

**PHILIPPINE SHIP SAFETY  
RULES AND REGULATIONS  
(PSSRR)**

**BOOK II**

**VOLUME I**

**PASSENGER SHIPS, ROLL ON-ROLL OFF (RO-  
RO) SHIPS AND FAST CRAFT**

**2018**

**SUBJECT FOR FINAL REVIEW**

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**DRAFT**  
**24 JANUARY 2019**

# CHAPTER I

## SCOPE AND COVERAGE

### Regulation 1

#### *General*

These Rules and Regulations are geared to ensure that all passenger ships, roll on-roll off ships (ro-ro), fast craft, of Philippine ownership and/or registry, are so designed, constructed, maintained, operated and inspected in accordance with the standards on maritime security, safety of life and property at sea, and the protection of the marine environment.

### Regulation 2

#### *Application*

1 Unless expressly provided otherwise, and except for Philippine-registered ships of 500 GT and above intended for or operating in the international voyage to which case the International Convention for the Safety of Life at Sea, 1974, as amended, applies, Book II shall apply to passenger ships, ro-ro and fast craft intended for or operating within the territorial waters of the Philippines, within the near coastal voyage of the Philippines, or with less than 500 GT intended for or operating in the international voyage, the keels of which are laid or which are at a similar stage of construction on or after 01 January 2019.

2 For these Regulations, the term a similar stage of construction means the stage at which:

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

3 For the purpose of these Regulations:

- .1 the expression ships constructed means ships the keels of which are laid or which are at a similar stage of construction;
- .2 the expression all ships means passenger ships constructed before, on or after 01 January 2019;
- .3 Applicable requirements for existing ships:
- .4 Unless expressly provided otherwise, for ships constructed before 01 January 2019 the Administration shall ensure that the requirements which are applicable under the Philippine Merchant Marine Rules & Regulations 1997 are complied with.

4 Repairs, alteration, modifications and outfitting.

- .1 All existing ships which undergo repairs and outfitting related thereto shall continue to comply with at least the requirements previously applicable to these ships.
- .2 Repairs, alterations and modifications which substantially alter the dimensions of ship or substantially increase a ship service life and outfitting related thereto shall comply with this rules and regulations. In so far as the Administration deems reasonable and practicable.

## **CHAPTER II**

### **CONSTRUCTION AND EQUIPMENT**

#### **Regulation 1**

##### *General*

1 All existing passenger ships shall, as a rule, comply with the requirements existing prior to coming into force of these Rules and Regulations. Where no such requirements are applicable, ships shall comply with these Rules and Regulations to the extent the Administration considers to be reasonable or practicable. Existing ships which undergo replacement of equipment or outfitting related thereto shall comply with the requirements specified in this Regulation.

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

#### **Regulation 2**

##### *Construction*

1 The strength and construction of hull, superstructures, deckhouses, machinery casings, companion ways and any other structure and equipment shall be sufficient to withstand all foreseeable conditions of the intended service. A ship built and maintained in conformity with the applicable rules of a classification society or any other body recognized by the Administration may be considered as adequate in this respect.

2 Ships propelled by mechanical means shall be fitted with a collision bulkhead in accordance with this regulations and with watertight bulkheads bounding the machinery spaces. Such bulkheads shall be extended up to the freeboard deck. In ships constructed of such bulkheads shall be watertight as far as practicable.

3 Propeller shafts and shafts logs or stern tubes shall not be situated in any space other than machinery spaces containing main propulsion machinery unless they are enclosed in watertight spaces or enclosures inside such spaces acceptable to the Administration. The Administration may exempt, from the requirements of this paragraph, ships having constraint of space or engaged on sheltered voyages, provided it is demonstrated that any progressive flooding of such space can be easily controlled and that the safety of the ship is not impaired.

4 Stern glands shall be located in spaces which are easily accessible at all times for inspection and maintenance to the satisfaction of the Administration.

#### **Regulation 3**

##### *Collision Bulkhead*

1 A collision bulkhead shall be fitted which shall be watertight up to the freeboard deck. This bulkhead shall, as far as practicable, be located at a distance

from the forward perpendicular of not less than five (5) percent and not more than eight (8) percent of the length of the ship. Where it can be shown to the satisfaction of the Administration that it is impractical for the collision bulkhead to be located at distance from the forward perpendicular of not more than eight (8) percent of the length of the ship, the Administration may allow relaxation therefrom, subject to the condition that, should the space forward of the bulkhead be flooded, the ship at full load condition will not be submerged to a line drawn at least 76 mm below the upper surface of the bulkhead deck at side.

