter and earth lamps.

4.13.5 Where electrical power, other than a low voltage supply, constitutes the only means of maintaining auxiliary services essential for the propulsion and the safety of the vessel, the main switchboard should be designed to allow preferential tripping of non-essential services to reduce the risk of overload and premature actuation of the emergency source of supply.

4.13.6 Electric circuits and the current-carrying capacity of each circuit should be permanently indicated, together with the rating or setting of the appropriate overload protective device should be clearly identified on switchboards and where appropriate on distribution boxes.

4.13.7 Each separate circuit should be protected against short circuit as well as against overload to the satisfaction of the competent authority.

4.13.8 Piping conveying liquid should not be fitted above or close to switchboards or other electrical equipment. Where such arrangements are unavoidable, provision should be made to prevent leakage damaging the equipment. The current-carrying capacity of each circuit should be permanently indicated, together with the rating or setting of the appropriate overload protective device.

4.13.9 Where the main source of supply is an accumulator battery system only, the batteries should be suitably housed and compartments used primarily for their storage should be properly constructed and ventilated. However, accumulator batteries should not be housed in crew accommodation spaces unless installed in a hermetically sealed container.

4.13.10 Batteries should be installed with sufficient capacity and in sufficient numbers to carry all anticipated loads during normal operations and with sufficient reserve capacity for emergencies. An efficient means of battery charging should be provided, either from a main engine driven generator or auxiliary driven generator. Battery charging systems should be fitted with voltage surge and reverse current protection.

4.13.11 When the main and or auxiliary engines are fitted with electric motor starters, the batteries connected to the system for starting should be separate from the batteries used for lighting and general services as well as from the radio batteries. The starter batteries should be capable of starting the engine at least six times without recharging.

4.13.12 The battery powered main source of supply should consist of two individual sets of radio batteries, two sets of lighting and general services batteries and two sets of starting batteries for the main engine (if electric starting is used). The competent authority, taking into consideration the design of the vessel and type of electrical equipment fitted as well as the area of operation, may allow a lesser number of battery banks to be fitted.

4.13.13 Battery banks should be fitted with double pole spark proof isolating switches. The switches should be placed in an accessible position.

4.13.14 There should be an arrangement for continuous charging of the accumulator batteries as and when the main and or auxiliary machines are running. The system should consist of a battery

charging switchboard fitted with voltmeters and ammeters for each system. The arrangement should allow alternate charging/discharging of the battery banks using an arrangement of changeover switches. Where possible, the change over switch should be of a type that would automatically ensure that when one bank of batteries in a system is selected for discharging, the other bank in the same system would be automatically placed on charge.

4.13.15 Cables between a battery bank and an isolating switch and between the switch and a starter motor should be as short as possible and double insulated.

4.13.16 Individual batteries and or banks of batteries should be secured in trays within boxes to avoid movement due to the motion of the vessel. The trays and boxes must be suitably protected against corrosion from acid and alkaline solutions and the boxes should be fitted with a ventilating pipe terminating in a save place above deck. The boxes should be positioned above the operating load waterline.

4.13.17 Where the main source of supply is an alternating current system, non self-regulating alternators should be provided with automatic voltage regulation.

4.13.18 The competent authority may approve the parallel operation of alternators, if synchronizing and power sharing devices are to be fitted. The system should also be fitted with reverse power protection.

4.13.19 Main and emergency switchboards should be of the dead front to prevent accidental access to live parts. The sides and backs and, where necessary, the fronts of switchboards, should be suitably guarded.

4.13.20 Each section of the switchboard, supplied by an individual alternator, should be fitted with a voltmeter, a frequency meter and an ammeter, switched to allow the current to be measured in each phase. A sub-distribution board fitted in the wheelhouse should be fitted with a voltmeter and a switch to isolate it from the mains. Where fitted, the primary windings of transformers are to be protected against short circuits by circuit breakers or fuses capable of withstanding power surges. If transformers are arranged for parallel operation, they are to be provided with secondary isolation.

4.13.21 Provision should be made for a shore connection to the main switchboard.

4.13.22 Arrangement for charging accumulator batteries should be to the satisfaction on the competent authority. Marine quality battery chargers powered from the A.C. mains may be considered by the competent authority.

4.14 Earthing and bonding

4.14.1 All electrical installations should be bonded to earth and each bonding point should be accessible for maintenance.

4.14.2 The competent authority, taking into consideration the design of the system and the working voltage may require a system of earth indicator lamps or means of detecting current leakage to be installed.

4.14.3 A copper earth plate of at least 0.2 m² should be fitted to the hull of a vessel, constructed of a material other than steel, or equivalent, at a point where it will always be submerged under all conditions of heel. Inside the hull, the earth plate should be connected to a copper bar or rod, of at least 64 mm², the length being appropriate to the number of bonding points.

4.14.4 Exposed permanently fixed metal parts of electrical machines or equipment which are not intended to be "live", but which are liable under fault conditions to become "live" should be earthed (grounded) unless:

.1 they are supplied at a voltage not exceeding 55 V direct current or 55 V, root mean square, between conductors; auto-transformers should not be used for the purpose of achieving this alternative current voltage; or

.2 they are supplied at a voltage not exceeding 250 V by safety isolating transformers supplying one consuming device only; or

.3 they are constructed taking into account the principle of double insulation.

4.14.5 All exposed metal parts of equipment that do not carry current are to be bonded to the earth bar. Lightning conductors should be attached directly to the earth plate.

4.14.6 Radar, radio and other navigational equipment that requires to be earthed should have a separate earthing point and the connection should be as short as possible.

4.14.7 Where a flexible, non-conducting coupling, is fitted between the gearbox output shaft and the propeller shafting, the coupling should be bridged by a piece of braided copper conductor.

4.15 Lighting systems

4.15.1 Lighting for machinery spaces, control stations and work spaces should be supplied from at least two separate final sub-circuits and arranged in such a manner that failure of one final sub-circuit should not leave the space in darkness.

4.15.2 Lighting of normally unattended spaces such as fishrooms and net stores should be controlled from outside the space.

4.15.3 An emergency source of power should be made available for a signalling lamp if carried.

4.16 Electric motors

4.16.1 Every electric motor should be provided with a means of starting and stopping so placed that the person controlling the motor can easily operate it.

4.16.2 The circuit supplying the motor should be fitted with short circuit and overload protection.

4.16.3 Where electric motors are fitted to deck machinery, the operating device should automatically return to the stop position when released. Emergency stops should also be located at the control station. The mechanical component of the deck machinery should be fitted with an appropriate fail-safe braking system.

4.16.4 Electric fans and pumps driven by electric motors for the transfer of fuel oil, fuel oil lift pumps and similar fuel oil pumps, are to be fitted with a remote control. The remote control should be positioned outside the machinery space concerned, for stopping the motors in the event of a fire in the space in which they are located.

4.17 Lightning conductors

4.17.1 Lightning conductors are to be fitted on wooden masts. They should be of continuous copper tape or copper rope having a cross section of not less than 75 mm² and secured to a copper spike of 12 mm diameter projecting at least 150 mm beyond the top of the mast.

4.17.2 In the case of metal hulls, the lower end of the conductor should be earthed to the hull.

4.17.3 In the case of wood or other non-metallic hulls, the lower end of the conductor is to be attached to the earth plate. All sharp bends must be avoided and bolted or riveted joints only may be used.

PART D – PERIODICALLY UNATTENDED MACHINERY SPACES

Part D of chapter IV of Part B of the Code of Safety for Fishermen and Fishing Vessels may be used as guidance, particularly in relation to fire protection, fire detection, protection against flooding and alarm systems in general.

CHAPTER 5 [410]

FIRE PROTECTION, FIRE DETECTION, FIRE EXTINCTION, AND FIRE FIGHTING

5.1 Structure

5.1.1 If steel decks or steel bulkheads in accommodation form the top or side of a fuel oil tank, they should be coated with a non-combustible material of minimum thickness 40 mm. Manholes or other openings to fuel oil tanks should not be positioned in the accommodation.

5.1.2 External bulkheads and vessel's sides, which delimit the accommodation spaces, should be insulated with at least 50 mm insulating material. Bulkheads between accommodation spaces and machinery spaces or cargo spaces should be insulated with a non-combustible material of minimum thickness 40 mm and with density to the satisfaction of the competent authority. In wooden vessels, they can be built of two layers of wood with two layers of felt or similar in between or of 60 mm wood with a lining of insulating plates or alternatively be constructed to "B-15" class standard. The surface of insulation fitted on the internal boundaries of the machinery spaces of category A and in spaces into which oil products may penetrate should be impervious to oil or oil vapours.

5.1.3 All insulation in accommodation spaces and the wheelhouse should be made of non-combustible materials. Combustible insulation fitted in spaces used for the storage or processing of fish should be protected by a tight non-combustible covering.

5.1.4 Where there is a door between the accommodation space and the machinery space, this should be a self-closing door of steel or equivalent. Doors between galley rooms and dining rooms might be permitted, provided they are made of fire-retardant material; the same applies to a serving hatch. Where only electric cooking appliances are used in the galley, the galley and the mess room could be seen as one common room, divided into two appropriate compartments.

5.2 Ventilation systems

5.2.1 With the exception of what may ensue from paragraph 5.3, there should be means for stopping the ventilators and closing the main openings in the ventilation system from a location outside the rooms being served.

5.2.2 Ventilation openings can be permitted in and under the doors in corridor bulkheads, although such openings should not be permitted in and under doors to staircases. The openings should only be positioned in the lower half of a door. Where such an opening is positioned in or under a door, the total net area of the opening(s) should not exceed 0.05 m^2. If such an opening is cut into a door, it should be provided with a grating of non-combustible material.

5.2.3 Ventilation ducts to machinery spaces or galleys should not normally be conducted through accommodation, service rooms, or control rooms. If the competent authority, however, permits such an arrangement, the ducts should be made of steel or equivalent material and arranged so as to maintain the fire protection of the subdivisions.

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410 The text of chapter 5 is inserted from document FP 48/19, annex 5.

5.2.4 Ventilation ducts to accommodation, service rooms, or control rooms should not normally be conducted through machinery spaces of category A or through galleys. If the competent authority, however, permits such an arrangement, the ducts should be made of steel or equivalent material and arranged so as to maintain the fire protection of the subdivisions.

5.2.5 Storerooms, containing appreciable quantities of highly flammable products should be provided with ventilation arrangements, which are separate from other ventilation systems. Ventilation should be arranged at high and low levels and the inlets and outlets of ventilators should be positioned in safe areas. Suitable wire mesh guards to arrest sparks should be fitted over inlet and outlet ventilation openings. Such ventilation systems should not exhaust in close proximity to the inlets of other ventilation systems.

5.2.6 Ventilation systems, which serve machinery spaces, should be independent of systems serving other rooms.

5.3 Heating installations

5.3.1 Where fitted, electric radiators should be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiator should be fitted with an element so exposed that clothing, curtains, or other similar materials can be scorched or set on fire by heat from the element or direct heat from the element should not be accepted by the competent authority.

5.3.2 Heating stoves and other similar appliances should be firmly permanent secured and there should be adequate protection and insulation against fire below and around such appliances and their flues. Uptakes of stoves, which burn solid fuel, should be positioned and executed so as to minimise the possibility of becoming blocked with flammable substances, and they should have adequate means for cleaning. Dampers to limit draught in the boiler flues should, when closed, always leave an adequate area open. Rooms in which furnaces are installed should be provided with ventilators of an adequate area to provide the furnace with the necessary combustion air.

5.3.3 Open flame gas appliances, except cooking stoves and water heaters, should not be permitted. Spaces containing any such stoves or water heaters should have suitable ventilation in order to remove vapours and any gas leaks to a safe place. All pipes conveying gas from tank to stove or water heater should be made of steel or other approved material. Automatic safety gas shut-off devices should be fitted to operate on loss of pressure in the main gas pipe or failure of the pilot flame in any appliance.

5.3.4 Where gaseous fuel is used for domestic purposes, the arrangements, distribution, and storage of the fuel should be to the satisfaction of the competent authority and comply with the provisions of 5.5.5.

5.3.5 Where gas appliances are used for domestic purposes and where such gas supplies are stored, hydrocarbon sensors should be fitted in appropriate locations to give warning of the leakage of gas.

5.4 Miscellaneous items

5.4.1 Exposed surfaces within accommodation spaces, service spaces, control stations, corridor and stairway enclosures and the concealed surfaces behind bulkheads, ceilings, panellings and

linings in accommodation spaces, service spaces and control station should have low flame-spread characteristics, or to be of fire-retardant materials to the satisfaction of the competent authority.*

5.4.2 All exposed surfaces of glass reinforced plastic construction within accommodation and service spaces, control stations, machinery spaces of category A and other machinery spaces of similar fire risk should have the final lay-up layer of approved resin having inherent fire-retardant properties or be coated with an approved fire-retardant paint or be protected by non-combustible materials.

5.4.3 Primary deck coverings within accommodation and service spaces and control stations should be of approved material which will not readily ignite or give rise to toxic or explosive hazards at elevated temperatures. This should be determined in accordance with the Fire Test Procedures Code.

5.4.4 In accommodation and service rooms and in control rooms, pipes, which penetrate fire integrated subdivisions should be made of approved material, taking into account the temperatures such subdivisions should be able to withstand. If the competent authority permits pipes carrying oil and flammable liquids to pass through accommodation and service rooms, the pipes should be of approved material, taking account of the fire hazard.

5.4.5 Materials, such as plastic or similar, which are readily rendered ineffective by heat should not be used for overboard scuppers, sanitary discharges and other outlets which are close to the water line and where the failure of the material in the event of fire would give rise to danger of flooding.

5.4.6 Short flexible piping connections may be accepted on sea water lines where the flexible connections are of a material that is not easily rendered ineffective by heat.

5.4.7 Flexible piping connections may be accepted for pipes transporting oil but the length of the connections should be carefully adapted to withstand the effects of vibrations. The connections should be resistant to oil, reinforced and of a material that is not easily rendered ineffective by heat.

5.4.8 All waste containers, with the exception of those, which are used in connection with the treatment of fish, should be made of non-flammable material without openings in the sides or base.

5.4.9 In the event of a fire in a space containing machinery, which operates fuel oil transfer pumps, fuel oil pumps and other similar fuel pumps, it should be possible to stop the machinery from a location outside the machinery space in question.

5.4.10 Drip pans should be fitted, where necessary, to prevent oils leaking into the bilge.

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* See the Guidelines on the Evaluation of Fire Properties of Materials adopted by the Organization by resolution A.166(ES.IV) and the Recommendation on Improved Fire Test Procedures for Surface Flammability of Bulkhead, Ceiling and Deck Finish Materials adopted by the Organization by resolution A.653(16).

5.5 Storage of gas cylinders and dangerous materials

5.5.1 Cylinders for compressed, liquid or dissolved gases should be carefully secured and clearly marked, using the prescribed identity colours, with a clear, legible identification of the name and chemical formula of their contents and properly secured to the cylinder.

5.5.2 Cylinders, which contain flammable or other dangerous gases, and empty containers, should be stored, suitably secured, on the open deck, and all valves, pressure regulators and pipes leading from such containers should be protected against damage. Cylinders should be protected against extreme changes in temperature, direct rays of the sun and accumulation of snow. However, the competent authority may permit such containers to be stored in compartments complying with the provisions in 5.5.3 to 5.5.5.

5.5.3 Spaces containing liquid gas and highly flammable liquids such as volatile paints, paraffin, benzole, etc. should have direct access from open decks only. Pressure adjusting devices and relief valves should exhaust within the compartment. Where boundary bulkheads of such compartments adjoin other enclosed spaces, they should be gas tight.

5.5.4 Except as necessary for services within the space, electrical wiring and fittings should not be permitted within compartments used for the storage of highly flammable liquids or liquid gases. Where such electrical fittings are installed, they should be to the satisfaction of the competent authority for use in a flammable atmosphere. Sources of heat should be kept clear of such rooms, and "Smoking prohibited" and "Naked flames prohibited" notices should be affixed in a prominent position.

5.5.5 Separate storage rooms should be provided for each individual type of compressed gas. Rooms, which are used for storage of such gases, should not be used for storage of other flammable substances not for tools or items, which constitute a part of the gas distribution system. However, the competent authority may consider alternative arrangements taking into consideration the size and configuration of the vessel as well as the character, volume and intended use of such compressed gases.

5.6 Means of escape

5.6.1 Stairways and ladders leading to and from all crew rooms and spaces in which members of the crew normally are employed should be so arranged as to provide ready means of escape to the open deck and thence to the survival craft.

5.6.2 In accommodation spaces, there should be two exit possibilities from each large room or group of rooms and the exits should be positioned as possible from each other.

5.6.3 Exceptionally the competent authority may grant exemption from one of the exits and means of escape taking account of the location of the room and the number of persons who will normally be accommodated in the room and the configuration of the vessel.

5.6.4 Below the weather deck, the main exit should be a stairway, and the second exit can be considered as an emergency exit. Above weather decks, the exits should be stairways or through doors to the open deck or a combination thereof.

5.6.5 Two means of escape should be provided from every machinery space of category A which should be as widely separated as possible. Vertical escapes should be by means of steel ladders. Where the size or configuration of the machinery spaces make it impracticable one of these means of escape may be omitted. In such cases special consideration should be given to the remaining exit.

5.7 Automatic fire alarm and fire detection systems

5.7.1 In fishing vessels, between 15 and 24 m in length, which are of flammable construction, or where in other respects considerable quantities of flammable materials are used in the fitting out of accommodation, service rooms and control rooms, it should be carefully considered, whether an automatic fire detection and alarm system should be installed in these rooms, taking into account the size of the rooms, lay-out and location in relation to control rooms, and, where relevant, the flame propagation properties of the installed furniture.

5.7.2 Machinery spaces containing propelling machinery should be provided with suitable alarm and fire detection systems.

5.8 Fire pumps – number, capacity and location

5.8.1 Fishing vessels should be provided with at least 1 mechanically-driven fire pump. Depending on the service area, the competent authority may however require an emergency fire pump.

5.8.2 Sanitary, ballast and general service pumps might be approved as fire pumps, provided that they are mechanically driven and not normally used for pumping oil and that, if they are occasionally used for pumping oil, they have suitable switching devices such that the pumps cannot, even accidentally, be activated to suck from tanks, which may be used for substances other than ballast water, and/or from the vessel's bilge system and simultaneously provide pressure to the vessel's fire hydrant. Such arrangements based on blanking off certain pipelines by using blind flanges should not be approved.

5.8.3 Where pumps that are not dedicated fire pumps are authorized for use as a fire pump as provided for in paragraph 5.8.2, their use should not reduce the capability to pump bilges at any time.

5.8.4 When the pumps are used as fire pumps, they should only be able to supply the fire hydrant if only one is required or the fire main.

5.8.5 Where two or more pumps can be used as fire pumps they should be capable of operating in parallel provided that each can deliver the capacity set out in paragraph 5.8.8.

5.8.6 Where the requirements to the maximum permissible suction height can be complied with, the emergency pump could be portable provided that it is driven by a diesel-engine with independent fuel oil supply and the necessary reserve fuel oil. The portable emergency fire pump should be tested at least every month, and the necessary tools for start, suction, connection of hoses, etc. should be positioned close to the pump. Pumps that require priming should be provided with a funnel and shutoff valve.

5.8.7 The capacity Q of a fire pump should be at least in accordance with the calculation method below, however, in no case less than 16m^3/h.

$$Q = \left(0.15\sqrt{L\,(B+D)} + 2.25\right)^2 \text{ m}^3/\text{h}$$

where L, B and D are in metres.

The capacity for a fire-extinguishing pump need not exceed 30 m^3/h.

5.8.8 Main fire pumps should be able to maintain a pressure of at least 0.25 N/mm^2 at the fire plugs when the two fire plugs farthest away from the pump are both in operation and each fitted with a single hose length with a 12 mm spraying nozzle.

5.8.9 Where fixed or portable power operated emergency fire pumps are delivering the maximum quantity of water through the jet required by 5.10.1, the pressure maintained at any hydrant should be to the satisfaction of the competent authority.

5.8.10 The engine for diesel-driven emergency pumps should have a service tank with sufficient fuel oil for at least 3 h operation at full load, and there should be reserves for a further 15 h operation outside the machinery space.

5.8.11 Power to electrically driven emergency pumps should be supplied from an energy source that is independent of installations in the main machinery space and such arrangements should be to the satisfaction of the competent authority.

5.8.12 Fire pumps, including emergency fire pumps, should not be positioned or stored forward of the forepeak bulkhead or its extension.

5.8.13 The sea-valves of fire pumps and other necessary valves should be located so that a fire in any other place than in the space where the pump is located will not prevent the use of the pump.

5.8.14 The pump's total suction height should not exceed 4.5 m (suction height + pipe resistance) under all conditions of heel and trim, which the vessel may be assumed to meet with during navigation.

5.8.15 All permanently installed fire pumps should be provided with a check valve and a non-return valve on the discharge side.

5.8.16 If the fire pumps are capable of developing a pressure in excess of the maximum permitted working pressure of the pipelines, fire hydrant or fire hoses or render flexible hoses uncontrollable, should be provided with safety valves to prevent harmful overpressure.

5.9 Fire mains

5.9.1 Where more than one hydrant is required to provide the number of jets required by 5.10.1, a fire main should be provided.

5.9.2 The maximum pressure at a fire hydrant should not exceed the pressure at which a fire hose can be effectively handled by one crew member.

5.9.3 Fire mains should be made of steel or other equivalent material, which does not easily render it ineffective under the effect of heat.

5.9.4 The fire mains should be laid so as to minimise the risk of mechanical damage to the pipes.

5.9.5 Where there is a risk of frost damage, measures should be taken to avoid such damage.

5.9.6 It should be possible to close off the fire main from a machinery space and from an easily accessible position outside that machinery space.

5.10 Fire hydrants, fire hoses and nozzles

5.10.1 Fire hydrants should be positioned such that they allow easy and rapid connection of fire hoses and such that at least one water jet can be directed towards any part of the vessel, which is normally accessible during navigation.

5.10.2 The water jet required in 5.10.1 should come from a single length fire hose.

5.10.3 In addition to the requirement of 5.10.1, machinery spaces should normally be equipped with at least one fire hydrant, complete with fire hose and combination nozzle (spray/jet). This fire hydrant should be positioned outside the space and close to the entrance.

5.10.4 There should be one fire hose for each prescribed fire hydrant. In addition at least one extra fire hose should be available.

