RULES

PUBLICATION 10/P

SAFETY REQUIREMENTS FOR SEA-GOING FISHING VESSELS

September
2023

Publications P (Additional Rule Requirements) issued by Polish Register of Shipping complete or extend the Rules and are mandatory where applicable.

GDAŃSK

Publication 10/P – Safety requirements for sea-going fishing vessels – September 2023 is based on the *Commission Directive 2002/35/EC, amending Council Directive 97/70/EC setting up a harmonised safety regime for fishing vessels of 24 meters in length and over* and is an extension of the requirements contained in *the Rules for the Classification and Construction of Sea-Going Ships.*

This *Publication* was approved by PRS Board on 31 August 2023 and enters into force on 5 September 2023

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PRS/RP, 09/2023

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0 INTRODUCTION

0.1 This *Publication* provides specific technical requirements for sea-going fishing vessels of 24 meters in length and more and is an extension of the *Rules for the Classification and Construction of Sea-going Ships* hereinafter referred to as the *Rules*.

0.2 This *Publication* has been developed on the basis and contains the relevant requirements of the following source documents:

- Commission Directive 2002/35/EC, amending Council Directive 97/70/EC setting up a harmonised safety regime for fishing vessels of 24 meters in length and over,
- Annex to the Torremolinos Protocol of 1993 relating to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977, as modified by the Cape Town Agreement of 2012.

For short, the source documents are referred to hereinafter as *Dir.35* (instead of *Commission Directive 2002/35/EC*), *Dir.70* (instead of *Council Directive 97/70/EC*) and *TP An.* (instead of *Annex* to the *Torremolinos Protocol* of 1993).

0.3 The editorial layout of this *Publication* corresponds in principle to the layout and the sequence chapter/regulation/paragraph of the *TP An.* This allows for easy comparison between the requirements of the *TP An.* and the *Publication* and facilitates future implementation of amendments to the *Publication* should the *TP An.* be amended again.

0.4 PRS' numbering of requirements in the *Publication* differs from that in the source documents (i.e. in the *TP An*, *Dir.35* and *Dir.70*), however at the end of each subchapter/paragraph coming from these documents, a number is given in brackets which is the original number of the requirement from the relevant source document. References in the text are made to PRS' numbering of requirements, accompanied, where relevant, by the original number from the source document given in square brackets.

0.5 Requirements of this *Publication* apply to both "*new fishing vessels*" and "*existing fishing vessels*", and they are in black font. Some of these requirements have been amended for "*new fishing vessels built on or after 1 January 2003*" and the amended requirements which apply to such vessels only are in dark red font.

0.6 Some requirements of this *Publication* can be different depending on the fishing vessel "*length*". Usually the limiting length is 45 m, 60 m, 75 m or 100 m. Relevant information on the limiting length and application of particular paragraphs/subchapters is given in such paragraphs/subchapters.

CHAPTER I

1 GENERAL PROVISIONS

1.1 Application

1.1.1 This *Publication* applies to sea-going fishing vessels of 24 meters in length and over, both new and existing, which are:

.1 flying the flag of an EU Member State and registered in the Community, or

.2 operating in the internal waters or territorial sea of an EU Member State, or

.3 landing their catch in the port of an EU Member State.

Recreational craft engaged in non-commercial fishing are excluded from the scope of this *Publication.* (Dir.70, Art. 1.1)

1.1.2 PRS will apply requirements of this *Publication* to fishing vessels classed by PRS and subject to 2.1.1.

1.1.3 Unless provided otherwise in this *Publication*, existing fishing vessels shall comply with the relevant requirements of this *Publication* not later than 1 July 1999. (Dir.70, Art. 3.1)

1.2 Definitions

For the purposes of this *Publication*, in addition to the definitions given in particular parts of the *Rules*, the following definitions apply:

.1 ***Fishing vessel*** or ***Vessel*** means any vessel equipped or used commercially for catching fish or other living resources of the sea. (Dir.70, Art. 2.1)

.2 ***New fishing vessel*** means a fishing vessel for which:

(a) on or after 1 January 1999 the building or major conversion contract is placed; or

(b) the building or major conversion contract has been placed before 1 January 1999, and which is delivered three years or more after that date; or

(c) in the absence of a building contract, on or after 1 January 1999:

– the keel is laid, or
– construction identifiable with a specific ship begins, or
– assembly has commenced comprising at least 50 tonnes or 1 % of the estimated mass of all structural material, whichever is less. (Dir.70, Art. 2.2)

.3 ***Existing fishing vessel*** is a fishing vessel which is not a new fishing vessel. (Dir.70, Art. 2.3)

.4 ***New fishing vessel built on or after 1 January 2003*** means a new fishing vessel for which:

(a) on or after 1 January 2003 the building or major conversion contract is placed; or

(b) the building or major conversion contract has been placed before 1 January 2003, and which is delivered three years or more after that date; or

(c) in the absence of a building contract, on or after 1 January 2003:

– the keel is laid, or
– construction identifiable with a specific ship begins, or
– assembly has commenced comprising at least 50 tonnes or 1 % of the estimated mass of all structural material, whichever is less. (Dir.35, An. I)

Note: New fishing vessels built on or after 1 January 2003 can be referred hereinafter as **NFV 2003** for short.

.5 ***Approved*** means approved by the Administration. (TP An., Reg. I/2(3))

.6 ***Crew*** means the skipper and all persons employed or engaged in any capacity on board a vessel on the business of that vessel. (TP An., Reg. I/2(4))

.7 ***Length*** *(L)* means, unless provided otherwise, 96 % of the total length on a waterline at 85 % of the least moulded depth measured from the keel line, or as the length from the foreside of the stem to the axis of the rudder stock on that waterline, if that be greater. In vessels designed with rake of keel the waterline on which this length is measured shall be parallel to the designed waterline. (Dir.70, Art. 2.6)

.8 ***Forward and after perpendiculars*** shall be taken at the forward and after ends of the length (*L*). The forward perpendicular shall be coincident with the foreside of the stem on the waterline on which the length is measured. (TP An., Reg. I/2(6))

.9 ***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. (TP An., Reg. I/2(7))

.10 ***Moulded depth*** is the vertical distance measured from the keel line to the top of the working deck beam at side.

In vessels having rounded gunwales, the moulded depth shall be measured to the point of intersection of the moulded lines of the deck and side shell plating, the lines extending as though the gunwale were of angular design.

Where the working deck is stepped and the raised part of the deck extends over the point at which the moulded depth is to be determined, the moulded depth shall be measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part. (TP An., Reg. I/2(8))

.11 ***Depth*** *(D)* is the moulded depth amidships. (TP An., Reg. I/2(9))

.12 ***Deepest operating waterline*** is the waterline related to the maximum permissible operating draught. (TP An., Reg. I/2(10))

.13 ***Amidships*** is the mid-length of *L.* (TP An., Reg. I/2(11))

.14 ***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 planes passing through amidships. (TP An., Reg. I/2(12))

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

(a) 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

(b) the rabbet lower line of the keel of a vessel with a shell of wood or a composite vessel; or

(c) 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. (TP An., Reg. I/2(13))

.16 ***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 Administration may accept a lower deck as a working deck provided that that deck is situated above the deepest operating waterline. (TP An., Reg. I/2(14))

.17 ***Superstructure*** is the decked structure on the working deck extending from side to side of the vessel or with the side plating not being inboard of the shell plating more than 0.04*B.* (TP An., Reg. I/2(15))

.18 ***Enclosed superstructure*** is a superstructure with:

(a) enclosing bulkheads of efficient construction;

(b) 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

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

A bridge or poop shall 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. (TP An., Reg. I/2(16))

.19 ***Superstructure deck*** is that complete or partial deck forming the top of a superstructure, deckhouse or other 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 deckhouses or other erections shall be treated in the same way as the working deck. (TP An., Reg. I/2(17))

.20 ***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. (TP An., Reg. I/2(18))

.21 ***Weathertight*** means that in any sea conditions water will not penetrate into the vessel. (TP An., Reg. I/2(19))

.22 ***Watertight*** 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. (TP An., Reg. I/2(20))

.23 ***Collision bulkhead*** is a watertight bulkhead up to the working deck in the forepart of the vessel which meets the following conditions:

(a) The bulkhead shall be located at a distance from the forward perpendicular:

- not less than 0.05*L* and not more than 0.08*L* for vessels of **45 m** in length and over;
- not less than 0.05*L* and not more than 0.05*L* plus 1.35 m for vessels of less than **45 m** in length, except as may be allowed by the Administration; (not applicable to NFV 2003)
- not less than 0.05*L* and not more than 0.05*L* plus 1.35 m for vessels of less than **45 m** in length;
- in no case, less than 2 m.

(b) Where any part of the underwater body extends forward of the forward perpendicular, e.g. a bulbous bow, the distance stipulated in subparagraph (a) shall be measured from a point at mid-length of the extension forward of the forward perpendicular or from a point 0.015*L* forward of the forward perpendicular, whichever is less.

(c) The bulkhead may have steps or recesses provided they are within the limits prescribed in subparagraph (a). (TP An., Reg. I/2(21)

.24 ***Gross tonnage*** means the gross tonnage calculated in accordance with the tonnage measurement regulations contained in *Annex I* to the *International Convention on Tonnage Measurement of Ships, 1969*, or any instrument amending or replacing it. (TP An., Reg. I/2(22)

.25 ***Operating*** means catching or catching and processing fish or other living resources of the sea without prejudice to the right of innocent passage in the territorial sea and the freedom of navigation in the 200 mile exclusive economic zone. (Dir.70, Art. 2.7)

.26 ***Rules*** means PRS' *Rules for the Classification and Construction of Sea-going Ships*

1.3 General requirements

1.3.1 The standards for the design, construction and maintenance of hull, main and auxiliary machinery, electrical and automatic plants of a fishing vessel shall be the rules in force at the date of its construction, specified for classification by a recognised organisation or used by an administration. (Dir.70, Art. 5)

1.3.2 Fishing vessels of 24 meters in length and over to be assigned with PRS class shall comply with the general (i.e. applicable to all ship types) and dedicated (i.e. applicable to fishing vessels only) requirements of the *Rules*.

1.3.3 Whenever specific technical requirements of this *Publication* are less stringent than or in contradiction with the general or dedicated requirements of the *Rules*, requirements of this *Publication* prevail.

1.3.4 Marine equipment complying with the requirements of the Directive 2014/90/EU (so called *MED Directive*), as amended, or earlier versions of the Directive, when placed on board a fishing vessel to comply with the provisions of this Directive, shall be automatically considered to be in conformity with such provisions, whether or not these provisions require that the equipment must be approved and subjected to tests to the satisfaction of the administration of the flag State. (Dir.70, Art. 3.6)

1.3.5 Fishing vessels of less than 24 meters in length to be assigned with PRS class shall comply with the applicable requirements of PRS' *Rules for the Classification and Construction of Small Sea-going Ships*.

1.3.6 Whenever in the text of the *Publication* some technical arrangements are subject to the flag State Administration approval or decision, PRS, acting as recognised organisation (RO) on behalf of the flag State Administration, will take necessary actions following provisions of Agreement with the Administration. If the flag State Administration of a newbuilding is unknown (not decided yet) PRS will make relevant decisions and take necessary actions on its own.

1.4 Ship classification documentation

The scope of technical documentation required to be submitted to be considered by PRS prior to commencement of ship construction or alteration shall comply with the requirements specified in particular Parts of PRS' *Rules for the Classification and Construction of Sea-going Ships*.

1.5 Additional marks in the symbol of class

1.5.1 A fishing vessel which complies with the requirements specified in this *Publication* and with the dedicated requirements of the *Rules* is assigned the following additional mark in the symbol of class:

FISHING VESSEL

1.5.2 A fishing vessel which also complies with the requirements specified in *Publication 20/P – Ship Side Strengthening of Fishing Vessels Mooring at Sea Alongside Other Vessels* is also assigned the following additional mark in the symbol of class:

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1.5.3 A fishing vessel which also complies with the requirements specified in *Part VII – Fishing equipment* of the *Rules for Statutory Survey of Sea-going Ships* is also assigned the following additional mark in the symbol of class:

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CHAPTER II

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 shall be sufficient to withstand all foreseeable conditions of the intended service and shall be to the satisfaction of the Administration. (TP An. Reg. II/1(1)) (not applicable to NFV 2003)

2.1.1 Strength and construction of hull, superstructures, deckhouses, machinery casings, companionways and any other structures and vessel's equipment shall be sufficient to withstand all foreseeable conditions of the intended service and shall be in accordance with the rules of recognised organisation. (TP An. Reg. II/1(1) as amended by Dir.35)

Note:

Specific requirements concerning fishing vessel hull construction and scantlings (including holds, bow, processing spaces, double bottom, stern ramp) are specified in Chapter 22 of *Part II – Hull* of the *Rules*.

2.1.2 The hull of vessels intended for operation in ice shall be strengthened in accordance with the anticipated conditions of navigation and area of operation. (TP An. Reg. II/1(2))

2.1.3 Bulkheads, closing devices and closures of openings in these bulkheads, as well as methods for their testing, shall be in accordance with the requirements of the Administration. Vessels constructed of material other than wood shall be fitted with a collision bulkhead and at least with watertight bulkheads bounding the main machinery space. Such bulkheads shall be extended up to the working deck. In vessels constructed of wood such bulkheads, which as far as practicable shall be watertight, shall also be fitted. (TP An. Reg. II/1(3))

2.1.4 Pipes piercing the collision bulkhead shall be fitted with suitable valves operable from above the working deck and the valve chest shall be secured at the collision bulkhead inside the forepeak. No door, manhole, ventilation duct or any other opening shall be fitted in the collision bulkhead below the working deck. (TP An. Reg. II/1(4))

2.1.5 Where a long forward superstructure is fitted, the collision bulkhead shall be extended weathertight to the deck next above the working deck. The extension need not be fitted directly over the bulkhead below provided it is located within the limits given in 1.2.23 [regulation I/2(21)] and the part of the deck which forms the step is made effectively weathertight. (TP An. Reg. II/1(5))

2.1.6 The number of openings in the collision bulkhead above the working deck shall be reduced to the minimum compatible with the design and normal operation of the vessel. Such openings shall be capable of being closed weathertight. (TP An. Reg. II/1(6))

2.1.7 In vessels of **75 m** in length and over, a watertight double bottom shall be fitted, as far as practicable, between the collision bulkhead and the afterpeak bulkhead. (TP An. Reg. II/1(7))

2.2 Watertight doors

2.2.1 The number of openings in watertight bulkheads, as required by 2.1.3 [regulation 1(3)], shall be reduced to the minimum compatible with the general arrangements and operational needs of the vessel; openings shall be fitted with watertight closing appliances to the satisfaction of the Administration. Watertight doors shall be of an equivalent strength to the adjacent unpierced structure. (TP An. Reg. II/2(1)) (not applicable to NFV 2003)

2.2.1 The number of openings in watertight bulkheads, as required by 2.1.3 [regulation 1(3)], shall be reduced to the minimum compatible with the general arrangements and operational needs of the vessel; openings shall be fitted with watertight closing appliances complying with the rules of recognised organisation. Watertight doors shall be of an equivalent strength to the adjacent unpierced structure. (TP An. Reg. II/2(1) as amended by Dir.35)

Note:

Requirements concerning watertight closing appliances are specified in Subchapter 7.3 of *Part III – Hull Equipment* of the *Rules*.

2.2.2 In vessels of less than **45 m** in length, such doors may be of the hinged type, which shall be capable of being operated locally from each side of the door and shall normally be kept closed at sea. A notice shall be attached to the door on each side to state that the door shall be kept closed at sea. (TP An. Reg. II/2(2))

2.2.3 In vessels of **45 m** in length and over, watertight doors shall be of the sliding type in:

(a) spaces where it is intended to open them at sea and if located with their sills below the deepest operating waterline, unless the Administration considers it to be impracticable or unnecessary taking into account the type and operation of the vessels; and (not applicable to NFV 2003)

(a) spaces where it is intended to open them at sea and if located with their sills below the deepest operating waterline, unless the Administration considers it to be impracticable or unnecessary taking into account the type and operation of the vessels.

Exemptions from 2.2.3(a) [this regulation] allowed by a Member State shall be subject to the procedure of Article 4 of this Directive (i.e. Dir.70). (TP An. Reg. II/2(3)(a) as amended by Dir.35)

(b) the lower part of a machinery space where there is access from it to a shaft tunnel.

Otherwise watertight doors may be of the hinged type. (TP An. Reg. II/2(3))

2.2.4 Sliding watertight doors shall be capable of being operated when the vessel is listed up to 15° either way. (TP An. Reg. II/2(4))

2.2.5 Sliding watertight doors whether manually operated or otherwise shall be capable of being operated locally from each side of the door; in vessels of **45 m** in length and over, these doors shall also be capable of being operated by remote control from an accessible position above the working deck except when the doors are fitted in crew accommodation spaces. (TP An. Reg. II/2(5))

2.2.6 Means shall be provided at remote operating positions to indicate when a sliding door is open or closed. (TP An. Reg. II/2(6))

2.3 Hull integrity

2.3.1 External openings shall be capable of being closed so as to prevent water from entering the vessel. Deck openings which may be open during fishing operations shall normally be arranged near to the vessel's centreline. However, the Administration may approve different arrangements if satisfied that the safety of the vessel will not be impaired. (TP An. Reg. II/3(1))

2.3.2 Fish flaps on stern trawlers shall be power-operated and capable of being controlled from any position which provides an unobstructed view of the operation of the flaps. (TP An. Reg. II/3(2))

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, shall 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 shall consist of gaskets and clamping devices or other equivalent means and shall be permanently attached to the bulkhead or to the doors themselves, and shall be so arranged that they can be operated from each side of the bulkhead. The Administration 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. (TP An. Reg. II/4(1))

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 shall 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 of the Administration, 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. (TP An. Reg. II/4(2))

2.5 Hatchways closed by wood covers

2.5.1 The height above deck of hatchway coamings shall be at least 600 mm on exposed parts of the working deck and at least 300 mm on the superstructure deck. (TP An. Reg. II/5(1))

2.5.2 The finished thickness of wood hatchway covers shall include an allowance for abrasion due to rough handling. In any case, the finished thickness of these covers shall 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 shall be at least 65 mm. (TP An. Reg. II/5(2))

2.5.3 Arrangements for securing wood hatchway covers weathertight shall be provided to the satisfaction of the Administration. (TP An. Reg. II/5(3)) (not applicable to NFV 2003)

2.5.3 Arrangements for securing wood hatchway covers weathertight shall be provided in accordance with the standards as given in regulations 14 and 15 of Annex I to the *International Convention on Load Lines 1966*. (TP An. Reg. II/5(3) as amended by Dir.35)

2.6 Hatchways closed by covers other than wood

2.6.1 The height above deck of hatchway coamings shall be as specified in 2.5.1 [regulation 5(1)]. Where operating experience has shown justification, and on the approval by the Administration, 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 shall 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 Administration. (TP An. Reg. II/6(1))

2.6.2 For the purpose of strength calculations, it shall be assumed that hatchway covers are subjected to the weight of cargo intended to be carried on them or to the following static loads, whichever is the greater:

(a) 10 kN/m^2 for vessels of **24 m** in length;

(b) 17 kN/m^2 for vessels of **100 m** in length and over.

For intermediate lengths the load values shall be determined by linear interpolation. The Administration may reduce the loads to not less than 75 per cent of the above values for covers to hatchways situated on the superstructure deck in a position abaft a point located 0.25*L* from the forward perpendicular. (TP An. Reg. II/6(2))

2.6.3 Where covers are made of mild steel, the maximum stress calculated according to 2.6.2 [paragraph (2)] multiplied by 4.25 shall not exceed the minimum ultimate strength of the material. Under these loads the deflections shall not be more than 0.0028 times the span. (TP An. Reg. II/6(3))

2.6.4 Covers made of materials other than mild steel shall be at least of equivalent strength to those made of mild steel, and their construction shall be of sufficient stiffness ensuring weathertightness under the loads specified in 2.6.2 [paragraph (2)]. (TP An. Reg. II/6(4))

2.6.5 Covers shall be fitted with clamping devices and gaskets sufficient to ensure weathertightness, or other equivalent arrangements to the satisfaction of the Administration. (TP An. Reg. II/6(5))

2.7 Machinery space openings

2.7.1 Machinery space openings shall be framed and enclosed by casings of a strength equivalent to the adjacent superstructure. External access openings therein shall be fitted with doors complying with the requirements of 2.4 [regulation 4]. (TP An. Reg. II/7(1))

2.7.2 Openings other than access openings shall be fitted with covers of equivalent strength to the unpierced structure, permanently attached thereto and capable of being closed weathertight. (TP An. Reg. II/7(2))

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 manholes may be fitted provided these are capable of being closed watertight and such devices shall 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 Administration is satisfied that they are effectively watertight. (TP An. Reg. II/8(1))

2.8.2 Openings other than hatchways, machinery space openings, manholes and flush scuttles in the working or superstructure deck shall be protected by enclosed structures fitted with weathertight doors or their equivalent. Companionways shall be situated as close as practicable to the centreline of the vessel. (TP An. Reg. II/8(2))

2.9 Ventilators

2.9.1 In vessels of **45 m** in length and over, the height above deck of ventilator coamings, other than machinery space ventilator coamings, shall be at least 900 mm on the working deck and at least 760 mm on the superstructure deck. In vessels of less than **45 m** in length, the height of these coamings shall be 760 mm and 450 mm respectively. The height above deck of machinery space ventilator openings shall be to the satisfaction of the Administration. (TP An. Reg. II/9(1)) (not applicable to NFV 2003)

2.9.1 In vessels of **45 m** in length and over, the height above deck of ventilator coamings, other than machinery space ventilator coamings, shall be at least 900 mm on the working deck and at least 760 mm on the superstructure deck. In vessels of less than **45 m** in length, the height of these coamings shall be 760 mm and 450 mm respectively. The height above deck of machinery space ventilator openings, necessary to continuously supply the machinery space and, on demand, immediately supply the generator room, in general shall be in compliance with 2.9.3 [regulation

II/9(3)]. However, where due to the ships size and arrangements this is not practicable, lesser heights, but in all cases not less than 900 mm above the working deck and the superstructure deck, may be accepted with the provision of weathertight closing appliances in accordance with 2.9.2 [regulation II/9(2)] in combination with other suitable arrangements to ensure an uninterrupted adequate supply of ventilation to the spaces. (TP An. Reg. II/9(1) as amended by Dir.35)

2.9.2 Coamings of ventilators shall be of equivalent strength to the adjacent structure and capable of being closed weathertight by closing appliances permanently attached to the ventilator or adjacent structure. Where the coaming of any ventilator exceeds 900 mm in height, it shall be specially supported. (TP An. Reg. II/9(2))

2.9.3 Closing appliances in vessels of **45 m** in length and over need not be fitted to ventilators the coamings of which extend to more than 4.5 m above the working deck or more than 2.3 m above the superstructure deck unless specifically required by the Administration. In vessels of less than **45 m** in length, closing appliances need not be fitted to ventilators the coamings of which extend to more than 3.4 m above the working deck or more than 1.7 m above the superstructure deck. If the Administration is satisfied that it is unlikely that water will enter the vessel through machinery space ventilators, closing appliances to such ventilators may be omitted. (TP An. Reg. II/9(3))

2.10 Air pipes

2.10.1 Where air pipes to tanks and void spaces below deck extend above the working or the superstructure decks, the exposed parts of the pipes shall be of strength equivalent to the adjacent structures and fitted with appropriate protection. Openings of air pipes shall be provided with means of closing, permanently attached to the pipe or adjacent structure. (TP An. Reg. II/10(1))

2.10.2 The height of air pipes above deck to the point where water may have access below shall be at least 760 mm on the working deck and at least 450 mm on the superstructure deck. The Administration may accept reduction of the height of an air pipe to avoid interference with the fishing operations. (TP An. Reg. II/10(2))

2.11 Sounding devices

2.11.1 Sounding devices, to the satisfaction of the Administration, shall be fitted:

(a) to the bilges of those compartments which are not readily accessible at all times during the voyage; and

(b) to all tanks and cofferdams. (TP An. Reg. II/11(1))

2.11.2 Where sounding pipes are fitted, their upper ends shall be extended to a readily accessible position and, where practicable, above the working deck. Their openings shall be provided with permanently attached means of closing. Sounding pipes which are not extended above the working deck shall be fitted with automatic self-closing devices. (TP An. Reg. II/11(2))

2.12 Sidescuttles and windows

2.12.1 Sidescuttles to spaces below the working deck and to spaces within the enclosed structures on that deck shall be fitted with hinged deadlights capable of being closed watertight. (TP An. Reg. II/12(1))

2.12.2 No sidescuttle shall be fitted in such a position that its sill is less than 500 mm above the deepest operating waterline. (TP An. Reg. II/12(2))

2.12.3 Sidescuttles fitted less than 1,000 mm above the deepest operating waterline shall be of the fixed type. (TP An. Reg. II/12(3))

2.12.4 Sidescuttles, together with their glasses and deadlights shall be of an approved construction. Those prone to be damaged by fishing gear shall be suitably protected. (TP An. Reg. II/12(4))

2.12.5 Toughened safety glass or its equivalent shall be used for the wheelhouse windows. (TP An. Reg. II/12(5))

2.12.6 The Administration may accept sidescuttles and windows without deadlights in side and aft bulkheads of deckhouses located on or above the working deck, if satisfied that the safety of the vessel will not be impaired. (TP An. Reg. II/12(6)) (not applicable to NFV 2003)

2.12.6 The Administration may accept sidescuttles and windows without deadlights in side and aft bulkheads of deckhouses located on or above the working deck, if satisfied that the safety of the vessel will not be impaired, taking into account the rules of recognised organisations based upon the relevant ISO standards. (TP An. Reg. II/12(6) as amended by Dir.35)

Note:

Specific requirements concerning windows and sidescuttles are specified in Subchapter 14.5.3 of *Part III – Hull Equipment* of the *Rules*.