2 The collision bulkhead may have steps or recesses in it provided that they are within the limits prescribed in paragraph 1. Pipes piercing the collision bulkhead shall be kept to the minimum. Such pipes shall be fitted with suitable valves operable from above the freeboard deck and the valves chest shall be secured at the collision bulkhead inside the forepeak. The Administration may permit the location of such valves on the after side of the collision bulkhead, provided that they are readily accessible under all service conditions and the space in which they are located is not a cargo space. All such valves shall be of material acceptable to the Administration.

3 Where a long forward superstructure is fitted, the collision bulkhead shall be extended weathertight to the deck immediately above the freeboard deck. The extension shall subject to the requirements of paragraph 2, be located within the limits prescribed in paragraph 1. The part of the deck, if any, between the collision bulkhead and its extension shall be weathertight.

4 Where a bow door and a sloping loading ramp that forms part of the extension of the collision bulkhead above the freeboard deck is fitted, the part of the extension, which is more than 2.3 m, or as specified by the Administration, above the freeboard deck may extend no more than 1 m forward limits specified in paragraph 1 . The ramp door shall be weathertight over its complete length.

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

6 No doors, manholes, ventilation ducts or access openings are permitted in the collision bulkhead below the freeboard deck.

7 Where a chain locker is located abaft the collision bulkhead or extends into the forepeak tank, it shall be watertight and provided with efficient means of drainage.

8 A chain locker shall not be used for any purpose other than stowage of anchor chain cables.

#### **Regulation 4**

##### *Watertight Bulkheads, Decks, Doors, Trunks, etc.*

1 These Rules and Regulations shall apply to new ships propelled by mechanical means.

2 Each weathertight subdivision bulkhead whether transverse or longitudinal shall be constructed in such a manner that it shall be capable of supporting with a proper margin of resistance, the pressure due to the maximum head of water which it might have to sustain in the event of damage to the ship but at least the pressure

due to a head of water up to the margin line. The construction of these bulkheads shall be to the satisfaction of the Administration.

3 Steps and recesses in bulkheads shall be watertight and of the same strength as the bulkhead at the place where each occurs.

4 Where frames or beams pass through a watertight deck or bulkhead, such deck or bulkhead shall be made structurally watertight to the satisfaction of the Administration.

5 The number of openings in watertight bulkheads shall be reduced to the minimum compatible with the general arrangements and operational needs of the ship. Openings shall be fitted with watertight closing appliances to the satisfaction of the Administration. Watertight doors shall be of equivalent strength to the adjacent unpierced structure.

6 Watertight decks, trunks, tunnels, duct keels and ventilators shall be of the same strength as watertight bulkheads at corresponding levels. The means used for making them watertight, and the arrangements adopted for closing openings in them, shall be to the satisfaction of the Administration. Watertight ventilators and trunks shall be carried at least up to the freeboard deck.

7 Testing main compartments by filling them with water is no compulsory. When testing by filling with water is not carried out, a hose test shall be carried out in the most advanced stage of the fitting out of the ship. In any case, a thorough inspection of watertight bulkheads shall be carried out.

8 The forepeak, after peak, double bottom tanks (including duct keels), and inner skins shall be tested with water to a head corresponding to the requirements of paragraph 2.

9 Tanks which are designed to hold liquids, and which form part of the subdivision of the ship, shall be tested for tightness with water to a head corresponding to two-third of the depth from the top of keel to the margin line in way of the tanks; provided that in no case shall the test head be less than 0.9 m above the top of the tank.

10 The tests referred to in paragraphs 8 and 9 are for the purpose of ensuring that the subdivision structural arrangements are watertight and are not to be regarded as a test of the fitness of any compartment for the storage of oil fuel or for other special purposes for which a test of a superior character may be required depending on the height to which the liquid has access in the tank or its connections.

## **Regulation 5**

### *Subdivision*

1 A passenger ship of 20 m or more in length, or of less than 20 m that carries 50 or more passengers, shall be provided with watertight bulkheads, fitted so that the ship, when damaged in way of any one compartment in its length from the keel to the deck but not extending to damage to a transverse bulkhead bounding the longitudinal limits of the damage, may be demonstrated to float in a stable condition having the margin line above the still water level and to float in a stable condition in intermediate stages of flooding.