5.10.5 The length of individual fire hoses should not exceed 20 m.

5.10.6 Fire hoses should be of approved material. Each fire hose should be provided with couplings and a dual purpose nozzle.

5.10.7 With the exception of cases where fire hoses are permanently connected to the main fire hydrant, the couplings on fire hoses and nozzles should be completely interchangeable.

5.10.8 The nozzles prescribed in point 5.10.6 should match the performance standard of the fire pumps installed, but should not in any case have a diameter of less than 12 mm.

5.11 Fire extinguishers*

5.11.1 Fire extinguishers should be of approved types. The capacity of required portable fluid extinguishers should be not more than 13.5 *l* and not less than 9 *l*. Other extinguishers should not be in excess of the equivalent portability of the 13.5 *l* fluid extinguisher and should not be less than the fire-extinguishing equivalent of a 9 *l* fluid extinguisher. The competent authority should determine the equivalents of fire extinguishers.

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* See the Improved Guidelines for Marine Portable Fire Extinguishers adopted by the Organization by resolution A.951(23)

5.11.2 Spare charges should be provided to the satisfaction of the competent authority.

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

5.11.4 Fire extinguishers should be periodically examined and subjected to such tests as the competent authority may require.

5.11.5 Normally, one of the portable fire extinguishers intended for use in any space should be stowed near an entrance to that space.

5.12 Portable fire extinguishers

5.12.1 A sufficient number of approved portable fire extinguishers should be provided in control stations and accommodation and service spaces to ensure that at least one extinguisher of a suitable type is readily available for use in any part of such spaces. A total number of extinguishers in these spaces should be to the satisfaction of the competent authority.

5.12.2 Spare charges should be provided to the satisfaction of the competent authority.

5.13 Fire-extinguishing installations in machinery spaces

5.13.1 Vessels should be provided with suitable installations and equipment for the detection and fighting of fire.

5.13.2 Spaces containing main propelling machinery, internal combustion machinery with a total power output of 750 kW and more, oil-fired boilers, including central heating boilers, incinerators and fuel oil aggregates, should be provided with one of the following fixed fire-extinguishing systems, to the satisfaction of the competent authority:

.1 a pressure water-spraying installation that may be supplied from a manually operated pump or another means of pressurizing the system;

.2 a fire-smothering gas installation; and

.3 a fire-extinguishing installation using high expansion foam.

5.13.3 New installations of halogenated hydrocarbon systems used, as fire-extinguishing media should be prohibited on new and existing vessels.

5.13.4 Where the engine and boiler rooms are not entirely separated from each other or if fuel oil can drain from the boiler room into the engine room, the combined engine and boiler rooms should be considered as one compartment.

5.13.5 Installations listed in paragraph 5.13.2 should be controlled from readily accessible positions outside such spaces not likely to be cut off by a fire in the protected space. Arrangements should be made to ensure the supply of power and water necessary for the operation of the system in the event of fire in the protected space.

5.13.6 Vessels which are mainly or completely built of wood or glass-fibre reinforced polyester and equipped with oil-fired boilers or internal combustion engines which, in terms of the machinery space, are covered with such material, should be equipped with one of the extinguishing systems referred to in 5.13.2.

5.14 Ready availability of fire-extinguishing appliances

Fire–extinguishing appliances should be kept in good order and continuously available for immediate use at all times when the vessel is in service.

5.15 Equivalence

Where in this chapter any special type of appliance, apparatus, extinguishing medium or arrangement is specified, any other type of appliance etc. may be allowed provided that the competent authority is satisfied that it is not less effective.

CHAPTER 6

PROTECTION OF THE CREW

6.1 General protective measures

6.1.1 The surfaces of decks and of flooring in working spaces on board, such as machinery spaces, galleys, fish handling and deck equipment operating areas, and deck areas at the foot and head of ladders, should be specially designed and treated to minimize the possibility of personnel slipping.

6.1.2 An adequate system of lifelines should be provided and it should be complete with the necessary, wires, ropes, shackles, eye bolts and cleats.

6.1.3 For vessels being operated single handed, permanently fixed means should be provided to allow the operator to climb on board after an accidental fall overboard.

6.1.4 On single-handed vessels the competent authority should require an arrangement which is to ensure that if the operator falls overboard the engine will stop. Such an arrangement should not constitute a danger to the operator.

6.2 Deck openings

6.2.1 Hinged covers of hatchways, manholes and other openings should be protected against accidental closing.

6.2.2 Dimensions of access hatches should not be less than 600 mm by 500 mm or 500 mm diameter.

6.2.3 Having regard to the operation of the vessel, suitable protection should be provided, where practicable, in positions where there is a danger of personnel falling through deck openings.

6.2.4 Where practicable, handholds should be provided above the level of the deck over escape openings.

6.2.5 External hatches and doors should be closed when the vessel is at sea. All openings occasionally required to be kept open during fishing and which may lead to flooding should be closed immediately if such danger of filling occurs with subsequent loss of buoyancy and stability.

6.3 Bulwarks, rails and guards[411]

6.3.1 Efficient bulwarks or guard rails should be fitted on all exposed parts of the working deck and on superstructure and deck erection decks. The height above deck of any fixed bulwark should be at least 600 mm for vessels of 12 m in length and at least 1.0 m for vessels of 24 m in

[411] Previously 2.12.

length. For vessels of intermediate length the minimum height should be determined by linear interpolation. In every such vessel where the fixed bulwark is less than 1.0 m, guard rails supported by adequate portable stanchions or similar means should be fitted up to the prescribed height of 1.0 m, provided that where this would interfere with the fishing operations of the vessel, alternative arrangements may be accepted by the competent authority.[412]

6.3.2 Clearance below the lowest course of guard rails should not exceed 230 mm. Other courses should not be more than 250 mm apart, and the distance between stanchions, should not be more than 1.5 m. In a vessel with rounded gunwales, guard rail supports should be placed on the flat of the deck. Rails should be free from sharp edges and corners and should be of adequate strength.[413]

6.3.3 Satisfactory means in the form of guard rails, lifelines, gangways or underdeck passages, etc. should be provided for the protection of the crew in getting to and from their quarters, machinery spaces and other working spaces. Storm rails should be fitted on the outside of all deckhouses and casings.[414]

6.3.4 Where practical, having due regard to the need to prevent the retention of water on deck, bulwark heights may be reduced below the minimum prescribed in 6.3.1 to the satisfaction of the competent authority.[415]

6.3.5 Where the height of a bulwark or guard rail is less than 1.0 m for the purpose of the fishing operation as provided for in 6.3.1, or where the effective height has been reduced through the fitting of a net or gear platform at deck level, additional provisions for the safety of the crew working in the area should be to the satisfaction of the competent authority.

6.3.6 Where a net roller is normally incorporated in the structure of a bulwark within the minimum height prescribed for the bulwark, or mounted between stanchions of a guard rail, provision should be made to protect the area when the roller is not in place.

6.3.7 Where part of a bulwark or guard rail has to be removed for the purpose of the fishing operation, protection for the crew should be provided at the opening.

6.4 Stairways and ladders

6.4.1 Stairways and ladders should be provided for safe working at sea and in port. They should be of adequate size and strength. Means of access to holds, 'tween-decks, bunkers and similar parts of a vessel should consist of fixed ladders or stairs. Treads of stairways should be flat and specially prepared to minimize slipping.

6.4.2 Fixed vertical ladders should be so situated as to be protected from damage and should be so fitted as to provide clearance of 150 mm behind. The rungs of steel vertical ladders should be made of square section steel bars with the sharp edge upwards. Where ladders are constructed with stringers, the rungs should pass through the stringers. Handholds should be provided where rungs or stringers are not suitable for this purpose.

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412 Previously 2.12.1.
413 Previously 2.12.2.
414 Previously 2.12.3.
415 Previously 2.12.4.

6.4.3 Stairways of more than 1.0 m in height should have handrails or hand grips on both sides.

6.4.4 Emergency escape ladders should normally be fixed, but if they are portable, they should be stowed adjacent to the escape area and when required, they should be secured in place without the use of tools or mechanical aids.

6.4.5 Ladders in machinery spaces should preferably be at least 450 mm wide.

6.5 Accommodation ladders and gangways

6.5.1 Means should be provided, where practicable, to ensure sufficiently safe and convenient access to the vessel where facilities are not provided in the port. Such means should be of reliable material, safe construction and adequate strength.

6.5.2 Accommodation ladders should be provided with hooks or other suitable fastenings for adequate support and securing against displacement or slipping and be able to be adjusted to the height of the landing place.

6.6 Galleys

6.6.1 Galleys should be provided with guard rails and hand rails.

6.6.2 Cooking stoves should be fitted with guards to retain cooking utensils.

6.6.3 Where food processing equipment is installed, dangerous parts should be fitted with permanent safety guards.

6.7 Deck machinery, tackle and lifting gear

General

6.7.1 All elements of a fishing gear system, including warping heads, winches, warps, wires, tackle, nets, etc., should be designed, arranged and installed to provide safe and convenient operation. In so far as is possible, such components should be of a suitable strength so that in the event of an overload strain the failure will occur on the designated weak link in the system. All crew members should be made aware of the designated weak link in the system.

6.7.2 Warp guards should be fitted where practicable between warp lead rollers.

6.7.3 Sheaves and rollers should be guarded where practicable.

6.7.4 Chains or other suitable devices should be provided for “stoppering off”.

6.7.5 Wires and warps provided should be of adequate strength for the anticipated loads.

6.7.6 Where practicable, provision should be made to stop trawl boards swinging inboard, such as the fitting of a portable prevention bar at the gallows aperture or other equally effective means.

6.7.7 Lifting and running parts of the fishing gear should be of adequate strength for the anticipated loads.

6.7.8 Provision should be made for the stowage of bulky netting to allow for drainage and to prevent lateral movement. The stowage area should be of adequate dimensions to keep the centre of gravity of the stowed net to a minimum and to allow for the crew to work in safety when flaking down nets.

6.7.9 Moving parts of winches line and net hauling equipment and of warp and chain leads which may present a hazard should be as far as practicable adequately guarded and fenced.

6.7.10 Controls of winches, line and net hauling equipment, should be so placed that winch operators have ample room for their unimpeded operation and have as unobstructed a view as possible of the working area. Where possible, control handles should be arranged to return to the stop position when released and be provided, where necessary, with a suitable locking device in the stop/neutral position, to prevent accidental movements or displacement or unauthorized use. In general, winches and hauling equipment for fishing gear should be fitted with safety devices designed to prevent accidents.

6.7.11 The arrangement of the safety devices should also ensure that an emergency stop would be activated if a person is pulled towards a winch or other hauling equipment.

6.7.12 Quick release devices should preferably be fitted in the case of beam trawling and in purse seining that can be activated in an emergency from the wheelhouse and at the main control station if not in the wheelhouse.

6.7.13 The design and construction of winches, line and net hauling equipment should be such that the maximum effort necessary for operating handwheels, handles, crank handles, levers, etc. should not exceed 160 N and in the case of pedals not exceed 320 N.

Winches

6.7.14 The design of winch systems should ensure that when power is supplied to the winch, the control valves and or levers, would always be in the stop/neutral position.

6.7.15 Winches should be provided with means to prevent overhoisting and to prevent the accidental release of a load if power supply fails. Where practicable, winches with wire storage drums should be fitted to avoid the need to use warping heads.

6.7.16 Winches should be equipped with brakes capable of effectively arresting and holding the safe working load. Brakes should be proof-tested before installation with a static load suitably in excess of the maximum safe working load to the satisfaction of the competent authority. Brakes should be provided with simple and easily accessible means of adjustment. Every winch drum, which could be uncoupled from the drive, should be furnished with a separate brake independent of the brake connected with the drive.

6.7.17 Where manually operated "guiding on" gear is installed, the operating wheels should be without open spokes or protrusions that could cause injury to the operator and should be capable of being disengaged when the warps are paying out. Preferably the "guiding on" gear should be capable of being disengaged when the warps are paying out.

6.7.18 Where practicable, winches should be reversible.

6.7.19 Winch barrels should be provided with means for fastening wire ends, for instance clamps, shackles or other equally effective method which should be so designed as to prevent kinking of the wires.

6.7.20 Where a fishing winch is provided with local and remote controls, these should be so arranged as to prevent simultaneous operation. The operator should have a clear view of the winch and adjacent area from either position. An emergency cut-off should be provided at the winch and at the remote station as well as in the wheelhouse.

6.7.21 Where a fishing winch is controlled from the wheelhouse, an emergency control switch at the winch should be provided. Where a second control at the winch is required by the competent authority, the arrangement should be such as to make simultaneous control from both control positions impossible, as well as to show which control position is in operation. Where necessary, emergency switches for winches should be provided remote from the winch to protect fishermen working in places which are dangerous for operation of warps and trawl boards. Where a fishing winch is controlled from the bridge, the arrangements should be such that the operator has a direct or televised clear view of the winch and adjacent area.

Line and net hauling equipment

6.7.22 Line and net hauling equipment should be fitted with devices to ensure that the designated safe working load is not exceeded. Such devices should be tested to the satisfaction of the competent authority.

6.7.23 Where line and net hauling equipment is intended to be blocked or braked in the stop position, the arrangements should be tested to the satisfaction of the competent authority.

6.7.24 Where line and net hauling equipment is controlled from the wheelhouse or from a position remote from the equipment, means should be provided at the equipment to stop hauling and/or shooting in an emergency. In like manner, when the main controls are at the equipment, means should be provided in the wheelhouse to stop it in an emergency.

6.7.25 The arrangement of the safety devices should also ensure that an emergency stop would be activated if a person is pulled towards a line or net hauling equipment.

Lifting gear

6.7.26 Cranes should be well constructed of sound material and the design should conform with national standards that may be appropriate. They should be tested to the satisfaction of the competent authority and the crane should be marked with the designated maximum safe working load. In the case of a crane fitted with an extendable jib, the safe working load at various radii should be clearly marked as close as practical to the operating controls.

6.7.27 In general, cranes adapted to carry net hauling equipment should be so designed that in the fail safe condition, the hanging point of the jib should not be too high or extend so far beyond the bulwark that retrieval of fishing gear or equipment would endanger the crew.

6.7.28 The braking or blocking arrangements of a crane should be tested to at least 1.5 times the designated safe working load to the satisfaction of the competent authority.

6.7.29 Lifting and hoisting appliances, as well as derricks and similar equipment including all parts of the working gear thereof, whether fixed or movable, and all plant should be of good construction, reliable material, adequate strength and free from patent defect. They should be adequately and suitably anchored, supported or suspended having regard to the purpose for which they are used and should be marked with the safe working load. They should have easy access for maintenance. Guards should be provided to prevent any undesirable movement of lifted or hoisted parts, such as codend or fishing gear, which could present danger to the crew.

6.7.30 Lifting and hoisting appliances, as well as derricks, should be protected from overhoisting.

6.7.31 The competent authority should ensure that lifting and hoisting appliances, as well as derricks, should be tested at least every two years and the results entered in the record of the vessel.

6.7.32 No such appliance of a kind referred to in 6.7.27 nor any part or working gear thereof, should be taken into use for the first time or after it has undergone any substantial repair unless it has been tested and the result entered in the record of the vessel.

6.8 Lighting in working spaces and areas

6.8.1 All companion-ways, doors or other means of access should be illuminated on both sides of the opening to facilitate safe passage.

6.8.2 All passageways and working spaces and areas should be provided with artificial lighting to the satisfaction of the competent authority. Particular attention should be paid to Rule 20(b) of the International Regulations for Preventing Collisions at Sea, 1972.

6.8.3 Glare, dazzle or sudden contrasts of illumination should be eliminated to the extent possible taking into consideration the need for effective lighting for the safety of the crew on the working deck.

6.8.4 Provision should be made for some form of emergency lighting, which is independent of the normal supply.

6.8.5 Portable watertight lights should be provided as necessary and fitted with heavy-duty cables, bulb guards and lanyards. Such lights for use in spaces, which may contain explosive gases, should be either explosive proof or otherwise intrinsically safe to the satisfaction of the competent authority.

6.8.6 Where necessary to prevent danger, electric lamps should be protected by guards.

6.8.7 In order to avoid the stroboscopic effect of fluorescent lighting double tube lamps should be used to illuminate working spaces with revolving machinery.

6.9 Ventilation in working and storage spaces

6.9.1 Ventilation in working and storage spaces should be in accordance with the provisions of 5.2.

6.9.2 Consideration should be given to providing ventilation for the protection of personnel entering fish holds and other spaces.

6.9.3 Where necessary to safeguard personnel, work places and storage spaces should be provided with an adequate system of heating and/or cooling.

6.10 Dangerous areas

6.10.1 Dangerous spaces or entrances thereto should be properly illuminated and marked and have warning signs prominently posted. Retro-reflective and fluorescent materials may be used to increase the conspicuousness. A notice should also be posted if a first aid procedure is appropriate.

6.10.2 A notice should be posted below radar and radio aerials warning that no work should be undertaken in the vicinity without authorization. A notice should also be posted at the operating controls of radar and radio equipment warning the operator that the equipment should not be started unless it is clear that no one is working near the aerials.

6.10.3 A working area, designated by the skipper as dangerous or requiring extra care, should be brought to the attention of the crew at regular briefing sessions on safety and to each new crew member on joining a vessel.

6.11 Fish processing equipment

6.11.1 Arrangement of fish processing equipment should ensure free access for inspection, operation and sanitary treatment of the equipment. Working areas in way of processing equipment should be not less than 750 mm wide.

6.11.2 Materials used to insulate fish processing equipment, including piping, should be non-combustible, durable and stable under conditions of vibration and should not have an external surface temperature harmful to personnel on contact. The insulation should be securely fastened.

6.11.3 Machinery and installations operating under pressure should comply with requirements of the competent authority.

6.11.4 Machinery and other installations from which vapour, gas, dust or other harmful substance may readily escape or be emitted during operation should be fitted with exhaust devices. Suction ends of these devices should be located as near as possible to the sources of vapour, gas, dust or other harmful substance and the piping should be so arranged that discharged products will not constitute a hazard to personnel.

6.11.5 Where conveyors are working in one line, emergency switches should be provided at intervals of not more than 3 m for stopping all conveyors working in the line. Where the length of a conveyor or series of conveyors is 10 m or more, sound or light signals should be provided for giving warning when the conveyor system starts.

6.11.6 Dampers, cocks, valves and other stopping devices should be positioned so that they are readily accessible and safe for operation.

6.11.7 Machinery and equipment in working spaces should be fitted on strong and rigid foundations securely connected to the vessel's structure.

6.11.8 Moving parts of machinery and other equipment or installations, as well as gear wheels, which may present a hazard, should be adequately guarded.

6.11.9 Machinery and installations which require routine servicing at a height of more than 2 m should be equipped with platforms of 600 mm in width and guarded with rails not less than 1m in height.

6.11.10 Fish processing equipment operating with water should be provided with effective drainage systems, having regard to their extra susceptibility to clogging.

6.11.11 Adequate drainage should be provided to prevent the accumulation of water in enclosed spaces as a consequence of fish handling or fish processing.

6.11.12 Loading and unloading devices for fish processing machinery and equipment should be arranged at a safe and convenient height for operation.

6.11.13 Steam or vapour outlets from machinery and equipment such as liver boilers, should be arranged as high as possible. Outlet pipes should be at least 50 mm in diameter and lead into open air. Vapour from outlets should not obscure visibility.

6.11.14 Filling openings of machinery and other equipment, such as liver or fish oil boilers, should be within easy reach of personnel. Such openings should be fitted with lids with suitable means of closing so as to prevent steam, hot water or vapour escaping into the working space. The lids should also be counterbalanced or provided with other safe means of securing the lid in the open position.

6.12 Medicine chest, radio-medical services and hospital accommodation

6.12.1 First aid equipment and instructions as required by the competent authorities should be provided in all fishing vessels. International standards relating to first aid at sea laid down in the International Medical Guide for Ships[416], prepared by the International Labour Organization, the International Maritime Organization and the World Health Organization, may serve as a guide. In addition, in recent years regional guidelines have also been developed.[*]

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[416] The International Medical Guide for Ships is currently being revised. It is not expected that a new version of the Guide will be available before 2004.

[*] See EU Council Directive 92/29/EEC on the minimum safety and health requirements for improved medical treatment on board vessels.

6.12.2 Fishing vessels should carry an appropriate medical guide or instructions. The medical guide or instructions, should be illustrated, should explain how the medical supplies are to be used and should be designed to enable persons other than a doctor to care for the sick or injured on board both with and, if necessary, without medical advice by radio or satellite communication.

6.12.3 The medicine chest should contain equipment and medical supplies suitable for the expected service of the vessel (e.g., unlimited trips; trips of less than a certain distance from the nearest port with adequate medical equipment; service in harbours and very close to shore).

6.12.4 The competent authority should establish requirements for the periodic replacement of medicines to ensure they are not outdated and appropriate to any changes in the operational requirements of the vessel (e.g., change in geographic location).

6.12.5 Appropriate instructions and equipment should be provided to enable appropriate fishing vessel personnel to consult effectively with radio-medical services ashore.

6.12.6 Appropriate hospital accommodation should be provided in accordance with international instruments.

6.12.7 Instructions and equipment necessary for safe medical evacuation by vessel, helicopter or other means should be carried on board.

6.12.8 Generally, all instructions should be in a language understood by the crew. Where possible, illustrations should be used to facilitate ease of understanding and communication.

6.13 Miscellaneous

6.13.1 Protective clothing and safety working equipment such as gloves, goggles, ear protectors, respirators, safety helmets, special footwear, and/or other apparel, oilskins, explosive gas and oxygen sufficiency indicators, etc. should be provided as appropriate to prevent injury or illness to personnel. The protective clothing and in particular oilskins, should have a highly visible colour, be reflectorized, and fit as closely to the body as possible. The protective clothing for crew members working on deck should be capable of supporting the wearer in the water in the event of being washed overboard. A buoyancy garment or a self-inflating working life jacket could be used for this purpose.

6.13.2 All reasonable steps should be taken to minimize harmful noise and vibration.

6.13.3 A portable gas detector should be carried on board all fishing vessels which carry fish in bulk in their holds to enable the crew to ascertain whether it is safe to enter the fish-holds. A portable gas detector to test for leakage of refrigerant, should also be carried in a fishing vessel fitted with refrigeration machinery.

6.13.4 The skipper should ensure that the crew are made aware of the health hazards in connection with the carriage of fish in bulk and should advise the crew concerning safe working practices in this regard.