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 [regulation 4] shall be fitted with accessible means for preventing water from passing inboard. Normally each separate discharge shall have an automatic non-return valve with a positive means of closing it from an accessible position. Such a valve is not required if the Administration 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 piping is sufficient. The means for operating the positive action valve shall be provided with an indicator showing whether the valve is open or closed. (TP An. Reg. II/13(1))

2.13.2 In manned machinery spaces main and auxiliary sea inlets and discharges essential for the operation of machinery may be controlled locally. The controls shall be accessible and shall be provided with indicators showing whether the valves are open or closed. (TP An. Reg. II/13(2))

2.13.3 Fittings attached to the shell and the valves required by 2.13 [this regulation] shall be of steel, bronze or other approved ductile material. All pipes between the shell and the valves shall be of steel, except that in spaces other than machinery spaces of vessels constructed of material other than steel the Administration may approve the use of other materials. (TP An. Reg. II/13(3))

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 square metres on each side of the vessel for each well on the working deck shall be determined in relation to the length (l) and height of bulwark in the well as follows:

(a) $A = 0.07\ l$
(l need not be taken as greater than $0.7L$).

(b) (i) Where the bulwark is more than 1,200 mm in average height, the required area shall be increased by 0.004 m^2 per metre of length of well for each 100 mm difference in height.

(ii) 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. (TP An. Reg. II/14(1))

2.14.2 The freeing port area calculated according to 2.14.1 [paragraph (1)] shall be increased where the Administration considers that the vessel's sheer is not sufficient to ensure that the deck is rapidly and effectively freed of water. (TP An. Reg. II/14(2))

2.14.3 Subject to the approval of the Administration the minimum freeing port area for each well on the superstructure deck shall be not less than one half the area (*A*) given in 2.14.1 [paragraph (1)]. (TP An. Reg. II/14(3))

2.14.4 Freeing ports shall be so arranged along the length of bulwarks as to ensure that the deck is freed of water most rapidly and effectively. Lower edges of freeing ports shall be as near the deck as practicable. (TP An. Reg. II/14(4))

2.14.5 Poundboards and means for stowage of the fishing gear shall be arranged so that the effectiveness of freeing ports will not be impaired. Poundboards shall be so constructed that they can be locked in position when in use and shall not hamper the discharge of shipped water. (TP An. Reg. II/14(5))

2.14.6 Freeing ports over 300 mm in depth shall be fitted with bars spaced not more than 230 mm or less than 150 mm apart or provided with other suitable protective arrangements. Freeing port covers, if fitted, shall be of approved construction. If devices are considered necessary for locking freeing port covers during fishing operations, they shall be to the satisfaction of the Administration and easily operable from a readily accessible position. (TP An. Reg. II/14(6))

2.14.7 In vessels intended to operate in areas subject to icing, covers and protective arrangements for freeing ports shall be capable of being easily removed to restrict ice accretion. The size of openings and means provided for removal of these protective arrangements shall be to the satisfaction of the Administration. (TP An. Reg. II/14(7))

2.15 Anchor and mooring equipment

2.15.1 Anchor equipment designed for quick and safe operation shall be provided which shall 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 shall also be provided with adequate mooring equipment for safe mooring in all operating conditions. Anchor and mooring equipment shall be to the satisfaction of the Administration.* (TP An. Reg. II/15) (not applicable to NFV 2003)

* See annex II, "Recommended practice for anchor and mooring equipment", of part B of the *Code of Safety for Fishermen and Fishing Vessels, 2005*.

2.15.1 Anchor equipment designed for quick and safe operation shall be provided which shall 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 shall also be provided with adequate mooring equipment for safe mooring in all operating conditions. Anchor and mooring equipment shall be in accordance with the rules of a recognised organisation. (TP An. Reg. II/15 as amended by Dir.35)

Note:

Specific requirements concerning fishing vessel anchoring equipment are specified in Chapter 14 of *Part III – Hull equipment* of the *Rules*.

2.16 Working decks within an enclosed superstructure

2.16.1 Such decks shall be fitted with an efficient drainage system having an appropriate drainage capacity to dispose of washing water and fish guts. (Dir.70, An. IV, Reg. II/16.1)

2.16.2 All openings necessary for fishing operations shall be provided with means for quick and efficient closure by one person. (Dir.70, An. IV, Reg. II/16.2)

2.16.3 Where the catch is brought on to such decks for handling or processing, the catch shall be placed in a pound. Such pounds shall comply with 3.11 [Regulation 11 of Chapter III]. An efficient drainage system shall be fitted. Adequate protection against inadvertent influx of water to the working deck shall be provided. (Dir.70, An. IV, Reg. II/16.3)

2.16.4 At least two exits from such decks shall be provided. (Dir.70, An. IV, Reg. II/16.4)

2.16.5 The clear headroom in the working space shall at all points be not less than two meters. (Dir.70, An. IV, Reg. II/16.5)

2.16.6 A fixed ventilation system providing at least six changes of air per hour shall be provided. (Dir.70, An. IV, Reg. II/16.6)

2.17 Draught marks

2.17.1 All ships shall be provided with draught marks in decimetres on the stem and the stern on both sides. (Dir.70, An. IV, Reg. II/17.1)

2.17.2 Such marks shall be placed as close as practicable to the perpendiculars. (Dir.70, An. IV, Reg. II/17.2)

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

2.18.1 If RSW- or CSW-tanks or similar tank systems are used, such tanks shall be provided with a separate, permanently fitted arrangement for the filling and emptying of seawater. (Dir.70, An. IV, Reg. II/18.1)

2.18.2 If such tanks are to be used also for carrying dry cargo, the tanks shall be arranged with a bilge system and provided with adequate means to avoid ingress of water from the bilge system into the tanks. (Dir.70, An. IV, Reg. II/18.2)

CHAPTER III

3 STABILITY AND ASSOCIATED SEAWORTHINESS

3.1 General

3.1.1 Vessels shall be so designed and constructed that the requirements of this chapter will be satisfied in the operating conditions referred to in 3.7 [regulation 7]. Calculations of the righting lever curves shall be to the satisfaction of the Administration.* (TP An. Reg. III/1) (not applicable to NFV 2003)

* See part B, chapter 2, section 2.1 of the *International Code on Intact Stability, 2008 (2008 IS CODE),* adopted by the Maritime Safety Committee of the Organization by resolution MSC.267(85) and the *Code of practice concerning the accuracy of stability information for fishing vessels*, adopted by the Organization by resolution MSC.267(85).

3.1.1 Vessels shall be so designed and constructed that the requirements of this chapter will be satisfied in the operating conditions referred to in 3.7 [regulation 7]. Calculations of the righting lever curves shall be carried out in accordance with the IMO *Code on Intact Stability for All Types of Ships.* (TP An. Reg. III/1 as amended by Dir.35)

3.2 Stability criteria

3.2.1 The following minimum stability criteria shall be met unless the Administration is satisfied that operating experience justifies departures therefrom:

(a) the area under the righting lever curve (GZ curve) shall not be less than 0.055 m-rad up to 30° angle of heel and not less than 0.09 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° shall not be less than 0.03 m-rad. Θ_f is the angle of heel at which openings in the hull, superstructure or deckhouses which cannot rapidly be closed weathertight commence to immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open;

(b) the righting level GZ shall be at least 200 mm at an angle of heel equal to or greater than 30°;

(c) the maximum righting lever GZ_{max} shall occur at an angle of heel preferably exceeding 30° but not less than 25°;

(d) the initial metacentric height GM shall not be less than 350 mm for single deck vessels. In vessels with complete superstructure or vessels of 70 m in length and over, the metacentric height may be reduced to the satisfaction of the Administration but in no case shall be less than 150 mm. (TP An. Reg. III/2(1)) (not applicable to NFV 2003)

3.2.1 The following minimum stability criteria shall be met unless the Administration is satisfied that operating experience justifies departures therefrom. Any departure from the required minimum stability criteria, allowed by a Member State, shall be subject to the procedure of Article 4 of this Directive (i.e. Dir.70)*.

(a) the area under the righting lever curve (GZ curve) shall not be less than 0.055 m-rad up to 30° angle of heel and not less than 0.09 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° shall not be less than 0.03 m-rad. Θ_f is the angle of heel at which

openings in the hull, superstructure or deckhouses which cannot rapidly be closed weathertight commence to immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open;

(b) the righting level GZ shall be at least 200 mm at an angle of heel equal to or greater than 30°;

(c) the maximum righting lever GZ_{max} shall occur at an angle of heel preferably exceeding 30° but not less than 25°;

(d) the initial metacentric height GM shall 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 Administration but in no case shall be less than 150 mm. Reduction of the required metacentric height, allowed by a Member State, shall be subject to the procedure of Article 4 of this Directive (i.e. Dir.70). (TP An. Reg. III/2(1) as amended by Dir.35)

* The stability criteria for offshore supply vessels in paragraph 4.5.6.2.1 to 4.5.6.2.4 in the IMO *Code on Intact Stability for All Types of Ships*) may be considered as equivalent to the stability criteria in 3.2.1(a) to (c) [regulation 2(1)(a) to (c)]. This equivalence can only be applied, subject to satisfaction of the Administration, for fishing vessels with a hull form which is similar to that of offshore supply vessels.

3.2.2 Where arrangements other than bilge keels are provided to limit the angles of roll, the Administration shall be satisfied that the stability criteria given in 3.2.1 [paragraph (1)] are maintained in all operating conditions. (TP An. Reg. III/2(2))

3.2.3 Where ballast is provided to ensure compliance with 3.2.1 [paragraph (1)], its nature and arrangement shall be to the satisfaction of the Administration. (TP An. Reg. III/2(3)) (not applicable to NFV 2003)

3.2.3 Where ballast is provided to ensure compliance with 3.2.1 [paragraph (1)], its nature and arrangement shall be to the satisfaction of the Administration. In vessels with a length of less than **45 m**, such ballast shall be permanent. Where ballast is permanent, it shall be solid and fixed securely in the vessel. The Administration may accept liquid ballast, stored in completely filled tanks which are not connected to any pumping system of the vessel. If liquid ballast is used as permanent ballast to ensure compliance with 3.2.1 [paragraph (1)], details shall be included in the Certificate of Compliance and in the stability booklet.

Permanent ballast shall not be removed from the ship or relocated without the approval of the Administration. (TP An. Reg. III/2(3) as amended by Dir.35)

3.3 Flooding of fish-holds

3.3.1 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 shall be at least 20° unless the stability criteria of 3.2.1 [regulation 2(1)] can be satisfied with the respective fish-holds partially or completely flooded. (TP An. Reg. III/3)

3.4 Particular fishing methods

3.4.1 Vessels engaged in particular fishing methods where additional external forces are imposed on the vessel during fishing operations, shall meet the stability criteria of 3.2.1 [regulation 2(1)] increased, if necessary, to the satisfaction of the Administration. (TP An. Reg. III/4) (not applicable to NFV 2003)

3.4.1 Vessels engaged in particular fishing methods where additional external forces are imposed on the vessel during fishing operations, shall meet the stability criteria of 3.2.1 [regulation 2(1)] increased, if necessary, to the satisfaction of the Administration. Vessels engaged in beam trawling shall comply with the following increased stability criteria:

(a) the criteria for the area's under the righting lever and for the righting levers as given in 3.2.1(a) and (b) [regulation 2(1)(a) and (b)] shall be increased by 20 %;

(b) the metacentric height shall not be less than 500 mm;

(c) the criteria as given under (a) shall be applicable only to vessels with an installed propulsion power not exceeding the value in kilowatts as given in the following formulas:

- $N = 0{,}6\ L_s^2$ for vessels with a length of **35 m** or less, and
- $N = 0{,}7\ L_s^2$ for vessels with a length of **37 m** and over,
- at intermediate length of the vessel the coefficient for L_s has to be obtained by interpolation in between 0,6 and 0,7,
- L_s is the overall length according to the *Tonnage Certificate*.

If the installed propulsion power exceeds the values for the standard propulsion power as given in the above formulas the criteria as mentioned under (a) shall be increased directly proportional to the higher propulsion power.

The Administration shall be satisfied that the above increased stability criteria for beam trawlers are met in the operating conditions mentioned under 3.7.1 [regulation 7(1)] of this chapter.

For the calculation of the stability, the beams shall be assumed to be hoisted up to an angle of 45 degrees with the horizontal. (TP An. Reg. III/4 as amended by Dir.35)

3.5 Severe wind and rolling

3.5.1 Vessels shall be able to withstand, to the satisfaction of the Administration, the effect of severe wind and rolling in associated sea conditions 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.* (TP An. Reg. III/5) (not applicable to NFV 2003)

* See part B, chapter 2, paragraph 2.1.4 of the *International Code on Intact Stability, 2008 (2008 IS CODE)*, adopted by the Maritime Safety Committee of the Organization by resolution MSC.267(85).

3.5.1 Vessels shall be able to withstand the effect of severe wind and rolling in associated sea conditions 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 relevant calculations shall be carried out in accordance with the IMO *Code on Intact Stability for All Types of Ships*. (TP An. Reg. III/5 as amended by Dir.35)

3.6 Water on deck

3.6.1 Vessels shall be able to withstand, to the satisfaction of the Administration, 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.* (TP An. Reg. III/6)

* 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 International Conference on Safety of Fishing Vessels, 1993.

3.7 Operating conditions

3.7.1 The number and type of operating conditions to be considered shall be to the satisfaction of the Administration and shall include the following, as appropriate:

(a) departure for the fishing grounds with full fuel, stores, ice, fishing gear, etc.;

(b) departure from the fishing grounds with full catch;

(c) arrival at home port with full catch and 10 per cent stores, fuel, etc.; and

(d) arrival at home port with 10 per cent stores, fuel, etc. and a minimum catch, which shall normally be 20 per cent of full catch but may be up to 40 per cent, provided the Administration is satisfied that operating patterns justify such a value. (TP An. Reg. III/7(1))

3.7.2 In addition to the specific operating conditions given in 3.7.1 [paragraph (1)] the Administration shall also be satisfied that the minimum stability criteria given in 3.2 [regulation 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 Administration shall 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. (TP An. Reg. III/7(2))

3.7.3 Concerning the conditions referred to in 3.7.1 [paragraph (1)], the calculations shall include the following:

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

(b) allowance for ice accretion, if anticipated, in accordance with the provisions of 3.8 [regulation 8];

(c) homogeneous distribution of the catch, unless this is inconsistent with practice;

(d) catch on deck, if anticipated, in operating conditions referred to in 3.7.1(b) and (c) [paragraph (1)(b) and (c)] and 3.7.2 [paragraph (2)];

(e) 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

(f) allowance for the free surface effect of liquids and, if applicable, catch carried. (TP An. Reg. III/7(3))

3.8 Ice accretion

This 3.8 [regulation 4.8] applies except where the modification of the icing allowance, left to the discretion of the Administration by recommendation 2* is not allowed. (TP An. Reg. III/8 as amended by Dir.35)

* For sea areas where ice accretion may occur and modifications of the icing allowance are suggested, see *Guidance relating to Ice Accretion* contained in recommendation 2 of attachment 3 to the final Act of the Torremolinos Conference.

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

(a) 30 kg/m$_2$ on exposed weather decks and gangways;

(b) 7.5 kg/m$_2$ for projected lateral area of each side of the vessel above the water plane;

(c) 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 shall be computed by increasing the total projected area of continuous surfaces by 5 per cent and the static moments of this area by 10 per cent. (TP An. Reg. III/8(1))

3.8.2 Vessels intended for operation in areas where ice accretion is known to occur shall be:

(a) designed to minimize the accretion of ice; and

(b) equipped with such means for removing ice as the Administration may require. (TP An. Reg. III/8(2))

3.9 Inclining test

3.9.1 Every vessel shall undergo an inclining test upon its completion and the actual displacement and position of the centre of gravity shall be determined for the lightship condition. (TP An. Reg. III/9(1))

3.9.2 Where alterations are made to a vessel affecting its lightship condition and the position of the centre of gravity, the vessel shall, if the Administration considers this necessary, be re-inclined and the stability information revised. (TP An. Reg. III/9(2))

3.9.3 The Administration may allow the inclining test of an individual vessel to be dispensed with, provided basic stability data are available from the inclining test of a sister ship and it is shown, to the satisfaction of the Administration, that reliable stability information for the exempted vessel can be obtained from such basic data. (TP An. Reg. III/9(3))

3.9.4 The inclining test and determination of conditions required by 3.9.1 [Regulation III/9(1)] shall be performed at least every 10 years. (Dir.70, An. IV, Reg. III/9.4)

3.10 Stability information

3.10.1 Suitable stability information shall be supplied to enable the skipper to assess with ease and certainty the stability of the vessel under various operating conditions.* Such information shall 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. A copy of the stability information shall be submitted to the Administration for approval.** (TP An. Reg. III/10(1))

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* See the *Guidance on stability information*, contained in recommendation 3 of attachment 3 to the Final Act of the International Conference on Safety of Fishing Vessels, 1993.

** See the *Code of practice concerning the accuracy of stability information for fishing vessels*, adopted by the Organization by resolution A.267(VIII).

3.10.2 The approved stability information shall 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. (TP An. Reg. III/10(2))

3.10.3 Where alterations are made to a vessel affecting its stability, revised stability calculations shall be prepared and submitted to the Administration for approval. If the Administration decides that the stability information must be revised, the new information shall be supplied to the skipper and the superseded information removed. (TP An. Reg. III/10(3))

3.11 Portable fish-hold divisions

3.11.1 The catch shall be properly secured against shifting which could cause dangerous trim or heel of the vessel. The scantlings of portable fish-hold divisions, if fitted, shall be to the satisfaction of the Administration.* (TP An. Reg. III/11)

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* See appendix V of the *Recommendation on intact stability of fishing vessels*, adopted by the Organization by resolution A.168(ES.IV), as amended by resolution A.268(VIII).

3.12 Bow height

3.12.1 The bow height shall be sufficient, to the satisfaction of the Administration, to prevent the excessive shipping of water and shall 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.* (TP An. Reg. III/12) (not applicable to NFV 2003)

* See the *Guidance on a method of calculation of bow height*, contained in recommendation 4 of attachment 3 to the Final Act of the International Conference on Safety of Fishing Vessels, 1993.

3.12.1 The bow height shall be sufficient to prevent the excessive shipping of water.

For vessels operating in restricted areas not more than 10 miles from the coast, the minimum bow height shall be to the satisfaction of the Administration and be determined taking into account the seasonal weather conditions, the sea states in which the vessel will operate, the type of the vessel and its mode of operation.

For vessels operating in all other areas:

.1 where, during the fishing operations, the catch has to be stowed into the fish holds via hatchways, which are situated on a exposed working deck forward of the deckhouse or superstructure, the minimum bow height shall be calculated in accordance with the method of calculation, contained in recommendation 4 of attachment 3 to the *Final Act of the Torremolinos conference*;

.2 where the catch has to be stowed into the fish holds via a hatchway, which is situated on an exposed working deck, protected by a deckhouse or superstructure, the minimum bow height shall be in accordance with regulation 39 of Annex I to the *International Load Line Convention 1966*, but shall not be less than 2 000 mm. In this respect the maximum permissible operating draught is to be regarded in place of the assigned summer freeboard. (TP An. Reg. III/12 as amended by Dir.35)

3.13 Maximum permissible operating draught

3.13.1 A maximum permissible operating draught shall be approved by the Administration and shall be such that, in the associated operating condition, the stability criteria of this chapter III and the requirements of chapters II and VI, as appropriate, are satisfied. (TP An. Reg. III/13)

3.14 Subdivision and damage stability

3.14.1 Vessels of **100 m** in length and over, where the total number of persons carried is 100 or more, shall be capable, to the satisfaction of the Administration, of remaining afloat with positive stability, after the flooding of any one compartment assumed damaged, having regard to the type of vessel, the intended service and area of operation.* (TP An. Reg. III/14) (not applicable to NFV 2003)

* See the *Guidance on subdivision and damage stability calculations*, contained in recommendation 5 of attachment 3 to the Final Act of the International Conference on Safety of Fishing Vessels, 1993.

3.14.1 Vessels of **100 m** in length and over, where the total number of persons carried is 100 or more, shall be capable of remaining afloat with positive stability, after the flooding of any one compartment assumed damaged, having regard to the type of vessel, the intended service and area of operation.* Calculations to be carried out in accordance with the guidance as mentioned in the footnote. (TP An. Reg. III/14 as amended by Dir.35)

* See the *Guidance on subdivision and damage stability calculations*, contained in recommendation 5 of attachment 3 to the Final Act of the International Conference on Safety of Fishing Vessels, 1993.

CHAPTER IV

4 MACHINERY AND ELECTRICAL INSTALLATIONS AND PERIODICALLY UNATTENDED MACHINERY SPACES

PART A
GENERAL

4.1 Application

4.1.1 Unless provided otherwise, Chapter IV [this chapter] shall apply to new fishing vessels of 24 metres in length and over. (TP An. Reg. IV/1 as amended by Dir.70)

Existing fishing vessels shall comply with this Chapter in accordance with 1.1.3.

4.2 Definitions

.1 ***Main steering gear*** is the machinery, the steering gear power units, if any, and ancillary equipment and the means of applying torque to the rudder stock (e.g. tiller or quadrant) necessary for effecting movement of the rudder for the purpose of steering the vessel under normal service conditions. (TP An. Reg. IV/2(1))

.2 ***Auxiliary means of activating the rudder*** is the equipment which is provided for effecting movement of the rudder for the purpose of steering the vessel in the event of failure of the main steering gear. (TP An. Reg. IV/2(2))

.3 ***Steering gear power unit*** means, in the case of:

(a) electric steering gear, an electric motor and its associated electrical equipment;

(b) electro-hydraulic steering gear, an electric motor and its associated electrical equipment and connected pump; and

(c) other hydraulic steering gear, a driving engine and connected pump. (TP An. Reg. IV/2(3))

.4 ***Maximum ahead service speed*** is the greatest speed which the vessel is designed to maintain in service at sea at its maximum permissible operating draught. (TP An. Reg. IV/2(4))

.5 ***Maximum astern speed*** is the speed which it is estimated the vessel can attain at the designed maximum astern power at its maximum permissible operating draught. (TP An. Reg. IV/2(5))

.6 ***Fuel oil unit*** is the equipment used for the preparation of fuel oil for delivery to an oil-fired boiler, or equipment used for the preparation of oil for delivery to an internal combustion engine, and includes any oil pressure pumps, filters and heaters dealing with oil at a pressure greater than 0.18 N/mm^2. (TP An. Reg. IV/2(6))

.7 ***Normal operational and habitable conditions*** means conditions under which the vessel as a whole, its machinery services, means of main and auxiliary propulsion, steering gear and associated equipment, aids to safe navigation and to limit the risks of fire and flooding, internal and external means of communicating and signalling, means of escape and winches for rescue boats, are in proper working order and the minimum comfortable conditions of habitability are satisfactory. (TP An. Reg. IV/2(7))

.8 ***Dead ship condition*** is the condition under which the main propulsion plant, boilers and auxiliaries are not in operation due to the absence of power. (TP An. Reg. IV/2(8))

.9 ***Main switchboard*** is a switchboard directly supplied by the main source of electrical power and intended to distribute electrical energy. (TP An. Reg. IV/2(9))

.10 ***Periodically unattended machinery spaces*** means those spaces containing main propulsion and associated machinery and all sources of main electrical supply which are not at all times manned under all operating conditions, including manoeuvring. (TP An. Reg. IV/2(10))

4.3 General

4.3.1 Machinery installations

4.3.1.1 Main propulsion, control, steam pipe, fuel oil, compressed air, electrical and refrigeration systems; auxiliary machinery; boilers and other pressure vessels; piping and pumping arrangements; steering equipment and gears, shafts and couplings for power transmission shall be designed, constructed, tested, installed and serviced to the satisfaction of the Administration. This machinery and equipment, as well as lifting gear, winches, fish handling and fish processing equipment shall be protected so as to reduce to a minimum any danger to persons on board. Special attention shall be paid to moving parts, hot surfaces and other dangers. (TP An. Reg. IV/3(1)) (not applicable to NFV 2003)

4.3.1.1 Main propulsion, control, steam pipe, fuel oil, compressed air, electrical and refrigeration systems; auxiliary machinery; boilers and other pressure vessels; piping and pumping arrangements; steering equipment and gears, shafts and couplings for power transmission shall be designed, constructed, tested, installed and serviced in accordance with the rules of a recognised organisation. This machinery and equipment, as well as lifting gear, winches, fish handling and fish processing equipment shall be protected so as to reduce to a minimum any danger to persons on board. Special attention shall be paid to moving parts, hot surfaces and other dangers. (TP An. Reg. IV/3(1) as amended by Dir.35)

Note:

Requirements concerning:

- main propulsion, auxiliary machinery, boilers and other pressure vessels, steering equipment and gears, shafts and couplings, refrigeration systems are specified in *Part VII – Main and Auxiliary Machinery and Equipment* of the *Rules*;
- piping and pumping arrangements are specified in *Part VI – Ship and Machinery Piping Systems* of the *Rules*;
- electrical and control systems are specified in *Part VIII – Electrical Installations and Control Systems* of the *Rules*.