2 Compliance with paragraph 1 will be considered as demonstrated if the watertight bulkheads are located in accordance with annex 2.

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

### **Regulation 6**

#### *Location of Watertight Bulkheads for Subdivision*

1 The maximum distance between adjacent main transverse watertight bulkheads shall not be more than the lesser of the following:

- .1 one third of the length of the bulkhead deck; or
- .2 the distance  $d$  given by the following equation:

$$d = \frac{F \cdot f \cdot L}{D}$$

where:

F = the floodable length factor from Table 1;

f = the effective freeboard in metres calculated for each pair of adjacent bulkheads; L = the length over deck in metres measured over the bulkhead deck; and

D = the depth in metres, measured amidships at a point one-quarter of the maximum beam out from the centreline, from the inside of the bottom planking or plating to the level of the top of the bulkhead deck (see Figure 5.4.1).

Table 1 - Floodable length factors

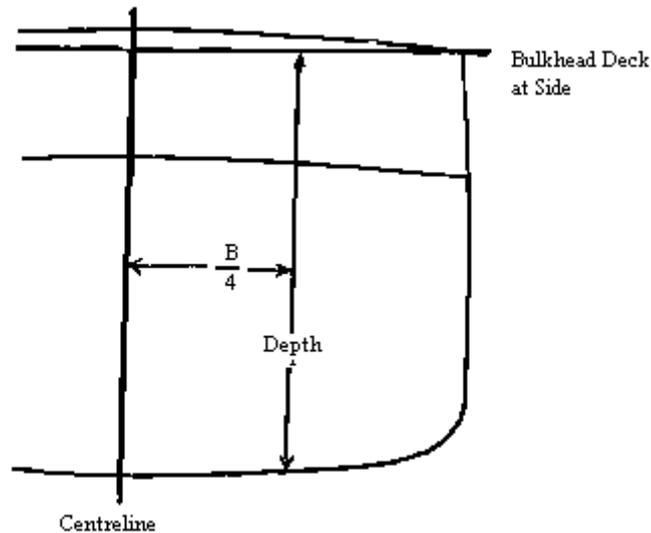
(d/L)x100	F
0-15	0.33
20	0.34
25	0.36
30	0.38
35	0.43
40	0.48
45	0.54
50	0.61
55	0.63
60	0.58
65	0.53
70	0.48
75	0.44
80	0.40
85	0.37
90-100	0.34

NOTE 1: Where:

D = distance in metres from the midpoint of the compartment to the forward-most point on the bulkhead deck excluding sheer

NOTE 2: Intermediate values of floodable length factor may be obtained by interpolation.

Figure 1  
Transverse Location for Measuring Depth (D)



2 The effective freeboard for each compartment is calculated from:

$$f = 0.5 (a+b)$$

where:

f = the effective freeboard;

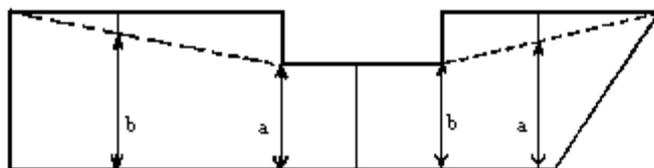
a = the freeboard at the forward most main transverse watertight bulkhead of the compartment; and

b = the freeboard at the aftermost main transverse bulkhead of the compartment, the freeboards a and b being calculated from the deepest waterline:

- .1 to the top of the bulkhead deck where a vessel has a flush deck; or
- .2 to the line shown in Figure 2 where a vessel has a stepped bulkhead deck; or
- .3 to the line shown in Figure 3 where a vessel has an opening scuttle ( porthole) below the bulkhead deck; or
- .4 as determined by the Administration where the vessel has a deck of a configuration not identified above.

Figure 2

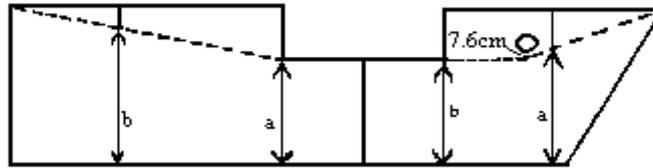
Freeboard measurement - Ship with stepped bulkhead deck



(a and b shown for two sample compartments)

Figure 3

Freeboard measurement - Ship with stepped bulkhead deck and a porthole below the bulkhead deck



### Regulation 7

#### *Means for Sounding*

1 Means for sounding to the satisfaction of the Administration, shall be provided for:

- .1 The bilges of those compartments which are not readily accessible at all times during the voyage; and
- .2 All tanks and cofferdams.