6.13.5 Effective lightning conductors should be fitted to all wooden masts or topmasts. In vessels built of steel, it is sufficient to fit spikes on steel masts. In vessels constructed of non-conductive material the lightning conductors should be connected by suitable conductors to a copper plate fixed to the vessel's hull well below the waterline.

6.13.6 The competent authority should ensure that fishing vessels that carry cargo and or fishing equipment on deck and or atop deckhouses, carry on board clear instructions in relation to:

.1 the provisions in the stability booklet covering conditions of loading at various freeboards;

.2 permitted loading conditions relative to weather conditions;

.3 ensuring that cargo/fishing gear is not stowed in a manner that would obscure view from the bridge or obscure navigation lights and signals; and

.4 ensuring that access to and the operation of essential equipment and machinery is not impeded.

CHAPTER 7

LIFE-SAVING APPLIANCES AND ARRANGEMENTS

PART A - GENERAL[417]

7.1 Definitions[418]

7.1.1 Float-free launching is that method of launching a survival craft whereby the craft is automatically released from a sinking vessel and is ready for use.

7.1.2 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.

7.1.3 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.

7.1.4 Inflated appliance is an appliance which depends upon non-rigid, gas-filled chamber for buoyancy and which is kept inflated and ready for use at all times.

7.1.5 Launching appliance or arrangements is a means of transferring a survival craft or rescue boat from its stowed position safety to water.

7.1.6 Novel life-saving appliance or arrangements is a life-saving appliance or arrangement which embodies new features not fully covered by the provisions of this chapter but which provides an equal or higher standard of safety.

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

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

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

7.2 Evaluation, testing and approval of life-saving appliances and arrangements*

7.2.1 Except as provided in 7.2.6, life-saving appliances and arrangements to which this chapter refers should be approved by the competent authority.

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417 Please refer to part A of the chapter VII of the Protocol.

418 Please refer to regulation VII/(2) of the Protocol.

* See the Revised Recommendations on the Testing of Life-Saving Appliances adopted by the Organization by resolution MSC.81(70), as revised, and the Code of Practice for the Evaluation, Testing and Acceptance of Prototype Novel Life-Saving Appliances and Arrangements adopted by the Organization by resolution A.520(13).

7.2.2 Before giving approval to life-saving appliances and arrangements, the competent authority should ensure that such life-saving appliances and arrangements:

.1 are tested, to confirm that they comply with the guidelines given in this chapter and with the recommendations of the Organization; or

.2 have successfully undergone, to the satisfaction of the competent authority, tests which are substantially equivalent to those specified in the recommendations of the Organization.[419]

7.2.3 Before giving approval to novel life-saving appliances or arrangements, the competent authority should ensure that such appliances or arrangements:

.1 provide safety standards at least equivalent to the guidelines given in this chapter and the applicable provisions of the Protocol and have been evaluated and tested in accordance with the recommendations of the Organization; or

.2 have successfully undergone, to the satisfaction of the competent authority, evaluation and tests which are substantially equivalent to those recommendations given in IMO resolutions on testing of life-saving appliances and arrangements.[420]

7.2.4 Procedures adopted by the competent authority for approval should also include the conditions whereby approval would continue or would be withdrawn.[421]

7.2.5 Part C of chapter VII of the Protocol should be used as guidance for the requirements for live-saving appliances.

7.2.6 Life-saving appliances referred to in this chapter for which specifications are not included in applicable provisions of the Protocol should be to the satisfaction of the competent authority.[422]

7.3 Production tests

The competent authority should require proof that life-saving appliances have been 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.

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419 Please refer to regulation VII/ 3.2 (a), (b) of the Protocol.

420 Please refer to regulation VII/ 3.3 (a), (b) of the Protocol.

421 Please refer to regulation VII/3.4 of the Protocol.

422 Please refer to paragraph 4.1.6 of the Asian Guidelines. Preference is given to the sense of chapter VII, regulation 3(6) of the Protocol.

Part B – VESSEL REQUIREMENTS[423]

7.4 Number and types of survival craft[424]

7.4.1 Survival craft should comply with the applicable provisions of the Protocol. Alternatively, the competent authority may permit vessels to carry other types of approved survival craft taking into account the vessel's navigational and operational condition.

7.4.2 The competent authority, taking into account the vessel's navigational area, conditions of operation and size of the vessel, may permit vessels to carry other types of survival craft of a type and number to the satisfaction of the competent authority. Such survival craft may be of rigid or semi-rigid construction or of a type that is permanently inflated and of strong abrasion resistant construction with subdivided buoyancy.

7.4.3 Vessels of 17 m in length and over should be provided with survival craft of sufficient aggregate capacity to accommodate at least 200% of the total number of persons on board. A sufficient number of these survival craft to accommodate at least the total number of persons on board should be capable of being launched from each side of the vessel.

7.4.4 The competent authority, taking into account the vessel's navigational area, conditions of operation and size of the vessel, may allow the vessel to be fitted with survival craft of sufficient aggregate capacity to accommodate at least the total number of persons on board.

7.4.5 A vessel less than 17 m in length should carry survival craft of an aggregate capacity capable of accommodating all of the persons on board. The competent authority, taking into account the vessel's navigation area and conditions of navigation may require the vessel to be provided with additional survival craft.

7.4.6 Every vessel should carry adequate means of recovering persons from the water.

7.5 Availability and stowage of survival craft[425]

7.5.1 Survival craft should:

.1 be readily available in case of emergency;

.2 be capable of being launched safely and rapidly under the conditions required by the applicable provisions of the Protocol;

.3 be so stowed that:

.1 the marshalling of persons at the embarkation deck is not impeded;

.2 their prompt handling is not impeded;

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423 Please refer to part B of the chapter VII of the Protocol.
424 Please refer to regulation 4.3 of the Asian Guidelines.
425 Please refer to paragraph 4.4 of the Asian Guidelines.

.3 embarkation can be effected rapidly and in good order; and

.4 the operation of any other survival craft is not interfered with.[426]

7.5.2 Survival craft and launching appliances should be in working order and available for immediate use before the vessel leaves port and kept so at all times when at sea.[427]

7.5.3.1 Survival craft should be stowed to the satisfaction of the competent authority.[428]

7.5.3.2 Every lifeboat should be attached to a separate set of davits or approved launching appliance.[429]

7.5.3.3 Survival craft should be positioned as close to accommodation and service spaces as possible, stowed in suitable positions to ensure safe launching, with particular regard to clearance from the propeller.

7.5.3.4 Lifeboats for lowering down the vessel's side should be stowed with regard to steeply overhanging portions of the hull, so ensuring, as far as practicable, that they can be launched down the straight side of the vessel. If positioned forward, they should be stowed abaft the collision bulkhead in a sheltered position and in this respect the competent authority should give special consideration to the strength of the davits.[430]

7.5.3.5 Liferafts should be so stowed as to be readily available in case of emergency in such a manner as to permit them to float free from their stowage and break free from the vessel in the event of its sinking. However, davit-launched liferafts need not float free.[431]

7.5.3.6 Lashings, if used, should be fitted with an automatic release system of an approved type.

7.5.3.7 The competent authority, if satisfied that the constructional features of the vessel and the method of fishing operation may render it unreasonable and impractical to apply particular provisions of this paragraph, may accept relaxation from such provisions, provided that the vessel is fitted with alternative launching and recovering arrangements adequate for the service for which it is intended.[432]

7.5.4 All survival craft should be marked with the same registration or other identification marks as used for the vessel as referred to in 7.15.1.

7.6 Embarkation into survival craft[433]

Suitable arrangements should be made for embarkation into the survival craft which should include:

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426 Please refer to paragraph 4.4.1 of the Asian Guidelines.
427 Please refer to regulation VII/6.3 of the Protocol.
428 Please refer to regulation VII/6.4(a) of the Protocol.
429 Please refer to regulation VII/6.4(b) of the Protocol.
430 Please refer to regulation VII/6.4(c) of the Protocol.
431 Please refer to regulation VII/6.4(f)(i) of the Protocol.
432 Please refer to paragraph 4.4.3.5 of the Asian Guidelines.
433 Please refer to regulation VII/7(a)-(d) of the Protocol.

.1 at least one ladder, or other approved means, on each side of the vessel to afford access to the survival craft when waterborne, except where the competent authority is satisfied that the distance from the point of embarkation to the waterborne survival craft is such that a ladder is unnecessary;

.2 means for illuminating the stowage position of survival craft and their launching appliances during preparation for and the process of launching, and also for illuminating the water into which the survival craft are launched until the process of launching is completed, the power for which to be supplied from the emergency source required by 4.11;

.3 arrangements for warning all persons on board that the vessel is about to be abandoned; and

.4 means for preventing any discharge of water into the survival craft.

7.7 Lifejackets

7.7.1 For every person on board, a lifejacket of an approved type should be carried. Lifejackets should comply with the provisions of the Recommendations for testing lifejackets reproduced at annex V.

7.7.2 Lifejackets should be so placed as to be readily accessible and their position should be plainly indicated.[434]

7.8 Immersion suits and thermal protective aids

7.8.1 For vessels operating in areas where low water or air temperature can be expected, an approved immersion suit of an appropriate size should be provided for every person on board.

7.8.2 Where the competent authority considers that water or air temperatures in the area of operations of the vessel warrant immersion suits with inherent insulation, these suits should be provided for every person on board.

7.8.3 Immersion suits should be placed as to be readily accessible and their position should be clearly indicated.

7.9 Lifebuoys

7.9.1 Vessels less than 17 m in length should be provided with at least two lifebuoys one of which should be attached to a buoyant line of not less than 30 m in length.[435]

7.9.2 Vessels of 17 m in length and over should be provided with at least three lifebuoys.

7.9.3 On every vessel, at least one of the lifebuoys should be provided with self-igniting lights.[436]

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434 Please refer to regulation VII/8.2 of the Protocol.
435 Please refer to regulation 7.1.2 of the Voluntary Guidelines.
436 Please refer to regulation 7.1.2 of the Voluntary Guidelines.

7.9.4 At least one of the lifebuoys provided with self-igniting lights in accordance with 7.9.3 should be provided with self-activating smoke signals.[437]

7.9.5 Where three lifebuoys are required, at least one lifebuoy on each side of the vessel should be fitted with a buoyant lifeline of not less than 30 m in length. At least one lifebuoy should not be fitted with a buoyant line. Such lifebuoys, fitted with buoyant lines, should not have self-igniting lights.[438]

7.9.6 All lifebuoys should be so placed as to be readily accessible to the persons on board and should always be capable of being rapidly cast loose and should not be permanently secured in any way.[439]

7.9.7 All lifebuoys should be in a bright contrasting colour to the sea and marked with the same registration or other identification marks as used for the vessel as referred to in 7.15.1.

7.10 Distress signals

7.10.1 Every vessel should be provided, to the satisfaction of the competent authority, with means of making effective distress signals by day and by night, including at least four rocket parachute flares.[440]

7.10.2 Distress signals should be of an approved type. They should be so placed as to be readily accessible and their position should be plainly indicated.[441]

7.11 Radio life-saving appliances[442]

7.11.1 Vessels should be equipped with suitable communications equipment having regard to the area of operation and the vessel's intended service.

7.11.2 Where two-way VHF radiotelephone apparatus is required by the competent authority, such apparatus should conform to performance standards not inferior to those adopted by the competent authority, having regard to those adopted by the Organization.

7.11.3 If a fixed two-way VHF radiotelephone apparatus is fitted in a survival craft it should conform to performance standards not inferior to those adopted by the competent authority having regard to those adopted by the Organization.

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437 Please refer to paragraph 4.7.3 of the Asian Guidelines.
438 Please refer to paragraph 4.7.4 of the Asian Guidelines.
439 Please refer to regulation VII/10.5 of the Protocol.
440 Please refer to paragraph 4.8.1 of the Asian Guidelines.
441 Please refer to regulation VII/12.2 of the Protocol.
442 Please refer to regulation 4.9 of the Asian Guidelines and SLF 44/5, paragraph 3.17.

7.12 Radar transponders[443*]

At least one radar transponder should be carried on every vessel. Such radar transponders should conform to performance standards not inferior to those adopted by the competent authority, having regard to those adopted by the Organization. It should be stowed in such a location that it can be rapidly placed in any survival craft.

7.13 Retro-reflective materials on life-saving appliances[444]

All survival craft, rescue boats, lifejackets, immersion suits and lifebuoys should be fitted with retro-reflective material in accordance with the recommendations of the Organization.

7.14 Operational readiness, maintenance and inspections

Operational readiness

7.14.1 Before the vessel leaves port and at all times during the voyage, all life-saving appliances should be in working order and ready for immediate use.[445]

Maintenance

7.14.2 Instructions for on-board maintenance of life-saving appliances should be carried on board.

Maintenance of falls

7.14.3 Falls used in launching should 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 five years, whichever is the earlier.[446]

Spares and repair equipment

7.14.4 Spares and repair equipment should be provided for life-saving appliances and their components which are subject to excessive wear or consumption and need to be replaced regularly.[447]

Weekly inspection[448]

7.14.5 The following tests and inspections should be carried out weekly:

.1 all survival craft and launching appliances should be visually inspected to ensure that they are ready for use;

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443 Please refer to regulation 4.10 of the Asian Guidelines.

* See the Performance standards for survival craft radar transponders for use in search and rescue operations, adopted by the Organization by resolution A.802(19).

444 Please refer to regulation VII/15 of the Protocol.

445 Please refer to regulation VII/16.1 of the Protocol.

446 Please refer to regulation VII/16.3 of the Protocol.

447 Please refer to regulation VII/16.4 of the Protocol.

448 Please refer to regulation VII/16.5(a)-(c) of the Protocol.

.2 all engines in lifeboats should be run ahead and astern for a total period of not less than 3 min, provided the ambient temperature is above the minimum temperature required for starting the engine; and

.3 the general emergency alarm system should be tested.

Monthly inspections

7.14.6 Inspection of the life-saving appliances, including lifeboat equipment, should be carried out monthly, using a checklist to ensure that they are complete and in good order. A report of the inspection should be entered in the log-book.[449]

Servicing of inflatable liferafts, inflatable life-jackets[450]

7.14.7 Every inflatable liferaft and inflatable lifejacket should be serviced:

.1 at intervals not exceeding 12 months. However, in cases where it appears proper and reasonable, the competent authority may extend this period to 17 months;

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

Periodic servicing of hydrostatic release units[451]

7.14.8 Hydrostatic release units should be serviced:

.1 at intervals not exceeding l2 months. However, in cases where it appears proper and reasonable, the competent authority 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.

7.14.9 In cases of vessels where the nature of fishing operations may cause difficulty for compliance with the requirements of 7.14.7 and 7.14.8, the competent authority may allow the extension of the service intervals to 24 months, provided that the competent authority is satisfied that such appliances are so manufactured and arranged that they will remain in satisfactory condition until the next period of servicing.[452]

7.14.10 Hydrostatic release units of disposable design should be replaced at or before the expiry date. Nevertheless, the competent authority should inspect the release units during statutory inspections of other life-saving equipment and if found defective they should be replaced, not serviced.[453]

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449 Please refer to regulation VII/16.6 of the Protocol.
450 Please refer to paragraph 4.12.7 of the Asian Guidelines.
451 Please refer to paragraph 4.12.8 of the Asian Guidelines.
452 Please refer to regulation VII/16.9 of the Protocol.
453 The FVS ISCG proposes to move paragraph 7.14.8.2 and change the wording of the first sentence. The paragraph is placed after existing paragraph 7.14.9 and becomes 7.14.10.

7.15 Miscellaneous

7.15.1 To facilitate aerial rescue operations, wheelhouse tops or other prominent horizontal surfaces should be painted in a highly visible colour and should bear the vessel's registration or other identification marks in letters and/or numerals in contrasting colours to the background. Similar marks on the sides of the wheelhouse would also facilitate search and identification by high-speed aircraft.[*] [454]

7.15.2 The skipper should ensure that the crew is adequately trained in the use and inspection of life-saving appliances and that regular inspection of the equipment is carried out.

PART C –LIFE-SAVING APPLIANCES REQUIREMENTS[455]

Part C of chapter VII of Part B of the Code of Safety for Fishermen and Fishing Vessels, may be used as a guidance for the requirements for life-saving appliances.

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[*] Marking of fishing vessels and fishing gear for identification should be in accordance with uniform and internationally recognizable vessel and gear marking systems, such as the Food and Agriculture Organization of the United Nations Standard Specifications for the Marking and Identification of Fishing Vessels.

[454] The FVS ISCG proposes to delete this paragraph since the emergency communications equipment is already covered in paragraphs 7.11 and 7.12.

[455] Please refer to part C of the chapter VII of the Protocol.

CHAPTER 8[456]

EMERGENCY PROCEDURES, MUSTERS AND DRILLS

8.1 General emergency alarm system, muster list and emergency instructions

8.1.1 The general emergency alarm system should be capable of sounding the general alarm signal consisting of seven or more short blasts followed by one long blast on the vessel's whistle or siren and additionally on an electrically operated bell or klaxon or other equivalent warning system which should be powered from the vessel's main supply and the emergency source of electrical power required by 4.11. As an alternative, an appropriate manual system should be used on vessels of a length less than 17 m.

8.1.2 All vessels should be provided with clear instructions for each crew member which should be followed in case of emergency.

8.1.3 The muster list should be posted up in several parts of the vessel and, in particular, in the wheelhouse, the engine room and in the crew accommodation and should include the information specified in the following paragraphs.

8.1.4 The muster list should specify details of the general alarm signal prescribed by 8.1.1 and also the action to be taken by the crew when this alarm is sounded. The muster list should also specify how the order to abandon ship will be given.

8.1.5 The muster list should show the duties assigned to the different members of the crew including:

.1 closing of watertight doors, fire doors, valves, scuppers, overboard shoots, sidescuttles, skylights, portholes and other similar openings in the vessel;

.2 equipping the survival craft and other life-saving appliances;

.3 preparation and launching of survival craft;

.4 general preparation of other life-saving appliances;

.5 use of communication equipment; and

.6 manning of fire parties assigned to deal with fires.

8.1.6 The competent authority may permit relaxation of the requirements of 8.1.5 if satisfied that, due to the small number of crew members, no muster list is necessary.

8.1.7 The muster list should specify which of the crew members are assigned to ensure that the life-saving and fire appliances are maintained in good condition and are ready for immediate use.

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456 Please refer to chapter VIII of the Protocol.

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

8.1.9 The muster list should be prepared before the vessel 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 skipper should either revise the list or prepare a new list.

8.2 Abandon ship training and drills

Practice musters and drills

8.2.1 Each member of the crew should participate in at least one abandon ship drill and one fire drill every month. However, the competent authority may modify this requirement, provided that at least one abandon ship and one fire drill is held at least every three months. The drills of the crew should take place within 24 hours of the vessel leaving a port if more than 25% of the crew have not participated in abandon ship and fire drills on board that particular vessel in the previous muster. The competent authority may accept other arrangements that are at least equivalent for those classes of vessel for which this is impracticable.

8.2.2 The provisions of 8.2.2 to 8.2.10 in Part B of the Code of Safety for Fishermen and Fishing Vessels may be used as guidance when determining how to practice musters and drills.

On-board training and instructions

8.2.3 On-board training in the use of the vessel's life-saving appliances, including survival craft equipment, should be given as soon as possible but not later than 2 weeks after a crew member joins the vessel. However, if the crew member is on a regularly scheduled rotating assignment to the vessel, such training should be given not later than 2 weeks after the time of first joining the vessel.

8.2.4 Instructions in the use of the vessel's life-saving appliances and in survival at sea should be given at the same intervals as the drills. Individual instruction may cover different parts of the vessel's life-saving system, but all the vessel's life-saving equipment and appliances should be covered within any period of 2 months. Each member of the crew should be given instructions which should include but not necessarily be limited to:

.1 operation and use of the vessel's inflatable liferafts, including precautions concerning nailed shoes and other sharp objects;

.2 problems of hypothermia, first-aid treatment for hypothermia and other appropriate first-aid procedures; and

.3 special instructions necessary for use of the vessel's life-saving appliances in severe weather and severe sea conditions.

Records

8.25 The date when musters are held, details of abandon ship drills and fire drills, drills of other life-saving appliances and on-board training should be recorded, to the satisfaction of the competent authority, in a logbook.

Training manual

8.26 A training manual should be provided. The training manual, which may comprise several volumes, should contain instructions and information, in easily understood terms illustrated wherever possible, on the life-saving appliances provided on the vessel 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 provisions of 8.2.15 in Part B of the Code of Safety for Fishermen and Fishing Vessels may be used as guidance when determining the content of the training manual.

8.3 Training in emergency procedures

Crews should be adequately trained, to the satisfaction of the competent authority, in their duties in the event of emergencies. The provisions of 8.3 in Part B of the Code of Safety for Fishermen and Fishing Vessels and the joint FAO/ILO/IMO Document for guidance on training and certification of fishing vessel personnel, as amended, may be used as guidance when determining items to be included in such training.

CHAPTER 9[457]

RADIOCOMMUNICATIONS

PART A – GENERAL

9.1 Application

9.1.1 This chapter should apply to new and existing fishing vessels.

9.1.2 No provision in this chapter should prevent the use by any vessel, survival craft or person in distress of any means at its disposal to attract attention, make known its position and obtain help.

9.1.3 For the purpose of this chapter, the following terms shall have the meanings defined below.

9.1.3.1 *Bridge-to-bridge communications* means safety communications between vessels from the position from which the vessels are normally navigated.

9.1.3.2 *Continuous watch* means that the radio watch concerned shall not be interrupted other than for brief intervals when the vessel's receiving capability is impaired or blocked by its own communications or when the facilities are under periodical maintenance or checks.

9.1.3.3 *Digital selective calling (DSC)* means a technique using digital codes which enables a radio station to establish contact with, and transfer information to, another station or group of stations, and complying with the relevant recommendations of the International Radio Consultative Committee (CCIR).

9.1.3.4 *Direct-printing telegraphy* means automated telegraphy techniques which comply with the relevant recommendations of the CCIR.

9.1.3.5 *General radiocommunications* means operational and public correspondence traffic, other than distress, urgency and safety messages, conducted by radio.

9.1.3.6 *Inmarsat* means the Organization established by the Convention on the International Maritime Satellite Organization adopted on 3 September 1976.