4.3.1.2 Machinery spaces shall 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 shall be adequately ventilated. (TP An. Reg. IV/3(2))

4.3.1.3 Means shall be provided whereby the operational capability of the propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative. Special consideration shall be given to the functioning of:

(i) the arrangements which supply fuel oil pressure for main propulsion machinery;
(ii) the normal sources of lubricating oil pressure;
(iii) the hydraulic, pneumatic and electrical means for the control of main propulsion machinery including controllable pitch propellers;
(iv) the sources of water pressure for main propulsion cooling systems; and
(v) an air compressor and an air receiver for starting or control purposes,

provided that the Administration may, having regard to overall safety considerations, accept a partial reduction in capability in lieu of full normal operation. (TP An. Reg. IV/3(3)(a))

4.3.1.4 Means shall be provided whereby the machinery can be brought into operation from the dead ship condition without external aid. (TP An. Reg. IV/3(3)(b))

4.3.1.5 Main propulsion machinery and all auxiliary machinery essential to the propulsion and the safety of the vessel shall, as fitted, be capable of operating whether the vessel is upright or listed up to 15° either way under static conditions and up to 22.5° either way under dynamic conditions, i.e. when rolling either way and simultaneously pitching (inclined dynamically) up to 7.5° by bow or stern. The Administration may permit deviation from these angles, taking into consideration the type, size and service conditions of the vessel. (TP An. Reg. IV/3(4))

4.3.1.6 Special consideration shall be given to the design, construction and installation of propulsion machinery systems so that any mode of their vibrations shall not cause undue stresses in such machinery systems in the normal operating ranges. (TP An. Reg. IV/3(5))

4.3.2 Electrical installations

4.3.2.1 The design and construction of electrical installations shall be such as to provide:

(a) the services necessary to maintain the vessel in normal operational and habitable conditions without having recourse to an emergency source of power;

(b) the services essential to safety when failure of the main source of electrical power occurs; and

(c) protection of the crew and vessel from electrical hazards. (TP An. Reg. IV/3(6))

4.3.2.2 The Administration shall be satisfied that 4.16 to 4.18 [regulations 16 to 18] are uniformly implemented and applied. (TP An. Reg. IV/3(7)) (not applicable to NFV 2003)

* See also the recommendation published by the International Electrotechnical Commission and, in particular, Publication 60092, Electric installations in ships.

4.3.2.2 The Administration shall be satisfied that 4.16 to 4.18 [regulations 16 to 18] are uniformly implemented and applied in accordance with the rules of a recognised organisation.* (TP An. Reg. IV/3(7) as amended by Dir.35)

* See also the recommendation published by the International Electrotechnical Commission and, in particular, *Publication 92, "Electric installations in ships"*.

Note:

Requirements concerning main and auxiliary source of electric power and precautions against shock, fire and other hazards of electric origin are specified respectively in Chapters 3, 9 and 2 of *Part VIII – Electrical Installations and Control Systems* of the *Rules*.

4.3.3 Periodically unattended machinery spaces

4.3.3.1 4.19 to 4.24 [Regulations 19 to 24] shall apply, in addition to 4.3 to 4.18 [regulations 3 to 18] and 5.1 to 5.44 [V/1 to V/44], to vessels with periodically unattended machinery spaces. (TP An. Reg. IV/3(8))

4.3.3.2 Measures shall be taken, to the satisfaction of the Administration, to ensure that all equipment is functioning in a reliable manner in all operating conditions, including manoeuvring, and that arrangements to the satisfaction of the Administration are made for regular inspections and routine tests to ensure continuous reliable operation. (TP An. Reg. IV/3(9)) (not applicable to NFV 2003)

4.3.3.2 Measures shall be taken, to the satisfaction of the Administration, to ensure that all equipment is functioning in a reliable manner in all operating conditions, including manoeuvring, and that arrangements in accordance with the rules of a recognised organisation are made for regular inspections and routine tests to ensure continuous reliable operation. (TP An. Reg. IV/3(9) as amended by Dir.35)

Note:

Requirements concerning periodical surveys and related test of all equipment are specified in *Part I – Classification Regulations* of the *Rules*.

4.3.3.3 Vessels shall be provided with documentary evidence, to the satisfaction of the Administration, of their fitness to operate with periodically unattended machinery spaces. (TP An. Reg. IV/3(10)) (not applicable to NFV 2003)

4.3.3.3 Vessels shall be provided with documentary evidence, complying with the rules of a recognised organisation of their fitness to operate with periodically unattended machinery spaces. (TP An. Reg. IV/3(10) as amended by Dir.35)

Note:

Requirements concerning documentary evidence for periodically unattended machinery spaces are specified in Subchapter 1.4 of *Part VIII – Electrical Installations and Control Systems* of the *Rules*.

PART B
MACHINERY INSTALLATIONS

4.4 Machinery

4.4.1 Main and auxiliary machinery essential for the propulsion and safety of the vessel shall be provided with effective means of control. (TP An. Reg. IV/4(1))

4.4.2 Internal combustion engines of a cylinder diameter greater than 200 mm or a crankcase volume greater than 0.6 m^3 shall be provided with crankcase explosion relief valves of an approved type with sufficient relief area. (TP An. Reg. IV/4(2))

4.4.3 Where main or auxiliary machinery including pressure vessels or any parts of such machinery are subject to internal pressure and may be subject to dangerous overpressure, means shall be provided, where applicable, which will protect against such excessive pressure. (TP An. Reg. IV/4(3))

4.4.4 All gearing and every shaft and coupling used for transmission of power to machinery essential for the propulsion and safety of the vessel or the safety of persons on board shall be so designed and constructed that it will withstand the maximum working stresses to which it may be subjected in all service conditions. Due consideration shall be given to the type of engines by which it is driven or of which it forms part. (TP An. Reg. IV/4(4))

4.4.5 Main propulsion machinery and, where applicable, auxiliary machinery shall be provided with automatic shut-off arrangements in the case of failures, such as lubricating oil supply failure, which could lead rapidly to damage, complete breakdown or explosion. An advance alarm shall also be provided so that warning is given before automatic shut-off, but the Administration may permit provisions for overriding automatic shut-off devices. The Administration may also exempt vessels from the provisions of this paragraph, giving consideration to the type of vessel or its specific service. (TP An. Reg. IV/4(5))

4.5 Means of going astern*

*See the *Recommendation on the provision and the display of manoeuvring information on board ships*, adopted by the Organization by resolution A.601(15) and *Standards for ship manoeuvrability*, adopted by the Maritime Safety Committee of the Organization by resolution MSC.137(76).

4.5.1 Vessels shall have sufficient power for going astern to secure proper control of the vessel in all normal circumstances. (TP An. Reg. IV/5(1))

4.5.2 The ability of the machinery to reverse the direction of thrust of the propeller in sufficient time and so to bring the vessel to rest within a reasonable distance from maximum ahead service speed shall be demonstrated at sea. (TP An. Reg. IV/5(2))

4.6 Steam boilers, feed systems and steam piping arrangements

4.6.1 Every steam boiler and every unfired steam generator shall be provided with not less than two safety valves of adequate capacity. Provided that the Administration may, having regard to the output or any other features of any steam boiler or unfired steam generator, permit only one safety valve to be fitted if satisfied that adequate protection against overpressure is thereby provided. (TP An. Reg. IV/6(1)) (not applicable to NFV 2003)

4.6.1 Every steam boiler and every unfired steam generator shall be provided with not less than two safety valves of adequate capacity. However the Administration may, having regard to the output or any other features of any steam boiler or unfired steam generator, permit only one safety valve to be fitted if satisfied that adequate protection against overpressure is thereby provided in accordance with the rules of a recognised organisation. (TP An. Reg. IV/6(1))

Note:

Requirements concerning steam boilers and generators safety valves are specified in Subchapter 9.7 of *Part VII – Main and auxiliary machinery and equipment* of the *Rules*.

4.6.2 Every oil-fired steam boiler which is intended to operate without manual supervision shall have safety arrangements which shut off the fuel supply and give an alarm in the case of low water level, air supply failure or flame failure. (TP An. Reg. IV/6(2))

4.6.3 The Administration shall give special consideration to steam boiler installations to ensure that feed systems, monitoring devices and safety provisions are adequate in all respects to ensure the safety of boilers, steam pressure vessels and steam piping arrangements. (TP An. Reg. IV/6(3))

4.7 Communication between the wheelhouse and machinery space

4.7.1 Two separate means of communication between the wheelhouse and the machinery space control platform shall be provided, one of which shall be an engine-room telegraph, except that in vessels of less than **45 metres** in length, where the propulsion machinery is directly controlled from the wheelhouse, the administration may accept means of communication other than an engine room telegraph.. (TP An. Reg. IV/7(1) as amended by Dir.70)

4.8 Wheelhouse control of propulsion machinery

4.8.1 Where remote control of propulsion machinery is provided from the wheelhouse, the following shall apply:

(a) under all operating conditions, including manoeuvring, the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the wheelhouse;

(b) the remote control referred to in subparagraph (a) shall be performed by means of a control device to the satisfaction of the Administration with, where necessary, means of preventing overload of the propulsion machinery; (not applicable to NFV 2003)

(b) where remote control of propulsion machinery is provided from the wheelhouse, the following shall apply: the remote control referred to in subparagraph (a) shall be performed by means of a control device complying with the rules of a recognised organisation with, where necessary, means of preventing overload of the propulsion machinery;

Note:

Requirements concerning remote control of propulsion machinery are specified in Chapter 20 of *Part VIII – Electrical Installations and Control Systems* of the *Rules*.

(c) the main propulsion machinery shall be provided with an emergency stopping device in the wheelhouse and independent from the wheelhouse control system referred to in subparagraph (a);

(d) remote control of the propulsion machinery shall be possible only from one station at a time; at any control station, interlocked control units may be permitted. There shall be at each station an indicator showing which station is in control of the propulsion

machinery. The transfer of control between the wheelhouse and machinery spaces shall be possible only in the machinery space or control room. On vessels of less than **45 metres** in length the administration may permit the control station in the machinery space to be an emergency station only, provided that the monitoring and control in the wheelhouse is adequate. (subparagraph (d) as amended by Res.70)

(e) indicators shall be fitted in the wheelhouse for:

(i) propeller speed and direction in the case of fixed propellers;

(ii) propeller speed and pitch position in the case of controllable pitch propellers; and

(iii) advance alarm as required in 4.4.5 [regulation 4(5)];

(f) it shall be possible to control the propulsion machinery locally even in the case of failure in any part of the remote control system;

(g) unless the Administration considers it impracticable, the design of the remote control system shall be such that, if it fails, an alarm will be given and the pre-set speed and direction of thrust will be maintained until local control is in operation;

(h) special arrangements shall be provided to ensure that automatic starting shall not exhaust the starting possibilities. An alarm shall be provided to indicate low starting air pressure and shall be set at a level which will still permit main engine starting operations. (TP An. Reg. IV/8(1))

4.8.2 Where the main propulsion and associated machinery including sources of main electrical supply are provided with various degrees of automatic or remote control and are under continuous manned supervision from a control room, the control room shall be so designed, equipped and installed that the machinery operation will be as safe and effective as if it were under direct supervision. (TP An. Reg. IV/8(2))

4.8.3 In general, automatic starting, operational and control systems shall include means for manually overriding the automatic means, even in the case of failure of any part of the automatic and remote control system. (TP An. Reg. IV/8(3))

4.9 Air pressure systems

4.9.1 Means shall be provided to prevent excess pressure in any part of compressed air systems and wherever water-jackets or casings of air compressors and coolers might be subjected to dangerous excess pressure due to leakage into them from air pressure parts. Suitable pressure-relief arrangements shall be provided. (TP An. Reg. IV/9(1))

4.9.2 The main starting air arrangements for main propulsion internal combustion engines shall be adequately protected against the effects of backfiring and internal explosion in the starting air pipes. (TP An. Reg. IV/9(2))

4.9.3 All discharge pipes from starting air compressors shall lead directly to the starting air receivers and all starting pipes from the air receivers to main or auxiliary engines shall be entirely separate from the compressor discharge pipe system. (TP An. Reg. IV/9(3))

4.9.4 Provision shall be made to reduce to a minimum the entry of oil into the air pressure systems and to drain these systems. (TP An. Reg. IV/9(4))

4.10 Arrangements for fuel oil, lubricating oil and other flammable oils

4.10.1 Fuel oil which has a flashpoint of less than 60°C (closed cup test) as determined by an approved flashpoint apparatus shall not be used as fuel, except in emergency generators, in which case the flashpoint shall be not less than 43°C. The Administration may permit the general use of fuel oil having a flashpoint of not less than 43°C subject to such additional precautions as it may consider necessary and on condition that the temperature of the space in which such fuel is stored or used shall not rise to within 10°C below the flashpoint of the fuel. (TP An. Reg. IV/10(1))

4.10.2 Safe and efficient means of ascertaining the amount of fuel oil contained in any oil tank shall be provided. If sounding pipes are installed, their upper ends shall terminate in safe positions and shall 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. (TP An. Reg. IV/10(2))

4.10.3 Provision shall be made to prevent overpressure in any oil tank or in any part of the fuel oil system including the filling pipes. Relief valves and air or overflow pipes shall discharge to a position and in a manner which is safe. (TP An. Reg. IV/10(3))

4.10.4 Subject to the satisfaction of the Administration, fuel oil pipes which, if damaged, would allow oil to escape from a storage, settling or daily service tank situated above the double bottom, shall be fitted with a cock or valve on the tank capable of being closed from a safe position outside the space concerned in the event of a fire arising in the space in which such tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel or similar space, valves on the tank shall be fitted but control in the event of fire may be effected by means of an additional valve on the pipe or pipes outside the tunnel or similar space. If such additional valve is fitted in the machinery space, it shall be capable of being operated outside this space. (TP An. Reg. IV/10(4)) (not applicable to NFV 2003)

4.10.4 Fuel oil pipes which, if damaged, would allow oil to escape from a storage, settling or daily service tank situated above the double bottom, shall be fitted with a cock or valve on the tank capable of being closed from a safe position outside the space concerned in the event of a fire arising in the space in which such tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel or similar space, valves on the tank shall be fitted but control in the event of fire may be effected by means of an additional valve on the pipe or pipes outside the tunnel or similar space. If such additional valve is fitted in the machinery space, it shall be capable of being operated outside this space. (TP An. Reg. IV/10(4) as amended by Dir.35)

4.10.5 Pumps forming part of the fuel oil system shall be separate from any other system and the connections of any such pumps shall be provided with an efficient relief valve which shall be in closed circuit. Where fuel oil tanks are alternatively used as liquid ballast tanks, proper means shall be provided to isolate the fuel oil and ballast systems. (TP An. Reg. IV/10(5))

4.10.6 No oil tank shall be situated where spillage or leakage therefrom can constitute a hazard by falling on heated surfaces. Precautions shall be taken to prevent any oil that may escape under pressure from any pump, filter or heater from coming into contact with heated surfaces. (TP An. Reg. IV/10(6))

4.10.7 Fuel oil pipes and their valves and fittings shall be steel or other equivalent material, provided that restricted use of flexible pipes may be permitted in positions where the Administration is satisfied that they are necessary. Such flexible pipes and end attachments shall be of adequate strength and shall, to the satisfaction of the Administration, be constructed of approved fire-resistant materials or have fire-resistant coatings. (TP An. Reg. IV/10(7)(a)) (not applicable to NFV 2003)

4.10.7 Fuel oil pipes and their valves and fittings shall be steel or other equivalent material, provided that a minimum of flexible pipes may be used. Such flexible pipes and end attachments shall be of adequate strength and shall be constructed of approved fire resistant material or have fire-resistant coatings in accordance with the rules of a recognised organisation. Fitting of those flexible pipes shall be in accordance with the IMO MSC. Circ. 647 "*Guidelines to minimise leakages from flammable liquid systems*". (TP An. Reg. IV/10(7)(a) as amended by Dir.35)

Note:
Requirements concerning flexible pipes and their properties are specified in Subchapter 1.6.12 of *Part VI – Ship and Machinery Piping Systems* of the *Rules*.

4.10.8 Where necessary, fuel oil and lubricating oil pipelines shall 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 shall be kept to a minimum. (TP An. Reg. IV/10(7)(b))

4.10.9 As far as practicable, fuel oil tanks shall be part of the vessel's structure and shall be located outside machinery spaces of category A. Where fuel oil tanks, other than double bottom tanks, are necessarily located adjacent to or within machinery spaces of category A, at least one of their vertical sides shall be contiguous to the machinery space boundaries, and shall preferably have a common boundary with the double bottom tanks, where fitted, and the area of the tank boundary common with the machinery space shall be kept to a minimum. When such tanks are sited within the boundaries of machinery spaces of category A, they shall not contain fuel oil having a flashpoint of less than 60°C (closed cup test). In general, the use of free-standing fuel oil tanks shall be avoided in fire hazard areas and, particularly, in machinery spaces of category A. When free-standing fuel oil tanks are permitted, they shall be placed in an oil-tight spill tray of ample size having a suitable drain pipe leading to a suitably sized spill oil tank. (TP An. Reg. IV/10(8))

4.10.10 The ventilation of machinery spaces shall be sufficient under all normal conditions to prevent accumulation of oil vapour. (TP An. Reg. IV/10(9))

4.10.11 The arrangements for the storage, distribution and use of oil employed in pressure lubrication systems shall be to the satisfaction of the Administration. Such arrangements in machinery spaces of category A and, wherever practicable, in other machinery spaces shall at least comply with the provisions of 4.10.1, 4.10.3, 4.10.6, 4.10.7 and 4.10.8 [paragraphs (1), (3), (6) and (7)] and, in so far as the Administration may consider necessary, with 4.10.2 and 4.10.4 [paragraphs (2) and (4)]. This does not preclude the use of sight flow glasses in lubrication systems provided they are shown by test to have a suitable degree of fire resistance. (TP An. Reg. IV/10(10)) (not applicable to NFV 2003)

4.10.11 The arrangements for the storage, distribution and use of oil employed in pressure lubrication systems shall be in accordance with the rules of a recognised organisation. Such arrangements in machinery spaces of category A and, wherever practicable, in other machinery spaces shall at least comply with the provisions of 4.10.1, 4.10.3, 4.10.6, 4.10.7 and 4.10.8

[paragraphs (1), (3), (6) and (7)] and, in so far as necessary in accordance with the rules of a recognised organisation, with 4.10.2 and 4.10.4 [paragraphs (2) and (4)]. This does not preclude the use of sight flow glasses in lubrication systems provided they are shown by test to have a suitable degree of fire resistance. (TP An. Reg. IV/10(10) as amended by Dir.35)

Note:

Requirements concerning pressure lubrication systems are specified in Chapter 9 of *Part VI – Ship and Machinery piping systems* of the *Rules*.

4.10.12 The arrangements for the storage, distribution and use of flammable oils employed under pressure in power transmission systems other than oils referred to in 4.10.11 [paragraph (10)] in control and activating systems and heating systems shall be to the satisfaction of the Administration. In locations where means of ignition are present, such arrangements shall at least comply with the provisions of 4.10.2 and 4.10.6 [paragraphs (2) and (6)] and with the provisions of 4.10.3 and 4.10.7 [paragraphs (3) and (7)] in respect of strength and construction. (TP An. Reg. IV/10(11))

4.10.13 Fuel oil, lubricating oil and other flammable oils shall not be carried in forepeak tanks. (TP An. Reg. IV/10(12))

4.11 Bilge pumping arrangements

4.11.1 An efficient bilge pumping plant shall be provided which under all practical conditions shall be capable of pumping from and draining any watertight compartment which is neither a permanent oil tank nor a permanent water tank whether the vessel is upright or listed. Wing suctions shall be provided if necessary for that purpose. Arrangements shall be provided for easy flow of water to the suction pipes. Provided the Administration is satisfied that the safety of the vessel is not impaired the bilge pumping arrangements may be dispensed with in particular compartments. (TP An. Reg. IV/11(1))

4.11.2 At least two independently driven power bilge pumps shall be provided, one of which may be driven by the main engine. A ballast pump or other general service pump of sufficient capacity may be used as a power driven bilge pump. (TP An. Reg. IV/11(2)(a))

4.11.3 Power bilge pumps shall be capable of giving a speed of water of at least 2 m/s through the main bilge pipe which shall have an internal diameter of at least:

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

where:

d is the internal diameter in millimetres; 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 Administration. (TP An. Reg. IV/11(2)(b))

4.11.4 Each of the bilge pumps provided in accordance with 4.11 [this regulation] shall be provided with a direct bilge suction, one of these suctions drawing from the port side of the machinery space and the other from the starboard side, except that in the case of a vessel of less than **75 m** in length only one bilge pump need be provided with a direct bilge suction. (TP An. Reg. IV/11(2)(c))

4.11.5 No bilge suction shall have an inside diameter of less than 50 mm. The arrangement and sizing of the bilge system shall be such that the full rated capacity of the pump specified above can be applied to each of the watertight compartments located between the collision and afterpeak bulkheads. (TP An. Reg. IV/11(2)(d))

4.11.6 A bilge ejector in combination with an independently driven high pressure seawater pump may be installed as a substitute for one independently driven bilge pump required by 4.11.2 [paragraph (2)(a)], provided this arrangement is to the satisfaction of the Administration. (TP An. Reg. IV/11(3))

4.11.7 In vessels, where fish handling or processing may cause quantities of water to accumulate in enclosed spaces, adequate drainage shall be provided. (TP An. Reg. IV/11(4))

4.11.8 Bilge pipes shall not be led through fuel oil, ballast or double bottom tanks, unless these pipes are of heavy gauge steel construction. (TP An. Reg. IV/11(5))

4.11.9 Bilge and ballast pumping systems shall 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 shall 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 shall be of a non-return type. (TP An. Reg. IV/11(6))

4.11.10 Any bilge pipe piercing a collision bulkhead shall be fitted with a positive means of closing at the bulkhead with remote control from the working deck with an indicator showing the position of the valve provided that, if the valve is fitted on the after side of the bulkhead and is readily accessible under all service conditions, the remote control may be dispensed with. (TP An. Reg. IV/11(7))

4.12 Protection against noise

4.12.1 Measures shall be taken to reduce the effects of noise upon personnel in machinery spaces to levels satisfactory to the Administration.* (TP An. Reg. IV/12) (not applicable to NFV 2003)

* See the *Code on Noise Levels on Board Ships*, adopted by the Organization by resolution A.468(XII) and the *Code on Noise Levels on Board Ships*, adopted by the Maritime Safety Committee of the Organization by resolution MSC.337(91), as appropriate.

4.12.1 Measures shall be taken to reduce the effects of noise upon personnel in machinery spaces to levels as given in the IMO *Code on Noise Levels on Board Ships*.* (TP An. Reg. IV/12 as amended by Dir.35)

* The *Code on Noise Levels on Board Ships* as adopted by the International Maritime Organization by its resolution A.468(XII) on 19 November 1981.