2 Where sounding pipes are fitted, their upper ends shall be extended to a readily position and, where practicable, above the freeboard deck. The opening shall be provide with permanently attached means of closing. Sounding pipes which are not extended above the freeboard deck shall be fitted with automatic self-closing device.

### Regulation 8

#### *Anchoring and Mooring Equipment*

1 At least two anchors of sufficient weight shall be provided. One (1) of these shall be provided with a chain cable or wire rope of adequate strength and size and windlass, capstan or winch of suitable size for the cable and other anchor handing equipment and arrangements shall be to the satisfaction of the Administration. The Administration may permit carriage of only one (1) anchor with adequate chain or wire and other arrangements taking into account the size of the ship and its area of operation.

2 Windlass, capstan, winches, fairleads, bollards, mooring bits and other anchoring mooring, towing and hauling equipment shall be:

- .1 Properly designed to meet all foreseeable operational loads and conditions;
- .2 Correctly seated; and
- .3 Effectively secured by stoppers to a part of the ship's structure which is strengthened suitably.

### Regulation 9

#### *General Protection Measures against Accidents*

1 Hinged covers of hatchways, manholes and other similar opening shall be protected against accidental closing. In particular, heavy covers on escape

hatches shall be equipped with counter weights. Escape doors and covers of escape and access of hatches shall be so constructed as to be capable of being opened from either side of the door or cover.

- 2 The dimensions of access hatches shall be such that it will allow a person to have a quick and easy escape to a safe place in the event of an emergency. Where practicable, the dimensions of access hatches of cargo, machinery and accommodations spaces shall be such that they will facilitate expeditious rescue operation.
- 3 Handrails, grabrails and handholds of sufficient size and strength shall be provided to the satisfaction of the Administration as support for persons when the ship is severely rolling or pitching.

**DRAFT**  
**24 JANUARY 2019**

## CHAPTER III

### MACHINERY INSTALLATIONS AND EQUIPMENT

#### Regulation 1

##### *General Requirements*

1 All boilers and other pressure vessels, all parts of machinery, all steam, hydraulic, pneumatic and other systems and their associated fittings, which are under internal pressure, shall be subjected to appropriate tests including a pressure test before being put into service. Corresponding certification from the manufacturer, classification society or other recognized body has to be provided to the Administration.

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

3 Adequate provisions shall be made to facilitate cleaning, inspection and maintenance of machinery installations including boilers and other pressure vessels.

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

5 Where main or auxiliary machinery, including pressure vessels or any parts of such machinery are subjected to dangerous overpressure, means shall be provided to protect against such excessive pressure.

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

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

8 Internal combustion engines of a cylinder diameter of 200 mm or crankcase volume of 0.6m<sup>3</sup> and above shall be provided with crankcase explosion relief area. The relief valves shall be arranged or provided with means to ensure that discharge from them is so directed as to minimize the possibility of injury to personnel.

#### Regulation 2

##### *Machinery Controls*

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

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

- .1 an electrical power generator which serves as a main source of electrical power;
- .2 the sources of lubricating systems oil pressure;
- .3 the fuel oil supply systems for engines;
- .4 the sources of water pressure;
- .5 an air compressor and receiver for standing or for control purposes;
- .6 the hydraulic, pneumatic or electrical means for control in main propulsion machinery including controllable pitch propellers;
- .7 steam boilers and boiler feed systems, if provided. However, the Administration, having regard to overall safety considerations may accept a partial reduction in propulsion capability from normal operation.

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

### **Regulation 3**

#### *Remote Control of Propulsion Machinery*

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

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

- .6 it shall be possible to control the propulsion machinery locally, even in the case of failure in any part of the remote control system;
- .7 the design of the remote control system shall be such that in case of its failure an alarm will be given. Unless the Administration considers it impracticable the preset speed and direction of thrust of the propellers shall be maintained until local control is in operation;
- .8 indicators shall be fitted on the navigating bridge for:
  - .1 propeller speed and direction of rotation in the case of fixed pitch propellers;
  - .2 propeller speed and pitch position in the case of controllable pitch propellers;
- .9 an alarm shall be provided in the machinery space to indicate low starting air pressure or low electrical power which shall be set at a level to permit further main engine starting operation. If the remote control systems of the propulsion machinery is designed for automatic consecutive attempts which fail to produce a start shall be limited in order in order to safeguard sufficient starting air pressure of adequate electrical power for starting locally. In this context, the recommendations or instructions of the manufacturers for remote controlled starting have to be observed. In case these are not available, an organization, recognized by the Administration, has to conduct tests and shall issue a certification stipulating the capacity (number of starts) of the available air pressure or electrical supply.