9.1.3.7 *International NAVTEX service* means the co-ordinated broadcast and automatic reception on 518 kHz of maritime safety information by means of narrow-band direct-printing telegraphy using the English language.*

9.1.3.8 *Locating* means the finding of ships, vessels, aircraft, units or persons in distress.

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457 The existing chapter 8 is replaced by this revised draft text.

* See the NAVTEX *Manual* approved by the Organization (publication IMO-951E).

9.1.3.9 *Maritime safety information* means navigational and meteorological warnings, meteorological forecasts and other urgent safety related messages broadcast to vessels.

9.1.3.10 *Polar orbiting satellite service* means a service which is based on polar orbiting satellites which receive and relay distress alerts from satellite emergency position-indicating radio beacons (satellite EPIRBs) and which provides their position.

9.1.3.11 *Radio Regulations* means the Radio Regulations annexed to, or regarded as being annexed to, the most recent International Telecommunication Convention which is in force at any time.

9.1.3.12 *Sea area A1* means an area within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available, as may be defined by a Party.*

9.1.3.13 *Sea area A2* means an area, excluding sea area A1, within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available, as may be defined by a Party.*

9.1.3.14 *Sea area A3* means an area, excluding sea areas A1 and A2, within the coverage of an Inmarsat geostationary satellite in which continuous alerting is available.

9.1.3.15 *Sea area A4* means an area outside sea areas A1, A2 and A3.

All other terms and abbreviations which are used in this chapter and which are defined in the Radio Regulations shall have the meanings as defined in those Regulations.

9.2 Exemptions

9.2.1 It is highly desirable not to deviate from the requirements of this chapter; nevertheless the competent authority may grant partial or conditional exemptions to individual vessels from the requirements of 9.5 to 9.9 provided:

.1 such vessels comply with the functional requirements of 9.3; and

.2 the competent authority has taken into account the effect such exemption may have upon the general efficiency of the service for the safety of all ships and vessels.

9.2.1 An exemption may be permitted under paragraph 9.2.1 only:

.1 if the conditions affecting safety are such as to render the full application of 9.5 to 9.9 unreasonable or unnecessary; or

.2 in exceptional circumstances, for a single voyage outside the sea area or sea areas for which the vessel is equipped.

* See resolution A.704(17), "Provision of Radio Services for the Global Maritime Distress and Safety System (GMDSS)".

9.2.3 The competent authority may exempt vessels operating always together in pair or in groups from being fully equipped in accordance with the requirements provided that:

.1 the vessel in command fully comply with the requirements of the actual Sea area:

.2 the other vessels in pair or in groups carry radio equipment sufficient for short distance distress alert and radiocommunications with the vessel in command, to the satisfaction of the competent authority. Vessels "operating in a pair or group" is defined as two or more vessels operating collaboratively within a 100 nautical miles of each other except for extremely brief periods; and

.3 this exemption does not apply to EPIRB carriage requirements.

9.3 Functional requirements

Every vessel, while at sea, should be capable:

.1 except as provided in 9.6.1.1 and 9.8.1.4.3, of transmitting ship-to-shore distress alerts by at least two separate and independent means, each using a different radiocommunication service;

.2 of receiving shore-to-ship distress alerts;

.3 of transmitting and receiving ship-to-ship distress alerts;

.4 of transmitting and receiving search and rescue co-ordinating communications;

.5 of transmitting and receiving on-scene communications;

.6 of transmitting and, as required by regulation X/3(6) of the Protocol, receiving signals for locating;

.7 of transmitting and receiving maritime safety information;

.8 of transmitting and receiving general radiocommunications to and from shore-based radio systems or networks subject to 9.13.7; and

.9 of transmitting and receiving bridge-to-bridge communications.

PART B - SHIP REQUIREMENTS

9.4 Radio installations

9.4.1 Every vessel should be provided with radio installations capable of complying with the functional requirements prescribed by 9.3 throughout its intended voyage and, unless relaxed under 9.2, complying with the requirements of 9.5 and, as appropriate for the sea area or areas through which it will pass during its intended voyage, the requirements of either 9.5, 9.6, 9.7 or 9.8.

9.4.2 Every radio installation should:

.1 be so located that no harmful interference of mechanical, electrical or other origin affects its proper use, and so as to ensure electromagnetic compatibility and avoidance of harmful interaction with other equipment and systems;

.2 be so located as to ensure the greatest possible degree of safety and operational availability,

.3 be protected against harmful effects of water, extremes of temperature and other adverse environmental conditions;

.4 be provided with reliable, permanently arranged electrical lighting, independent of the main and emergency sources of electrical power, for the adequate illumination of the radio controls for operating the radio installation; and

.5 be clearly marked with the call sign, the ship station identity and other codes as applicable for the use of the radio installation. This includes the Maritime Mobile Service Identifier (MMSI).

9.4.3 Control of the VHF radiotelephone channels, required for navigational safety, should be immediately available on the navigation bridge convenient to the conning position and, where necessary, facilities should be available to permit radiocommunications from the wings of the navigation bridge. Portable VHF equipment may be used to meet the latter provision.

9.5 Radio equipment - General

9.5.1 Every vessel should be provided with:

.1 a VHF radio installation capable of transmitting and receiving:

.1 DSC on the frequency 156.525 MHz (channel 70). It should be possible to initiate the transmission of distress alerts on channel 70 from the position from which the vessel is normally navigated; and

.2 radiotelephony[458] on the frequencies 156.300 MHz (channel 6), 156.650 MHz (channel 13) and 156.800 MHz (channel 16);

.2 a VHF DSC watch receiver which may be separate from, or combined with, that required by 9.5.1.1.1;

.3 a radar transponder capable of operating in the 9 GHz band, which:

.1 should be so stowed that it can be easily utilized; and

.2 may be one of those required by 7.12 for a survival craft;

[458] Change made by COMSAR 6.

.4 a receiver capable of receiving international NAVTEX service broadcasts if the ship is engaged on voyages in any area in which an international NAVTEX service is provided. However, if a NAVTEX service is not established in the actual area the competent authority may permit vessels to receive navigational warnings and safety messages by other means of reception, to the satisfaction of the competent authority.

.5 a radio facility for reception of maritime safety information by the Inmarsat enhanced group calling system if the vessel is engaged on voyages in any area of Inmarsat coverage but in which a NAVTEX or an alternative service is not provided. However, vessels engaged exclusively on voyages in areas where an HF direct-printing telegraphy maritime safety information service is provided and fitted with equipment capable of receiving such service, may be exempted from this requirement;

.6 a satellite emergency position-indicating radio beacon (satellite EPIRB) which should be:

.1 capable of transmitting a distress alert either through the polar orbiting satellite service operating in the 406 MHz band or, if the vessel is engaged only on voyages within Inmarsat coverage, through the Inmarsat geostationary satellite service operating in the 1.6 GHz band;

.2 installed in an easily accessible position;

.3 ready to be manually released and capable of being carried by one person into a survival craft;

.4 capable of floating free if the vessel sinks and of being automatically activated when afloat; and

.5 capable of being activated manually.

9.6 Radio equipment - Sea Area A1 or Sea Areas within the coverage of a VHF coast station (without DSC) operating on a 24 hours a day, 7 days a week basis

9.6.1 In addition to meeting the requirements of 9.5, every vessel engaged on voyages exclusively in sea area A1 should be provided with a radio installation capable of initiating the transmission of ship-to-shore distress alerts from the position from which the vessel is normally navigated, operating either:

.1 on VHF using DSC; this requirement may be fulfilled by the EPIRB prescribed by 9.6.3, [459] either by installing the EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated; or

.2 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by 9.5.1.6, either by installing the

[459] Change made by COMSAR 6.

satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated; or

.3 if the vessel is engaged on voyages within coverage of MF coast stations equipped with DSC, on MF using DSC; or

.4 on HF using DSC; or

.5 through the Inmarsat geostationary satellite service; this requirement may be fulfilled by:

.1 an Inmarsat ship earth station; or

.2 the satellite EPIRB, required by 9.5.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated.

9.6.2 The VHF radio installation, required by 9.5.1.1, should also be capable of transmitting and receiving general radiocommunications using radiotelephony.

9.6.3 Vessels engaged on voyages exclusively in sea area A1 may carry, in lieu of the satellite EPIRB required by 9.5.1.6, an EPIRB which should be:

.1 capable of transmitting a distress alert using DSC on VHF channel 70 and providing for locating by means of a radar transponder operating in the 9 GHz band;

.2 installed in an easily accessible position;

.3 ready to be manually released and capable of being carried by one person into a survival craft;

.4 capable of floating free if the vessel sinks and being automatically activated when afloat; and

.5 capable of being activated manually.

9.7 Radio equipment - Sea Areas A1 and A2 or Sea Areas within the coverage of an MF coast station (without DSC) providing a continuous watch on 2182 kHz as well as a continuously operating VHF station

9.7.1 In addition to meeting the requirements of 9.5 and 9.6, every vessel engaged on voyages beyond sea area A1, but remaining within sea area A2, should be provided with:

.1 an MF radio installation capable of transmitting and receiving, for distress and safety purposes, on the frequencies:

.1 2,187.5 kHz using DSC; and

.2 2,182 kHz using radiotelephony;

.2 a radio installation capable of maintaining a continuous DSC watch on the frequency 2,187.5 kHz which may be separate from or combined with, that required by 9.7.1.1; and

.3 means of initiating the transmission of ship-to-shore distress alerts by a radio service other than MF operating either:

.1 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by 9.5.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated; or

.2 on HF using DSC; or

.3 through the Inmarsat geostationary satellite service; this requirement may be fulfilled by an Inmarsat ship earth station, or by the satellite EPIRB, required by 9.5.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated.

9.7.2 It should be possible to initiate transmission of distress alerts by the radio installations specified in 9.7.1.1 and 9.7.1.3 from the position from which the vessel is normally navigated.

9.7.3 The vessel should, in addition, be capable of transmitting and receiving general radiocommunications using radiotelephony or direct-printing telegraphy by either:

.1 a radio installation operating on working frequencies in the bands between 1,605 kHz and 4,000 kHz or between 4,000 kHz and 27,500 kHz. This requirement may be fulfilled by the addition of this capability in the equipment required by 9.7.1.1; or

.2 an Inmarsat ship earth station.

9.7.4 If the vessel is operating exclusively within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is not available, but is providing a continuous watch on 2182 kHz, the vessel need not to be equipped with the DSC functions mentioned above in paragraph 9.5.1.1, 9.5.1.2, 9.7.1.1 to 9.7.1.3.

9.8 Radio equipment - Sea Areas A1, A2 and A3

9.8.1 In addition to meeting the requirements of 9.5, 9.6, and 9.7, every vessel engaged on voyages beyond sea areas A1 and A2, but remaining within sea area A3, should, if it does not comply with the requirements of 9.8.2, be provided with:

.1 an Inmarsat ship earth station capable of:

.1 transmitting and receiving distress and safety communications using either radiotelephony or direct-printing telegraphy;

.2 initiating and receiving distress priority calls;

.3 maintaining watch for shore-to-ship distress alerts, including those directed to specifically defined geographical areas;

.4 transmitting and receiving general radiocommunications, using either radiotelephony or direct-printing telegraphy; and

.2 an MF radio installation capable of transmitting and receiving, for distress and safety purposes, on the frequencies:

.1 2,187.5 kHz using DSC; and

.2 2,182 kHz using radiotelephony, and

.3 a radio installation capable of maintaining a continuous DSC watch on the frequency 2,187.5 kHz which may be separate from or combined with that required by 9.8.1.2.1; and

.4 means of initiating the transmission of ship-to-shore distress alerts by a radio service operating either:

.1 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by 9.5.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated; or

.2 on HF using DSC; or

.3 through the Inmarsat geostationary satellite service, by an additional ship earth station or by the satellite EPIRB required by 9.5.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated.

9.8.2 In addition to meeting the requirements of 9.5, 9.6, and 9.7, every vessel engaged on voyages beyond sea areas A1 and A2, but remaining within sea area A3, should, if it does not comply with the requirements of 9.8.1, be provided with:

.1 an MF/HF radio installation capable of transmitting and receiving, for distress and safety purposes, on all distress and safety frequencies in the bands between 1,609 kHz and 4,000 kHz and between 4,000 kHz and 27,500[460] kHz:

.1 using DSC; and

.2 using radiotelephony; [461]

[460] Change made by COMSAR 6.
[461] Change made by COMSAR 6.

.2 equipment capable of maintaining DSC watch on 2,187.5 kHz, 8,414.5 kHz and on at least one of the distress and safety DSC frequencies 4,207.5 kHz, 6,312 kHz, 12,577 kHz or 16,804.5 kHz; at any time, it should be possible to select any of these DSC distress and safety frequencies. This equipment may be separate from, or combined with, the equipment required by 9.8.2.1; and

.3 means of initiating the transmission of ship-to-shore distress alerts by a radiocommunication service other than HF operating either:

.1 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by 9.5.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated; or

.2 through the Inmarsat geostationary satellite service; this requirement may be fulfilled by an Inmarsat ship earth station or the satellite EPIRB, required by 9.5.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated.

[462]

9.8.3 It should be possible to initiate transmission of distress alerts by the radio installations specified in 9.8.1.1, 9.8.1.2, 9.8.1.4, 9.8.2.1 and 9.8.2.3 from the position from which the vessel is normally navigated.

9.9 Additional Note on Relaxation - Sea Area A3

9.9.1 Notwithstanding the provisions of 9.5, the competent authority may permit exemption of the provision of 9.5.1.1 and 9.5.1.2 in areas where such shore-based services are not available.[463]

9.10 Watches

9.10.1 Every vessel, while at sea, should maintain either a continuous watch:

.1 on VHF DSC channel 70, if the vessel, in accordance with the requirements of 9.5.1.2, is fitted with a VHF radio installation;

.2 on the distress and safety DSC frequency 2,187.5 kHz, if the vessel, in accordance with the requirements of 9.7.1.2 or 9.8.13, is fitted with an MF radio installation;

.3 on the distress and safety DSC frequencies 2,187.5 kHz and 8,414.5 kHz and also on at least one of the distress and safety DSC frequencies 4,207.5 kHz, 6,312 kHz, 12,577 kHz or 16,804.5 kHz, appropriate to the time of day and the geographical position of the vessel, if the vessel, in accordance with the requirements of 9.8.2.2,

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[462] Change made by COMSAR 6. The COMSAR 6 proposed a deletion of paragraph 9.8.2.3. The FVS ISCG thinks there is an error here and that paragraph 9.8.2.4 should be deleted instead (see document COMSAR 6/22, paragraph 12.7).

[463] Clarification that VHF with DSC should be recommended/required if the vessel is operating within the coverage of a coast station with such services.

is fitted with an MF/HF radio installation. This watch may be kept by means of a scanning receiver;

.4 for satellite shore-to-ship distress alerts, if the vessel, in accordance with the requirements of 9.8.1.1, is fitted with an Inmarsat ship earth station; or

.5 on the radiotelephone distress frequency 2,182 kHz if the vessel is operating within the radiotelephone coverage of an MF coast station in which continuous DSC alerting is not available or is not fitted with the MF DSC functions in paragraphs 9.7.1.1 and 9.7.1.2. This watch should be kept at the position from which the vessel is normally navigated.[464]

9.10.2 Every vessel, while at sea, should maintain a radio watch for broadcasts of maritime safety information on the appropriate frequency or frequencies on which such information is broadcast for the area in which the vessel is navigating.

9.10.3 Every vessel, while at sea, should maintain, when practicable, a continuous listening watch on VHF channel 16.[465]

9.11 Sources of energy

9.11.1 There should be available at all times, while the vessel is at sea, a supply of electrical energy sufficient to operate the radio installations and to charge any batteries used as part of a reserve source or sources of energy for the radio installations.

9.11.2 A reserve source or sources of energy should be provided on every vessel, to the satisfaction of the competent authority, to supply radio installations, for the purpose of conducting distress and safety radiocommunications, in the event of failure of the vessel's main and emergency source of electrical power. The reserve source of energy should be capable of simultaneously operating:

.1 the VHF radio installation in Sea Area A1;

.2 the VHF radio installation and the MF or MF/HF installation in Sea Area A2;

.3 the VHF radio installation and the MF or MF/HF installation or the Inmarsat station in Sea Area A3; and

.4 for a period of at least 3 h.

The reserve source of energy need not supply independent HF and MF radio installation at the same time.

9.11.3 The reserve source or sources of energy should be independent of the propelling power of the vessel and the vessel's electrical system.

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[464] Change made by COMSAR 6.
[465] Change made by COMSAR 6.

9.11.4 The reserve source or sources of energy may be used to supply the electrical lighting required by 9.4.2.4.

9.11.5 Where a reserve source of energy consists of a rechargeable accumulator battery or batteries:

.1 a means of automatically charging such batteries should be provided which should be capable of recharging them to minimum capacity requirements within 10 hours; and

.2 the capacity of the battery or batteries should be checked using an appropriate method, at intervals not exceeding 12 months.

9.12 Performance standards

All equipment to which this chapter applies should be of a type approved by the competent authority. Such equipment, except for the domestic radio installation and its ancillary equipment, should conform to appropriate performance standards approved by the competent authority having regard to those adopted by the Organization.

9.13 Maintenance requirements

9.13.1 Equipment should be so designed that the main units can be replaced readily, without elaborate re-calibration or readjustment.

9.13.2 Where applicable, equipment should be so constructed and installed that it is readily accessible for inspection and onboard maintenance purposes.

9.13.3 Adequate information should be provided to enable the equipment to be properly operated and maintained taking into account the recommendations of the Organization.

9.13.4 Adequate tools and spares should be provided to enable the equipment to be maintained.

9.13.5 The competent authority should ensure that radio equipment required by this chapter is maintained to provide the availability of the functional requirements specified in 9.3 and to meet the recommended performance standards of such equipment.

9.13.6 On vessels engaged on voyages in sea area A3, the availability should be ensured by using such methods as duplication of equipment, shore-based maintenance or at-sea electronic maintenance capability, or a combination of these, as may be approved by the competent authority.

9.13.7 While all reasonable steps should be taken to maintain the equipment in efficient working order to ensure compliance with all the functional requirements specified in 9.3, malfunction of the equipment for providing the general radiocommunications required by 9.3.8 should not be considered as making a vessel unseaworthy or as a reason for delaying the vessel in ports where repair facilities are not readily available, provided the vessel is capable of performing all distress and safety functions.

9.13.8 Satellite EPIRBs should be tested at intervals not exceeding 12 months for all aspects of operational efficiency with particular emphasis on frequency stability, signal strength and coding. However, in cases where it appears proper and reasonable, the Administration may extend this period to 17 months. The test may be conducted on board the vessel or at an approved testing or servicing station. [466]

9.14 Radio personnel

Every vessel should carry personnel qualified for distress and safety radiocommunications purposes to the satisfaction of the competent authority any one of whom should be designated to have primary responsibility for radiocommunications during distress incidents. The personnel should be holders of certificates specified in the Radio Regulation as appropriate. Alternatively, national certificates based on the same requirements as the Radio Regulation, but taking account of particular local circumstances, may be issued.

9.15 Radio records

A record should be kept, to the satisfaction of the competent authority and as required by the Radio Regulations, of all incidents connected with the radiocommunication service which appear to be of importance to safety of life at sea.

9.16 Position-updating

All two-way communication equipment carried on board a vessel to which this chapter applies which is capable of automatically including the vessel's position in the distress alert should be automatically provided with this information from an internal or external navigation receiver, if either is installed. If such a receiver is not installed, the vessel's position and the time at which the position was determined should be manually updated at intervals not exceeding four hours, while the vessel is underway, so that it is always ready for transmission by the equipment.[467]

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[466] Change made by COMSAR 6. COMSAR 7 was of the opinion that if the proposed draft amendments to SOLAS regulation IV/15.9 (on maintenance requirements for satellite EPIRBs) were adopted by the MSC then respective changes should also be included in the Fishing Vessel Safety Code and Voluntary Guidelines. The IMO Secretariat has informed the FVS ISCG that these proposed draft amendments to SOLAS are planned to be adopted at MSC 78. Therefore, the text of this paragraph is kept within square brackets until SLF 47.

[467] Change made by COMSAR 6.

CHAPTER 10

SHIPBORNE NAVIGATIONAL EQUIPMENT AND ARRANGEMENTS

10.1 Shipborne navigational equipment*

10.1.1 Vessels should be fitted with a standard magnetic compass, except as provided in paragraph 10.1.2. The magnetic compass should be properly adjusted and its table or curve of residual deviations should be available at all times.[274]

10.1.2 The competent authority, if it considers it unreasonable or unnecessary to require a standard magnetic compass, may exempt individual vessels or classes of vessels from these requirements if the nature of the voyage, the vessel's proximity to land or the type of vessel does not warrant a standard compass, provided that a suitable steering compass is in all cases carried.[275]

10.1.3 It should be possible to read the compass by day and by night from the steering position. Magnetic compasses should be provided with means for adjustment; securing devices for compasses and compensators should be made on non magnetic materials. Compasses should be sited as near the fore-and-aft line of the vessels as practicable, with the lubber line, as accurately as possible, parallel with the fore-and-aft line.[276]

10.1.4 In vessels equipped with an auto-pilot system actuated by a magnetic sensor, which does not indicate the vessel's heading, suitable means should be provided to show this information.[276]

10.1.5 Consideration should be given to fitting vessels with radar. In vessels where radar is fitted, the installation should be capable of operating in the 9 GHz frequency band.

10.1.6 Vessels should be provided with suitable means to the satisfaction of the competent authority for determining the depth of water under the vessel. Where fish-finding devices are fitted they could be used for that purpose.[277]

10.1.7 If practicable, every vessel should be equipped with radar reflector meeting the internationally accepted performance standards for such devices, unless the vessel is built of steel.[278]

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* See the Recommendation on the Carriage of Electronic Position-Fixing Equipment adopted by the Organization by resolution A.156(ES.IV) and the World-Wide Radionavigation System adopted by the Organization by resolution A.953(23).

274 Please refer to regulation X/3(1), paragraphs (a)(i) and (b) of the Protocol.

275 Please refer to regulation X/3(1)(d) of the Protocol.

276 Please refer to paragraph 9.2.2 of the existing Guidelines.

276 Please refer to paragraph 9.2.3 of the existing Guidelines.

277 Please refer to paragraph 9.2.4 of the existing Guidelines.

278 Please refer to paragraph 9.2.6 of the existing Guidelines.

10.1.8 All equipment fitted in compliance with this section should be to the satisfaction of the competent authority.[280]

10.2 Nautical instruments and publications

10.2.1 Suitable nautical instruments, adequate and up-to-date charts, sailing directions, lists of lights, notices to mariners, tide tables and all other nautical publications necessary for the intended voyage, to the satisfaction of the competent authority, should be carried on board.[282]

.1 An electronic chart display and information system (ECDIS) may be accepted as meeting the chart carriage requirements of this subparagraph.