4.13 Steering gear

4.13.1 Vessels shall be provided with a main steering gear and an auxiliary means of actuating the rudder to the satisfaction of the Administration. The main steering gear and the auxiliary means of actuating the rudder shall be arranged so that, so far as is reasonable and practicable, a single failure in one of them will not render the other one inoperative. (TP An. Reg. IV/13(1))

4.13.2 Where the main steering gear comprises two or more identical power units, an auxiliary steering gear need not be fitted if the main steering gear is capable of operating the rudder as required by 4.13.10 [paragraph (10)] when any one of the units is out of operation. Each of the power units shall be operated from a separate circuit. (TP An. Reg. IV/13(2))

4.13.3 The position of the rudder, if power operated, shall be indicated in the wheelhouse. The rudder angle indication for power-operated steering gear shall be independent of the steering gear control system. (TP An. Reg. IV/13(3))

4.13.4 In the event of failure of any of the steering gear units, an alarm shall be given in the wheelhouse. (TP An. Reg. IV/13(4))

4.13.5 Indicators for running indication of the motors of electric and electrohydraulic steering gear shall be installed in the wheelhouse. Short circuit protection, an overload alarm and a no-voltage alarm shall be provided for these circuits and motors. Protection against excess current, if provided, shall be for not less than twice the full load current of the motor or circuit so protected, and shall be arranged to permit the passage of the appropriate starting currents. (TP An. Reg. IV/13(5))

4.13.6 The main steering gear shall be of adequate strength and sufficient to steer the vessel at maximum service speed. The main steering gear and rudder stock shall be so designed that they will not be damaged at maximum speed astern or by manoeuvring during fishing operations. (TP An. Reg. IV/13(6))

4.13.7 The main steering gear shall, with the vessel at its maximum permissible operating draught, be capable of putting the rudder over from 35° on one side to 35° on the other side with the vessel running ahead at maximum service speed. The rudder shall be capable of being put over from 35° on either side to 30° on the other side in not more than 28 s, under the same conditions. The main steering gear shall be operated by power where necessary to fulfil these requirements. (TP An. Reg. IV/13(7))

4.13.8 The main steering gear power unit shall be arranged to start either by manual means in the wheelhouse or automatically when power is restored after a power failure. (TP An. Reg. IV/13(8))

4.13.9 The auxiliary means for actuating the rudder shall be of adequate strength and sufficient to steer the vessel at navigable speed and capable of being brought speedily into action in an emergency. (TP An. Reg. IV/13(9))

4.13.10 The auxiliary means for actuating the rudder shall be capable of putting the rudder over from 15° on one side to 15° on the other side in not more than 60 s with the vessel running at one-half of its maximum service speed ahead or 7 knots whichever is the greater. The auxiliary means for actuating the rudder shall be operated by power, where necessary, to fulfil these requirements. (TP An. Reg. IV/13(10))

If this power source is electrical, the emergency source of electrical power shall be capable of serving the auxiliary means for activating the rudder for a period of at least 10 minutes. (Dir.70, An. IV, Reg. IV/13.10)

4.13.11 Electric or electrohydraulic steering gear in vessels of **75 m** in length and over shall be served by at least two circuits fed from the main switchboard and these circuits shall be as widely separated as possible. (TP An. Reg. IV/13(11))

4.14 Engineers' alarm

4.14.1 In vessels of **75 m** in length and over, an engineers' alarm shall be provided to be operated from the engine control room or at the manoeuvring platform as appropriate, and shall be clearly audible in the engineers' accommodation(TP An. Reg. IV/14)

4.15 Refrigeration systems for the preservation of the catch

4.15.1 Refrigeration systems shall be so designed, constructed, tested and installed as to take account of the safety of the system and also the emission of chlorofluorocarbons (CFCs) or any other ozone-depleting substances from the refrigerant held in quantities or concentrations which are hazardous to human health or to the environment, and shall be to the satisfaction of the Administration. (TP An. Reg. IV/15(1))

4.15.2 Refrigerants to be used in refrigeration systems shall be to the satisfaction of the Administration. However, methylchloride or CFCs whose ozone-depleting potential is higher than 5 per cent of CFC-11 shall not be used as refrigerants. (TP An. Reg. IV/15(2))

4.15.3 Refrigerating installations shall be adequately protected against vibration, shock, expansion, shrinkage, etc. and shall be provided with an automatic safety control device to prevent a dangerous rise in temperature and pressure. (TP An. Reg. IV/15(3)(a))

4.15.4 Refrigeration systems in which toxic or flammable refrigerants are used shall be provided with drainage devices leading to a place where the refrigerant presents no danger to the vessels or to persons on board. (TP An. Reg. IV/15(3)(b))

4.15.5 Any space containing refrigerating machinery including condensers and gas tanks utilizing toxic refrigerants shall be separated from any adjacent space by gastight bulkheads. Any space containing the refrigerating machinery including condensers and gas tanks shall be fitted with a leak detection system having an indicator outside the space adjacent to the entrance and shall be provided with an independent ventilation system and a water spray system. (TP An. Reg. IV/15(4)(a))

4.15.6 When such containment is not practicable, 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. (TP An. Reg. IV/15(4)(b))

4.15.7 In refrigerating machinery spaces and refrigerating rooms, alarms shall be connected to the wheelhouse or control stations or escape exits to prevent persons being trapped. At least one exit from each such space shall be capable of being opened from the inside. Where practicable, exits from the spaces containing refrigerating machinery using toxic or flammable gas shall not lead directly into any accommodation spaces. (TP An. Reg. IV/15(5))

4.15.8 Where any refrigerant harmful to persons is used in a refrigeration system, at least two sets of breathing apparatus shall be provided, one of which shall 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 shall be provided. (TP An. Reg. IV/15(6))

4.15.9 Adequate guidance for the safe operation and emergency procedures for the refrigeration system shall be provided by suitable notices displayed on board the vessel. (TP An. Reg. IV/15(7))

PART C
ELECTRICAL INSTALLATIONS

4.16 Main source of electrical power

4.16.1 Where electrical power constitutes the only means of maintaining auxiliary services essential for the propulsion and the safety of the vessel, a main source of electrical power shall be provided which shall include at least two generating sets, one of which may be driven by the main engine. The Administration may accept other arrangements having equivalent electrical capability. (TP An. Reg. IV/16(1)(a))

4.16.2 The power of these sets shall be such as to ensure the functioning of the services referred to in 4.3.2.1(a) [regulation 3(6)(a)], excluding the power required in fishing activities, processing and preservation of the catch, in the event of any one of these generating sets being stopped. However, in vessels of less than **45 metres** in length, in the event of any one of the generating sets being stopped, it shall only be necessary to ensure the functioning of the services essential for propulsion and safety of the vessels. (TP An. Reg. IV/16(1)(b) as amended by Dir.70)

4.16.3 The arrangement of the vessel's main source of electrical power shall be such that the services referred to in 4.3.2.1(a) [regulation 3(6)(a)] can be maintained regardless of the number of revolutions and direction of the main propelling engines or shafting. (TP An. Reg. IV/16(1)(c))

4.16.4 Where transformers constitute an essential part of the supply system required by 4.16.1 to 4.16.3 [this paragraph], the system shall be so arranged as to ensure continuity of the supply. (TP An. Reg. IV/16(1)(d))

4.16.5 The arrangement of the main lighting system shall be such that a fire or other casualty in the space or spaces containing the main source of electrical power, including transformers, if any, will not render the emergency lighting system inoperative. (TP An. Reg. IV/16(2)(a))

4.16.6 The arrangement of the emergency lighting system shall be such that a fire or other casualty in the space or spaces containing the emergency source of electrical power, including transformers, if any, will not render the main lighting system inoperative. (TP An. Reg. IV/16(2)(b))

4.16.7 Navigation lights, if solely electrical, shall be supplied through their own separate switchboard and adequate means for the monitoring of such lights shall be provided. (Dir.70, An. IV, Reg. IV/17.3)

4.17 Emergency source of electrical power

4.17.1 A self-contained emergency source of electrical power located, to the satisfaction of the Administration, outside the machinery spaces shall be provided and so arranged as to ensure its functioning in the event of fire or other causes of failure of the main electrical installations. (TP An. Reg. IV/17(1))

4.17.2 The emergency source of electrical power shall be capable, having regard to starting current and the transitory nature of certain loads, of serving simultaneously for a period of at least 3 h:

(a) the VHF radio installation required by Chapter IX [regulations IX/6(1)(a) and (b)] and, if applicable:
  (i) the MF radio installation required by Chapter IX [regulations IX/8(1)(a) and (b) and regulation IX/9(1)(b) and (c)];
  (ii) the ship earth station required by 9 Chapter IX [regulation IX/9(1)(a)]; and

(iii) the MF/HF radio installation required by Chapter IX [regulations IX/9 (2)(a) and (b) and regulation IX/10(1)];

(b) internal communication equipment, fire detecting systems and signals which may be required in an emergency;

(c) the navigation lights, if solely electrical, and the emergency lights:

(i) of launching stations and overside of the vessel;

(ii) in all alleyways, stairways and exits;

(iii) in spaces containing machinery or the emergency source of power;

(iv) in control stations; and

(v) in fish handling and fish processing spaces; and

(d) the operation of the emergency fire pump, if any. (TP An. Reg. IV/17(2))

Notwithstanding this 4.17.2 [paragraph 2], for vessels of a length of **45 metres** and over, the emergency source of electrical power shall be capable of serving the installations listed for a period of not less than eight hours. (Dir.70, An. IV, Reg. IV/17)

4.17.3 The emergency source of electrical power may be either a generator or an accumulator battery. (TP An. Reg. IV/17(3))

4.17.4 Where the emergency source of electrical power is a generator, it shall be provided both with an independent fuel supply and with efficient starting arrangements to the satisfaction of the Administration. Unless a second independent means of starting the emergency generator is provided the single source of stored energy shall be protected to preclude its complete depletion by the automatic starting system. (TP An. Reg. IV/17(4)(a))

4.17.5 Where the emergency source of electrical power is an accumulator battery it shall 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 per cent of its nominal voltage. In the event of failure of the main power supply this accumulator battery shall be automatically connected to the emergency switchboard and shall immediately supply at least those services specified in 4.17.2(b) and (c) [paragraphs (2)(b) and (c)]. The emergency switchboard shall be provided with an auxiliary switch allowing the battery to be connected manually, in case of failure of the automatic connection system. (TP An. Reg. IV/17(4)(b))

4.17.6 The emergency switchboard shall be installed as near as is practicable to the emergency source of power and shall be located in accordance with 4.17.1 [paragraph (1)]. Where the emergency source of power is a generator, the emergency switchboard shall be located in the same place unless the operation of the emergency switchboard would thereby be impaired. (TP An. Reg. IV/17(5))

4.17.7 An accumulator battery fitted in accordance with 4.17.3 and 4.17.5 [this regulation], other than batteries fitted for the radio transmitter and receiver in vessels of less than **45 metres** in length, shall be installed in a well-ventilated space which shall not be the space containing the emergency switchboard. An indicator shall be mounted in a suitable place on the main switchboard or in the machinery control room to indicate when the battery constituting the emergency source of power is being discharged. The emergency switchboard is to be supplied in normal operation from the main switchboard by an inter-connector feeder which is to be protected at the main switchboard against overload and short circuit. The arrangement at the emergency switchboard shall be such that, in the event of a failure of the main power supply,

an automatic connection of the emergency supply shall be provided. When the system is arranged for feedback operation, the inter-connector feeder shall also be protected at the emergency switchboard at least against short circuit. (TP An. Reg. IV/17(6) as amended by Dir.70)

4.17.8 The emergency generator and its prime mover and any accumulator battery shall 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. (TP An. Reg. IV/17(7))

4.17.9 The emergency source of electrical power and automatic starting equipment shall be so constructed and arranged as to enable adequate testing to be carried out by the crew while the vessel is in operating condition. (TP An. Reg. IV/17(8))

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

4.18.1 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" shall be earthed (grounded), unless:

(i) they are supplied at a voltage not exceeding 55 V direct current or 55 V root mean square, between conductors; autotransformers shall not be used for the purpose of achieving this alternative current voltage; or

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

(iii) they are constructed in accordance with the principle of double insulation. (TP An. Reg. IV/18(1)(a))

4.18.2 Portable electrical equipment shall operate at a safe voltage, exposed metal parts of such equipment which are not intended to have a voltage but which may have such under fault conditions, shall be earthed. The Administration may require additional precautions for portable electric lamps, tools or similar apparatus for use in confined or exceptionally damp spaces where particular risks due to conductivity may exist. (TP An. Reg. IV/18(1)(b))

4.18.3 Electrical apparatus shall be so constructed and so installed that it shall not cause injury when handled or touched in the normal manner. (TP An. Reg. IV/18(1)(c))

4.18.4 Main and emergency switchboards shall 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, shall be suitably guarded. Exposed "live" parts having voltages to earth exceeding a voltage to be specified by the Administration shall not be installed on the front of such switchboards. There shall be non-conducting mats or gratings at the front and rear, where necessary. (TP An. Reg. IV/18(2))

4.18.5 The hull return system of distribution shall not be used for power, heating or lighting in vessels of **75 m** in length and over. . (TP An. Reg. IV/18(3)(a))

4.18.6 The requirement of 4.18.5 [subparagraph (a)] does not preclude, under conditions approved by the Administration, the use of:

(i) impressed current cathodic protective systems;

(ii) limited and locally earthed systems; or

(iii) insulation level monitoring devices provided the circulation current does not exceed 30 mA under the most unfavourable conditions. (TP An. Reg. IV/18(3)(b))

4.18.7 Where the hull return system is used, all final subcircuits (all circuits fitted after the last protective device) shall be two-wire and special precautions shall be taken to the satisfaction of the Administration. . (TP An. Reg. IV/18(3)(c))

4.18.8 Where a distribution system, whether primary or secondary, for power, heating or lighting, with no connection to earth is used, a device capable of monitoring the insulation level to earth shall be provided. . (TP An. Reg. IV/18(4)(a))

4.18.9 Where the distribution system is in accordance with 4.18.8 [subparagraph (a)] and a voltage exceeding 55 V direct current or 55 V root mean square, between conductors, is used, a device capable of continuously monitoring the insulation level to earth and of giving an audible or visual indication of abnormally low insulation values shall be provided. (TP An. Reg. IV/18(4)(b))

4.18.10 Distribution systems which are supplied at a voltage not exceeding 250 V direct current or 250 V root mean square, between conductors and which are limited in extent, may comply with 4.18.8 [subparagraph (a)], subject to the satisfaction of the Administration. (TP An. Reg. IV/18(4)(c))

4.18.11 Except as permitted by the Administration in exceptional circumstances, all metal sheaths and armour of cables shall be electrically continuous and shall be earthed. (TP An. Reg. IV/18(5)(a))

4.18.12 All electrical cables shall be at least of a flame-retardant type and shall be so installed as not to impair their original flame-retarding properties. The Administration may permit the use of special types of cables when necessary for particular applications, such as radio frequency cables, which do not comply with the foregoing. (TP An. Reg. IV/18(5)(b))

4.18.13 Cables and wiring serving essential or emergency power, lighting, internal communications or signals shall as far as practicable be routed clear of galleys, machinery spaces of category A and other high fire risk areas and laundries, fish handling and fish processing spaces and other spaces where there is a high moisture content. Cables connecting fire pumps to the emergency switchboard shall be of a fire-resistant type where they pass through high fire risk areas. Where practicable, all such cables should be run in such a manner as to preclude their being rendered unserviceable by heating of the bulkheads that may be caused by a fire in an adjacent space. (TP An. Reg. IV/18(5)(c))

4.18.14 Where cables which are installed in spaces where the risk of fire or explosion exists in the event of an electrical fault, special precautions against such risks shall be taken to the satisfaction of the Administration. (TP An. Reg. IV/18(5)(d))

4.18.15 Wiring shall be supported in such a manner as to avoid chafing or other damage. (TP An. Reg. IV/18(5)(e))

4.18.16 Terminations and joints in all conductors shall be made such that they retain the original electrical, mechanical, flame-retarding and, where necessary, fire-resisting properties of the cable. (TP An. Reg. IV/18(5)(f))

4.18.17 Cables installed in refrigerated compartments shall be suitable for low temperatures and high humidity. (TP An. Reg. IV/18(5)(g))

4.18.18 Circuits shall be protected against short circuit. Circuits shall also be protected against overload, except in accordance with 4.13 [regulation 13] or where the Administration may exceptionally otherwise permit. (TP An. Reg. IV/18(6)(a))

4.18.19 The rating or appropriate setting of the overload protective device for each circuit shall be permanently indicated at the location of the protective device. (TP An. Reg. IV/18(6)(b))

4.18.20 Lighting fittings shall be arranged to prevent temperature rises which could damage the wiring and to prevent surrounding material from becoming excessively hot. (TP An. Reg. IV/18(7))

4.18.21 Lighting or power circuits terminating in a space where the risk of fire or explosion exists shall be provided with isolating switches outside the space. (TP An. Reg. IV/18(8))

4.18.22 The housing of an accumulator battery shall be constructed and ventilated to the satisfaction of the Administration. (TP An. Reg. IV/18(9)(a))

4.18.23 Electrical and other equipment which may constitute a source of ignition of flammable vapours shall not be permitted in these compartments except as permitted in 5.18.25 [paragraph (10)]. (TP An. Reg. IV/18(9)(b))

4.18.24 An accumulator battery shall not be located in accommodation spaces unless installed in a hermetically sealed container. (TP An. Reg. IV/18(9)(c))

4.18.25 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 shall be installed, unless the Administration is satisfied that it is:

(a) essential for operational purposes;

(b) of a type which will not ignite the mixture concerned;

(c) appropriate to the space concerned; and

(d) appropriately certified for safe usage in the dusts, vapours or gases likely to be encountered. (TP An. Reg. IV/18(10))

4.18.26 Lightning conductors shall be fitted to all wooden masts or topmasts. In vessels constructed of non-conductive materials, the lightning conductors shall be connected by suitable conductors to a copper plate fixed to the vessel's hull well below the waterline. (TP An. Reg. IV/18(11))

PART D
PERIODICALLY UNATTENDED MACHINERY SPACES

4.19 Fire safety

4.19.1 Fire prevention

4.19.1.1 Special consideration shall be given to high pressure fuel oil pipes. Where practicable, leakages from such piping systems shall be collected in a suitable drain tank which shall be provided with a high level alarm. (TP An. Reg. IV/19(1))

4.19.1.2 Where daily service fuel oil tanks are filled automatically or by remote control, means shall be provided to prevent overflow spillages. Similar consideration shall be given to other equipment which treats flammable liquids automatically, e.g. fuel oil purifiers, which, whenever practicable, shall be installed in a special space reserved for purifiers and their heaters. (TP An. Reg. IV/19(2))

4.19.1.3 Where fuel oil daily service tanks or settling tanks are fitted with heating arrangements, a high temperature alarm shall be provided if the flashpoint of the fuel oil can be exceeded. (TP An. Reg. IV/19(3))

4.19.2 Fire detection

4.19.2.1 An approved fire detection system based on a self-monitoring principle and including facilities for periodical testing shall be installed in machinery spaces. (TP An. Reg. IV/19(4))

4.19.2.2 The detection system shall initiate both audible and visual alarm in the wheelhouse and in sufficient appropriate spaces to be heard and observed by persons on board, when the vessel is in harbour. (TP An. Reg. IV/19(5))

4.19.2.3 The fire detection system shall be fed automatically from an emergency source of power if the main source of power fails. (TP An. Reg. IV/19(6))

4.19.2.4 Internal combustion engines of 2,500 kW and over shall be provided with crankcase oil mist detectors or engine bearing temperature detectors or equivalent devices. (TP An. Reg. IV/19(7))

4.19.3 Fire fighting

4.19.3.1 A fixed fire-extinguishing system shall be provided to the satisfaction of the Administration, which shall be in compliance with the requirements of 6.22 and 6.40 [regulations V/22 and V/40]. (TP An. Reg. IV/19(8))

4.19.3.2 In vessels of **75 m** in length and over, provision shall be made for immediate water delivery from the fire main system either by:

(a) remote starting arrangements of one of the main fire pumps in the wheelhouse and at the fire control station, if any; or

(b) permanent pressurization of the fire main system, due regard being paid to the possibility of freezing.* (TP An. Reg. IV/19(9))

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* See the *Guidance for precautions against freezing of fire mains*, contained in recommendation 6 of attachment 3 to the Final Act of the International Conference on Safety of Fishing Vessels, 1993.

4.19.3.3 The Administration shall be satisfied with the maintenance of the fire integrity of the machinery spaces, the location and centralization of the fire-extinguishing system controls, the shutdown arrangements referred to in 4.24 [regulation 24], e.g. ventilation, fuel pumps, etc., and may require fire-extinguishing appliances and other fire-fighting equipment and breathing apparatus in addition to the relevant requirements of chapter V. (TP An. Reg. IV/19(10))

4.20 Protection against flooding

4.20.1 Bilges in machinery spaces shall 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 shall initiate an audible and visual alarm in the places where continuous watch is maintained. (TP An. Reg. IV/20(1))

4.20.2 The controls of any valve serving a sea inlet, a discharge below the waterline or a bilge injection system shall be so sited as to allow adequate time for operation in case of influx of water to the space. (TP An. Reg. IV/20(2))

4.21 Communications

4.21.1 In vessels of **75 m** in length and over, one of the two separate means of communication referred to in 4.7 [regulation 7] shall be a reliable vocal communication. An additional reliable means of vocal communication shall be provided between the wheelhouse and the engineers' accommodation. (TP An. Reg. IV/21)

4.22 Alarm system

4.22.1 An alarm system shall be provided which shall indicate any fault requiring attention. (TP An. Reg. IV/22(1))

4.22.2 The alarm system shall be capable of sounding an audible alarm in the machinery space and shall indicate visually each separate alarm function at a suitable position. However, in vessels of less than **45 metres** in length the administration may permit the system to be capable of sounding and indicating visually each separate alarm function in the wheelhouse only. (TP An. Reg. IV/22(2)(a) as amended by Dir.70)

4.22.3 In vessels of less than **45 metres** in length and over the alarm system shall have a connection to the engineers' cabins through a selector switch to ensure connection to one of those cabins and to the engineers' public rooms, if any. The Administration may permit alternative arrangements which provide an equivalent measure of safety. (TP An. Reg. IV/22(2)(b) as amended by Dir.70)

4.22.4 In vessels of less than **45 metres** in length and over an engineers' alarm and an alarm to the wheelhouse for persons on watch shall be activated if an alarm function has not received attention within a limited period as specified by the Administration. (TP An. Reg. IV/22(2)(c) as amended by Dir.70)

4.22.5 Audible and visual alarms shall be activated in the wheelhouse for any situation requiring action by the responsible person on watch or which should be brought to his attention. (TP An. Reg. IV/22(2)(d))

4.22.6 The alarm system shall as far as practicable be designed on the fail-safe principle. (TP An. Reg. IV/22(2)(e))

4.22.7 The alarm system shall be:

(a) continuously powered with automatic change-over to a stand-by power supply in case of loss of normal power supply; and

(b) activated by failure of the normal power supply. (TP An. Reg. IV/22(3))

4.22.8 The alarm system shall be able to indicate at the same time more than one fault and the acceptance of any alarm shall not inhibit another alarm. (TP An. Reg. IV/22(4)(a))

4.22.9 Acceptance at the position referred to in 4.22.2 [paragraph (2)(a)] of any alarm condition shall be indicated at the positions where it was shown. Alarms shall be maintained until they are accepted and the visual indications shall remain until the fault has been corrected. All alarms shall automatically reset when the fault has been rectified. (TP An. Reg. IV/22(4)(b))

4.23 Special requirements for machinery, boiler and electrical installations

4.23.1 In vessels of **75 m** in length and over, the main source of electrical power shall be supplied as follows:

(a) where the electrical power can normally be supplied by one generator, there shall be provided suitable load shedding arrangements to ensure the integrity of supplies to services required for propulsion and steering. To cover the case of loss of the generator in operation, there shall be adequate provisions for automatic starting and connecting to the main switchboard of a stand-by generator of sufficient capacity to permit propulsion and steering and with automatic restarting of the essential auxiliaries including, where necessary, sequential operations. Means may be provided to the satisfaction of the Administration for remote (manual) starting and connection of the stand-by generator to the main switchboard as well as means of repeated remote starting of essential auxiliaries; and

(b) if the electrical power is normally supplied by more than one generating set simultaneously, there shall be provisions, e.g. by load shedding, to ensure that, in case of loss of one of these generating sets, the remaining ones are kept in operation without overload to permit propulsion and steering. (TP An. Reg. IV/23(1))

4.23.2 Where required to be duplicated, other auxiliary machinery essential to propulsion shall be fitted with automatic change-over devices allowing transfer to a stand-by machine. An alarm shall be given on automatic change-over. (TP An. Reg. IV/23(2))

4.23.3 Automatic control and alarm systems shall be provided as follows:

(a) the control system shall be such that, through the necessary automatic arrangements, the services needed for the operation of the main propulsion machinery and its auxiliaries are ensured;

(b) means shall be provided to keep the starting air pressure at the required level where internal combustion engines are used for main propulsion;

(c) an alarm system complying with 4.22 [regulation 22] shall be provided for all important pressures, temperatures, fluid levels, etc.; and

(d) where appropriate, an adequate central position shall be arranged with the necessary alarm panels and instrumentation indicating any alarmed fault. (TP An. Reg. IV/23(3))

4.24 Safety system

4.24.1 A safety system shall be provided so that serious malfunction in machinery or boiler operations, which presents an immediate danger, shall initiate the automatic shutdown of that part of the plant and an alarm shall be given. Shutdown of the propulsion system shall not be automatically activated except in cases which could lead to serious damage, complete breakdown or explosion. Where arrangements for overriding the shutdown of the main propelling machinery are fitted, these shall be such as to preclude inadvertent activation. Visual means shall be provided to show whether or not it has been activated. (TP An. Reg. IV/24)

CHAPTER V

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

PART A
GENERAL

5.1 General

5.1.1 Unless expressly provided otherwise, this chapter shall apply to new fishing vessels of **45 m** in length and over. (TP An. Reg. V/1(1))

Existing fishing vessels shall comply with this Chapter in accordance with 2.1.3.

5.1.2 One of the following methods of protection shall be adopted in accommodation and service spaces:

(a) Method IF – The construction of all internal divisional bulkheads of non-combustible "B" or "C" class divisions generally without the installation of a detection or sprinkler system in the accommodation and service spaces; or

(b) Method IIF – The fitting of an automatic sprinkler and fire alarm system for the detection and extinction of fire in all spaces in which fire might be expected to originate, generally with no restrictions on the type of internal divisional bulkheads; or

(c) Method IIIF – The fitting of an automatic fire alarm and detection system in all spaces in which a fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheads, except that in no case shall the area of any accommodation space or spaces bounded by an "A" or "B" class division exceed 50 m^2. However, the Administration may increase this area for public spaces. (TP An. Reg. V/1(2)) (this subparagraph (c) is not applicable to NFV 2003)

(c) Method IIIF – The fitting of an automatic fire alarm and detection system in all spaces in which a fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheads, except that in no case shall the area of any accommodation space or spaces bounded by an "A" or "B" class division exceed 50 m^2. However, the Administration may increase this area for public spaces up to 75 m^2. (TP An. Reg. V/1(2)(c) as amended by Dir.35)

5.1.3 The requirements for use of non-combustible materials in construction and insulation of the boundary bulkheads of machinery spaces, control stations, etc., and the protection of stairway enclosures and corridors shall be common to all three methods. (TP An. Reg. V/1(3))

5.2 Definitions

.1 ***Non-combustible material*** means a material which neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750°C, this being determined to the satisfaction of the Administration by an established test procedure. Any other material is a combustible material.* (TP An. Reg. V/2(1)) (not applicable to NFV 2003)

* See Part 1 – Non–combustibility test, contained in annex 1 of *the International Code for Application of Fire Test Procedures, 2010*, adopted by the Maritime Safety Committee of the Organization by resolution MSC.307(88).