2 In all ships where the main propulsion and associated machinery, including main electrical supply, are provided with various degrees of automatic or remote control and are under continuous manual supervision from a control room, the arrangements and controls shall be so designed, equipped and installed that the machinery operation will be as safe and effective as if it were under direct supervision. Particular consideration shall be given to protect such spaces against fire and flooding.

#### **Regulation 4**

##### *Periodically Unattended Machinery Spaces*

1 Ships having periodically unattended machinery spaces shall, as far as practicable and reasonable, in the opinion of the Administration, comply with the applicable requirements of SOLAS'74, as amended for such machinery spaces.

2 Where alternative arrangements are provided the Administration shall ensure that:

- .1 The safety of the ship in all conditions, including maneuvering, is equivalent to that of a ship having manned machinery spaces;
- .2 Documentary evidence indicating that such arrangements are satisfactory is provided.

#### **Regulation 5**

##### *Steam Boilers and Boiler Feed System*

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

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

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

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

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

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

#### **Regulation 6**

##### *Steam Pipe Systems*

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

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

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

#### **Regulation 7**

##### *Air Pressure Systems*

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

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

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

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

### **Regulation 8**

#### *Ventilation Systems in Machinery Spaces*

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

2 In addition to complying with the requirements of paragraph 1, the ventilation of machinery spaces shall also be sufficient under all normal conditions to prevent accumulation of oil vapor.

### **Regulation 9**

#### *Protection against Noise*

Measures shall be taken to reduce machinery noise in machinery spaces to acceptable levels at 85 decibel or less and as may be determined by the Administration. If this noise cannot be sufficiently reduced, the source of excessive noise shall be suitably insulated or isolated or a refuge from noise shall be provided if the space is required to be manned. Ear protectors shall be provided for personnel required to enter such spaces, if necessary. In case of ear protectors being applied, it must be made sure by appropriate optical means that an alarm will be attended to by the person in charge.

### **Regulation 10**

#### *Means of Going Astern*

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

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

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

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

### **Regulation 11**

#### *Steering Gear*

1 Unless expressly provided otherwise, every ship shall be provided with a main steering gear and subject to the provisions of paragraph 4, with an auxiliary means of steering the ship in the event of failure of the steering gear.

2 The main steering gear shall be of adequate strength and capable of steering the ship at maximum ahead service speed. The main steering gear and rudder stock shall be so designed that they will not be damaged at maximum astern speed.

3 The auxiliary means of steering shall be adequate strength and capable of steering the ship at navigable speed and of being brought speedily into action in an emergency.

4 Where the power-operated main and auxiliary steering gear units are provided:

- .1 the main steering gear shall be capable of putting the rudder over from  $35^{\circ}$  on one side to  $35^{\circ}$  on the other side with the ship at its deepest seagoing draught and running ahead at maximum ahead service speed and, under the same conditions, from  $35^{\circ}$  on either side to  $30^{\circ}$  on the other side is not more than 28 seconds;
- .2 the auxiliary steering gear shall be capable of putting the rudder over from  $15^{\circ}$  on one side to  $15^{\circ}$  on the other side in not more than 60 seconds with the ship at its deepest seagoing draught and running ahead at one half of the maximum ahead service speed or 7 knots, whichever is the greater;
- .3 where power operated main steering gear units and the connections are fitted in duplicate and each unit complies with the provisions of paragraph 3 no auxiliary steering unit need be required.

5 The main steering power failure unit shall be arranged to restart either by manual or automatic means of power.

6 In the event of a power failure to any one of the steering gear power units, an audible and a visual alarm shall be given on the navigating bridge.

7 The angular position of the rudder, if the main steering gear is power-operated, shall be indicated on the navigating bridge. The rudder angle indication shall be independent of the steering gear control system.

8 Where a non-conventional rudder is installed, the Administration shall give special consideration to the steering system, so as to ensure that an acceptable degree of reliability and effectiveness which is based on the provisions of these Rules and Regulations is provided.