.2 Back-up arrangements should be provided to meet the functional requirements of subparagraph .1, if this function is partly or fully fulfilled by electronic means.[*]

10.3 Signalling equipment

10.3.1 Attention is drawn to the need to provide the equipment to comply in every respect with the requirements of the International Regulations for Preventing Collisions at Sea 1972, as amended.[281]

10.3.2 Lights, shapes and flags should be provided to indicate that the vessel is engaged in any specific operation for which such signals are used.[282]

10.3.3 All vessels which are required to carry radio installations should carry the table of life-saving signals contained in the International Code of Signals as far as practicable.

10.4 Navigating bridge visibility

Vessels should meet the following requirements:

.1 The view of the sea surface from the conning position should extend from right ahead to 22.5° abaft the beam on either side of the vessel. Blind sectors caused by any obstruction outside the wheelhouse should be kept as small as possible.[285]

.2 From each side of the wheelhouse, the horizontal field of vision should extend over an arc of at least 225º, that is from at least 45º on the opposite bow through right ahead and then from right ahead to right astern through 180º on the same side of the vessel.[286]

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280 Please refer to regulation X/3(16) of the Protocol.

282 Please refer to paragraph 9.3 of the existing Guidelines and to regulation X/4 of the Protocol.

* An appropriate folio of paper nautical charts may be used as a back-up arrangement for ECDIS. Other back-up arrangements for ECDIS are acceptable (see appendix 6 to resolution A.817(19), as amended).

281 Please refer to paragraph 9.4.1 of the existing Guidelines.

282 Please refer to paragraph 9.4.2 of the existing Guidelines.

285 Please refer to regulation X/6(1)(e) of the Protocol.

286 Please refer to regulation X/6(1)(f) of the Protocol.

CHAPTER 11

CREW ACCOMMODATION

11.1 General

11.1.1 Before the construction of a fishing vessel, and before the crew accommodation of an existing fishing vessels is substantially altered or reconstructed, detailed plans of, and information concerning, the accommodation should be submitted to the competent authority, or an entity authorized by the competent authority, for approval.

11.1.2 Location, structure and arrangement of crew accommodation spaces and means of access thereto should be such as to ensure adequate security, protection against weather and sea and insulate from heat and cold, condensation, undue noise, vibration or effluvia from other spaces. In particular, the insulation material to be applied to bulkheads and deckheads of machinery spaces adjacent to crew accommodation should be of a type approved by the competent authority. Sleeping rooms should be placed aft the collision bulkhead and, to the extent possible, not below the working deck.

11.1.3 Where practical, noise measurements may be taken by the competent authority on completion of construction of a new vessel. Similar measurements may also be taken following a refit or major alterations to an existing vessel if it is considered that noise levels might have been influenced.*

11.1.4 Bulkheads and decks between accommodation spaces and fish-holds, machinery spaces, fuel tanks, galleys, engine, deck and other store rooms, drying rooms, communal wash-places or water closets should be so constructed as to prevent the infiltration of fumes and odours. Direct openings into sleeping rooms from such places should be avoided whenever reasonable or practicable.

11.1.5 Where passageways are provided in crew accommodation these should be as wide as possible, but the clear width should not be less than 700 mm. Where doors open outwards into a passageway, there should be sufficient space to pass the door when it is open at a right angle to the passageway.

11.1.6 Accommodation spaces should be adequately insulated to prevent loss of heat, condensation or overheating.

11.1.7 In the choice of materials used for construction of accommodation spaces, account should be taken of properties potentially harmful to the health of personnel or likely to harbour vermin and mould. Surfaces, including decks, of accommodation and furnishings should be of a kind easily kept clean and hygienic, as well impervious to damp. Bulkhead and deckhead surfaces, if painted, should be light in colour and the paint specification should be to the approval of the competent authority. Other surface coverings, such as lime wash, should not be used.

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* Where practical, taking into account the size and type of the vessel, resolution A.468(XII) may be used as a point of reference.

11.1.8 Where appropriate, access to ordinary exits and emergency exits should be marked with direction indicators. Exits should be marked in a conspicuous manner above or beside the door.

11.1.9 Where the deck covering is of composition material, the connection to the side of the vessel, bulkheads and partitions should be rounded to avoid crevices.

11.1.10 All practical measures should be taken to protect crew accommodation and furnishings against the admission of insects and other pests.

11.1.11 Overhead exposed decks over crew accommodation should be sheathed with wood or equivalent insulation.

11.1.12 The electrical switchboard should be so arranged that when the shore power connection is made, power would be available for crew accommodation lighting, ventilation systems and, where applicable, heating and cooking facilities.

11.2 Lighting, heating and ventilation

11.2.1 All crew accommodation spaces should be adequately lighted, as far as possible, by natural lighting. Such spaces should also be equipped with adequate artificial light. Artificial light should be in accordance with accepted standards of visual comfort in living spaces. The minimum standards for natural lighting in crew accommodation should be such as to permit a person with normal vision to read an ordinary newspaper on a clear day.

11.2.2 If there are no two independent sources of electricity for lighting, additional lighting should be provided by properly constructed lamps or lighting apparatus for emergency use.

11.2.3 Methods of lighting should not endanger the health or safety of the crew or the safety of the vessel.

11.2.4 Adequate heating facilities in crew accommodation spaces should be provided as required by climatic conditions. Heating facilities should be capable of maintaining a satisfactory air temperature in crew accommodation under normal conditions of service of a fishing vessel. The accommodation should be capable of being heated sufficiently to maintain a minimum temperature of +22°C in all day rooms at an outside temperature of -15°C.

11.2.5 Facilities for heating should be designed so as not to endanger health or safety of the crew or safety of the vessel.

11.2.6 Heating by means of open fires should be prohibited.

11.2.7 Accommodation spaces should be adequately ventilated at all times when the crew is expected to remain on board. Ventilation systems should be capable of control so as to maintain the air in a satisfactory condition and to ensure a sufficiency of air movement in all conditions of weather and climate. The ventilation of galleys and sanitary spaces should be to the open air and, unless fitted with a mechanical ventilation system, be independent from that for other crew accommodation.

11.2.8 Accommodation spaces of vessels regularly engaged on voyages in the tropics and under similar conditions, except in deckhouses with satisfactory natural ventilation, should be equipped with mechanical ventilation and, if necessary, with additional electric fans or air conditioning, in particular, mess rooms and sleeping quarters.

11.2.9 Drying rooms or lockers for working clothes and oilskin lockers should have adequate ventilation that is separate from other spaces. The exhaust from such spaces should be well clear of the air intakes of the ventilation systems for other spaces.

11.3 Sleeping rooms

11.3.1 Sleeping rooms should be so planned and equipped as to ensure reasonable comfort for the occupants and to facilitate tidiness. The clear headroom should, whenever possible, be not less than 2.0 m. There should be no access to the accommodation from the fish room.

11.3.2 Wherever reasonable and practical, the floor area of sleeping rooms per person accommodated therein, excluding space occupied by berths and lockers, should not be less than 0.75 m^2.

11.3.3 Each member of the crew should be provided with an individual berth, the inside dimensions of which should, wherever practicable, be 1.9 m by 680 mm.

11.3.4 Berths should, wherever possible, not be placed side by side in such a way that access to one berth can he obtained only over another. Berths should not normally be arranged in tiers of more than two. The lower berth in a double tier should be not less than 300 mm above the deck; the upper berth should he paced approximately midway between the bottom of the lower berth and the lower side of the deck head beams.

11.3.5 Where the upper berth in a tier overlaps a lower berth, the underside of the upper berth should be fitted with a dust proof bottom of wood, canvas or other material.

11.3.6 If tubular frames are used for the construction of berths, they should be completely sealed and without perforations that would give access to vermin.

11.3.7 Suitable bedding should be provided for the crew. Mattresses should not be of a type that is liable to develop toxic fumes in cases of fire nor of a type that will attract pests or insects. Mattresses should be provided with a cover of fire retardant material.

11.3.8 Whenever reasonable and practicable, having regard to the size, type or intended service of the vessel, the furnishings of sleeping rooms should include both a fitted cupboard preferably with an integral lock and a drawer for each occupant. A table or desk, adequate seating, a mirror, cabinet for toilet requisites, a book rack and coat hooks should also be provided. Where fitted, tables or desks of the pull-out type should be to the approval by the competent authority.

11.3.9 The maximum number of persons to be accommodated in any sleeping room should be clearly and indelibly marked in the room where it can be conveniently seen.

11.4 Mess rooms

11.4.1 Wherever reasonable and practicable, mess room accommodation separate from sleeping quarters should be provided.

11.4.2 The mess room should be as close as practicable to the galley.

11.4.3 The dimensions and equipment of each mess room should be sufficient for the number of persons likely to use it at any one time.

11.4.4 The furnishings of mess rooms should include tables and approved seats sufficient for the number of persons likely to use them at any one time. The tops of tables and seats should be free of sharp edges and should be of damp resisting material without cracks and easily kept clean.

11.4.5 Where pantries are not accessible from mess rooms, adequate lockers for mess utensils and proper facilities for washing should be provided.

11.4.6 Mess rooms should be planned, furnished and equipped to provide appropriate facilities for recreation.

11.5 Sanitary facilities

11.5.1 Sufficient sanitary facilities, including wash-basins, shower-baths and water-closets, should be provided to the satisfaction of the competent authority, having due regard to the intended service of the vessel. Wherever, practicable, such facilities should be provided as follows:

.1 one shower-bath for every eight persons or less;

.2 one water-closet or suitable alternative for every eight person or less;

.3 one wash-basin for every six persons or less; and

.4 cold fresh water and hot fresh water or means of heating fresh water should be available in all wash spaces.

11.5.2 Soil and waste discharge pipes should not pass through fresh water or drinking water tanks or, where practicable, provision stores. Neither should they, where practicable, pass overhead in mess rooms or sleeping accommodation. Such pipes should be fitted with anti-syphon closures.

11.5.3 In general, water-closets should be situated convenient to, but separate from, sleeping rooms, mess rooms and wash-rooms.

11.5.4 The deck area of wash places should have a covering of durable material, easily cleaned, impervious to damp and properly drained. The deck covering should be carried up the sides of the compartment to a height of not less than 0.20 m and be adequately sealed at all joints to prevent the ingress of water and damp.

11.5.5 The bulkheads should be of steel or other approved material and should be watertight to a height of at least 0.25 m above the deck to allow for effective sealing of the deck covering where it meets the bulkheads.

11.5.6 Facilities for washing and drying clothes should be provided on a scale appropriate to the number of the crew and the duration of intended voyages.

11.5.7 In general, international standards concerning shipboard sanitary facilities contained in the WHO Guide to Ship Sanitation, 1967 as amended[468] may serve as guidance.

11.6 Potable water facilities

Filling, storage and distribution arrangements for potable water should be designed to preclude any possibility of water contamination or overheating. Tanks should be designed to allow internal cleaning.

11.7 Provision stores

Having regard to the intended service of the vessel, store rooms of adequate capacity should be provided which can be kept cool, dry and well ventilated in order to avoid deterioration of the stores. Where possible, refrigerators or other low-temperature storage should be provided, to the satisfaction of the competent authority. Where refrigerating or freezing rooms are fitted, the access doors should be capable of being opened from either side. An alarm system should be arranged from the refrigerating and freezing room to the galley or other appropriate location if such rooms are large enough for personnel to enter them.

11.8 Cooking facilities

11.8.1 Having regard to the intended service of the vessel, satisfactory cooking appliances and equipment should be provided and should, wherever practicable, be fitted in a separate galley.

11.8.2 Galleys should be of adequate dimensions for the purpose and have sufficient storage space and satisfactory drainage.

11.8.3 The galley should be provided with cooking utensils, the necessary number of cupboards, shelves, sinks and dish racks of rustproof material and with satisfactory drainage. Drinking water should be supplied to the galley by means of pipes. Where it is supplied under pressure, the system should be protected against backflow. Where hot water is not supplied to the galley, a water heater should be fitted.

11.8.4 The galley should be fitted with suitable facilities for the preparation of hot drinks for the crew at all times.

11.8.5 Cooking appliances should be fitted with fail-safe devices in the event of failure of the power source or fuel. Supplies of fuel in the form of gas or oil should not be stored in the galley.

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[468] Although modifications were made after 1967, WHO plans a more thorough undertaking.

ANNEX I

ILLUSTRATION OF TERMS USED IN THE DEFINITIONS

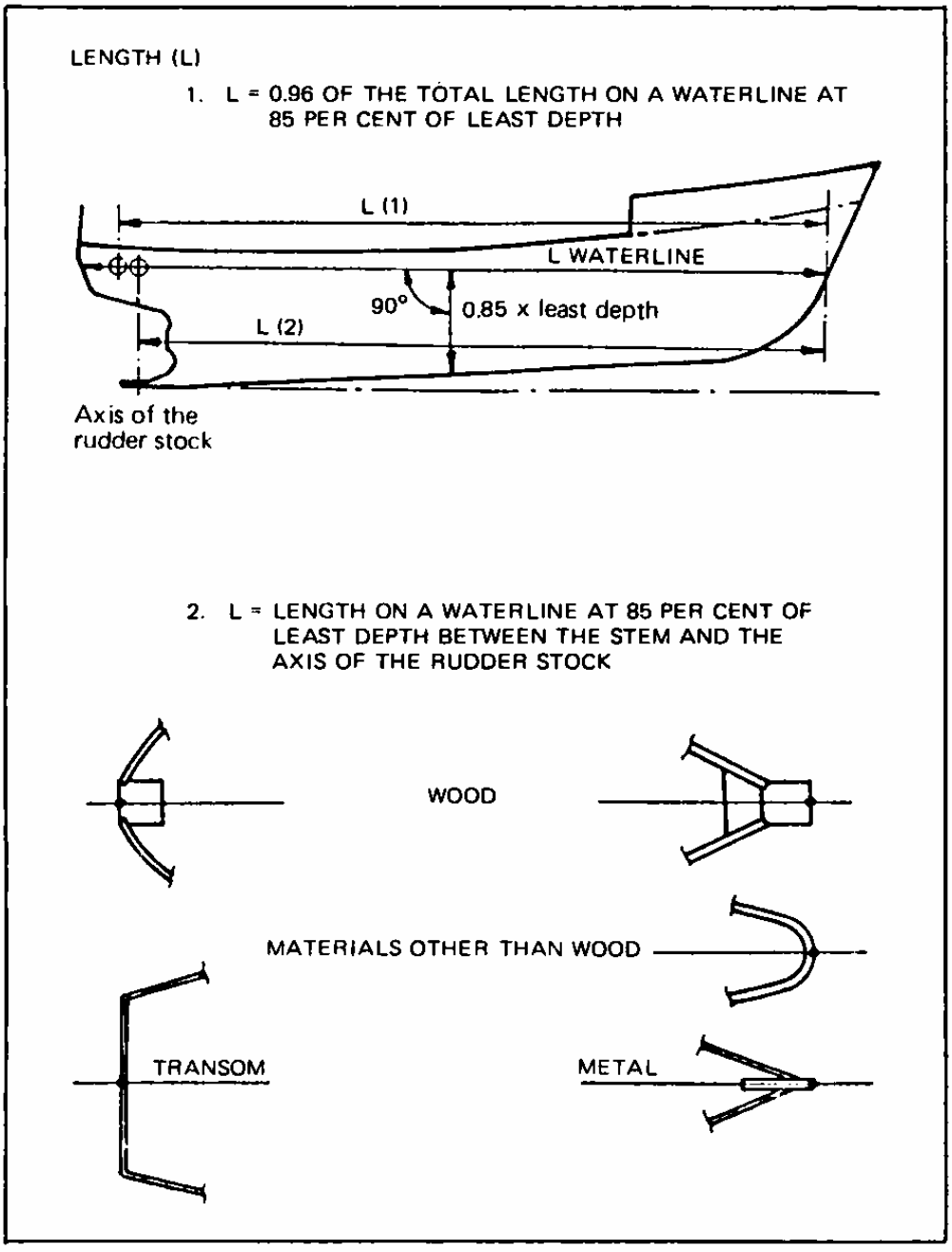


Figure 1

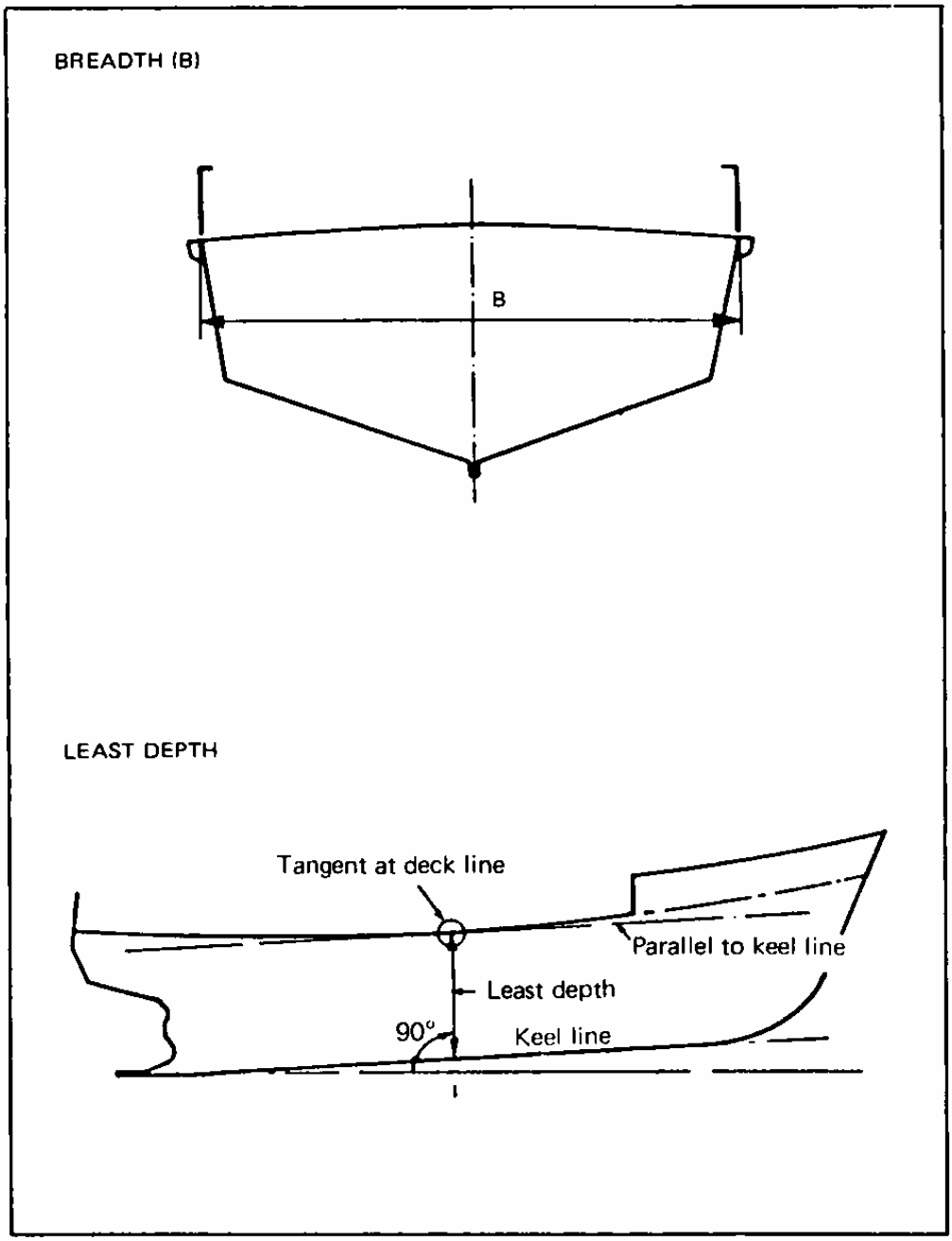

BREADTH (B)
B
LEAST DEPTH
Tangent at deck line
Parallel to keel line
Least depth
90°
Keel line