.1 ***Non-combustible material*** means a material which neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750°C, this being determined in accordance with the IMO *Fire Test Procedures Code**. Any other material is a combustible material. (TP An. Reg. V/2(1) as amended by Dir.35)

* The *International Code for Application of Fire Test Procedures* (*FTP Code*), as adopted by the Maritime Safety Committee of the International Maritime Organisation by resolution MSC. 61(67).

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

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

(TP An. Reg. V/2(2)) (not applicable to NFV 2003)

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

initial internal furnace temperature	20 °C
at the end of the first 5 min	576 °C
at the end of the first 10 min	679 °C
at the end of the first 15 min	738 °C
at the end of the first 30 min	841 °C
at the end of the first 60 min	945 °C

(TP An. Reg. V/2(2) as amended by Dir.35)

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

(a) they shall be constructed of steel or other equivalent material;

(b) they shall be suitably stiffened;

(c) they shall be so constructed as to be capable of preventing the passage of smoke and flame to the end of the one-hour standard fire test; and

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

class "A-60" 60 min

class "A-30" 30 min
class "A-15" 15 min
class "A-0" 0 min

The Administration may require a test of a prototype bulkhead or deck to ensure that it meets the above requirements for integrity and temperature rise.* (TP An. Reg. V/2(3)) (this last sentence is not applicable to NFV 2003)

* See Part 3 – Test for "A", "B" and "F" class divisions, contained in annex 1 of the *International Code for Application of Fire Test Procedures, 2010*, adopted by the Maritime Safety Committee of the Organization by resolution MSC.307(88).

The Administration shall require a test of a prototype bulkhead or deck to ensure that it meets the above requirements for integrity and temperature rise in accordance with the IMO *Fire Test Procedures Code*. (TP An. Reg. V/2(3) as amended by Dir.35)

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

(a) they shall be so constructed as to be capable of preventing the passage of flame to the end of the first one-half hour of the standard fire test;

(b) they shall have an insulation value such that the average temperature of the unexposed side will not rise more than 139°C above the original temperature, nor will the temperature at any one point, including any joint, rise more than 225°C above the original temperature, within the time listed below:

class "B-15" 15 min
class "B-0" 0 min; and

(c) they shall be constructed of approved non-combustible materials and all materials entering into the construction and erection of "B" class divisions shall be non-combustible with the exception that combustible veneers may be permitted provided they meet the relevant requirements of this chapter.

The Administration may require a test of a prototype division to ensure that it meets the above requirements for integrity and temperature rise.* (TP An. Reg. V/2(4)) (this last sentence is not applicable to NFV 2003)

* See Part 3 – Test for "A", "B" and "F" class divisions, contained in annex 1 of the *International Code for Application of Fire Test Procedures, 2010*, adopted by the Maritime Safety Committee of the Organization by resolution MSC.307(88).

The Administration shall require a test of a prototype division to ensure that it meets the above requirements for integrity and temperature rise in accordance with the IMO *Fire Test Procedures Code*. (TP An. Reg. V/2(4) as amended by Dir.35)

.5 ***"C" class divisions*** are those divisions constructed of approved non-combustible materials. They need meet no requirements relative to the passage of smoke and flame nor the limiting of temperature rise. Combustible veneers are permitted provided they meet other requirements of this chapter. (TP An. Reg. V/2(5))

.6 ***"F" class divisions*** are those divisions formed by bulkheads, decks, ceilings or linings which comply with the following:

(a) they shall be so constructed as to be capable of preventing the passage of flame to the end of the first one-half hour of the standard fire test; and

(b) they shall have an insulation value such that the average temperature of the unexposed side will not rise more than 139°C above the original temperature, nor will the temperature at any one point, including any joint, rise more than 225°C above the original temperature, up to the end of the first one-half hour of the standard fire test.

The Administration may require a test of a prototype division to ensure that it meets the above requirements for integrity and temperature rise.* (TP An. Reg. V/2(6)) (this last sentence is not applicable to NFV 2003)

* See Part 3 – Test for "A", "B" and "F" class divisions, contained in annex 1 of the *International Code for Application of Fire Test Procedures, 2010*, adopted by the Maritime Safety Committee of the Organization by resolution MSC.307(88).

The Administration shall require a test of a prototype division to ensure that it meets the above requirement for integrity and temperature rise in accordance with the IMO *Fire Test Procedures Code*. (TP An. Reg. V/2(6) as amended by Dir.35)

.7 ***Continuous "B" class ceilings or linings*** are those "B" class ceilings or linings which terminate only at an "A" or "B" class division. (TP An. Reg. V/2(7))

.8 ***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 fire test (e.g. aluminium alloy with appropriate insulation). (TP An. Reg. V/2(8))

.9 ***Low flame spread*** means that the surface thus described will adequately restrict the spread of flame, this being determined to the satisfaction of the Administration by an established test procedure. (TP An. Reg. V/2(9)) (not applicable to NFV 2003)

.9 ***Low flame spread*** means that the surface thus described will adequately restrict the spread of flame, this being determined in accordance with the IMO *Fire Test Procedures Code*. (TP An. Reg. V/2(9) as amended by Dir.35)

.10 ***Accommodation spaces*** are those spaces used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, games and hobbies rooms, pantries containing no cooking appliances and similar spaces. (TP An. Reg. V/2(10))

.11 ***Public spaces*** are those portions of the accommodation spaces which are used for halls, dining rooms, lounges, and similar permanently enclosed spaces. (TP An. Reg. V/2(11))

.12 ***Service spaces*** are those spaces used for galleys, pantries containing cooking appliances, lockers and store-rooms, workshops other than those forming part of the machinery spaces, and similar spaces and trunks to such spaces. (TP An. Reg. V/2(12))

.13 ***Control stations*** are those spaces in which the vessel's radio or main navigation equipment or the emergency source of power is located, or where the fire recording or fire control equipment is centralized. (TP An. Reg. V/2(13))

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

(a) for main propulsion; or

(b) for other purposes where such machinery has in the aggregate a total power output of not less than 375 kW,

or which contain any oil-fired boiler or fuel oil unit. (TP An. Reg. V/2(14) as amended by Dir.70)

.15 ***Machinery spaces*** are those machinery spaces of category A and all other spaces containing propulsion machinery, boilers, fuel oil units, steam and internal combustion engines, generators, steering gear, major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilating and air conditioning machinery and similar spaces, and trunks to such spaces. (TP An. Reg. V/2(15))

PART B
FIRE SAFETY MEASURES IN VESSELS OF 60 METRES IN LENGTH AND OVER

5.3 Structure

5.3.1 The hull, superstructure, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material except as otherwise specified in 5.3.4 [paragraph (4)]. (TP An. Reg. V/3(1))

5.3.2 The insulation of aluminium alloy components of "A" or "B" class divisions, except structures which, in the opinion of the Administration, are non-load bearing, shall be such that the temperature of the structural core does not rise more than 200°C above the ambient temperature at any time during the applicable fire exposure to the standard fire test. (TP An. Reg. V/3(2))

5.3.3 Special attention shall be given to the insulation of aluminium alloy components of columns, stanchions and other structural members required to support survival craft stowage, launching and embarkation areas, and "A" and "B" class divisions, to ensure:

(a) that for such members supporting survival craft areas and "A" class divisions the temperature rise limitation specified in 5.3.2 [paragraph (2)] shall apply at the end of one hour; and

(b) that for such members required to support "B" class divisions, the temperature rise limitation specified in 5.3.2 [paragraph (2)] shall apply at the end of one half-hour. (TP An. Reg. V/3(3))

5.3.4 Crowns and casings of machinery spaces of category A shall be of steel construction adequately insulated and any openings therein shall be suitably arranged and protected to prevent the spread of fire. (TP An. Reg. V/3(4))

5.4 Bulkheads within the accommodation and service spaces

5.4.1 Within the accommodation and service spaces, all bulkheads required to be "B" class divisions shall extend from deck to deck and to the shell or other boundaries, unless continuous "B" class ceilings or linings, or both, are fitted on both sides of the bulkheads in which case the bulkhead may terminate at the continuous ceiling or lining. (TP An. Reg. V/4(1))

5.4.2 Method IF. All bulkheads not required by this or other regulations of this Part B [part] to be "A" or "B" class divisions shall be at least "C" class divisions. (TP An. Reg. V/4(2))

5.4.3 Method IIF. There shall be no restriction on the construction of bulkheads not required by this or other regulations of this part to be "A" or "B" class divisions except in individual cases where "C" class bulkheads are required in accordance with table 1 in 5.7 [regulation 7]. (TP An. Reg. V/4(3))

5.4.4 Method IIIF. There shall be no restriction on the construction of bulkheads not required by this or other regulations of this Part B [part] to be "A" or "B" class divisions. In no case shall the area of any accommodation space or spaces bounded by a continuous "A" or "B" class division exceed 50 m^2, except in individual cases where "C" class bulkheads are required in accordance with table 1 in 5.7 [regulation 7]. However, the Administration may increase this area for public spaces. (TP An. Reg. V/4(4)) (not applicable to NFV 2003)

5.4.4 Method IIIF. There shall be no restriction on the construction of bulkheads not required by this or other regulations of this Part B [part] to be "A" or "B" class divisions. In no case shall the area of any accommodation space or spaces bounded by a continuous "A" or "B" class division

exceed 50 m², except in individual cases where "C" class bulkheads are required in accordance with table 1 in 5.7 [regulation 7]. However, the Administration may increase this area for public spaces up to 75 m². (TP An. Reg. V/4(4) as amended by Dir.35)

5.5 Protection of stairways and lift trunks in accommodation spaces, service spaces and control stations

5.5.1 Stairways which penetrate only a single deck shall be protected at least at one level by at least "B-0" class divisions and self-closing doors. Lifts which penetrate only a single deck shall be enclosed by "A-0" class divisions with steel doors at both levels. Stairways and lift trunks which penetrate more than a single deck shall be enclosed by at least "A-0" class divisions and protected by self-closing doors at all levels. (TP An. Reg. V/5(1))

5.5.2 All stairways shall be of steel frame construction except where the Administration permits the use of other equivalent material. (TP An. Reg. V/5(2))

5.6 Doors in fire-resistant divisions

5.6.1 Doors shall have resistance to fire as far as practicable, equivalent to the division in which they are fitted. Doors and door frames in "A" class divisions shall be constructed of steel. Doors in "B" class divisions shall be non-combustible. Doors fitted in boundary bulkheads of machinery spaces of category A shall be self-closing and reasonably gastight. The Administration may permit the use of combustible materials in doors separating cabins from the individual interior sanitary accommodation, such as showers, if constructed according to method IF. (TP An. Reg. V/6(1))

5.6.2 Doors required to be self-closing shall not be fitted with hold-back hooks. However, hold-back arrangements fitted with remote release fittings of the fail-safe type may be used. (TP An. Reg. V/6(2))

5.6.3 Ventilation openings may be permitted in and under the doors in corridor bulkheads, except that such openings shall not be permitted in and under stairway enclosure doors. The openings shall be provided only in the lower half of a door. Where such opening is in or under a door, the total net area of any such opening or openings shall not exceed 0.05 m². When such opening is cut in a door, it shall be fitted with a grille made of non-combustible material. (TP An. Reg. V/6(3))

5.6.4 Watertight doors need not be insulated. (TP An. Reg. V/6(4))

5.7 Fire integrity of bulkheads and decks

5.7.1 In addition to the specific provisions for fire integrity of bulkheads and decks required elsewhere in this part, the minimum fire integrity of bulkheads and decks shall be as prescribed in table 1 and table 2 of 5.7 [this regulation]. (TP An. Reg. V/7(1))

5.7.2 The following requirements shall govern application of the tables:

(a) tables 1 and 2 shall apply respectively to bulkheads and decks separating adjacent spaces; and

(b) for determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as follows:

(i) Control stations (1)

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.
Spaces containing the vessel's radio equipment.

Fire-extinguishing rooms, fire-control rooms and fire-recording stations.
Control room for propulsion machinery when located outside the machinery space.
Spaces containing centralized fire alarm equipment.

(ii) Corridors (2)

Corridors and lobbies.

(iii) Accommodation spaces (3)

Spaces as defined in6.2.10 and 5.2.11 [regulations 2(10) and (11)] excluding corridors.

(iv) Stairways (4)

Interior stairways, lifts and escalators other than those wholly contained within the machinery spaces and enclosures thereto. In this connection, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(v) Service spaces of low fire risk (5)

Lockers and store-rooms having areas of less than 2 m^2, drying rooms and laundries.

(vi) Machinery spaces of category A (6)

Spaces as defined in 5.2.14 [regulation 2(14)].

(vii) Other machinery spaces (7)

Spaces as defined in 5.2.15 [regulation 2(15)] including fishmeal processing spaces, but excluding machinery spaces of category A.

(viii) Cargo spaces (8)

All spaces used for cargo, including cargo oil tanks, and trunkways and hatchways to such spaces.

(ix) Service spaces of high fire risk (9)

Galleys, pantries containing cooking appliances, paint rooms , lamp rooms, lockers and store-rooms having areas of 2 m^2 or more, and workshops other than those forming part of the machinery spaces.

(x) Open decks (10)

Open deck spaces and enclosed promenades, spaces for processing fish in the raw state, fish washing spaces and similar spaces containing no fire risk.
The air spaces outside superstructures and deckhouses.

The title of each category is intended to be typical rather than restrictive. The number in parenthesis following each category refers to the applicable column or row in the tables.

Table 1
Fire integrity of bulkheads separating adjacent spaces

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Control stations (1)	A-0[e]	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*
Corridors (2)		C	B-0	B-0 A-0[c]	B-0	A-60	A-0	A-0	A-0	*
Accommodation spaces (3)			C[a,b]	B-0 A-0[c]	B-0	A-60	A-0	A-0	A-0	*
Stairways (4)				B-0 A-0[c]	B-0 A-0[c]	A-60	A-0	A-0	A-0	*
Service spaces of low fire risk (5)					C	A-60	A-0	A-0	A-0	*
Machinery spaces of category A (6)						*	A-0	A-0	A-60	*
Other machinery spaces (7)							A-0[d]	A-0	A-0	*
Cargo spaces (8)								*	A-0	*
Service spaces of high fire risk (9)									A-0[d]	*
Open decks (10)										–

Table 2
Fire integrity of decks separating adjacent spaces

Space above ↓ Space → below	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Control stations (1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*
Corridors (2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*
Accommodation spaces (3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*
Stairways (4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*
Service spaces of low fire risk (5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*
Machinery spaces of category A (6)	A-60	A-60	A-60	A-60	A-60	*	A-60	A-30	A-60	*
Other machinery spaces (7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*
Cargo spaces (8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*
Service spaces of high fire risk (9)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0[d]	*
Open decks (10)	*	*	*	*	*	*	*	*	*	–

Notes: To be applied to both tables 1 and 2, as appropriate.

a No special requirements are imposed upon these bulkheads in methods IIF and IIIF fire protection.

b In case of method IIIF "B" class bulkheads of "B-0", rating shall be provided between spaces or groups of spaces of 50 m^2 and over in area.

c For clarification as to which applies see 5.4 and 5.5 [regulations 4 and 5].

d Where spaces are of the same numerical category and superscript [d] appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose, e.g. in category (9). A galley next to a galley does not require a bulkhead, but a galley next to a paint room requires an "A-0" bulkhead.

e Bulkheads separating the wheelhouse, chartroom and radio room from each other may be "B-0" rating.

f Fire insulation need not be fitted if the machinery space in category (7), in the opinion of the Administration, has little or no fire risk.

* Where an asterisk appears in the tables, the division is required to be of steel or equivalent material, but is not required to be of "A" class standard. (this note is not applicable to NFV 2003)

* Where an asterisk appears in the tables, the division is required to be of steel or equivalent material, but is not required to be of "A" class standard.

Where a deck is penetrated for the passage of electrical cables, pipes and vent ducts, such penetrations shall be made tight to prevent the passage of flame and smoke. (note as amended by Dir.35)

(TP An. Reg. V/7(2))

5.7.3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division. (TP An. Reg. V/7(3))

5.7.4 Windows and skylights to machinery spaces shall be as follows:

(a) where skylights can be opened, they shall be capable of being closed from outside the space. Skylights containing glass panels shall be fitted with external shutters of steel or other equivalent material permanently attached;

(b) glass or similar materials shall not be fitted in machinery space boundaries. This does not preclude the use of wire-reinforced glass for skylights and glass in control rooms within the machinery spaces; and

(c) in skylights referred to in subparagraph (a) wire-reinforced glass shall be used. (TP An. Reg. V/7(4))

5.7.5 External boundaries which are required by 5.3.1 [regulation 3(1)] to be of steel or equivalent material may be pierced for the fitting of windows and sidescuttles, provided that there is no requirement elsewhere in this part for such boundaries to have "A" class integrity. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be of materials to the satisfaction of the Administration. (TP An. Reg. V/7(5))

5.8 Details of construction

5.8.1 Method IF. In accommodation and service spaces and control stations all linings, draught stops, ceilings and their associated grounds shall be of non-combustible materials. (TP An. Reg. V/8(1))

5.8.2 Methods IIF and IIIF. In corridors and stairway enclosures serving accommodation and service spaces and control stations, ceilings, linings, draught stops and their associated grounds shall be of non-combustible materials. (TP An. Reg. V/8(2))

5.8.3 Methods IF, IIF and IIIF

(a) Except in cargo spaces or refrigerated compartments of service spaces, insulating materials shall be non-combustible. Vapour barriers and adhesives used in conjunction with insulation, as well as the insulation of pipe fittings, for cold service systems need not be of non-combustible material, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have qualities of resistance to the propagation of flame to the satisfaction of the Administration. In spaces where penetration of oil products is possible, the surface of insulation shall be impervious to oil or oil vapour. (not applicable to NFV 2003)

(a) Except in cargo spaces or refrigerated compartments of service spaces, insulating materials shall be non-combustible. Vapour barriers and adhesives used in conjunction with insulation, as well as the insulation of pipe fittings, for cold service systems need not be of non-combustible material, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have low flame characteristics, this being determined in accordance with the IMO *Fire Test Procedures Code*. In spaces where penetration of oil products is possible, the surface of insulation shall be impervious to oil or oil vapour. (subparagraph (a) as amended by Dir.35)

(b) Where non-combustible bulkheads, linings and ceilings are fitted in accommodation and service spaces, they may have a combustible veneer not exceeding 2 mm in thickness within any such space except corridors, stairway enclosures and control stations, where it shall not exceed 1.5 mm in thickness.

(c) Air spaces enclosed behind ceilings, panellings, or linings shall be divided by close-fitting draught stops spaced not more than 14 m apart. In the vertical direction, such spaces, including those behind linings of stairways, trunks, etc., shall be closed at each deck. (TP An. Reg. V/8(3))

5.9 Ventilation systems

5.9.1 Ventilation ducts shall be of non-combustible material. Short ducts, however, not generally exceeding 2 m in length and with a cross section not exceeding 0.02 m^2 need not be non-combustible, subject to the following conditions:

(i) these ducts shall be of a material which, to the satisfaction of the Administration, has a low fire risk;

(ii) they may only be used at the end of the ventilation device; and

(iii) they shall not be situated less than 600 mm, measured along the duct, from an opening in an "A" or "B" class division including continuous "B" class ceilings. (TP An. Reg. V/9(1)(a)) (not applicable to NFV 2003)

5.9.1 Ventilation ducts shall be of non-combustible material. Short ducts, however, not generally exceeding 2 m in length and with a cross section not exceeding 0.02 m^2 need not be non-combustible, subject to the following conditions:

(i) these ducts shall be of a material which, has low flame spread characteristics, this being determined in accordance with the IMO *Fire Test Procedures Code*. (TP An. Reg. V/9(1)(a) as amended by Dir.35)

5.9.2 Where the ventilation ducts with a free cross-sectional area exceeding 0.02 m^2 pass through "A" class bulkheads or decks, the openings shall be lined with a steel sheet sleeve unless the ducts passing through the bulkheads or decks are of steel in the vicinity of passage through the deck or bulkhead and comply in that portion of the duct with the following:

(i) for ducts with a free cross-sectional area exceeding 0.02 m^2, the sleeves shall have a thickness of at least 3 mm and a length of at least 900 mm. When passing through bulkheads, this length shall preferably be divided evenly on each side of the bulkhead. Ducts with a free cross-sectional area exceeding 0.02 m^2 shall be provided with fire insulation. The insulation shall have at least the same fire integrity as the bulkhead or deck through which the duct passes. Equivalent penetration protection may be provided to the satisfaction of the Administration; and

(ii) ducts with a free cross-sectional area exceeding 0.075 m^2 shall be fitted with fire dampers in addition to the requirements of subparagraph (i). The fire damper shall operate automatically, but shall also be capable of being closed manually from both sides of the bulkhead or deck. The damper shall be provided with an indicator which shows whether the damper is open or closed. Fire dampers are not required, however, where ducts pass through spaces surrounded by "A" class divisions, without serving those spaces, provided those ducts have the same fire integrity as the bulkheads which they penetrate. (TP An. Reg. V/9(1)(b))

5.9.3 Ventilation ducts for machinery spaces of category A or galleys shall not in general pass through accommodation spaces, service spaces or control stations. Where the Administration permits this arrangement, the ducts shall be constructed of steel or equivalent material and so arranged as to preserve the integrity of the divisions. (TP An. Reg. V/9(1)(c))

5.9.4 Ventilation ducts of accommodation spaces, service spaces or control stations shall not, in general, pass through machinery spaces of category A or through galleys. Where the Administration permits this arrangement, the ducts shall be constructed of steel or equivalent material and so arranged as to preserve the integrity of the divisions. (TP An. Reg. V/9(1)(d))

5.9.5 Where ventilation ducts with a free cross-sectional area exceeding 0.02 m^2 pass through "B" class bulkheads, the openings shall be lined with steel sheet sleeves of at least 900 mm in length, unless the ducts are of steel for this length in way of the bulkheads. When passing through a "B" class bulkhead, this length shall preferably be divided evenly on each side of the bulkhead. (TP An. Reg. V/9(1)(e))

5.9.6 Such measures, as are practicable, shall be taken in respect of control stations outside machinery spaces in order to ensure that ventilation, visibility and freedom from smoke are maintained, so that, in the event of fire, the machinery and equipment contained therein may be supervised and continue to function effectively. Alternative and separate means of air supply shall be provided; air inlets of the two sources of supply shall be so disposed that the risk of both inlets drawing in smoke simultaneously is minimized. At the discretion of the Administration, such requirements need not apply to control stations situated on, and openings on to, an open deck, or where local closing arrangements are equally effective. (TP An. Reg. V/9(1)(f))

5.9.7 Where they pass through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be constructed of "A" class divisions. Each exhaust duct shall be fitted with:

(i) a grease trap readily removable for cleaning;

(ii) a fire damper located in the lower end of the duct;

(iii) arrangements, operable from within the galley, for shutting off the exhaust fan; and

(iv) fixed means for extinguishing a fire within the duct, except where the Administration considers such fittings impractical in a vessel of less than **75 m** in length. (TP An. Reg. V/9(1)(g))

5.9.8 The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated. Power ventilation of accommodation spaces, service spaces, control stations and machinery spaces shall be capable of being stopped from an easily accessible position outside the space being served. This position should not be readily cut off in the event of a fire in the spaces served. The means provided for stopping the power ventilation of the machinery spaces shall be entirely separate from the means provided for stopping ventilation of other spaces. (TP An. Reg. V/9(2))

5.9.9 Means shall be provided for closing, from a safe position, the annular spaces around funnels. (TP An. Reg. V/9(3))

5.9.10 Ventilation systems serving machinery spaces shall be independent of systems serving other spaces. (TP An. Reg. V/9(4))

5.9.11 Store-rooms containing appreciable quantities of highly flammable products shall be provided with ventilation arrangements which are separate from other ventilation systems. Ventilation shall be arranged at high and low levels and the inlets and outlets of ventilators shall be positioned in safe areas and fitted with spark arresters. (TP An. Reg. V/9(5))

5.10 Heating installations

5.10.1 Electric radiators shall be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiator shall be fitted with an element so exposed that clothing, curtains or other similar materials can be scorched or set on fire by heat from the element. (TP An. Reg. V/10(1))

5.10.2 Heating by means of open fires shall not be permitted. Heating stoves and other similar appliances shall be firmly secured and adequate protection and insulation against fire shall be provided beneath and around such appliances and in way of their uptakes. Uptakes of stoves which burn solid fuel shall be so arranged and designed as to minimize the possibility of becoming blocked by combustion products and shall have a ready means for cleaning. Dampers for limiting draughts in uptakes shall, when in the closed position, still leave an adequate area open. Spaces in which stoves are installed shall be provided with ventilators of sufficient area to provide adequate combustion-air for the stove. Such ventilators shall have no means of closure and their position shall be such that closing appliances in accordance with 2.9 [regulation II/9] are not required. (TP An. Reg. V/10(2))

5.10.3 Open flame gas appliances, except cooking stoves and water heaters, shall not be permitted. Spaces containing any such stoves or water heaters shall have adequate ventilation to remove fumes and possible gas leakage to a safe place. All pipes conveying gas from container to stove or water heater shall be of steel or other approved material. Automatic safety gas shut-off devices shall be fitted to operate on loss of pressure in the gas main pipe or flame failure on any appliance. (TP An. Reg. V/10(3))

5.10.4 Where gaseous fuel is used for domestic purposes, the arrangements, storage, distribution and use of the fuel shall be to the satisfaction of the Administration and in accordance with 5.12 [regulation 12]. (TP An. Reg. V/10(4))

5.11 Miscellaneous items*

* See the *Guidance concerning the use of certain plastic materials*, contained in recommendation 7 of attachment 3 to the Final Act of the International Conference on Safety Fishing Vessels 1993.