9 A means of communication shall be provided, where necessary, between the navigating bridge and the steering gear compartment.

## **Regulation 12**

### *Communication between Navigating Bridge and Machinery Spaces*

1 Ships shall be provided with at least two independent means for communicating orders between navigating bridge and the machinery space or control room from which the main propulsion engines are normally controlled. One of the means shall be an engine-room telegraph. The arrangement of these means shall to the satisfaction of the Administration.

2 The engine-room telegraph referred to in paragraph 1 may be dispensed with if the main propulsion engine is directly controlled from the navigating bridge under normal operating conditions.

3 In lieu of meeting the requirements of paragraph 1, ships of less than 24 m in length may be provided with only one means of communications referred to in paragraph 1, if the Administration is satisfied that, due to close proximity of the navigating bridge and the position of local control of the main propulsion machinery, two means of communication are not necessary.

4 Appropriate means of communication shall be provided to any position (other than navigating bridge) from which the engines may be controlled.

### **Regulation 13**

#### *Engineer's Alarm*

An engineer's alarm shall be provided to be operated from the engine control room or at the maneuvering platform, as appropriate, and shall be clearly audible in the engineer's accommodation. The Administration may dispense with this requirement, if satisfied that, due to particular manning patterns adopted in the engine room or close proximity of the engine control room or the maneuvering platform and the engineer's accommodation, no engineer's alarm is necessary.

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## **CHAPTER IV**

### *ELECTRICAL INSTALLATIONS*

#### **Regulation 1**

##### *General Electrical Requirements*

- 1 Electrical installations on ships shall comply with the requirements of this Chapter, except as provided otherwise in Regulation IV/5.
- 2 Electrical installations shall be such that:
  - .1 all electrical auxiliary services necessary for maintaining the ship in normal operational and habitable conditions will be ensured without recourse to the emergency source of electrical power;
  - .2 electrical services essential for safety will be ensured under various emergency conditions; and
  - .3 the safety of passengers, crew and ship from electrical hazards will be ensured.

#### **Regulation 2**

##### *Safety Precautions*

- 1 Exposed metal parts of electrical machines or equipment which are not intended to be live but which are liable under fault conditions to become live shall be earthed unless the machines or equipment are:
  - .1 supplied at a voltage not exceeding 55 V direct current or 55 V, root mean square between conductors. Auto-transformers shall not be used for the purpose of achieving this voltage; or
  - .2 supplied at a voltage not exceeding 250 V by safely isolating transformers supplying only one consuming device; or
  - .3 constructed in accordance with the principle of double insulation.
- 2 The Administration may require additional precautions for portable electrical equipment for use in confined or exceptionally damp spaces where particular risks due to conductivity may exist.
- 3 All electrical apparatus shall be constructed and so installed as not to cause injury when handled or touched in the normal manner.
- 4 Main and emergency switchboards shall be so arranged as to give easy access may be needed to apparatus and equipment, without danger to personnel. The sides and the rear and, where necessary, the front of switchboards shall be suitably guarded. Exposed live parts having voltages to earth exceeding a voltage to be specified by the Administration shall not be installed on the front of such switchboards. Where necessary, non-conducting mats or gratings shall be provided at the front and rear of the switchboard.
- 5 The hull return system of distribution shall not be used.
- 6 The requirement of paragraph 5 does not preclude under conditions approved by the Administration the use of:
  - .1 impressed current cathodic protective systems;

- .2 limited and locally earthed systems (e.g. engine starting system);
- .3 limited and locally earthed welding systems; where the Administration is satisfied that the equipotential of the structure is assured in a satisfactory manner, welding systems with hull return may be installed without restriction imposed by paragraph 5; or
- .4 insulation level monitoring devices, provided the circulation current does not exceed 30mA under the most unfavorable conditions.

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

8 Earthed distribution system shall not be used. The Administration may permit the use of the following earthed system:

- .1 power supplied, control circuits and instrumentation circuits where technical or safety reasons preclude the use of a system with no connection to earth, provided the current in the hull is limited to not more than 5 A in both the normal fault conditions;
- .2 limited and locally earthed systems, provided that any possible resulting current does not flow directly through any of the dangerous spaces; or
- .3 alternating current power network of 1000 V root mean square (line to line) and over, provided that any possible resulting current does not flow directly through any of the dangerous spaces.