Figure 2

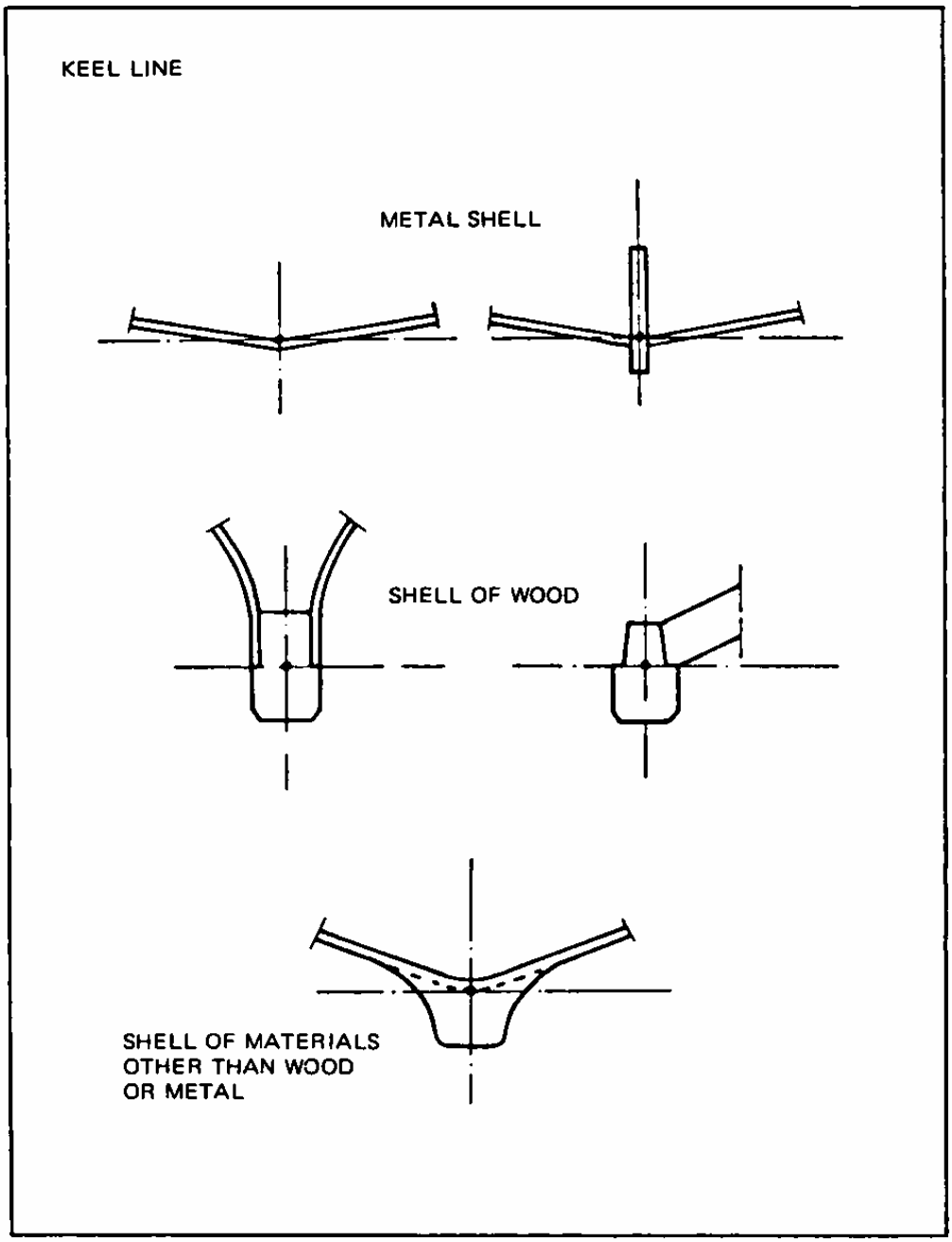

KEEL LINE
METAL SHELL
SHELL OF WOOD
SHELL OF MATERIALS
OTHER THAN WOOD
OR METAL

Figure 3

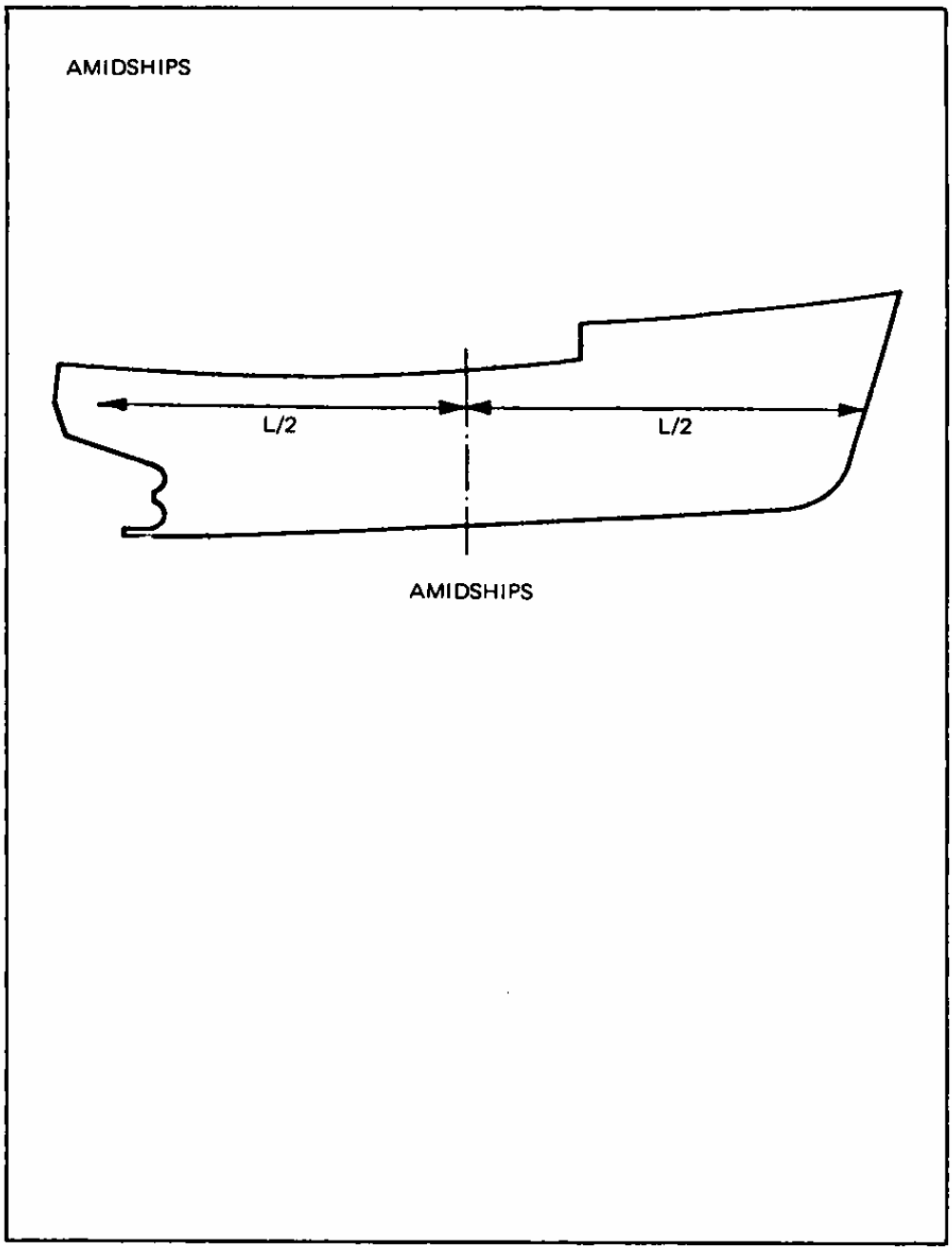


Figure 4

ANNEX II

RECOMMENDED PRACTICE FOR ANCHOR AND MOORING EQUIPMENT

1 The characteristics of anchors, chain, wires, towlines and mooring lines should be determined in accordance with the attached table, based on an equipment number "EN" as follows.

$$EN = \Delta^{\frac{2}{3}} + 2B(\mathrm{a} + \sum h_j) + 0.1A$$

where:

Δ moulded displacement, in tonnes to the maximum design waterline;

B breadth in m, as defined in 1.2.1.9;

a distance in m from the maximum design waterline to the upper edge of the uppermost complete deck at side amidships;

h_j height in m on the centreline of each tier of deckhouses having a breadth greater than B/4. For the lowest tier h_j is to be measures at centreline from the upper deck or from a notional deck line where there is a local discontinuity in the upper deck. When calculating h_j sheer and trim are to be ignored;

A area in m^2 in profile view of the hull, within L as defined in 1.2.1.7 and of superstructures and deckhouses above the maximum design water-line having a width greater than B/4. Screens and bulwarks more than 1.5 m in height are to be regarded as parts of deckhouses when determining h_j and A.

Anchors and chains

2 Vessels should be fitted with at least two anchors which should be located at the bow. However, vessels of less than 17 m in length may be fitted with only one anchor, provided that the weight of the anchor is at least twice the weight of an anchor as specified in the table to this annex.

3 The weight of each anchor should be in accordance with the table given in this annex.

4 "High holding power anchors" of a design approved by the competent authority may be used as bower anchors. The weight of each such anchor may be 75% of the table weight given in this annex.

5 The competent authority may require increased anchor equipment for vessels fishing in very rough waters and/or may permit reduction in the equipment for vessels operating in sheltered waters.

6 Anchors with a weight of and above 150 kg should be fitted in hawse pipes, skids or a similar arrangement that is suitable for the quick and safe operation in dropping and hoisting the anchors. If the weight of each of the anchors is below 300 kg, but greater than 150 kg, it may be accepted that only one of the anchors need be fitted in a hawse pipe or skid. Anchors should also be secured in the stowed position by means of a locking or lashing device.

7 In general, anchors should be fitted with anchor chains. The length and dimension of each anchor chain should be in accordance with the table given in this annex.

8 For vessels of 17 m in length and over, the chain of one anchor may be replaced with anchor wire of equal strength, provided a chain meeting the requirements given in the table to this annex is maintained for the second one.

9 For vessels less than 17 m in length, the chain of both anchors may be replaced with anchor wire of equal strength to the chain.

10 Where anchor wires are used as a substitute for anchor chains, their length should be equal to 1.5 times the corresponding tabular length of chain. In addition, a chain of not less than 12.5 m in length and of the same specifications as set out in the table to this annex should be provided between anchor and anchor wire.

11 Where the competent authority has authorized the use of trawl warp as anchor wire, it should be satisfied that the arrangement does not reduce the efficiency required for the quick and safe operation in dropping and hoisting the anchors and for holding the vessel at anchor in all foreseeable service conditions. The requirements for a trawl warp should not be less than that required for anchor wire.

Anchor handling

12 Fishing vessels provided with anchors of or above 150 kg should be fitted with a windlass. The windlass should be fitted with a messenger wheel and/or drum for each anchor and means for the release of each messenger wheel or drum.

13 It should not be possible to carry the chains forward to the hawse pipe, skid or similar arrangement without the chain passing over the messenger wheels. When anchor wire is used, it should pass over a roller adjacent to the hawse pipe to avoid chafing.

14 The windlass, its support and its brakes should be capable of absorbing a static tension of at least 45% of the breaking strength of the anchor chain or anchor wire without the occurrence of any lasting deformations and without the brake losing its hold. Furthermore, a chain stopper or wire nipper should be fitted between the windlass and the hawse pipe or similar for each anchor chain or anchor wire capable of holding the vessel while at anchor. If chain stoppers or wire nippers are not fitted, the windlass, its support and its brake should be capable of absorbing a static tension of at least 80% of the breaking strength of the anchor chain or anchor wire. The chain stopper or wire nipper and their supports should be capable of absorbing a static tension of at least 80% of the breaking strength of the anchor chain/wire without the occurrence of any lasting deformations and without the chain stopper or wire nipper losing its hold.

15 If the trawl winch is fitted with messenger wheels, etc. and meets the requirements set out in paragraphs 12, 13 and 14, such a winch may be used as a windlass.

16 Fishing vessels which have been authorized to use trawl warp as anchor wire may use their trawl winch as a windlass, provided the trawl warp can be wound on a drum with a braking device that is independent of the actual trawl warps in use for fishing. Lead blocks and guide rollers should be suitably fitted and arranged to prevent the warps from chafing at the deckhouses, superstructures, deck plating and equipment on deck.

17 If a vessel has lost its anchors and it is not immediately possible to re-acquire them, the competent authority, after having assessed the conditions applying to the vessel, as given in paragraph 5, may permit otter boards/trawl doors with a least the same weight for anchors given in the table to this annex to be used for a limited period of time.

Towing lines

18 Vessels of 17 m of length and over should be provided with at least one tow line with a length and breaking strength in accordance with the table given in this annex. It should be appropriately located so that it is possible to make it ready for use at sea. The tow line may be replaced by one of the fishing vessel's trawl warps if this has at least a similar length and breaking strength. If warp is used, a length of rope of at least 12.5 m, with a minimum breaking strength as given in the table for the tow line, should also be provided and attached to the warp.

Mooring equipment

19 Vessels should be provided with suitable cleats and bollards as well as hawseholes in order to moor the vessel securely. The number of bollards, etc. should be determined in each individual case, dependent on the size and deck arrangement of the vessel. At least one bollard should be fitted forward and at least two abaft of amidships. Cleats and bollards should be of such a size that it is possible to accommodate at least four turns of the mooring lines or tow line below the horns of the cleat or the upper protruding edge of the bollard. The area where cleats and bollards are to be fastened should be securely reinforced.

20 The vessel should be provided with at least three mooring lines, each of a length and breaking strength in accordance with the table given in this annex.

TABLE

Equipment number		Stockless bower anchors		Stud link chain cables for bower anchors			Towline		Mooring lines	
Exceeding	Not exceeding	Number	Weight per anchor (kg)	Total length (m)	Diameter (mm)		Minimum length of each line (m)	Minimum breaking strength (kN)	Minimum length of each line (m)	Minimum breaking strength (kN)
					Mild steel	Special quality steel				
up to	30	2	70	137.5	11	-	-	-	40	25
30	40	2	80	165	11	-	-	-	50	30
40	50	2	100	192.5	11	-	-	-	60	30
50	60	2	120	192.5	12.5	-	180	98	60	34
60	70	2	140	192.5	12.5	-	180	98	80	34
70	80	2	160	220	14	12.5	180	98	100	37
80	90	2	180	220	14	12.5	180	98	100	37
90	100	2	210	220	16	14	180	98	110	39
100	110	2	240	220	16	14	180	98	110	39
110	120	2	270	247.5	17.5	16	180	98	110	44
120	130	2	300	247.5	17.5	16	180	98	110	44
130	140	2	340	275	19	17.5	180	98	120	49
140	150	2	390	275	19	17.5	180	98	120	49
150	175	2	480	275	22	19	180	98	120	54
175	205	2	570	302.5	24	20.5	180	112	120	59
205	240	2	660	302.5	26	22	180	129	120	64
240	280	2	780	330	28	24	180	150	120	69
280	320	2	900	357.5	30	26	180	174	140	74

ANNEX III

RECOMMENDED PRACTICE FOR AMMONIA REFRIGERATION SYSTEMS IN MANNED SPACES

1 All electrical equipment on or adjacent to the ammonia machinery flat should be explosion proof or of an intrinsically safe type to the satisfaction of the competent authority.

2 Flame producing devices and hot surfaces above 427ºC in the machinery space should be located as remotely as practicable from the ammonia machinery flat.

3 Ammonia equipment should be surrounded by an efficient water curtain and, in addition, water sprays should be directed at all potential leak sources, e.g. pipe connections and flanges, compressors, etc. The water curtain and sprays should be provided with an adequate supply of water which should be maintained under constant pressure.

4 A large capacity ventilation system including mechanical exhaust should be provided for the ammonia machinery flat. The system should not exhaust to another space and should be well clear of ventilator intakes to other spaces. The mechanical exhaust ventilation fan motor should be either fitted exterior to the ammonia flat or should be of an intrinsically safe type to the satisfaction of the competent authority.

5 Coamings should be provided around the ammonia machinery flat.

6 Personal safety equipment, including suitable gas masks and protective clothing, should be provided inside and outside the machinery space.

7 Remote controls located in the wheelhouse or another suitable place should be provided for the following services:

.1 the water curtain and spray systems;

.2 the ammonia machinery flat ventilation system; and

.3 the main engine.

8 Means are to be provided for stopping the ammonia compressor prime movers from the wheelhouse or another suitable place.

9 Means of escape direct to deck from the ammonia machinery flat should be provided in addition to any other escape which may be required by the competent authority.

10 Drainage should be provided from machinery spaces and/or flats leading to a place where water which could be contaminated with refrigerant presents no danger to the vessel or to persons on board.

11 Information concerning hazards, precautions and first aid should be clearly displayed at the access to the ammonia machinery space.

Piping systems

12 Joints in steel piping systems should be butt welded wherever practical to reduce the possibility of leaks. Flanged joints should be limited to connections with compressors, vessels, valves, branches for future extensions or where required for maintenance. The number of joints, whether flanged or welded, should be kept to a minimum.

13 If for operational reasons flexible hoses are required, the competent authority should be satisfied that that they are suitable for ammonia service. They should be adequately protected against mechanical damage, torsion and stress.

14 To the extent possible, flexible bellows should be avoided. Where flexible bellows are proposed, the competent authority should be satisfied that they are only used within the recommendations of the manufacturer and adequate precautions are taken to avoid excessive vibration, mechanical damage, torsion and stress.

15 All refrigerant piping should be adequately supported and the supports or hangers should be designed to carry the weight of the pipe including contents and, where required, insulation.

16 There should be sufficient clearance around pipelines to allow for any necessary attention to flanges, screwed joints and fittings.

17 Ammonia piping should not be located in lift wells, accommodation spaces, in stairways or at entrances/exits. Pipework should also be arranged so as not to obstruct access ways and inhibit access to the machinery.

18 Special attention should be paid to the clearance around pipes passing through fire resistant bulkheads and deckheads, which should be adequately sealed to maintain the integrity of the bulkhead or deckhead. Pipe ducts and shafts should be isolated from other spaces to resist the spread of fire.

Decommissioning

19 When a refrigeration system is to be decommissioned or taken out of service and dismantled, the procedure should ensure that:

.1 hazards to the personnel carrying out the process are minimized;

.2 refrigerant and oil are correctly removed for reclamation or disposal; and

.3 the system as left does not present any future hazard to personnel or to the environment due to residual content.

ANNEX IV

RECOMMENDED PRACTICE ON PORTABLE FISH-HOLD DIVISIONS*

1 Recognizing the desirability of ensuring the adequate strength of scantlings of portable fish-hold divisions, studies on national practices have been carried out, resulting in the establishment of certain formulae for scantlings, which are recommended to Administrations for their guidance.

2 These formulae represent the average of a wide range of experience covering all types of vessels operating in all sea areas, and in conditions likely to impose the maximum loading on a division. Alternative scantlings might, however, be accepted where experience has shown that these are more appropriate.

3 According to the basic type of construction, the following formulae are recommended for vertical fish-hold divisions:

.1 ***Vertical steel uprights and horizontal wooden boards***

Minimum section modulus of vertical steel uprights

$$Z = 4 \rho \, sbh^2 \qquad (1)$$

Minimum thickness of horizontal wooden boards

$$t = \sqrt{8 \rho \, sb^2} \qquad (2)$$

.2 ***Horizontal steel beams and vertical wooden boards***

Minimum section modulus of horizontal steel beams

$$Z = 4 \rho \, sHS^2 \qquad (3)$$

Minimum thickness of vertical wooden boards

$$t = \sqrt{3.6 \rho \, sh^2} \qquad (4)$$

where:

Z = section modulus, ... cm^3.
t = thickness of wooden board, ... cm.
ρ = density of cargo, ... t/m^3.
s = maximum transverse distance between any two adjacent longitudinal divisions or line of supports, ... m.
h = maximum vertical span of a column taken to be the hold depth, ... m.
b = maximum longitudinal distance between any two adjacent transverse divisions or line of supports, ... m.
H = vertical span of a division which is supported by a horizontal beam, ... m.
S = horizontal distance between adjacent points of support of a horizontal beam, ... m.

* Appendix V of the annex of Assembly resolution A.168(ES.IV) incorporating subparagraphs 4(g) and 4(h) adopted by the eighth Assembly.

4 In applying the above formulae, the following notes should be observed:

.1 The formulae are applicable to longitudinal divisions. Where the divisions are athwartships the formulae should be modified by interchanging s and b.

.2 The formulae were derived on the assumption that the loads were on one side only of the divisions. When it is known that the divisions will always be loaded on both sides, reduced scantlings may be accepted.

.3 If vertical steel uprights are permanent and well connected at both ends with the structure of the ship, reduced scantlings may be accepted depending upon the degree of security provided by the end connections.

.4 In the formula for vertical wooden boards the full depth of the hold is assumed as the unsupported span, where the span is less the thickness may be calculated using the reduced span.

.5 The timber used should be of sound durable quality, of a type and grade which has proved satisfactory for fish-hold divisions and the actual finished thicknesses of boards should be those derived from the formulae. The thickness of boards made from good quality hardwood may be reduced by 12.5 per cent.

.6 Divisions made of other materials should have strength and stiffness equivalent to those associated with the scantlings recommended for wood and steel having regard to the comparative mechanical properties of the materials.

.7 Channelways in stanchions to take pound boards should have a depth of not less than 4 cm and the width should be equal to the pound board thickness plus 0.5 cm.

.8 Each pound board should have a length not less than the distance between the bottom of the respective channelways into which it will engage minus 1 cm.

If pound boards have shaped ends to allow a rotational manoeuvre for easy housing, the extent of end shaping should not be more than allowed by a radius equal to one half the length of the board with its centre at the mid length and depth of the board.

5 Figures 1 and 2 illustrate the application of the formulae.

HORIZONTAL WOOD BOARDS – STEEL UPRIGHTS

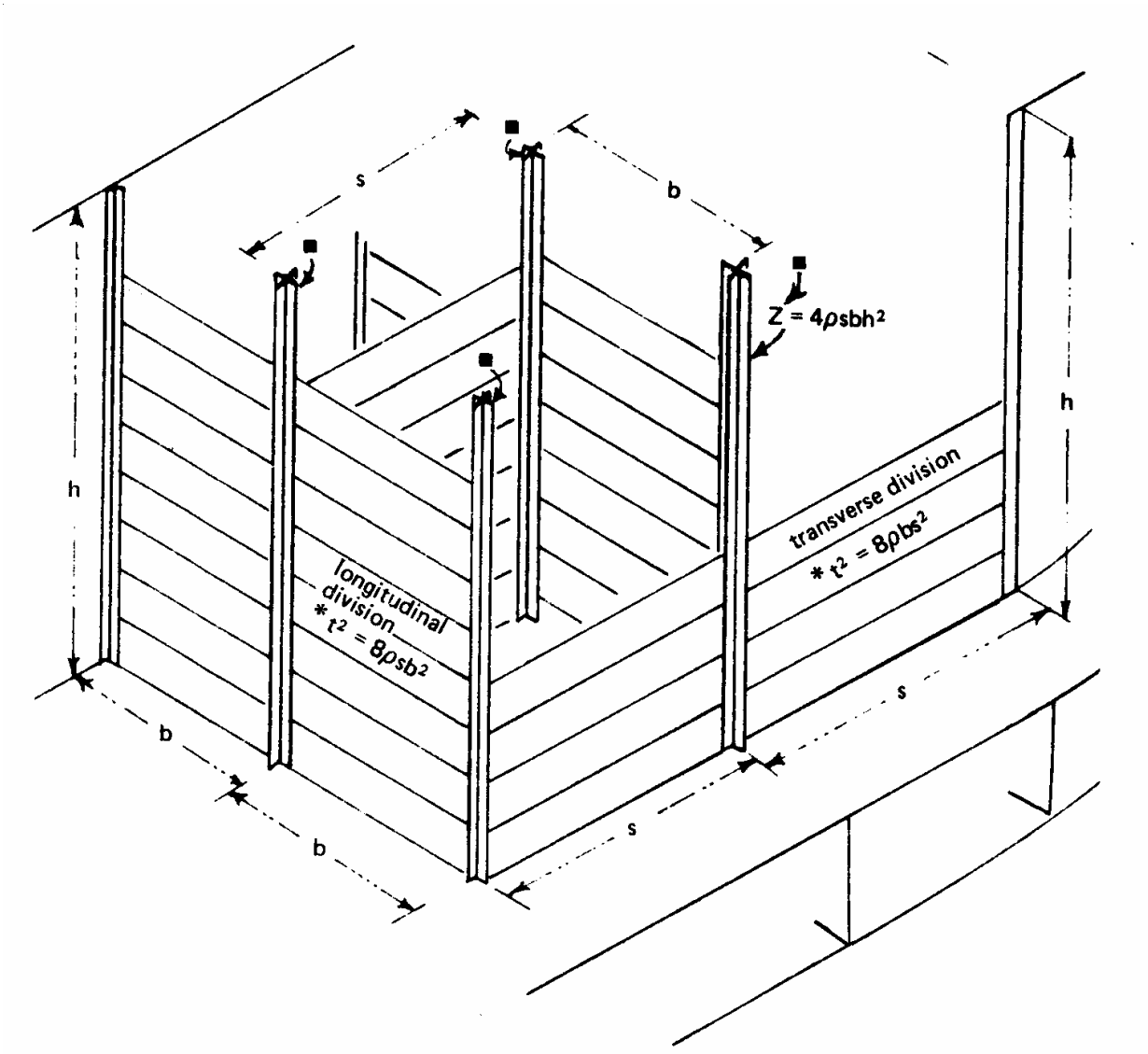


Figure 1

*** Note:** When the longitudinal and transverse divisional boards are interchangeable b will equal s and the thickness by either formula will be the same. If the boards are required to be of equal thickness but varying span the greater thickness should be used for all the boards when the section modulus is kept constant for all the uprights.