5.11.1 All exposed surfaces in corridors and stairway enclosures and surfaces including grounds in concealed or inaccessible spaces in accommodation and service spaces and control stations shall have low flame-spread characteristics.** Exposed surfaces of ceilings in accommodation and service spaces and control stations shall have low flame-spread characteristics. (TP An. Reg. V/11(1))

** See the *Guidelines on the evaluation of fire hazard properties of materials, adopted by the Organization by resolution* A.166(ES.IV) and *Part 5 – Test for surface flammability* (test for surface materials and primary deck coverings), contained in Annex 1 of the *International Code for Application of Fire Test Procedures, 2010* adopted by the Maritime Safety Committee of the Organization by resolution MSC.307(88).

5.11.2 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke or toxic gases or vapours. The Administration shall be satisfied that they are not of a nature to offer an undue fire hazard. (TP An. Reg. V/11(2)) (not applicable to NFV 2003)

5.11.2 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke or toxic gases or vapours, to be determined in accordance with the IMO *Fire Test Procedures Code*. (TP An. Reg. V/11(2) as amended by Dir.35)

5.11.3 Primary deck coverings within accommodation and service spaces and control stations, shall be of approved material which will not readily ignite or give rise to toxic or explosive hazards at elevated temperatures.* (TP An. Reg. V/11(3))

* See the Recommendation on *Fire test procedures for ignitability of primary deck coverings*, adopted by the Organization by resolution A.687(17).

5.11.4 Where "A" or "B" class divisions are penetrated for the passage of electrical cables, pipes, trunks, ducts, etc., or for the fitting of ventilation terminals, lighting fixtures and similar devices, arrangements shall be made to ensure that the fire integrity of the divisions is not impaired. (TP An. Reg. V/11(4))

5.11.5 In accommodation and service spaces and control stations, pipes penetrating "A" or "B" class divisions shall be of approved materials having regard to the temperature such divisions are required to withstand. Where the Administration permits the conveying of oil and combustible liquids through accommodation and service spaces, the pipes conveying oil or combustible liquids shall be of an approved material having regard to the fire risk. (TP An. Reg. V/11(5)(a))

5.11.6 Materials readily rendered ineffective by heat shall not be used for overboard scuppers, sanitary discharges and other outlets which are close to the waterline and where the failure of the material in the event of fire would give rise to danger of flooding. (TP An. Reg. V/11(5)(b))

5.11.7 Cellulose-nitrate-based film shall not be used in cinematograph installations. (TP An. Reg. V/11(6))

5.11.8 All waste receptacles other than those used in fish processing shall be constructed of non-combustible materials with no openings in the sides or bottom. (TP An. Reg. V/11(7))

5.11.9 Machinery driving fuel oil transfer pumps, fuel oil unit pumps and other similar fuel pumps shall be fitted with remote controls situated outside the space concerned so that they can be stopped in the event of a fire arising in the space in which they are located. (TP An. Reg. V/11(8))

5.11.10 Drip trays shall be fitted, where necessary, to prevent oil leaking into bilges. (TP An. Reg. V/11(9))

5.11.11 Within compartments used for stowage of fish, combustible insulation shall be protected by close-fitting cladding. (TP An. Reg. V/11(10))

5.12 Storage of gas cylinders and dangerous materials

5.12.1 Cylinders for compressed, liquefied or dissolved gases shall be clearly marked by means of prescribed identifying colours, have a clearly legible identification of the name and chemical formula of their contents and be properly secured. (TP An. Reg. V/12(1))

5.12.2 Cylinders containing flammable or other dangerous gases and expended cylinders shall be stored, properly secured on open decks and all valves, pressure regulators and pipes leading from such cylinders shall be protected against damage. Cylinders shall be protected against excessive variations in temperature, direct rays of the sun and accumulation of snow. However, the Administration may permit such cylinders to be stored in compartments complying with the requirements of 5.12.3 to 5.12.5 [paragraphs (3) to (5)]. (TP An. Reg. V/12(2))

5.12.3 Spaces containing highly flammable liquids, such as volatile paints, paraffin, benzole, etc. and, where permitted, liquefied gas, shall have direct access from open decks only. Pressure-adjusting devices and relief valves shall exhaust within the compartment. Where boundary bulkheads of such compartments adjoin other enclosed spaces, they shall be gastight. (TP An. Reg. V/12(3))

5.12.4 Except as necessary for service within the space, electrical wiring and fittings shall not be permitted within compartments used for the storage of highly flammable liquids or liquefied gases. Where such electrical fittings are installed, they shall be to the satisfaction of the Administration for use in a flammable atmosphere. Sources of heat shall be kept clear of such spaces and "No smoking" and "No naked light" notices shall be displayed in a prominent position. (TP An. Reg. V/12(4)) (not applicable to NFV 2003)

5.12.4 Except as necessary for service within the space, electrical wiring and fittings shall not be permitted within compartments used for the storage of highly flammable liquids or liquefied gases. Where such electrical fittings are installed, they shall be of a certified safe type and comply with the relevant provisions of the International Standard IEC Publication 79 "*Electrical apparatus for explosive gas atmospheres*". Sources of heat shall be kept clear of such spaces and "No smoking" and "No naked light" notices shall be displayed in a prominent position. (TP An. Reg. V/12(4) as amended by Dir.35)

5.12.5 Separate storage shall be provided for each type of compressed gas. Compartments used for the storage of such gases shall not be used for storage of other combustible products nor for tools or objects not part of the gas distribution system. However, the Administration may relax these requirements considering the characteristics, volume and intended use of such compressed gases. (TP An. Reg. V/12(5))

5.13 Means of escape

5.13.1 Stairways and ladders leading to and from all accommodation spaces and in spaces in which the crew is normally employed, other than machinery spaces, shall be so arranged as to provide ready means of escape to the open deck and, thence, to the survival craft. In particular, in relation to these spaces:

(a) at all levels of accommodation, at least two widely separated means of escape shall be provided which may include the normal means of access from each restricted space or group of spaces;

(b) (i) below the weather deck, the main means of escape shall be a stairway and the second escape may be a trunk or a stairway; and

(ii) above the weather deck, the means of escape shall be stairways or doors to an open deck or a combination thereof;

(c) exceptionally, the Administration may permit only one means of escape, due regard being paid to the nature and location of spaces and to the number of persons who normally might be accommodated or employed there;

(d) a corridor or part of a corridor from which there is only one route of escape, shall not exceed 7 m in length; and

(e) the width and continuity of the means of escape shall be to the satisfaction of the Administration. (this subparagraph (e) is not applicable to NFV 2003)

(e) the continuity of the means of escape shall be to the satisfaction of the Administration. Stairways and corridors used as means for escape shall be not less than 700 mm in clear width and shall have a handrail on at least one side. Doorways which give access to a stairway shall be not less than 700 mm in clear width. (subparagraph (e) as amended by Dir.35)

(TP An. Reg. V/13(1))

5.13.2 Two means of escape shall be provided from every machinery space of category A by one of the following means:

(a) two sets of steel ladders as widely separated as possible leading to doors in the upper part of the space similarly separated and from which access is provided to the open deck. In general, one of these ladders shall provide continuous fire shelter from the lower part of the space to a safe position outside the space. However, the Administration may not require such shelter if, due to special arrangements or dimensions of the machinery space, a safe escape route from the lower part of this space is provided. This shelter shall be of steel, insulated, where necessary, to the satisfaction of the Administration and be provided with a self-closing steel door at the lower end; or (this subparagraph (e) is not applicable to NFV 2003)

(a) two sets of steel ladders as widely separated as possible leading to doors in the upper part of the space similarly separated and from which access is provided to the open deck. In general, one of these ladders shall provide continuous fire shelter from the lower part of the space to a safe position outside the space. However, the Administration may not require such shelter if, due to special arrangements or dimensions of the machinery space, a safe escape route from the lower part of this space is provided. This shelter shall be of steel, insulated to "A-60" class standard and be provided with a "A-60" class self-closing steel door at the lower end; or (subparagraph (a) as amended by Dir.35)

(b) one steel ladder leading to a door in the upper part of the space from which access is provided to the open deck and, additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the open deck. (TP An. Reg. V/13(2))

5.13.3 From machinery spaces other than those of category A, escape routes shall be provided to the satisfaction of the Administration having regard to the nature and location of the space and whether persons are normally employed in that space. (TP An. Reg. V/13(3))

5.13.4 Lifts shall not be considered as forming one of the required means of escape. (TP An. Reg. V/13(4))

5.14 Automatic sprinkler and fire alarm and fire detection systems (Method IIF)

5.14.1 In vessels in which method IIF is adopted, an automatic sprinkler and fire alarm system of an approved type and complying with the requirements of 5.14 [this regulation] shall be installed and so arranged as to protect accommodation spaces and service spaces except spaces which afford no substantial fire risks, such as void spaces and sanitary spaces. (TP An. Reg. V/14(1))

5.14.2 The system shall be capable of immediate operation at all times and no action by the crew shall be necessary to set it in operation. It shall be of the wet pipe type, but small exposed sections may be of the dry pipe type where in the opinion of the Administration this is a necessary precaution. Any parts of the system which may be subjected to freezing temperatures in service shall be suitably protected against freezing.* It shall be kept charged at the necessary pressure and shall have provision for a continuous supply of water as required in 5.14.13 [paragraph (6)(b)]. (TP An. Reg. V/14(2)(a))

*See the *Guidance for precautions against freezing of fire mains*, contained in recommendation 6 of attachment 3 to the Final Act of the International Conference on Safety of Fishing Vessels, 1993.

5.14.3 Each section of sprinklers shall include means for giving a visible and audible alarm signal automatically at one or more indicating units whenever any sprinkler comes into operation. Such units shall indicate in which section served by the system, fire has occurred and shall be centralized in the wheelhouse and, in addition, visible and audible alarms from the unit shall be placed in a position other than in the wheelhouse, so as to ensure that the indication of fire is immediately received by the crew. Such an alarm system shall be so constructed as to indicate if any fault occurs in the system. (TP An. Reg. V/14(2)(b))

5.14.4 Sprinklers shall be grouped into separate sections, each of which shall contain not more than 200 sprinklers. (TP An. Reg. V/14(3)(a))

5.14.5 Each section of sprinklers shall be capable of being isolated by one stop valve only. The stop valve in each section shall be readily accessible and its location shall be clearly and permanently indicated. Means shall be provided to prevent the operation of the stop valves by any unauthorized person. (TP An. Reg. V/14(3)(b))

5.14.6 A gauge indicating the pressure in the system shall be provided at each section stop valve and at a central station. (TP An. Reg. V/14(3)(c))

5.14.7 The sprinklers shall be resistant to corrosion. In accommodation and service spaces, the sprinklers shall come into operation within the temperature range of 68°C and 79°C, except that in locations such as drying rooms, where high ambient temperatures might be expected, the operating temperature may be increased by not more than 30°C above the maximum deck head temperature. (TP An. Reg. V/14(3)(d))

5.14.8 A list or plan shall be displayed at each indicating unit showing the spaces covered and the location of the zone in respect of each section. Suitable instructions for testing and maintenance shall be available. (TP An. Reg. V/14(3)(e))

5.14.9 Sprinklers shall be placed in an overhead position and spaced in a suitable pattern to maintain an average application rate of not less than 5 $l/m^2/min$ over the nominal area covered by the sprinklers. Alternatively, the Administration may permit the use of sprinklers providing such quantity of water suitably distributed as has been shown to the satisfaction of the Administration to be not less effective. (TP An. Reg. V/14(4))

5.14.10 A pressure tank having a volume equal to at least twice that of the charge of water specified in this subparagraph shall be provided. The tank shall contain a standing charge of fresh water, equivalent to the amount of water which would be discharged in one minute by the pump referred to in 5.14.13 [paragraph (6)(b)], and the arrangements shall provide for maintaining such air pressure in the tank as to ensure that, where the standing charge of fresh water in the tank has been used, the pressure will be not less than the working pressure of the sprinkler, plus the pressure due to a head of water measured from the bottom of the tank to the highest sprinkler in the system. Suitable means of replenishing the air under pressure and of replenishing the fresh water charge in the tank shall be provided. A glass gauge shall be provided to indicate the correct level of the water in the tank. (TP An. Reg. V/14(5)(a))

5.14.11 Means shall be provided to prevent the passage of seawater into the tank. (TP An. Reg. V/14(5)(b))

5.14.12 An independent power pump shall be provided solely for the purpose of continuing automatically the discharge of water from the sprinklers. The pump shall be brought into action automatically by the pressure drop in the system before the standing fresh water charge in the pressure tank is completely exhausted. (TP An. Reg. V/14(6)(a))

5.14.13 The pump and the piping system shall be capable of maintaining the necessary pressure at the level of the highest sprinkler to ensure a continuous output of water sufficient for the simultaneous coverage of the maximum area separated by fire-resisting bulkheads of "A" and "B" class divisions or an area of 280 m^2 whichever is the less at the application rate specified in 5.14.9 [paragraph (4)]. (TP An. Reg. V/14(6)(b))

5.14.14 The pump shall have fitted on the delivery side a test valve with a short open-ended discharge pipe. The effective area through the valve and pipe shall be adequate to permit the release of the required pump output while maintaining the pressure in the system specified in 5.14.10 [paragraph (5)(a)]. (TP An. Reg. V/14(6)(c))

5.14.15 The sea inlet to the pump shall, wherever possible, be in the space containing the pump and shall be so arranged that, when the vessel is afloat, it will not be necessary to shut off the supply of seawater to the pump for any purpose other than the inspection or repair of the pump. (TP An. Reg. V/14(6)(d))

5.14.16 The sprinkler pump and tank shall be situated in a position reasonably remote from any machinery space of category A and shall not be situated in any space required to be protected by the sprinkler system. (TP An. Reg. V/14(7))

5.14.17 There shall not be less than two sources of power supply for the seawater pump and the automatic fire alarm and fire detection system. If the pump is electrically driven, it shall be connected to the main source of electrical power, which shall be capable of being supplied by at least two generators. (TP An. Reg. V/14(8)(a))

5.14.18 The feeders shall be arranged so as to avoid galleys, machinery spaces and other enclosed spaces of high fire risk except, in so far as it is necessary to reach the appropriate switchboard. One of the sources of power supply for the fire alarm and fire detection system shall be an emergency source. Where one of the sources of power for the pump is an internal combustion-type engine, it shall, in addition to complying with the provisions of 5.14.16 [paragraph (7)], be so situated that a fire in any protected space will not affect the air supply to that engine. (TP An. Reg. V/14(8)(b))

5.14.19 The sprinkler system shall have a connection from the vessel's fire main by way of a lockable screw-down non-return valve at the connection which will prevent a backflow from the sprinkler system to the fire main. (TP An. Reg. V/14(9))

5.14.20 A test valve shall be provided for testing the automatic alarm for each section of sprinklers by a discharge of water equivalent to the operation of one sprinkler. The test valve for each section shall be situated near the stop valve for that section. (TP An. Reg. V/14(10)(a))

5.14.21 Means shall be provided for testing the automatic operation of the pump on reduction of pressure in the system. (TP An. Reg. V/14(10)(b))

5.14.22 Switches shall be provided at one of the indicating positions referred to in 5.14.3 [paragraph (2)(b)] which will enable the alarm and the indicators for each section of sprinklers to be tested. (TP An. Reg. V/14(8)(a))

5.14.23 Spare sprinkler heads shall be provided for each section of sprinklers to the satisfaction of the Administration. (TP An. Reg. V/14(11)) (not applicable to NFV 2003)

5.14.23 Spare sprinkler heads shall be provided for each section of sprinklers.

Spare sprinkler heads shall include all types and ratings installed in the vessel and shall be provided as follows:

- less than 100 sprinkler heads: 3 spare heads,
- less than 300 sprinkler heads: 6 spare heads,
- 300 to 1 000 sprinkler heads: 12 spare heads. (TP An. Reg. V/14(11) as amended by Dir.35)

5.15 Automatic fire alarm and fire detection systems (Method IIIF)

5.15.1 In vessels, in which method IIIF is adopted, an automatic fire alarm and fire detection system of an approved type and complying with the requirements of 5.15 [this regulation] shall be installed and so arranged as to detect the presence of fire in all accommodation spaces and service spaces except spaces which afford no substantial fire risk, such as void spaces and sanitary spaces. (TP An. Reg. V/15(1))

5.15.2 The system shall be capable of immediate operation at all times and no action of the crew shall be necessary to set it in operation. (TP An. Reg. V/15(2)(a))

5.15.3 Each section of detectors shall include means for giving a visible and audible alarm signal automatically at one or more indicating units whenever any detector comes into operation. Such units shall indicate in which section served by the system a fire has occurred and shall be centralized on the wheelhouse and such other positions as will ensure that any alarm from the system is immediately received by the crew. Additionally, arrangements shall be provided to ensure that an alarm is sounded on the deck on which the fire has been detected. Such an alarm and detection system shall be so constructed as to indicate if any fault occurs in the system. (TP An. Reg. V/15(2)(b))

5.15.4 Detectors shall be grouped into separate sections, each covering not more than 50 rooms served by such a system and containing not more than 100 detectors. Detectors shall be zoned to indicate on which deck a fire has occurred. (TP An. Reg. V/15(3))

5.15.5 The system shall be operated by an abnormal air temperature, by an abnormal concentration of smoke or by other factors indicative of incipient fire in any one of the spaces to be protected. Systems which are sensitive to air temperature shall not operate at less than 54°C and shall operate at a temperature not greater than 78°C when the temperature increase to those levels is not more than 1°C per minute. At the discretion of the Administration, the permissible temperature of operation may be increased to 30°C above the maximum deckhead temperature in drying rooms and similar places of normally high ambient temperature. Systems which are sensitive to smoke concentration shall operate on the reduction of the intensity of a transmitted light beam by an amount to be determined by the Administration. Other equally effective methods of operation may be accepted at the discretion of the Administration. The detection system shall not be used for any purpose other than fire detection. (TP An. Reg. V/15(4)) (not applicable to NFV 2003)

5.15.5 The system shall be operated by an abnormal air temperature, by an abnormal concentration of smoke or other factors indicative of incipient fire in any one of the spaces to be protected. Systems which are sensitive to air temperature shall not operate at less than 54 °C and shall operate at a temperature not greater than 78 °C when the temperature increase to those levels is not more than 1 °C per minute. At the discretion of the Administration the permissible temperature of operation may be increased to 30 °C above the maximum deckhead temperature in drying rooms and similar places of normally high ambient temperature. Systems which are sensitive to smoke concentration shall operate on the reduction of the intensity of a transmitted light beam. Smoke detectors shall be certified to operate before the smoke density exceeds 12,5 % obscuration per metre, but not until the smoke density exceeds 2 % obscuration per metre. Other equally effective methods of operation may be accepted at the discretion of the Administration. The detection system shall not be used for any purpose other than fire detection. (TP An. Reg. V/15(4) as amended by Dir.35)

5.15.6 The detectors may be arranged to operate the alarm by the opening or closing of contacts or by other appropriate methods. They shall be fitted in an overhead position and shall be suitably protected against impact and physical damage. They shall be suitable for use in a marine atmosphere. They shall be placed in an open position clear of beams and other objects likely to obstruct the flow of hot gases or smoke to the sensitive element. Detectors operated by the closing of contacts shall be of the sealed contact type and the circuit shall be continuously monitored to indicate fault conditions. (TP An. Reg. V/15(5))

5.15.7 At least one detector shall be installed in each space where detection facilities are required and there shall be not less than one detector for each 37 m^2 of deck area approximately. In large spaces the detectors shall be arranged in a regular pattern so that no detector is more than 9 m from another detector or more than 4.5 m from a bulkhead. (TP An. Reg. V/15(6))

5.15.8 There shall be not less than two sources of power supply for the electrical equipment used in the operation of the fire alarm and fire detection system, one of which shall be an emergency source. The supply shall be provided by separate feeders reserved solely for that purpose. Such feeders shall run to a change-over switch situated in the control station for the fire detection system. The wiring system shall be so arranged as to avoid galleys, machinery spaces and other enclosed spaces having a high fire risk, except, in so far as it is necessary, to provide for fire detection in such spaces or to reach the appropriate switchboard. (TP An. Reg. V/15(7))

5.15.9 A list or plan shall be displayed adjacent to each indicating unit showing the spaces covered and the location of the zone in respect of each system. Suitable instructions for testing and maintenance shall be available. (TP An. Reg. V/15(8)(a))

5.15.10 Provision shall be made for testing the correct operation of the detectors and the indicating units by supplying means for applying hot air or smoke at detector positions. (TP An. Reg. V/15(8)(b))

5.15.11 Spare detector heads shall be provided for each section of detectors, to the satisfaction of the Administration. (TP An. Reg. V/15(9))

5.16 Fixed fire-extinguishing arrangements in cargo spaces of high fire risk

5.16.1 Cargo spaces of high fire risk shall be protected by a fixed gas fire-extinguishing system or by a fire-extinguishing system which gives equivalent protection, to the satisfaction of the Administration. (TP An. Reg. V/16)

5.17 Fire pumps

5.17.1 At least two fire pumps shall be provided. (TP An. Reg. V/17(1))

5.17.2 If a fire in any one compartment could put all the fire pumps out of action, there shall be an alternative means of providing water for fire fighting. In vessels of **75 m** in length and over, this alternative means shall be a fixed emergency fire pump independently driven. This emergency fire pump shall be capable of supplying two jets of water, to the satisfaction of the Administration. (TP An. Reg. V/17(2)) (not applicable to NFV 2003)

5.17.2 If a fire in any one compartment could put all the fire pumps out of action, there shall be an alternative means of providing water for fire fighting. In vessels of **75 m** in length and over, this alternative means shall be a fixed emergency fire pump independently driven. This emergency fire pump shall be capable of supplying two jets of water at a minimum pressure of 0.25 N/mm^2. (TP An. Reg. V/17(2) as amended by Dir.35)

5.17.3 The fire pumps, other than the emergency pump, shall be capable of delivering for fire-fighting purposes a quantity of water at a minimum pressure of 0.25 N/mm^2, with a total capacity (Q) of at least:

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

where:

L, B and D are in metres.

However, the total required capacity of the fire pumps need not exceed 180 m^3/h. (TP An. Reg. V/17(3)(a))

5.17.4 Each of the required fire pumps other than any emergency pump shall have a capacity of not less than 40 per cent of the total capacity of fire pumps required by 5.17.3 [subparagraph (a)] and shall, in any event, be capable of delivering at least the jets of water required by 5.19.3 [regulation 19(2)(a)]. These fire pumps shall be capable of supplying the fire main systems under the required conditions. Where more than two pumps are installed, the capacity of such additional pumps shall be to the satisfaction of the Administration. (TP An. Reg. V/17(3)(b))

5.17.5 Fire pumps shall be independently driven power pumps. Sanitary, ballast, bilge or general service pumps may be accepted as fire pumps, provided that they are not normally used for pumping oil and that, if they are subject to occasional duty for the transfer or pumping of fuel oil, suitable change-over arrangements are fitted. (TP An. Reg. V/17(4)(a))

5.17.6 Relief valves shall be provided in conjunction with all fire pumps if the pumps are capable of developing a pressure exceeding the design pressure of the water service pipes, hydrants and hoses. These valves shall be so placed and adjusted as to prevent excessive pressure in any of the fire main systems. (TP An. Reg. V/17(4)(b))

5.17.7 Emergency power-operated fire pumps shall be independently driven self-contained pumps either with their own diesel engine prime mover and fuel supply fitted in an accessible position outside the compartment which contains the main fire pumps, or be driven by a self-contained generator, which may be the emergency generator referred to in 4.17 [regulation IV/17], of sufficient capacity and which is positioned in a safe place outside the engine room and preferably above the working deck. The emergency fire pump shall be capable of operating for a period of at least 3 h. (TP An. Reg. V/17(4)(c))

5.17.8 Emergency fire pumps, sea-suction valves and other necessary valves shall be operable from outside compartments containing main fire pumps in a position not likely to be cut off by a fire in those compartments. (TP An. Reg. V/17(4)(d))

5.18 Fire mains

5.18.1 Where more than one hydrant is required to provide the number of jets specified in 5.19.3 [regulation 19(2)(a)], a fire main shall be provided. (TP An. Reg. V/18(1)(a))

5.18.2 Fire mains shall have no connections other than those required for fire fighting, except for the purpose of washing the deck and anchor chains and operation of bilge ejectors, subject to the efficiency of the fire-fighting system being maintained. (TP An. Reg. V/18(1)(b))

5.18.3 Where fire mains are not self-draining, suitable drain cocks shall be fitted where frost damage could be expected.* (TP An. Reg. V/18(1)(c))

* See the *Guidance for precautions against freezing of fire mains*, contained in recommendation 6 of attachment 3 to the Final Act of the International Conference on Safety of Fishing vessels, 1993.