VERTICAL WOOD BOARDS – STEEL BEAMS

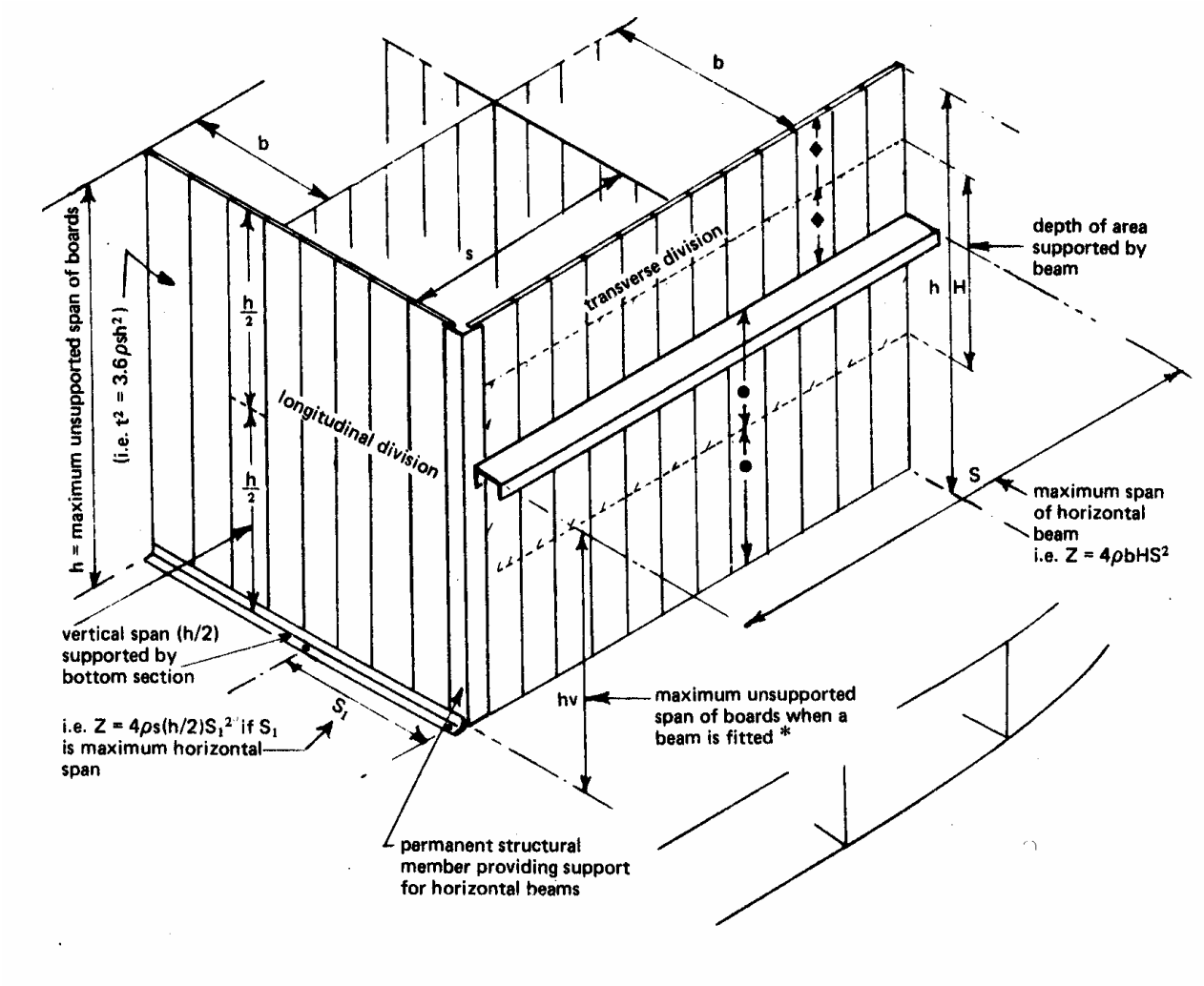


Figure 2

*** Note:** If no beam was fitted the thickness of the vertical wood planks would be given by $t^2 = 3.6\,\rho\,bh^2$. The beam reduces the maximum span to hv and the thickness is now given by $t_1^2 = 3.6\,\rho\,bhv^2$ or $t_1 = t\left(\frac{hv}{h}\right)$.

ANNEX V

RECOMMENDATION FOR TESTING LIFEJACKETS*

PART 1 - PROTOTYPE TEST FOR LIFE-SAVING APPLIANCES

1 TESTING

1.1 Temperature test

The lifebuoys should be alternately subjected to surrounding temperatures of -30°C and +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of 10 cycles, is acceptable:

.1 an 8 h cycle at +65°C to be completed in one day;

.2 the specimens removed from the warm chamber that same day and left exposed under ordinary room conditions until the next day;

.3 an 8 h cycle at -30°C to be completed the next day; and

.4 the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions until the next day.

1.2 Test for oil resistance

One of the lifebuoys should be immersed horizontally for a period of 24 h under a 100 mm head of diesel oil at normal room temperature. After this test the lifebuoy should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.

1.3 Fire test

The other lifebuoy should be subjected to a fire test. A test pan 30 cm x 35 cm x 6 cm should be placed in an essentially draught-free area. Water should be put in the bottom of the test pan to a depth of 1 cm followed by enough petrol to make a minimum total depth of 4 cm. The petrol should then be ignited and allowed to burn freely for 30 s. The lifebuoy should then be moved through flames in an upright, forward, free-hanging position, with the bottom of the lifebuoy 25 cm above the top edge of the test pan so that the duration of exposure to the flames is 2 s. The lifebuoys should not sustain burning or continue melting after being removed from the flames.

* An extract from resolution MSC.81(70). Refer also to MSC/Circ.980 on Standardized life-saving appliance evaluation and test report forms.

2 LIFEJACKETS

2.1 Temperature cycling test

A lifejacket should be subjected to the temperature cycling as prescribed in 1.1 and should then be externally examined. If the buoyancy material has not been subjected to the tests prescribed in 2.7, the lifejacket should also be examined internally. The lifejacket materials should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.

2.2 Buoyancy test

The buoyancy of the lifejacket should be measured before and after 24 h complete submersion to just below the surface in fresh water. The difference between the initial buoyancy and the final buoyancy should not exceed 5% of the initial buoyancy.

2.3 Fire test

A lifejacket should be subjected to the fire test prescribed in 1.3. The lifejacket should not sustain burning or continue melting after being removed from the flames.

2.4 Test for oil resistance

2.4.1 The lifejacket should be tested for oil resistance as prescribed in 1.2.

2.4.2 If the buoyancy material has not been subjected to the tests prescribed in 2.7, the lifejacket should also be examined internally and the effect determined. The material must show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.

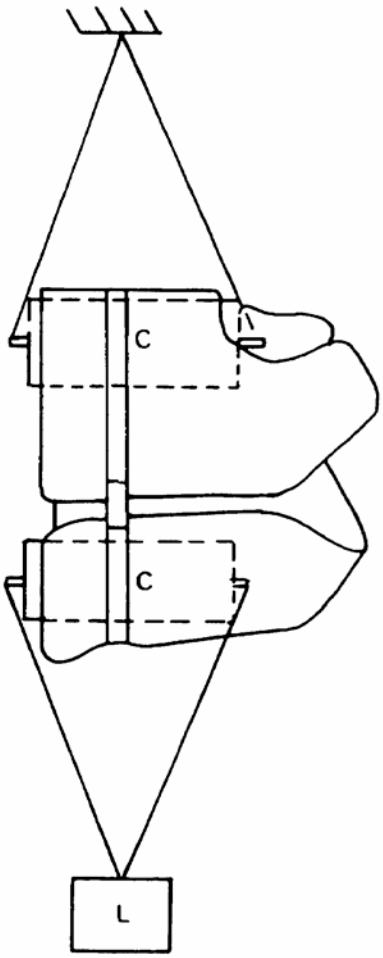
2.5 Tests of materials for cover, tapes and seams

The materials used for the cover, tapes, seams and additional equipment should be tested to the satisfaction of the competent authority to establish that they are rot-proof, colour-fast and resistant to deterioration from exposure to sunlight and that they are not unduly affected by sea water, oil or fungal attack.

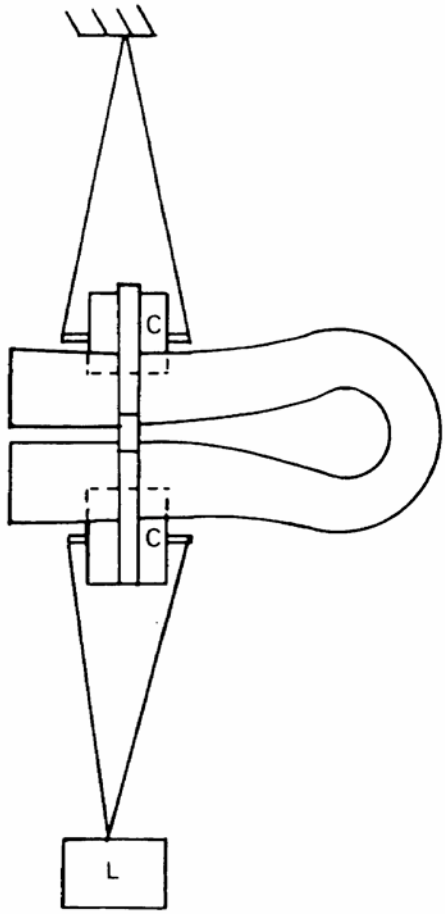
2.6 Strength tests

Body or lifting loop strength tests

2.6.1 The lifejacket should be immersed in water for a period of 2 min. It should then be removed from the water and closed in the same manner as when it is worn by a person. A force of not less than 3,200 N (2,400 N in the case of a child-size lifejacket) should be applied for 30 min to the part of the lifejacket that secures it to the body of the wearer (see figure 1) or to the lifting loop of the lifejacket. The lifejacket should not be damaged as a result of this test.



Vest-type lifejacket



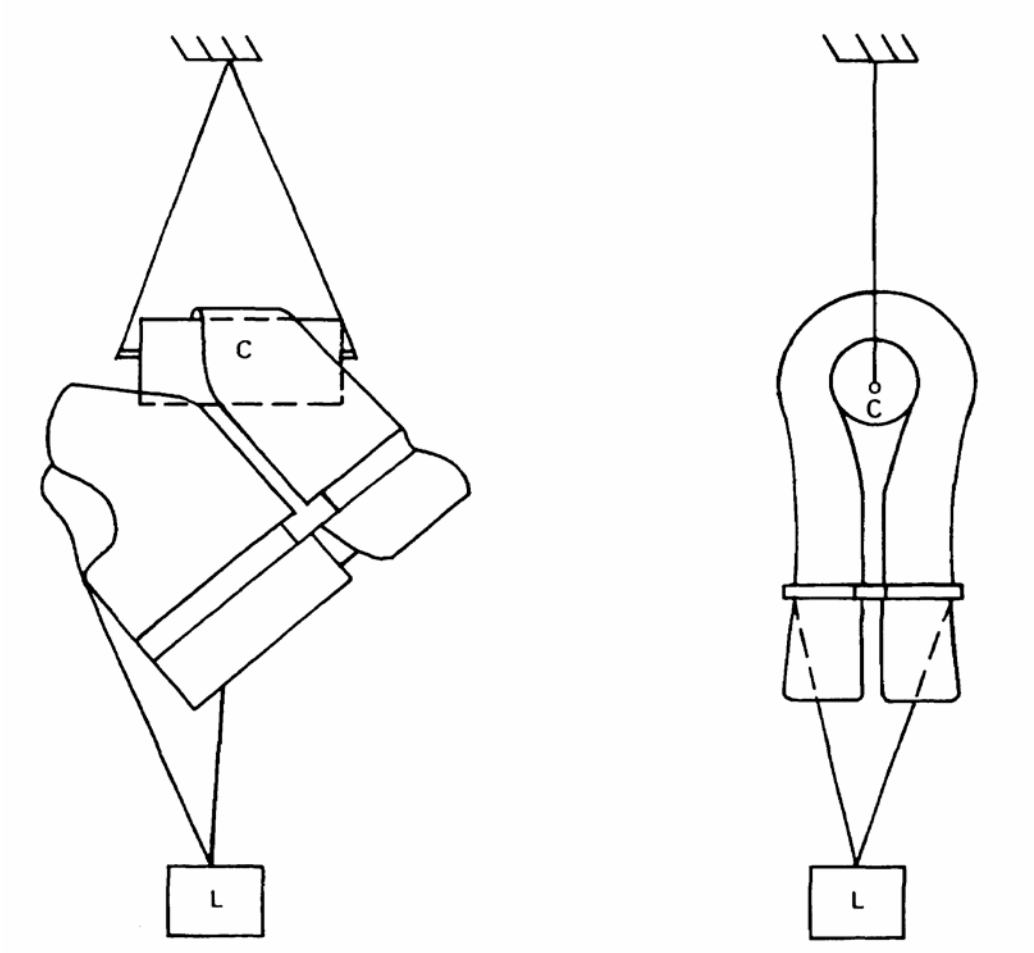
Yoke or over-the-head-type lifejacket

C - Cylinder
125 mm diameter for adult sizes
50 mm diameter for child sizes
L - Test load

Figure 1 - Body strength test arrangement for lifejackets

Shoulder strength test

2.6.2 The lifejacket should be immersed in water for a period of 2 min. It should then be removed from the water and closed in the same manner as when it is worn by a person. A force of not less than 900 N (700 N in the case of a child-size lifejacket) should be applied for 30 min to the shoulder section of the lifejacket (see figure 2). The lifejacket should not be damaged as a result of this test.



Vest-type lifejacket **Yoke or over-the-head-type lifejacket**

C - Cylinder
125 mm diameter for adult sizes
50 mm diameter for child sizes
L - Test load

Figure 2 - Shoulder strength test arrangement for lifejackets

2.7 Additional tests for lifejacket buoyancy material other than cork or kapok

The following tests should be carried out on eight specimens of lifejacket buoyancy materials other than cork or kapok.

Test for stability under temperature cycling

2.7.1 Six specimens should be alternately subjected for 8 h to surrounding temperatures of -30°C and +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for ten cycles, is acceptable:

.1 an 8 h cycle at +65°C to be completed in one day;

.2 the specimens removed from the warm chamber that same day and left exposed under ordinary room conditions until the next day;

.3 an 8 h cycle at -30°C to be completed the next day; and

.4 the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions until the next day.

2.7.2 The dimensions of the specimens should be recorded at the end of the 10-cycle period. The specimens should be carefully examined and should not show any sign of external change of structure or of mechanical qualities.

2.7.3 Two of the specimens should be cut open and should not show any sign of internal change of structure.

2.7.4 Four of the specimens should be used for water absorption tests, two of which should be so tested after they have also been subjected to the diesel oil test as prescribed in 1.2.

Tests for water absorption

2.7.5 The tests should be carried out in fresh water and the specimens should be immersed for a period of seven days under a 1.25 m head of water.

2.7.6 The tests should be carried out:

.1 on two specimens as supplied;

.2 on two specimens which have been subjected to the temperature cycling as prescribed in 2.7.1; and

.3 on two specimens which have been subjected to the temperature cycling as prescribed in 2.7.1 followed by the diesel oil test as prescribed in 2.4.

2.7.7 The specimens should be at least 300 mm square and be of the same thickness as used in the lifejacket. Alternatively, the entire lifejacket may be subjected to the test. The dimensions should be recorded at the beginning and end of these tests.

2.7.8 The results should state the mass in kilograms which each specimen could support out of the water after one and seven days immersion (the selection of a test method suitable for obtaining this result directly or indirectly is left to the discretion of the testing authority). The reduction of buoyancy should not exceed 16% for specimens which have been exposed to the diesel oil conditioning and must not exceed 5% for all other specimens. The specimens should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.

2.8 Donning test

2.8.1 As lifejackets will be used by uninitiated persons, often in adverse conditions, it is essential that risk of incorrect donning be minimized. Ties and fastenings necessary for proper performance should be few and simple. Lifejackets should readily fit various sizes of adults, both lightly and heavily clad. Lifejackets should be capable of being worn inside-out, or clearly in only one way.

Test subjects

2.8.2 These tests should be carried out with at least six able-bodied persons of the following heights and weights:

Height	**Weight**
1.40 m - 1.60 m	1 person under 60 kg 1 person over 60 kg
1.60 m - 1.80 m	1 person under 70 kg 1 person over 70 kg
over 1.80 m	1 person under 80 kg 1 person over 80 kg

.1 at least one and not more than two of the persons should be females with not more than one female in the same height range; and

.2 for the approval of the lifejackets, the test results obtained from each of the participating subjects should be acceptable except as provided otherwise.

Clothing

2.8.3 Each test subject should be tested wearing normal clothing. The test should be repeated with the test subject wearing heavy-weather clothing.

Test

2.8.4 After demonstration, the test subjects should correctly don lifejackets within a period of 1 min, without assistance.

Assessment

2.8.5 The observer should note:

.1 ease and speed of donning; and

.2 proper fit and adjustment.

2.9 Water performance tests

2.9.1 This portion of the test is intended to determine the ability of the lifejacket to assist a helpless person or one in an exhausted or unconscious state and to show that the lifejacket does not unduly restrict movement. All tests should be carried out in fresh water under still conditions.

Test subjects

2.9.2 These tests should be carried out with at least six persons as described in 2.8.2. Only good swimmers should be used, since the ability to relax in the water is rarely otherwise obtained.

Clothing

2.9.3 Subjects should wear only swimming costumes.

Preparation for water performance tests

2.9.4 The test subjects should be made familiar with each of the tests set out below, particularly the requirement regarding relaxing and exhaling in the face-down position. The test subject should don the lifejacket, unassisted, using only the instructions provided by the manufacturer. The observer should note the points prescribed in 2.8.5.

Righting tests

2.9.5 The test subject should swim at least three gentle strokes (breast stroke) and then with minimum headway relax, with the head down and the lungs partially filled, simulating a state of utter exhaustion. The period of time should be recorded starting from the completion of the last stroke until the mouth of the test subject comes clear of the water. The above test should be repeated after the test subject has exhaled. The time should again be ascertained as above. The freeboard from the water surface to the mouth should be recorded with the test subject at rest.

Drop test

2.9.6 Without readjusting the lifejacket, the test subject should jump vertically into the water, feet first, from a height of at least 4.5 m. When jumping into the water, the test subject should be allowed to hold on to the lifejacket during water entry to avoid possible injury. The freeboard to the mouth should be recorded after the test subject comes to rest.

Assessment

2.9.7 After each of the water tests described above, the test subject should come to rest with the mouth clear of the water by at least 120 mm. The average of all subjects' trunk angles should be at least 30° back of vertical, and each individual subject's angle should be at least 20° back of vertical. The average of all subjects' faceplane (head) angles should be at least 40° above horizontal, and each individual subject's angle should be at least 30° above horizontal. In the righting test, the mouth should be clear of the water in not more than 5 s. The lifejacket should not become dislodged or cause harm to the test subject.

2.9.8 When evaluating the results of a test in accordance with 2.9.5, 2.9.7 and 2.9.8, the competent authority may, in exceptional circumstances, disregard the results of a test on a subject if the results show a very slight deviation from the specified criteria, provided the competent authority is satisfied that the deviation can be attributed to the unusual size and stature characteristics of the test subject and the results of tests on other subjects, chosen in accordance with 2.9.2, show the satisfactory performance of the lifejacket.

Swimming and water emergence test

2.9.9 All test subjects, without wearing the lifejacket, should attempt to swim 25 m and board a liferaft or a rigid platform with its surface 300 mm above the water surface. All test subjects who successfully complete this task should perform it again wearing the lifejacket. At least two thirds of the test subjects who can accomplish the task without the lifejacket should also be able to perform it with the lifejacket.

2.10 Children's lifejacket tests

As far as possible, similar tests should be applied for approval of lifejackets suitable for children.

2.10.1 When conducting water performance tests under 2.9, child-size lifejackets should meet the following requirements for their critical flotation stability characteristics. The range of sizes for child-size lifejackets, should be considered based on the test results. Devices should be sized by height or by height and weight.

2.10.2 Test subjects should be selected to fully represent the range of sizes for which the device is to be approved. Devices for smaller children should be tested on children as small as approximately 760 mm tall and 9 kg mass. At least six test subjects should be used for each 380 mm and 16 kg of size range:

.1 Turning time. Each individual subject must turn face-up in not more than 5 s.

.2 Freeboard. The combined results for clearance of the mouth above the water for all subjects should average at least 90 mm; each individual subject under 1,270 mm and 23 kg should have at least 50 mm clearance, and each individual subject over 1,270 mm and 23 kg should have at least 75 mm clearance.

.3 Trunk angle. The average of all subjects' results should be at least 40° back of vertical, and each individual subject's result should be at least 20° back of vertical.

.4 Faceplane (head) angle. The average of all subjects' results should be at least 35° above horizontal, and each individual subject's result should be at least 20° above horizontal.

.5 Mobility. Mobility of the subject both in and out of the water should be given consideration in determining the acceptability of a device for approval.