5.18.4 The diameter of the fire main and water service pipes shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously or of 140 m^3/h, whichever is the less. (TP An. Reg. V/18(2)(a))

5.18.5 With the two pumps simultaneously delivering through nozzles specified in 6.19.7 and 5.19.8 [regulation 19(5)] the quantity of water specified in 5.18.4 [subparagraph (a)], through any adjacent hydrants, the minimum pressure of 0.25 N/mm^2 shall be maintained at all hydrants. (TP An. Reg. V/18(2)(b))

5.19 Fire hydrants, fire hoses and nozzles

5.19.1 The number of fire hoses provided shall be equal to the number of fire hydrants arranged according to 5.19.3 and 5.19.4 [paragraph (2)] and one spare hose. This number does not include any fire hoses required in any engine or boiler room. The Administration may increase the number of fire hoses required so as to ensure that hoses in sufficient number are available and accessible at all times, having regard to the size of the vessel. (TP An. Reg. V/19(1)(a))

5.19.2 Fire hoses shall be of approved material and sufficient in length to project a jet of water to any of the spaces in which they may be required to be used. Their maximum length shall be 20 m. Every fire hose shall be provided with a nozzle and the necessary couplings. Fire hoses shall,

together with any necessary fittings and tools, be kept ready for use in conspicuous positions near the water service hydrants or connections. (TP An. Reg. V/19(1)(b))

5.19.3 The number and position of the hydrants shall be such that at least two jets of water not emanating from the same hydrant, one of which shall be from a single length of fire hose, may reach any part of the vessel normally accessible to the crew while the vessel is being navigated. (TP An. Reg. V/19(2)(a))

5.19.4 All required hydrants shall be fitted with fire hoses having dual purpose nozzles as required by 5.19.7 to 5.19.9 [paragraph (5)]. One hydrant shall be located near the entrance of the space to be protected. (TP An. Reg. V/19(2)(b))

5.19.5 Materials readily rendered ineffective by heat shall not be used for fire mains and hydrants, unless adequately protected. The pipes and hydrants shall be so placed that the fire hoses may be easily coupled to them. In vessels where deck cargo may be carried, the positions of the hydrants shall be such that they are always readily accessible and the pipes shall be arranged, as far as practicable, to avoid risk of damage by such cargo. Unless one fire hose and nozzle is provided for each hydrant, there shall be complete interchangeability of fire hose couplings and nozzles. (TP An. Reg. V/19(3))

5.19.6 A cock or valve shall be fitted to serve each fire hose so that any fire hose may be removed while the fire pumps are operating. (TP An. Reg. V/19(4))

5.19.7 Standard nozzle sizes shall be 12 mm, 16 mm and 19 mm or as near thereto as possible. Larger diameter nozzles may be permitted at the discretion of the Administration. (TP An. Reg. V/19(5)(a))

5.19.8 For accommodation and service spaces, a nozzle size greater than 12 mm need not be used. (TP An. Reg. V/19(5)(b))

5.19.9 For machinery spaces and exterior locations, the nozzle size shall be such as to obtain the maximum discharge possible from two jets at the pressure specified in 6.18.5 [regulation 18(2)(b)] from the smallest pump, provided that a nozzle size greater than 19 mm need not be used. (TP An. Reg. V/19(5)(c))

5.20 Fire extinguishers*

* See the *Improved Guidelines for marine portable fire extinguishers*, adopted by the Organization by resolution A.951(23).

5.20.1 Fire extinguishers shall be of approved types. The capacity of required portable fluid extinguishers shall be not more than 13.5 *l* and not less than 9 *l*. Other extinguishers shall not be in excess of the equivalent portability of the 13.5 *l* fluid extinguisher and shall not be less than the fire-extinguishing equivalent of a 9 *l* fluid extinguisher. The Administration shall determine the equivalents of fire extinguishers. (TP An. Reg. V/20(1))

5.20.2 Spare charges shall be provided to the satisfaction of the Administration. (TP An. Reg. V/20(2)) (not applicable to NFV 2003)

5.20.2 Spare charges

.1 For each type of fire extinguisher carried, capable of being recharged on board, 100 % spare charges for the first 10 extinguishers shall be provided and 50 % for the remaining extinguishers but not more than 60.

.2 For fire extinguishers which cannot be recharged on board, at least 50 % additional fire extinguishers of same type and capacity shall be provided in lieu of spare charges.

.3 Instructions for recharging should be carried on board. Only refills approved for the fire extinguishers in question may be used for recharging. (TP An. Reg. V/20(2) as amended by Dir.35)

5.20.3 Fire extinguishers containing an extinguishing medium which, in the opinion of the Administration, either by itself or under expected conditions of use, gives off toxic gases in such quantities as to endanger persons shall not be permitted. (TP An. Reg. V/20(3))

5.20.4 Fire extinguishers shall be periodically examined and subjected to such tests as the Administration may require. (TP An. Reg. V/20(4)) (not applicable to NFV 2003)

5.20.4 Fire extinguishers shall be examined annually by a competent person, authorised by the Administration. Each extinguisher shall be provided with a sign indicating that it has been examined. All containers of permanently pressurised fire extinguishers and propellant bottles of non-pressurised extinguishers shall be hydraulic pressure tested every 10 years. (TP An. Reg. V/20(4) as amended by Dir.35)

5.20.5 Normally, one of the portable fire extinguishers intended for use in any space shall be stowed near an entrance to that space. (TP An. Reg. V/20(5))

5.21 Portable fire extinguishers in control stations and accommodation and service spaces

5.21.1 At least five approved portable fire extinguishers shall be provided in control stations and accommodation and service spaces, to the satisfaction of the Administration. (TP An. Reg. V/21(1))

5.21.2 Spare charges shall be provided to the satisfaction of the Administration. (TP An. Reg. V/21(2)) (not applicable to NFV 2003)

5.21.2 Spare charges

.1 For fire extinguishers, capable of being recharged on board, 100 % spare charges for the first 10 extinguishers shall be provided and 50 % for the remaining extinguishers but not more than 60.

.2 For fire extinguishers which cannot be recharged on board at least 50 % additional fire extinguishers of same type and capacity shall be provided in lieu of spare charges.

.3 Instructions for recharging should be carried on board. Only refills approved for the fire extinguishers in question may be used for recharging. (TP An. Reg. V/21(2) as amended by Dir.35)

5.22 Fire-extinguishing appliances in machinery spaces

Notwithstanding the provisions of 5.22 [this Regulation], all machinery spaces of category A shall be fitted with a fixed fire-extinguishing arrangement. (TP An. Reg. V/22)

5.22.1 Spaces containing oil-fired boilers or fuel oil units shall be provided with one of the following fixed fire-extinguishing systems, to the satisfaction of the Administration:

(i) a pressure water-spraying installation;

(ii) a fire-smothering gas installation;

(iii) a fire-extinguishing installation using vapours from low toxicity vapourizing liquids; or

(iv) a fire-extinguishing installation using high expansion foam.

Where the engine and boiler rooms are not entirely separate, or if fuel oil can drain from the boiler room into the engine-room, the combined engine and boiler rooms shall be considered as one compartment. (TP An. Reg. V/22(1)(a))

5.22.2 New installations of halogenated hydrocarbon systems used as fire-extinguishing media shall be prohibited on new and existing vessels. (TP An. Reg. V/22(1)(b))

5.22.3 Every boiler room shall be provided with at least one set of portable air-foam equipment to the satisfaction of the Administration. (TP An. Reg. V/22(1)(c))

5.22.4 At least two approved portable extinguishers discharging foam or equivalent shall be provided in each firing space in each boiler room and each space in which a part of the fuel oil installation is situated. At least one approved foam-type extinguisher of at least 135 *l* capacity or equivalent shall be provided with hoses on reels suitable for reaching any part of the boiler room. The Administration may relax the requirements of this subparagraph, having regard to the size and nature of the space to be protected. (TP An. Reg. V/22(1)(d))

5.22.5 In each firing space, there shall be a receptacle containing sand, sawdust impregnated with soda or other approved dry material, in such quantity as may be required by the Administration. Alternatively, an approved portable extinguisher may be provided. (TP An. Reg. V/22(1)(e))

5.22.6 Spaces containing internal combustion machinery used either for main propulsion or for other purposes, when such machinery has a total power output of not less than 750 kW, shall be provided with the following arrangements:

(a) one of the fire-extinguishing systems required by 5.22.1 [paragraph (1)(a)];

(b) at least one set of portable air-foam equipment to the satisfaction of the Administration; and

(c) in each such space, approved foam-type fire extinguishers each of at least 45 *l* capacity, or equivalent, sufficient in number to enable foam or its equivalent to be directed on to any part of the fuel and lubricating oil pressure systems, gearing and other fire hazards. In addition, there shall be provided a sufficient number of portable foam extinguishers or equivalent which shall be so located that an extinguisher is not more than 10 m walking distance from any point in the space, provided that there shall be at least two such extinguishers in each such space. For smaller spaces, the Administration may relax these requirements. (TP An. Reg. V/22(2))

5.22.7 Spaces containing steam turbines or enclosed steam engines used either for main propulsion, or for other purposes, when such machinery has a total power output of not less than 750 kW shall be provided with the following arrangements:

(a) foam fire extinguishers each of at least 45 *l* capacity, or equivalent, sufficient in number to enable foam or its equivalent to be directed on to any part of the pressure lubrication system, on to any part of the casings enclosing pressure lubricated parts of the turbines, engines or associated gearing, and any other fire hazards. Provided that such extinguishers shall not be required if protection at least equivalent to that of this subparagraph is provided in such spaces by a fixed fire-extinguishing system fitted in compliance with 5.22.1 [paragraph (1)(a)]; and

(b) a sufficient number of portable foam extinguishers, or equivalent, which shall be so located that an extinguisher is not more than 10 m walking distance from any point in the space; provided that there shall be at least two such extinguishers in each such space, and such extinguishers shall not be required in addition to any provided in compliance with 5.22.6(c) [paragraph (2)(c)]. (TP An. Reg. V/22(3))

5.22.8 Where, in the opinion of the Administration, a fire hazard exists in any machinery space for which no specific provisions for fire-extinguishing appliances are prescribed in 5.22.1 to 5.22.7 [paragraphs (1), (2) and (3)], there shall be provided in, or adjacent to, that space a number of approved portable fire extinguishers or other means of fire extinction to the satisfaction of the Administration. (TP An. Reg. V/22(4))

5.22.9 Where fixed fire-extinguishing systems not required by this part are installed, such systems shall be to the satisfaction of the Administration. (TP An. Reg. V/22(5))

5.22.10 For any machinery space of category A to which access is provided at a low level from an adjacent shaft tunnel, there shall be provided, in addition to any watertight door and on the side remote from that machinery space, a light steel fire-screen door which shall be capable of being operated from each side of the door. (TP An. Reg. V/22(6))

5.23 International shore connection

5.23.1 At least one international shore connection, complying with 5.23.2 [paragraph (2)], shall be provided. (TP An. Reg. V/23(1))

5.23.2 Standard dimensions of flanges for the international shore connection shall be in accordance with the following table: (TP An. Reg. V/23(2))

Description	Dimension
Outside diameter	178 mm
Inner diameter	64 mm
Bolt circle diameter	132 mm
Slots in flange	4 holes 19 mm in diameter equidistantly placed on a bolt circle of the above diameter, slotted to the flange periphery
Flange thickness	14.5 mm minimum
Bolts and nuts	4 each of 16 mm in diameter and 50 mm in length

5.23.3 This connection shall be constructed of material suitable for 1 N/mm^2 service pressure. (TP An. Reg. V/23(3))

5.23.4 The flange shall have a flat face on one side and the other shall have a coupling permanently attached thereto that will fit the vessel's hydrant and hose. The connection shall be kept aboard the vessel together with a gasket of any material suitable for 1 N/mm^2 service pressure, together with four 16 mm bolts 50 mm in length and eight washers. (TP An. Reg. V/23(4))

5.23.5 Facilities shall be available enabling such a connection to be used on either side of the vessel. (TP An. Reg. V/23(5))

5.24 Fireman's outfits (not applicable to NFV 2003)

5.24.1 At least two fireman's outfits shall be carried to the satisfaction of the Administration. (TP An. Reg. V/24(1)) (not applicable to NFV 2003)

5.24.2 The fireman's outfits shall be stored so as to be easily accessible and ready for use and shall be stored in widely separated positions. (TP An. Reg. V/24(2)) (not applicable to NFV 2003)

5.24 Firefighter's outfits

5.24.1 At least two firefighter's outfits shall be carried. The firefighter's outfits shall be in accordance with the IMO *Fire Safety Systems Code*, Chapter III, regulations 2.1, 2.1.1 and 2.1.2. Two spare charges shall be provided for each required breathing apparatus. (TP An. Reg. V/24(1) as amended by Dir.35)

5.24.2 The firefighter's outfits shall be stored so as to be easily accessible and ready for use and shall be stored in widely separated positions. (TP An. Reg. V/24(2) as amended by Dir.35)

5.25 Fire control plan

5.25.1 There shall be a permanently exhibited fire control plan to the satisfaction of the Administration. (TP An. Reg. V/25) (not applicable to NFV 2003)

5.25.1 There shall be a permanently exhibited fire control plan. The contents of such a plan shall be in accordance with IMO Resolution A.654(16) "*Graphical symbols for fire control plans*" and IMO Resolution A.756(18) "*Guidelines on the information to be provided with fire control plans*". (TP An. Reg. V/25 as amended by Dir.35)

5.26 Ready availability of fire-extinguishing appliances

5.26.1 Fire-extinguishing appliances shall be kept in good order and available for immediate use at all times. (TP An. Reg. V/26)

5.27 Acceptance of substitutes

5.27.1 Where in this part any special type of appliance, apparatus, extinguishing medium or arrangement is specified, any other type of appliance, etc., may be allowed, provided the Administration is satisfied that it is not less effective. (TP An. Reg. V/27)

PART C
FIRE SAFETY MEASURES IN VESSELS OF 24 METRES IN LENGTH AND OVER BUT LESS THAN 60 METRES

5.28 Structural fire protection

5.28.1 The hull, superstructure, structural bulkheads, decks and deckhouses shall be constructed of non-combustible materials. The Administration may permit combustible construction, provided the requirements of 5.28 [this regulation] and the additional fire-extinguishing requirements of 5.40.5 [regulation 40(3)] are complied with. (TP An. Reg. V/28(1))

5.28.2 In vessels, the hull of which is constructed of non-combustible materials, the decks and bulkheads separating machinery spaces of category A from accommodation spaces, service spaces or control stations shall be constructed to "A-60" class standard where the machinery space of category A is not provided with a fixed fire-extinguishing system and to "A-30" class standard where such a system is fitted. Decks and bulkheads separating other machinery spaces from accommodation, service spaces and control stations shall be constructed to "A-0" class standard. Decks and bulkheads separating control stations from accommodation and service spaces shall be constructed to "A" class standard, insulated to the satisfaction of the Administration, except that an Administration may permit the fitting of "B-15" class divisions for separating such spaces as skipper's cabin from the wheelhouse. (TP An. Reg. V/28(2)(a)) (not applicable to NFV 2003)

5.28.2 In vessels, the hull of which is constructed of non-combustible materials, the decks and bulkheads separating machinery spaces of category A from accommodation spaces, service spaces or control stations shall be constructed to "A-60" class standard where the machinery space of category A is not provided with a fixed fire-extinguishing system and to "A-30" class standard where such a system is fitted. Decks and bulkheads separating other machinery spaces from accommodation, service spaces and control stations shall be constructed to "A-0" class standard. Decks and bulkheads separating control stations from accommodation and service spaces shall be constructed to "A" class standard, in accordance with the tables 1 and 2 of 5.7 [regulation 7] of this chapter, except that an Administration may permit the fitting of "B-15" class divisions for separating such spaces as skipper's cabin from the wheelhouse. (TP An. Reg. V/28(2)(a) as amended by Dir.35)

5.28.3 In vessels, the hull of which is constructed of combustible materials, the decks and bulkheads separating machinery spaces from accommodation spaces, service spaces or control stations shall be constructed to "F" class or "B-15" class standard. In addition, machinery space boundaries shall, as far as practicable, prevent the passage of smoke. Decks and bulkheads separating control stations from accommodation and service spaces shall be constructed to "F" class standard. (TP An. Reg. V/28(2)(b))

5.28.4 In vessels, the hull of which is constructed of non-combustible materials, bulkheads of corridors serving accommodation spaces, service spaces and control stations shall be of "B-15" class divisions. (TP An. Reg. V/28(3)(a))

5.28.5 In vessels, the hull of which is constructed of combustible materials, bulkheads of corridors serving accommodation spaces, service spaces and control stations shall be of "F" class divisions. (TP An. Reg. V/28(3)(b))

5.28.6 Any bulkhead required by 5.28.4 or 5.28.5 [subparagraph (a) or (b)] shall extend from deck to deck unless a continuous ceiling of the same class as the bulkhead is fitted on both sides of the bulkhead, in which case the bulkhead may terminate at the continuous ceiling. (TP An. Reg. V/28(3)(c))

5.28.7 Interior stairways serving accommodation spaces, service spaces or control stations shall be of steel or other equivalent material. Such stairways shall be within enclosures constructed of "F" class divisions in vessels the hull of which is constructed of combustible materials, or "B-15" class divisions in vessels the hull of which is constructed of non-combustible materials, provided that, where a stairway penetrates only one deck, it need be enclosed at one level only. (TP An. Reg. V/28(4))

5.28.8 Doors and other closures of openings in bulkheads and decks referred to in 5.28.2 to 5.28.6 [paragraphs (2) and (3)], doors fitted to stairway enclosures referred to in 5.28.7 [paragraph (4)] and doors fitted in engine and boiler casings, shall be as far as practicable equivalent in resisting fire to the divisions in which they are fitted. Doors to machinery spaces of category A shall be self-closing. (TP An. Reg. V/28(5))

5.28.9 Lift trunks which pass through the accommodation and service spaces shall be constructed of steel or equivalent material and shall be provided with means of closing which will permit control of draught and smoke. (TP An. Reg. V/28(6))

5.28.10 In vessels, the hull of which is constructed of combustible materials, the boundary bulkheads and decks of spaces containing any emergency source of power and bulkheads and decks between galleys, paint rooms, lamp rooms or any store-rooms which contain appreciable quantities of highly flammable materials, and accommodation spaces, service spaces or control stations shall be constructed of "F" class or "B-15" class divisions. (TP An. Reg. V/28(7)(a))

5.28.11 In vessels, the hull of which is constructed of non-combustible materials, the decks and bulkheads referred to in 5.28.10 [subparagraph (a)] shall be "A" class divisions insulated to the satisfaction of the Administration, having in mind the risk of fire, except that the Administration may accept "B-15'" class divisions between a galley and accommodation spaces, service spaces and control stations when the galley contains electrically heated furnaces, electrically heated hot water appliances or other electrically heated appliances only. (TP An. Reg. V/28(7)(b))

5.28.12 Highly flammable products shall be carried in suitably sealed containers. (TP An. Reg. V/28(7)(c))

5.28.13 Where bulkheads or decks required by 6.28.2 and 6.28.3, 6.28.4 to 6.28.6, 6.28.8 or 5.28.10 and 5.28.11 [paragraphs (2), (3), (5) or (7)] to be of "A" class, "B" class or "F" class divisions, are penetrated for the passage of electrical cables, pipes, trunks, ducts, etc., arrangements shall be made to ensure that the fire integrity of the division is not impaired. (TP An. Reg. V/28(8))

5.28.14 Air spaces enclosed behind ceilings, panellings or linings in accommodation spaces, service spaces and control stations shall be divided by close-fitting draught stops spaced not more than 7 m apart. (TP An. Reg. V/28(9))

5.28.15 Windows and skylights to machinery spaces shall be as follows:

(a) where skylights can be opened, they shall be capable of being closed from outside the space. Skylights containing glass panels shall be fitted with external shutters of steel or other equivalent material permanently attached;

(b) glass or similar materials shall not be fitted in machinery space boundaries. This does not preclude the use of wire-reinforced glass for skylights and glass in control rooms within the machinery spaces; and

(c) in skylights referred to in subparagraph (a), wire-reinforced glass shall be used. (TP An. Reg. V/28(10))

5.28.16 Insulating materials in accommodation spaces, service spaces except domestic refrigerating compartments, control stations and machinery spaces shall be non-combustible. The surface of insulation fitted on the internal boundaries of machinery spaces of category A shall be impervious to oil or oil vapours. (TP An. Reg. V/28(11))

5.28.17 Within compartments used for stowage of fish, combustible insulation shall be protected by close-fitting cladding. (TP An. Reg. V/28(12))

5.28.18 Notwithstanding the requirements of 5.28 [this regulation], the Administration may accept "A-0" class divisions in lieu of "B-15" or "F" class divisions, having regard to the amount of combustible materials used in adjacent spaces. (TP An. Reg. V/28(13))

5.29 Ventilation systems

5.29.1 Except as provided for in 5.30.2 [regulation 30(2)], means shall be provided to stop fans and close main openings to ventilation systems from outside the spaces served. (TP An. Reg. V/29(1))

5.29.2 Means shall be provided for closing, from a safe position, the annular spaces around funnels. (TP An. Reg. V/29(2))

5.29.3 Ventilation openings may be permitted in and under the doors in corridor bulkheads except that such openings shall not be permitted in and under stairway enclosure doors. The openings shall be provided only in the lower half of a door. Where such opening is in or under a door, the total net area of any such opening or openings shall not exceed 0.05 m^2. When such opening is cut in a door, it shall be fitted with a grille made of non-combustible material. (TP An. Reg. V/29(3))

5.29.4 Ventilation ducts for machinery spaces of category A or galleys shall not, in general, pass through accommodation spaces, service spaces or control stations. Where the Administration permits this arrangement, the ducts shall be constructed of steel or equivalent material and arranged to preserve the integrity of the divisions. (TP An. Reg. V/29(4))

5.29.5 Ventilation ducts of accommodation spaces, service spaces or control stations shall not, in general, pass through machinery spaces of category A or through galleys. Where the Administration permits this arrangement, the ducts shall be constructed of steel or equivalent material and arranged to preserve the integrity of the divisions. (TP An. Reg. V/29(5))

5.29.6 Store-rooms containing appreciable quantities of highly flammable products shall be provided with ventilation arrangements which are separate from other ventilation systems. Ventilation shall be arranged at high and low levels and the inlets and outlets of ventilators shall be positioned in safe areas. Suitable wire mesh guards to arrest sparks shall be fitted over inlet and outlet ventilation openings. (TP An. Reg. V/29(6))

5.29.7 Ventilation systems serving machinery spaces shall be independent of systems serving other spaces. (TP An. Reg. V/29(7))

5.29.8 Where trunks or ducts serve spaces on both sides of "A" class bulkheads or decks, dampers shall be fitted so as to prevent the spread of fire and smoke between compartments. Manual dampers shall be operable from both sides of the bulkhead or the deck. Where the trunks or ducts with a free cross-sectional area exceeding 0.02 m_2 pass through "A" class bulkheads or decks, automatic self-closing dampers shall be fitted. Trunks serving compartments situated only on one side of such bulkheads shall comply with 5.9.2 [regulation 9(1)(b)]. (TP An. Reg. V/29(8))

5.30 Heating installations

5.30.1 Electric radiators shall be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiator shall be fitted with an element so exposed that clothing, curtains or other similar materials can be scorched or set on fire by heat from the element. (TP An. Reg. V/30(1))

5.30.2 Heating by means of open fires shall not be permitted. Heating stoves and other similar appliances shall be firmly secured and adequate protection and insulation against fire shall be provided beneath and around such appliances and in way of their uptakes. Uptakes of stoves which burn solid fuel shall be so arranged and designed as to minimize the possibility of becoming blocked by combustion products and shall have a ready means for cleaning. Dampers for limiting draughts in uptakes shall, when in the closed position, still leave an adequate area open. Spaces in which stoves are installed shall be provided with ventilators of sufficient area to provide adequate combustion-air for the stove. Such ventilators shall have no means of closure and their position shall be such that no closing appliances in accordance with 2.9 [regulation II/9] are required. (TP An. Reg. V/30(2))

5.30.3 Open flame gas appliances, except cooking stoves and water heaters, shall not be permitted. Spaces containing any such stoves or water heaters shall have adequate ventilation to remove fumes and possible gas leakage to a safe place. All pipes conveying gas from container to stove or water heater shall be of steel or other approved material. Automatic safety gas shut-off devices shall be fitted to operate on loss of pressure in the gas main pipe or flame failure on any appliance. (TP An. Reg. V/30(3))

5.31 Miscellaneous items*

* See the *Guidance concerning the use of certain plastic materials*, contained in recommendation 7 of attachment 3 to the Final Act of the International Conference on Safety of Fishing Vessels, 1993.

5.31.1 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 stations shall have low flame-spread characteristics.** (TP An. Reg. V/31(1)) (not applicable to NFV 2003)

** See the *Guidelines on the evaluation of fire hazard properties of materials*, adopted by the Organization by resolution A.166(ES.IV) and *Part 5 – Testing for surface flammability* (test for surface materials and primary deck coverings), contained in Annex 1 of the *International Code for Application of Fire Test Procedures, 2010*, adopted by the Maritime Safety Committee of the Organization by resolution MSC.307(88).

5.31.1 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 stations shall have low flame-spread characteristics, as determined in accordance with the IMO *Fire Test Procedures Code*. (TP An. Reg. V/31(1) as amended by Dir.35)

5.31.2 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 shall 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. (TP An. Reg. V/31(2))

5.31.3 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke or toxic gases or vapours. The Administration shall be satisfied that they are not of a nature to offer an undue fire hazard. (TP An. Reg. V/31(3)) (not applicable to NFV 2003)

5.31.3 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke or toxic gases or vapours, this being determined in accordance with the IMO *Fire Test Procedures Code*. (TP An. Reg. V/31(3) as amended by Dir.35)

5.31.4 Primary deck coverings within accommodation and service spaces and control stations shall be of approved material which will not readily ignite or give rise to toxic or explosive hazards at elevated temperatures.* (TP An. Reg. V/31(4))

* For vessels, the decks of which are constructed of steel, see the Recommendation on *Fire test procedures for ignitability of primary deck coverings*, adopted by the Organization by resolution A.687(17).

5.31.5 In accommodation and service spaces and control stations, pipes penetrating "A" or "B" class divisions shall be of approved materials having regard to the temperature such divisions are required to withstand. Where the Administration permits the conveying of oil and combustible liquids through accommodation and service spaces, the pipes conveying oil or combustible liquids shall be of an approved material having regard to the fire risk. (TP An. Reg. V/31(5)(a))

5.31.6 Materials readily rendered ineffective by heat shall not be used for overboard scuppers, sanitary discharges and other outlets which are close to the waterline and where the failure of the material in the event of fire would give rise to danger of flooding. (TP An. Reg. V/31(5)(b))

5.31.7 All waste receptacles, other than those used in fish processing, shall be constructed of non-combustible materials with no openings in the sides and bottom. (TP An. Reg. V/31(6))

5.31.8 Machinery driving fuel oil transfer pumps, fuel oil unit pumps and other similar fuel pumps shall be fitted with remote controls situated outside the space concerned so that they can be stopped in the event of a fire arising in the space in which they are located. (TP An. Reg. V/31(7))

5.31.9 Drip trays shall be fitted, where necessary, to prevent oil leaking into bilges. (TP An. Reg. V/31(8))

5.32 Storage of gas cylinders and dangerous materials

5.32.1 Cylinders for compressed, liquefied or dissolved gases shall be clearly marked by means of prescribed identifying colours, have a clearly legible identification of the name and chemical formula of their contents and be properly secured. (TP An. Reg. V/32(1))

5.32.2 Cylinders containing flammable or other dangerous gases and expended cylinders shall be stored, properly secured, on open decks and all valves, pressure regulators and pipes leading from such cylinders shall be protected against damage. Cylinders shall be protected against excessive variations in temperature, direct rays of the sun, and accumulation of snow. However, the Administration may permit such cylinders to be stored in compartments complying with the requirements of 5.23.2 to 5.23.5 [paragraphs (3) to (5)]. (TP An. Reg. V/32(2))

5.32.3 Spaces containing highly flammable liquids, such as volatile paints, paraffin, benzole, etc., and, where permitted, liquefied gas, shall have direct access from open decks only. Pressure-adjusting devices and relief valves shall exhaust within the compartment. Where boundary bulkheads of such compartments adjoin other enclosed spaces, they shall be gastight. (TP An. Reg. V/32(3))

5.32.4 Except as necessary for service within the space, electrical wiring and fittings shall not be permitted within compartments used for the storage of highly flammable liquids or liquefied gases. Where such electrical fittings are installed, they shall be to the satisfaction of the Administration for use in a flammable atmosphere. Sources of heat shall be kept clear of such spaces and "No smoking" and "No naked light" notices shall be displayed in a prominent position. (TP An. Reg. V/32(4)) (not applicable to NFV 2003)

5.32.4 Except as necessary for service within the space, electrical wiring and fittings shall not be permitted within compartments used for the storage of highly flammable liquids or liquefied gases. Where such electrical fittings are installed, they shall be of a certified safe type and comply with the relevant provisions of the International Standard IEC Publication 79 "*Electrical apparatus for explosive gas atmospheres*". Sources of heat shall be kept clear of such spaces and "No smoking" and "No naked light" notices shall be displayed in a prominent position. (TP An. Reg. V/32(4) as amended by Dir.35)

5.32.5 Separate storage shall be provided for each type of compressed gas. Compartments used for the storage of such gases shall not be used for storage of other combustible products nor for tools or objects not part of the gas distribution system. However, the Administration may relax these requirements considering the characteristics, volume and intended use of such compressed gases. (TP An. Reg. V/32(5))

5.33 Means of escape

5.33.1 Stairways and ladders leading to and from all accommodation spaces and in spaces in which the crew is normally employed, other than machinery spaces, shall be so arranged as to provide ready means of escape to the open deck and, thence, to the survival craft. In particular, in relation to these spaces:

(a) at all levels of accommodation at least two widely separated means of escape shall be provided which may include the normal means of access from each restricted space or group of spaces;

(b) (i) below the weather deck, the means of escape shall be a stairway and the second escape may be a trunk or a stairway; and

(ii) above the weather deck, the means of escape shall be stairways or doors to an open deck or a combination thereof. Where it is not practicable to fit stairways or doors, one of these means of escape may be by means of adequately sized portholes or hatches protected, where necessary, against ice accretion;

(c) exceptionally, the Administration may permit only one means of escape, due regard being paid to the nature and location of spaces and to the number of persons who normally might be accommodated or employed there;

(d) a corridor or a part of a corridor from which there is only one route of escape shall preferably not exceed 2.5 m in length and, in no case, be greater than 5 m in length; and

(e) the width and continuity of the means of escape shall be to the satisfaction of the Administration. (TP An. Reg. V/33(1))

5.33.2 Two means of escape shall be provided from every machinery space of category A which shall be as widely separated as possible. Vertical escapes shall be by means of steel ladders. Where the size of the machinery spaces makes it impracticable, one of these means of escape may be omitted. In such cases, special consideration shall be given to the remaining exit. (TP An. Reg. V/33(2))

5.33.3 Lifts shall not be considered as forming one of the required means of escape. (TP An. Reg. V/33(3))

5.34 Automatic fire alarm and fire detection systems

5.34.1 Where the Administration has permitted under 5.28.1 [regulation 28(1)] a combustible construction, or where otherwise appreciable amounts of combustible materials are used on the construction of accommodation spaces, service spaces and control stations, special consideration shall be given to the installation of an automatic fire alarm and fire detection system in those spaces, having due regard to the size of those spaces, their arrangement and location relative to control stations as well as, where applicable, the flame-spread characteristics of the installed furniture. (TP An. Reg. V/34)

5.35 Fire pumps

Notwithstanding the provision of this 5.35 [Regulation V/35(1)], at least two fire pumps shall always be provided. (Dir.70, An. II, Reg. V/35)

5.35.1 The minimum number and type of fire pumps to be fitted shall be as follows:

(a) one power pump not dependent upon the main machinery for its motive power; or

(b) one power pump driven by main machinery, provided that the propeller shafting can be readily disconnected or provided that a controllable pitch propeller is fitted. (TP An. Reg. V/35(1))

5.35.2 Sanitary, bilge, ballast, general service or any other pumps may be used as fire pumps if they comply with the requirements of this chapter and do not affect the ability to cope with pumping of the bilges. Fire pumps shall be so connected that they cannot be used for pumping oil or other flammable liquids. (TP An. Reg. V/35(2))

5.35.3 Centrifugal pumps or other pumps connected to the fire main through which backflow could occur shall be fitted with non-return valves. (TP An. Reg. V/35(3))

5.35.4 Vessels not fitted with a power-operated emergency fire pump and without a fixed fire-extinguishing system in the machinery spaces shall be provided with additional fire-extinguishing means to the satisfaction of the Administration. (TP An. Reg. V/35(4))

5.35.5 Where fitted, emergency power-operated fire pumps shall be independently driven self-contained pumps either with their own prime mover and fuel supply fitted in an accessible position outside the compartment which contains the main fire pumps, or be driven by a self-contained generator which may be an emergency generator of sufficient capacity and which is positioned in a safe place outside the engine-room and preferably above the working deck. (TP An. Reg. V/35(5))

5.35.6 For any emergency fire pump, where fitted, the pump, sea-suction valves and other necessary valves shall be operable from outside compartments containing main fire pumps in a position not likely to be cut off by a fire in those compartments. (TP An. Reg. V/35(6))

5.35.7 The total capacity (Q) of main power-operated fire pumps shall be at least:

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

where:

L, B and D are in metres. (TP An. Reg. V/35(7))

5.35.8 Where two independent power-operated fire pumps are fitted, the capacity of each pump shall not be less than 40 per cent of the quantity required by 5.35.7 [paragraph (7)] or 25 m^3/h, whichever is the greatest. (TP An. Reg. V/35(8) as amended by Dir.70)

5.35.9 When main power fire pumps are delivering the quantity of water required by 5.35.7 [paragraph (7)] through the fire main, fire hoses and nozzles, the pressure maintained at any hydrant shall be not less than 0.25 N/mm^2. (TP An. Reg. V/35(9))

5.35.10 Where power-operated emergency fire pumps are delivering the maximum quantity of water through the jet required by 5.37.1 [regulation 37(1)], the pressure maintained at any hydrant shall be to the satisfaction of the Administration. (TP An. Reg. V/35(10))

5.36 Fire mains

5.36.1 Where more than one hydrant is required to provide the number of jets required by 5.37.1 [regulation 37(1)], a fire main shall be provided. (TP An. Reg. V/36(1))

5.36.2 Materials readily rendered ineffective by heat shall not be used for fire mains, unless adequately protected. (TP An. Reg. V/36(2))

5.36.3 Where fire pump delivery pressure can exceed the designed working pressure of fire mains, relief valves shall be fitted. (TP An. Reg. V/36(3))

5.36.4 Fire mains shall have no connections other than those required for fire fighting, except for the purpose of washing the deck and anchor chains and operation of bilge ejectors, subject to the efficiency of the fire-fighting system being maintained. (TP An. Reg. V/36(4))

5.36.5 Where fire mains are not self-draining, suitable drain cocks shall be fitted where frost damage may be expected.* (TP An. Reg. V/36(5))

* See the *Guidance for precautions against freezing of fire mains*, contained in recommendation 6 of attachment 3 to the Final Act of the International Conference on Safety of Fishing Vessels, 1993.

5.37 Fire hydrants, fire hoses and nozzles

5.37.1 Fire hydrants shall be positioned so as to allow easy and quick connection of fire hoses and so that at least one jet can be directed into any part of the vessel which is normally accessible during navigation. (TP An. Reg. V/37(1))

5.37.2 The jet required in 5.37.1 [paragraph (1)] shall be from a single length of fire hose. (TP An. Reg. V/37(2))

5.37.3 In addition to the requirements of 5.37.1 [paragraph (1)], machinery spaces of category A shall be provided with at least one hydrant complete with fire hose and dual purpose nozzle. The fire hydrant shall be located outside the space and near the entrance. (TP An. Reg. V/37(3))

5.37.4 For every required fire hydrant, there shall be one fire hose. At least one spare fire hose shall be provided in addition to this requirement. (TP An. Reg. V/37(4))

5.37.5 Single lengths of fire hose shall not exceed 20 m. (TP An. Reg. V/37(5))

5.37.6 Fire hoses shall be of an approved material. Each fire hose shall be provided with couplings and a dual purpose nozzle. (TP An. Reg. V/37(6))

5.37.7 Except where fire hoses are permanently attached to the fire main, the couplings of fire hoses and nozzles shall be completely interchangeable. (TP An. Reg. V/37(7))

5.37.8 The nozzles, as required by 5.37.6 [paragraph (6)] shall be appropriate to the delivery capacity of the fire pumps fitted, but in any case shall have a diameter of not less than 12 mm. (TP An. Reg. V/37(8))

5.38 Fire extinguishers*

* See the *Improved Guidelines for marine portable fire extinguishers*, adopted by the Organization by resolution A.951(23).

5.38.1 Fire extinguishers shall be of approved types. The capacity of required portable fluid extinguishers shall be not more than 13.5 *l* and not less than 9 *l*. Other extinguishers shall not be in excess of the equivalent portability of the 13.5 *l* fluid extinguisher and shall not be less than the fire-extinguishing equivalent of a 9 *l* fluid extinguisher. The Administration shall determine the equivalents of fire extinguishers. (TP An. Reg. V/38(1))

5.38.2 Spare charges shall be provided to the satisfaction of the Administration. (TP An. Reg. V/38(2)) (not applicable to NFV 2003)

5.38.2 Spare charges:

.1 Except in the cases mentioned under 2 (below) for each type of fire extinguishers carried, capable of being recharged on board, 100 % spare charges for the first 10 extinguishers shall be provided and 50 % for the remaining extinguishers, but not more than 60.

.2 For vessels with a length of less than **45 m** and for fire extinguishers which cannot be recharged on board, at least 50 % additional fire extinguishers of same type and capacity shall be provided in lieu of spare charges.

.3 Instructions for recharging shall be carried on board. Only refills approved for the fire extinguishers in question may be used for recharging. (TP An. Reg. V/38(2) as amended by Dir.35)

5.38.3 Fire extinguishers containing an extinguishing medium which, in the opinion of the Administration, either by itself or under expected conditions of use, gives off toxic gases in such quantities as to endanger persons shall not be permitted. (TP An. Reg. V/38(3))

5.38.4 Fire extinguishers shall be periodically examined and subjected to such tests as the Administration may require. (TP An. Reg. V/38(4)) (not applicable to NFV 2003)

5.38.4 Fire extinguishers shall be examined annually by a competent person, authorised by the Administration. Each extinguisher shall be provided with a sign indicating that it has been examined. All containers of permanently pressurised fire extinguishers and propellant bottles of non-pressurised extinguishers shall be hydraulic pressure tested every 10 years. (TP An. Reg. V/38(4) as amended by Dir.35)

5.38.5 Normally, one of the portable fire extinguishers intended for use in any space shall be stowed near an entrance to that space. (TP An. Reg. V/38(5))

5.39 Portable fire extinguishers in control stations and accommodation and service spaces

5.39.1 A sufficient number of approved portable fire extinguishers shall 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. The total number of extinguishers in these spaces, however, shall not be less than three. (TP An. Reg. V/39(1))

5.39.2 Spare charges shall be provided to the satisfaction of the Administration. (TP An. Reg. V/39(2)) (not applicable to NFV 2003)

5.39.2 Spare charges:

.1 Except in the cases mentioned under 2 (below) for each type of fire extinguisher carried, capable of being recharged on board, at least 100 % spare charges for the first 10 extinguishers shall be provided and 50 % for the remaining extinguishers but not more than 60.

.2 For vessels with a length of less than **45 m** and for fire extinguishers, which cannot be recharged on board, at least 50 % additional fire extinguishers of same type and capacity shall be provided in lieu of spare charges.

.3 Instructions for recharging should be carried on board. Only refills approved for the extinguishers in question may be used for recharging. (TP An. Reg. V/39(2) as amended by Dir.35)

5.40 Fire-extinguishing appliances in machinery spaces

Notwithstanding the provisions of 5.40 [this Regulation], all machinery spaces of category A shall be fitted with a fixed fire-extinguishing arrangement. (Dir.70, An. IV, Reg. V/40)

5.40.1 Spaces containing oil-fired boilers, fuel oil units or internal combustion machinery having a total power output of not less than 375 kW shall be provided with one of the following fixed fire-extinguishing systems, to the satisfaction of the Administration:

(i) a pressure water-spraying installation;

(ii) a fire-smothering gas installation;

(iii) a fire-extinguishing installation using vapours from low toxicity vapourizing liquids; or

(iv) a fire-extinguishing installation using high expansion foam. (TP An. Reg. V/40(1)(a) as amended by Dir.70)

5.40.2 New installations of halogenated hydrocarbon systems used as fire-extinguishing media shall be prohibited on new and existing vessels. (TP An. Reg. V/40(1)(b))

5.40.3 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 shall be considered as one compartment. (TP An. Reg. V/40(1)(c))

5.40.4 Installations listed in 5.40.1 [paragraph (1)(a)] shall be controlled from readily accessible positions outside such spaces not likely to be cut off by a fire in the protected space. Arrangements shall 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. (TP An. Reg. V/40(2))

5.40.5 Vessels which are constructed mainly or wholly of wood or fibre reinforced plastic and fitted with oil-fired boilers or internal combustion machinery which are decked in way of the machinery space with such material, shall be provided with one of the extinguishing systems referred to in 5.40.1 to 5.40.3 [paragraph (1)]. (TP An. Reg. V/40(3))

5.40.6 In all machinery spaces of category A at least two portable extinguishers shall be provided, of a type suitable for extinguishing fires involving fuel oil. Where such spaces contain machinery which has a total power output of not less than 250 kW, at least three such extinguishers shall be provided. One of the extinguishers shall be stowed near the entrance to the space. (TP An. Reg. V/40(4))

5.40.7 Vessels having machinery spaces not protected by a fixed fire-extinguishing system shall be provided with at least a 45 *l* foam extinguisher or its equivalent, suitable for fighting oil fires. Where the size of the machinery spaces makes this provision impracticable, the Administration may accept an additional number of portable fire extinguishers. (TP An. Reg. V/40(5))

5.41 Fireman's outfits (not applicable to NFV 2003)

5.41.1 The number of fireman's outfits and their location shall be to the satisfaction of the Administration. (TP An. Reg. V/41) (not applicable to NFV 2003)

5.41 Firefighter's outfits

5.41.1 For vessels with a length of **45 m** and over at least two fire-fighter' outfits shall be carried and stored in readily accessible and widely separated positions, which are not likely to be cut off in the event of fire. The firefighter's outfits shall be in accordance with the IMO *Fire Safety Systems Code*, Chapter III, regulations 2.1, 2.1.1 and 2.1.2.

At least two spare charges shall be provided for each required breathing apparatus. (TP An. Reg. V/41(1) as amended by Dir.35)

5.42 Fire control plan

5.42.1 There shall be a permanently exhibited fire control plan to the satisfaction of the Administration. In small vessels, the Administration may dispense with this requirement. (TP An. Reg. V/42) (not applicable to NFV 2003)

5.42.1 There shall be a permanently exhibited fire control plan. The contents of such a plan shall be in accordance with IMO Resolution A.654(16) "*Graphical symbols for fire control plans*" and IMO Resolution A.756(18) "*Guidelines on the information to be provided with fire control plans*".

In vessels with a length of less than **45 m**, the Administration may dispense with this requirement. (TP An. Reg. V/42 as amended by Dir.35)

5.43 Ready availability of fire-extinguishing appliances

5.43.1 Fire-extinguishing appliances shall be kept in good order and available for immediate use at all times. (TP An. Reg. V/43)

5.44 Acceptance of substitutes

5.44.1 Where in this Part C any special type of appliance, apparatus, extinguishing medium or arrangement is specified, any other type of appliance, etc., may be allowed provided the Administration is satisfied that it is not less effective. (TP An. Reg. V/44)

CHAPTER VI

6 PROTECTION OF THE CREW

6.1 General protection measures

6.1.1 A lifeline system shall be designed to be effective for all needs and the necessary wires, ropes, shackles, eye bolts and cleats shall be provided. (TP An. Reg. VI/1(1))

6.1.2 Deck openings provided with coamings or sills of less than 600 mm in height shall be provided with guards, such as hinged or portable railings or nettings. The Administration may exempt small openings such as fish scuttles from compliance with these requirements. (TP An. Reg. VI/1(2))

6.1.3 Skylights or other similar openings shall be fitted with protective bars not more than 350 mm apart. The Administration may exempt small openings from compliance with this requirement. (TP An. Reg. VI/1(3))

6.1.4 The surface of all decks shall be so designed or treated as to minimize the possibility of personnel slipping. In particular, decks of working areas, such as in machinery spaces, in galleys, at winches and where fish is handled as well as at the foot and head of ladders and in front of doors, shall be provided with anti-skid surfaces. (TP An. Reg. VI/1(4))

6.2 Deck openings

6.2.1 Hinged covers of hatchways, manholes and other openings shall be protected against accidental closing. In particular, heavy covers on escape hatches shall be equipped with counterweights, and so constructed as to be capable of being opened from each side of the cover. (TP An. Reg. VI/2(1))

6.2.2 Dimensions of access hatches shall not be less than 600 mm by 600 mm or 600 mm diameter. (TP An. Reg. VI/2(2))

6.2.3 Where practicable, handholds shall be provided above the level of the deck over escape openings. (TP An. Reg. VI/2(3))

6.3 Bulwarks, rails and guards

6.3.1 Efficient bulwarks or guard rails shall be fitted on all exposed parts of the working deck and on superstructure decks if they are working platforms. The height of bulwarks or guard rails above deck shall be at least 1 m. Where this height would interfere with the normal operation of the vessel, a lesser height may be approved by the Administration. (TP An. Reg. VI/3(1))

6.3.2 The minimum vertical distance from the deepest operating waterline to the lowest point of the top of the bulwark, or to the edge of the working deck if guard rails are fitted shall ensure adequate protection of the crew from water shipped on deck, taking into account the sea states and the weather conditions in which the vessel may operate, the areas of operation, type of vessel and its method of fishing and shall be to the satisfaction of the Administration.* (TP An. Reg. VI/3(2)) (not applicable to NFV 2003)

* See the *Guidance on a method of calculation of the minimum distance from the deepest operating waterline to the lowest point of the top of the bulwark or to the edge of the working deck*, contained in recommendation 8 of attachment 3 to the Final Act of the International Conference on Safety of Fishing Vessels, 1993.

6.3.2 The minimum vertical distance from the deepest operating waterline to the lowest point of the top of the bulwark, or to the edge of the working deck if guard rails are fitted shall ensure adequate protection of the crew from water shipped on deck, taking into account the sea states and the weather conditions in which the vessel may operate, the areas of operation, type of vessel and its method of fishing. The freeboard measured amidships from the edge of the working deck from which fishing is undertaken, shall not be less than 300 mm or not less than the freeboard corresponding with the maximum permissible draught, whichever is the greater. For vessels with sheltered working decks, which are so arranged that water will not enter the sheltered working spaces no minimum freeboard other than the one corresponding with the maximum permissible draught is required. (TP An. Reg. VI/3(2) as amended by Dir.35)

6.3.3 Clearance below the lowest course of guard rails shall not exceed 230 mm. Other courses shall not be more than 380 mm apart, and the distance between stanchions shall not be more than 1.5 m. In a vessel with rounded gunwales, guard rail supports shall be placed on the flat of the deck. Rails shall be free from sharp points, edges and corners and shall be of adequate strength. (TP An. Reg. VI/3(3))

6.3.4 Means to the satisfaction of the Administration, such as guard rails, lifelines, gangways or underdeck passages, shall be provided to protect the crew in moving between accommodation, machinery and other working spaces. Storm rails shall be fitted, as necessary to the outside of all deckhouses and casings to secure safety of passage or work for the crew. (TP An. Reg. VI/3(4))

6.3.5 Stern trawlers shall be provided with suitable protection such as doors, gates or nets at the top of the stern ramp at the same height as the adjacent bulwark or guard rails. When such protection is not in position, a chain or other means of protection shall be provided across the ramp. (TP An. Reg. VI/3(5))

6.4 Stairways and ladders

6.4.1 For the safety of the crew, stairways and ladders of adequate size and strength with handrails and non-slip treads shall be provided to the satisfaction of the Administration. (TP An. Reg. VI/4) (not applicable to NFV 2003)

6.4.1 For the safety of the crew, stairways and ladders of adequate size and strength with handrails and non-slip treads shall be provided and constructed in accordance with the relevant ISO standards. (TP An. Reg. VI/4 as amended by Dir.35)

CHAPTER VII

7 LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Requirements concerning life-saving appliances and arrangements are specified in *Part II – Life Saving Appliances and Equipment* of the *Rules for Statutory Survey of Sea-going Ships.*

CHAPTER VIII

8 EMERGENCY PROCEDURES, MUSTERS AND DRILLS

These are operational requirements which are not included in any PRS' Rules.

CHAPTER IX

9 RADIOCOMMUNICATIONS

Requirements concerning radiocommunication are specified in *Part IV – Radio Equipment* of the *Rules for Statutory Survey of Sea-going Ships.*

CHAPTER X

10 SHIPBORNE NAVIGATIONAL EQUIPMENT AND ARRANGEMENTS

Requirements concerning navigational equipment and arrangements are specified in *Part V – Navigational Equipment* of the *Rules for Statutory Survey of Sea-going Ships.*