2.11 Tests for inflatable lifejackets

2.11.1 Two inflatable lifejackets should be subjected to the temperature cycling test prescribed in paragraph 1.1 in the uninflated condition and should then be externally examined. The inflatable lifejacket materials should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities. The automatic and manual inflation systems shall each be tested immediately after each temperature cycling test as follows:

.1 after the high temperature cycle (test in paragraph 1.1.1) the two inflatable lifejackets take from a stowage temperature of +65°C, one should be activated using the automatic inflation system by placing it in sea water at a temperature of +30°C and the other should be activated using the manual inflation system; and

.2 after the low temperature cycle (test in paragraph 1.1.3) the two inflatable lifejackets take from a stowage temperature of -30°C, one should be activated using the automatic inflation system by placing it in sea water at a temperature of -1°C and the other should be activated using the manual inflation system.

2.11.2 The test in 2.8 should be conducted using lifejackets both in the inflated and uninflated conditions.

2.11.3 The tests in 2.9 should be conducted using lifejackets that have been inflated both automatically and manually, and also with one of the compartments uninflated. The tests with one of the compartments uninflated should be repeated as many times as necessary to perform the test once with each compartment in the uninflated condition.

Tests of materials for inflatable bladders, inflation systems and components

2.11.4 The material used for the inflatable bladder, inflation system and components should be tested to establish that they are rot-proof, colour fast and resistant to deterioration from exposure to sunlight and that they are not duly affected by sea water, oil or fungal attack.

Material tests

2.11.5 Resistance to rot and illumination tested according to AATCC Method 30:1981 and ISO 105-B04:1988 Illumination should take place to Class 4-5.

2.11.6 Following exposure to rot or illumination tests above the tensile strength should be measured using the grab method given in ISO 5082. Minimum tensile strength should be not less than 300 N per 25 mm in the warp and weft direction.

Coated fabrics

2.11.7 Coated fabrics used in the construction of inflatable buoyancy chambers should comply with the following requirements:

.1 coating adhesion should be tested in accordance with ISO 2411:1991 by dropping the lifejacket from a height of 18m into the water at 100 mm/min and should be not less than 50 N per 50 mm width;

.2 coating adhesion should be tested when wet following ageing according to ISO 188 with an exposure of 336 ± 0.5 h in fresh water at (70.0 ± 1.0)°C, following which the method at ISO 2411:1991 of dropping the lifejacket from a height of 18 m into the water at 100 mm/min and should not be less then 40 N per 50 mm width;

.3 tear strength should be tested in accordance with ISO 4674:1977 using method A1 and should not be less than 35 N;

.4 resistance to flex cracking should be tested in accordance with ISO 7854:1984 method A using 9000 flex cycles, there should be no visible cracking or deterioration;

.5 breaking strength should be tested in accordance with ISO 1421:1977 using the CRE or CRT method, following conditioning for 24 ± 0.5 h at room temperature and should not be less than 200 N per 50 mm width;

.6 breaking strength should be tested in accordance with ISO 1421:1977 using the CRE or CRT method, following conditioning immersed in fresh water for 24 ± 0.5 h at room temperature and should not be less than 200 N per 50 mm width;

.7 elongation to break should be tested in accordance with ISO 1421:1977 using the CRE or CRT method following conditioning at room temperature for 24 ± 0.5 h and should not be more than 60%;

.8 elongation to break should be tested in accordance with ISO 1421:1977 using the CRE or CRT method following conditioning immersed in fresh water at room temperature for 24 ± 0.5 h and should not be more than 60%;

.9 the resistance to exposure to light when tested in accordance with ISO 105-BO2:1988 and the contrast between the unexposed and exposed samples should not be less than class 5;

.10 the resistance to wet and dry rubbing when tested in accordance with ISO-105-X12:1995 and should not be less than class 3;

.11 the resistance to sea water shall not be less than class 4 in accordance with ISO-105-EO2:1978 and the change in colour of the specimen should not be less than class 4.

Operating head load test

2.11.8 The operating head load test should be carried out using two lifejackets one lifejacket to be conditioned at -30°C for 8 h and the other at +65°C for 8 h. After mounting on the mannequin or the test form the lifejackets should be inflated, and a steady force of 220 ± 10 N applied to the operating head as near as possible to the point where it enters the buoyancy chamber. This load should be maintained for 5 min during which the direction and angle in which it is applied should be continuously varied. On completion of the test the lifejacket should remain intact and should hold its pressure for 30 min.

Pressure test

2.11.9 The inflatable buoyancy chambers should be capable of withstanding an internal over pressure at ambient temperature. A lifejacket should be inflated using the manual method of inflation, after inflation the relief valves should be disabled and a fully charged gas cylinder according to the manufacturers recommendation should be fitted to the same inflation device and fired. The lifejacket should remain intact and should hold its pressure for 30 min. The lifejackets should show no signs of damage such as cracking, swelling or changes of mechanical qualities and that there has been no significant damage to the lifejacket inflation component. All fully charged gas cylinders used in this test should be sized according to the markings on lifejacket.

2.11.10 With one buoyancy chamber inflated, the operating head on the opposite buoyancy chamber should be fired manually, using a fully charged gas cylinder according to the manufacturers recommendations. The operation of the relief valves should be noted to ensure that the excess pressure is relieved. The lifejacket should remain intact and should hold its pressure for 30 min. The lifejackets should no signs of damage such as cracking, swelling or changes of mechanical qualities and that there has been no significant damage to the lifejacket inflation component.

2.11.11 Air retention test: One inflation chamber of a lifejacket is filled with air until air escapes from the over-pressure valve or, if the lifejacket does no have an over-pressure valve, until its design pressure, as stated in the plans and specifications, is reached. After 12 h the drop in pressure should not be greater than 10%. This test is then repeated as many times as necessary to test a different chamber until each chamber has been tested in this manner.

Compression test

2.11.12 The inflatable lifejacket, packed in the normal manner should be laid on a table. A bag containing 75 kg of sand and having a base of 320 mm diameter should be lowered onto the lifejacket from a height of 150 mm in a time of 1 second. This should be repeated ten times, after which the bag should remain on the jacket for not less than 3 h. The lifejacket should be inflated by immersion into water and should inflate fully, the jacket to be inspected to ensure that no swelling or change of mechanical properties has occurred, the jacket should be checked for leaks.

Test of metallic components

2.11.13 Metal parts and components of a lifejacket should be corrosion-resistant to sea water and should be tested in accordance with ISO 9227:1990 for a period of 96 h. The metal

components should be inspected and should not be significantly affected by corrosion, or affect any other part of the lifejacket and should not impair the performance of the lifejacket.

2.11.14 Metal components should not affect a magnetic compass of a type used in small boats by more than 1 degree, when placed at a distance of 500 mm from it.

Inadvertent inflation test

2.11.15 The resistance of an automatic inflation device to inadvertent operation should be assessed by exposing the entire lifejacket to sprays of water for fixed period. The lifejacket should be fitted correctly to a free-standing mannequin of adult size, with a minimum shoulder height of 1500 mm. The lifejacket should be deployed in the mode in which it is worn ready for use but not deployed as used in the water (i.e. if it is equipped with a cover which is normally worn closed, then the cover should be closed for the test. Two sprays should be installed so as to spray fresh water onto the lifejacket, as shown in the diagram. One should be positioned 500 mm above the highest point of the lifejacket, and at an angle of 15° from the vertical centre line of the mannequin and the bottom line of the lifejacket. The other nozzle should be installed horizontally at a distance of 500 mm from the bottom line of the lifejacket, and points directly at the lifejacket. These nozzles should have a spray cone of 30°, each orifice being 1.5 ± 0.1 mm in diameter, and the total area of the orifice should be 50 ± 5 mm², the orifice being evenly spread over the spray nozzle area.

2.11.16 The air temperature should be 20°C, and water should be supplied to the sprays at a pressure of 0.3 kPa–0.4 kPa, a flow of 600 l/h, and a temperature of 18°C to 20°C.

2.11.17 The sprays should be turned on, and the lifejacket exposed to the following series of test to access the ability of the jacket to resist inadvertent inflation:

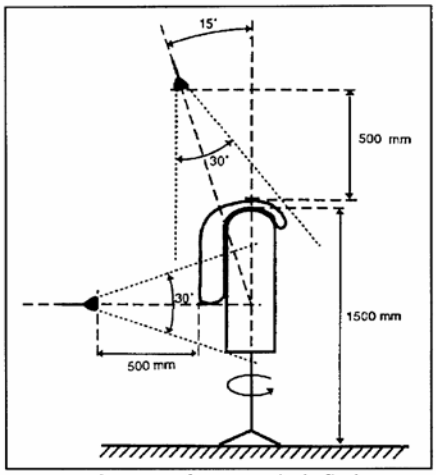
.1 5 min with the high spray on the front of the lifejacket;

.2 5 min with the high spray on the left side of the lifejacket;

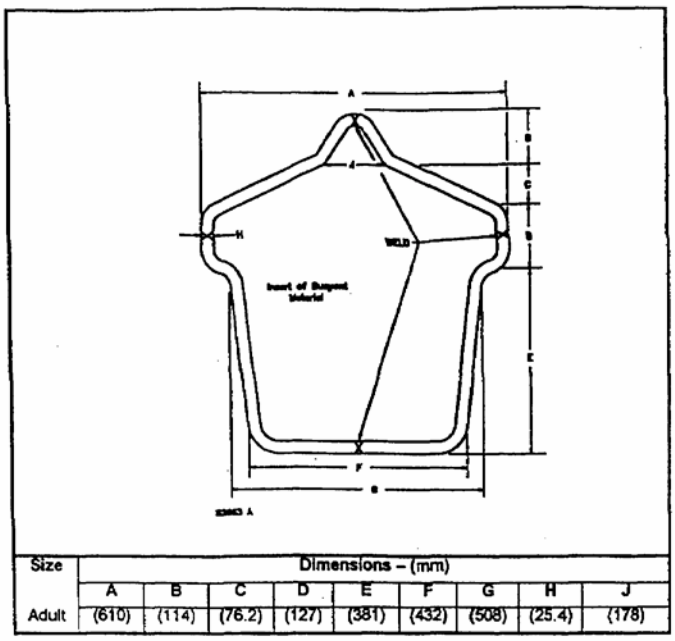
.3 5 min with the high spray on the back of the lifejacket; and

.4 5 min with the high spray on the right side of the lifejacket.

2.11.18 During exposures specified in 2.11.17.1, 2.11.17.2 and 2.11.17.4 above, the horizontal spray should be applied for 10 periods of 3 s each to the front, left or right sides (but not back) as with the high spray.



Test set-up for test of automatic inflation system



Size	Dimensions – (mm)								
	A	B	C	D	E	F	G	H	J
Adult	(610)	(114)	(76.2)	(127)	(381)	(432)	(508)	(25.4)	(178)

Alternative former

2.11.19 After completing the above test the lifejacket should be removed from the mannequin and immersed in water to verify that the auto-inflation system functions.

PART 2 - PRODUCTION AND INSTALLATION TESTS

1 GENERAL

1.1 Representatives of the competent authority should make random inspection of manufacturers to ensure that the quality of life-saving appliances and the materials used comply with the specification of the approved prototype life-saving appliance.

1.2 Manufacturers should be required to institute a quality control procedure to ensure that life-saving appliances are produced to the same standard as the prototype life-saving appliance approved by the competent authority and to keep records of any production tests carried out in accordance with the competent authority instructions.

1.3 Where the proper operation of life-saving appliances is dependent on their correct installation in ships, the competent authority should require installation tests to ensure that the appliances have been correctly fitted in a ship.

2 INDIVIDUAL BUOYANCY EQUIPMENT FOR LIFEJACKETS

Production tests

2.1 Manufacturers should be required to carry out a buoyancy test on at least 0.5% of each batch of lifejackets produced, subject to a minimum of one from every batch.

Inspections by the competent authority

2.2 Inspections by a representative of the competent authority should be made at intervals of at least one per 6,000 lifejackets produced, subject to a minimum of one inspection per calendar quarter. When the manufacturer's quality control programme results in lifejackets that are consistently free of defects, the rate of inspection may be reduced to one in every 12,000. At least one lifejacket of each type in production should be selected at random by the inspector and subjected to detailed examination including, if necessary, cutting open. He should also satisfy himself that the flotation tests are being conducted satisfactorily; if he is not satisfied, a flotation test should be undertaken.

ANNEX VI

ANNOTATED LIST OF PERTINENT PUBLICATIONS

FAO (www.fao.org)

FAO Code of Conduct for Responsible Fisheries

FAO Technical Guidelines for Responsible Fisheries, No. 1 – Fishing Operations

FAO Standard Specifications for the Marking and Identification of Fishing Vessels

IMO (www.imo.org)

Document for Guidance on Training and Certification of Fishing Vessel Personnel

The FAO/ILO/IMO Document for Guidance takes into account the conventions and recommendations adopted by the ILO and IMO and the wide practical experience of FAO in the field of training fishing vessel personnel. It covers training and certification of fishing vessel personnel on small and large fishing vessels. It is intended to provide guidance for those developing, establishing or reviewing national training schemes for training and certification programmes for fishing vessel personnel.

Regulations for Prevention of Collisions at Sea (COLREGS)

The 1993 Torremolinos Protocol and Torremolinos International Convention for the Safety of Fishing Vessels, consolidated edition, 1995

Code on Intact Stability for All Types of Ships covered by IMO Instruments, as adopted by the Organization by resolution A.749(18) as amended

Code of Practice concerning the Accuracy of Stability Information for Fishing Vessels adopted by the Organization by resolution A.267(VIII)

Recommended Practice on Portable Fish-Hold Divisions, adopted by the Organization by resolution A.168(ES.IV), as amended by resolution A.268(VIII), appendix V

Fire Test Procedures Code

Fire Safety Systems Code

Recommendation on improved fire test procedures for flammability of bulkheads, ceiling and deck finish materials adopted by the Organization by resolution A.653(16)

Guidelines for the Evaluation of Fire Hazards Properties of Materials adopted by the Organization by resolution A.166(ES.IV)

Improved Guidelines for Marine Portable Fire Extinguishers adopted by the Organization by resolution A.951(23)

Graphical symbols for shipboard fire control plans adopted by the Organization by resolution A.952(23)

Recommendation on Fire Test Procedures for Ignitability of Primary Deck Coverings adopted by the Organization by resolution A.687(17)

Life Saving Appliances Code (LSA Code) adopted by the Organization by resolution MSC.48(66)

Revised Recommendations on the testing of life-saving appliances, adopted by the Organization by resolution MSC.81(70), as revised

Code of Practice for the evaluation, testing and acceptance of prototype novel life-saving appliances and arrangements, adopted by the Organization by resolution A.520(13)

Standardized life-saving appliance evaluation and test report forms, adopted by the Organization by MSC/Circ.980

Recommendation on Performance Standard for Magnetic Compasses, adopted by the Organization by resolution A.382(X)

Recommendation on Performance Standards for Gyro-Compasses, adopted by the Organization by resolution A.424(XI)

Recommendation on Performance Standards for radar equipment, adopted by the Organization by resolution MSC.64(67), annex 4

Performance standards for automatic radar plotting aids (ARPAs) adopted by the Organization by resolution A.823(19)

Performance standards for survival craft radar transponders for use in search and rescue operations, adopted by the Organization by resolution A.802(19)

Recommendation on Performance Standards for echo-sounding equipment, adopted by the Organization by resolution A.224(VII), as amended by resolution MSC.74(69), annex 4

Recommendation on Performance Standards for devices to indicate speed and distance, adopted by the Organization by resolution A.824(19), as amended by resolution MSC.96(72)

Performance Standards for Rate-of-Turn Indicators adopted by the Organization by resolution A.526(13)

Recommendation on Unification Performance Standards for Navigational Equipment, adopted by the Organization by resolution A.575(14)

Recommendation on Methods of Measuring Noise Levels at Listening Posts adopted by the Organization by resolution A.343(IX)

Recommendation on Performance Standards for shipborne global positioning system receiver equipment, adopted by the Organization by resolution A.819(19), as amended by resolution MSC.112(73)

Recommendation on Performance Standards for shipborne GLONASS receiver equipment, adopted by the Organization by resolution MSC.53(66)), as amended by resolution MSC.113(73)

Recommendation on Performance Standards for combined GPS/GLONASS receiver equipment, adopted by the Organization by resolution MSC.74(69), annex 1, as amended by resolution MSC.115(73).

Recommendation on the Carriage of Electronic Position-Fixing Equipment adopted by the Organization by resolution A.815(19)

Recommendation on Performance Standards for heading control systems, adopted by the Organization by resolution MSC.64(67), annex 3

Recommendation on Performance Standards for shipborne Loran-C and Chayka receivers, adopted by the Organization by resolution A.818(19)

Recommendation on Performance Standards for shipborne DGPS and DGLONASS maritime radio beacon receiver equipment, adopted by the Organization by resolution MSC.64(67), annex 2, as amended by resolution MSC.114(73)

Recommendation on Performance Standards for track control systems, adopted by the Organization by resolution MSC.74(69), annex 2

Recommendation on Performance Standards for a universal shipborne automatic identification system (AIS), adopted by the Organization by resolution MSC.74(69), annex 3

Recommendation on Performance Standards for radar reflectors, adopted by the Organization by resolution A.384(X), as amended by resolution MSC.164(78)

Recommendation on Performance Standards for sound reception systems, adopted by the Organization by resolution MSC.86(70), annex 1

Recommendation on Performance Standards for voyage data recorders (VDRs), adopted by the Organization by resolution A.861(20)

Recommendation on Performance Standards for Electronic Chart Display and Information Systems (ECDIS), adopted by the Organization by resolution A.817(19)), as amended by resolutions MSC.64(67), annex 5, and MSC.86(70), annex 4, as appropriate

Recommendation on Performance Standards for daylight signalling lamps, adopted by the Organization by resolution MSC.95(72)

NAVTEX Manual approved by the Organization (publication IMO-951E)

Provision of Radio Services for the Global Maritime Distress and Safety System (GMDSS), adopted by the Organization by resolution A.704(17)

Carriage of Radar Operating in the Frequency Band 9,300-9,500 MHz, adopted by the Organization by resolution A.614(15)

Carriage of Inmarsat Enhanced Group Call SafetyNET Receivers under the Global Maritime Distress and Safety System (GMDSS), adopted by the Organization by resolution A.701(17)

Promulgation of Maritime Safety Information, adopted by the Organization by resolution A.616(15)

Search and rescue homing capability, adopted by the Organization by resolution A.615(15)

Operational Standards for Radiotelephone Alarm Signal Generators, adopted by the Organization by resolution A.421(XI)

Performance Standards for Narrow-Band Direct-Printing Telegraph Equipment for the Reception of Navigational and Meteorological Warnings and Urgent Information to Ships, adopted by the Organization by resolution A.525(13)

General Requirements for Shipborne Radio Equipment Forming Part of the Global Maritime Distress and Safety System (GMDSS) and for Electronic Navigational Aids, adopted by the Organization by resolution A.694(17)

Performance Standards for Ship Earth Stations Capable of Two-Way Communications, adopted by the Organization by resolution A.698(17)

Type Approval of Ship Earth Stations, adopted by the Organization by resolution A.570(14)

Performance Standards for Shipborne VHF Radio Installations Capable of Voice Communication and Digital Selective Calling, adopted by the Organization by resolution A.609(15)

Performance Standards for Shipborne MF Radio Installations Capable of Voice Communication and Digital Selective Calling, adopted by the Organization by resolution A.610(15)

Performance Standards for Shipborne MF/HF Radio Installations Capable of Voice Communication, Narrow Band Direct-Printing and Digital Selective Calling, adopted by the Organization by resolution A.613(15)

Performance Standards for Float-Free Satellite Emergency Position-Indicating Radio Beacons (EPIRBS) Operating on 406 MHz, adopted by the Organization by resolution A.695(17)

Type Approval of Satellite Emergency Position-Indicating Radio Beacons (EPIRBs) Operating in the COSPAS-SARSAT System, adopted by the Organization by resolution A.696(17)

Performance Standards for Survival Craft Radar Transponders for Use in Search and Rescue Operations, adopted by the Organization by resolution A.697(17)

Performance Standards for Float-Free VHF Emergency Position-Indicating Radio Beacons, adopted by the Organization by resolution A.612(15)

Performance Standards for Inmarsat Standard-C Ship Earth Stations Capable of Transmitting and Receiving Direct-Printing Communications, adopted by the Organization by resolution A.663(16)

Type Approval of Ship Earth Stations, adopted by the Organization by resolution A.570(14)

Performance Standards for Enhanced Group Call Equipment, adopted by the Organization by resolution A.664(16)

Performance Standards for Float-Free Satellite Emergency Position-Indicating Radio Beacons Operating through the Geostationary Inmarsat Satellite System on 1.6 GHz, adopted by the Organization by resolution A.661(16)

Performance Standards for Float-Free Release and Activation Arrangements for Emergency Radio Equipment, adopted by the Organization by resolution A.662(16)

System Performance Standards for the Promulgation and Co-ordination of Maritime Safety Information using High-Frequency Narrow-Band Direct Printing, adopted by the Organization by resolution A.699(17)

Performance Standards for Narrow-Band Direct-Printing Telegraph Equipment for the Reception of Navigational and Meteorological Warnings and Urgent Information to Ships (MSI) by HF, adopted by the Organization by resolution A.700(17)

General Requirements for Shipborne Radio Equipment Forming Part of the Global Maritime Distress and Safety System (GMDSS) and for Electronic Navigational Aids adopted by the Organization by resolution A.694(17)

Pilot Transfer Arrangements (SOLAS Convention, 1974, as amended, Regulation 23 of Chapter V)

Code on Noise Levels on board Ships adopted by the Organization by resolution A.468(XII)

WHO (www.who.int/en/org)

International Medical Guide for Ships

The ILO/IMO/WHO International Medical Guide for Ships, published by the World Health Organization, is intended for use by people, with little or no formal medical training, who are responsible for health care on board ships of all kinds. It is written in a simple language, and adopts a straightforward approach to the diagnosis and treatment of a wide range of diseases and injuries. Advice is given on first aid and specific problems that may arise at sea, such as diseases of fishermen and care of castaways and persons rescued from drowning. Consideration is also given to prevention of disease on board ship.

OTHERS

European Union Council Directive 92/29/EEC on minimum safety and health requirements for improved medical treatment on board vessels

IEC Publication 60079

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