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

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

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

12 Cables and wiring serving essential or emergency power, lighting, internal communications or signals shall so far as practicable be routed clear of galleys, laundries, machinery spaces of category A and their casings and other high fire risk areas. Cables connecting fire pumps to the emergency switchboard shall be of a fire-resistant type where they pass through high fire risk areas. Where practicable all such cables shall 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.

13 Where cables which are installed in hazardous areas introduce the risk of fire or explosion in the event of an electrical fault in such areas, special precautions against such risk shall be taken to the satisfaction of the Administration.

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

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

16 Each separate circuit shall be protected against short circuit and against overload, except the circuit for the steering gear and where the Administration may exceptionally otherwise permit. The rating or appropriate setting of the overload protective device for each circuit shall be permanently indicated at the location of the protective device.

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

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

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

20 Electrical or other equipment which may constitute a source of ignition of flammable vapors shall not be permitted in those compartments except as permitted in paragraph 22.

21 Accumulator batteries except for batteries used in self-contained battery operated lights shall not be located in sleeping quarters except where hermetically sealed to the satisfaction of the Administration.

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

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

23 Lighting conductors shall be fitted to all masts or topmasts constructed of non-conducting materials. In ships constructed of non-conductive materials the lightning conductors shall be connected by suitable conductors to copper plate fixed to the ship's hull well below the waterline.

### **Regulation 3**

#### *Main Source of Electrical Power*

1 A main source of electrical power of sufficient capacity to supply those services mentioned in Regulation IV/1 paragraph 2.1 shall be provided. This main source of electrical power shall consist of at least two generating sets (one could be

accepted if driven by the main propulsion engine) and shall comply with the following:

- .1 the capacity of these generating sets shall be such that in the event of any one generating set being stopped it will be possible to supply those services necessary to provide normal operational conditions of propulsion and safety;
- .2 the arrangements of the ship's main source of electrical power shall be such that the services referred to in Regulation IV/1 paragraph 2.1 can be maintained regardless of the speed and direction of rotation of the propulsion machinery or shafting;
- .3 in addition, the generating sets can be such as to ensure that with any one generator or its primary source of power out of operation, the remaining generating sets shall be capable of providing the electrical services necessary to start the main propulsion plant from a dead ship condition. The emergency source of electrical power may be used for such electrical service if its capability is sufficient to provide at the same time those services required to be supplied by Regulation IV/4 paragraph 5.

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

3 The arrangement of the main electric lighting system shall be such that a fire or other casualty in spaces containing the main source of electrical power, associated transforming equipment, if any, and the main switchboard will not render the emergency electric lighting system required by Regulation IV/4 paragraph 5 inoperative.

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

5 Ships due to its size and operation may use one (1) main source of power such as battery coupled with charging mechanism or its equivalent.

#### **Regulation 4**

##### *Emergency Source of Electrical Power*

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

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

3 The location of the emergency source of electrical power, associated transforming equipment, if any, the emergency switchboard in relation to the main source of electrical power, associated transforming equipment, if any, and the main switchboard shall be such as to ensure, to the satisfaction of the Administration, that

a fire or other casualty in the space containing the main source of equipment, if any, and the main switchboard, or in any machinery space category A will not interfere with the supply, control and distribution of emergency electrical power.

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

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

- .1 For a period of three hours, emergency lighting at every muster and embarkation station and over the sides in the way of such stations;
- .2 For a period of 12 hours, emergency lighting;
  - .1 in all service and accommodation alleys, stairways and exits;
  - .2 in spaces containing propulsion machinery used for navigation, if any and main source of electrical power and their control positions;
  - .3 in all control stations, machinery control rooms and at each main and emergency switchboard;
  - .4 at all stowage positions for firemen's outfits;
  - .5 at the steering gear, if any; and
  - .6 at the emergency fire pump and its control position;
- .3 For a period of 12 hours, the navigation lights and other lights required by COLREG;
- .4 For a period of 12 hours:
  - .1 all communication equipment required for transmission of distress and safety messages, including ship's whistle and all internal communication equipment as required in an emergency;
  - .2 the fire detection and fire alarm systems; and
  - .3 operation of emergency of emergency fire pumps, if electrically operated.

6 In a ship regularly engaged in voyages of short duration, the Administration, if satisfied that an adequate standard of safety would be attained, may accept a lesser period than the 12-hour period specified in sub-paragraphs 5.2 to 5.4 of this Regulation but not less than three hours.

7 The emergency source of electrical power may be either:

- .1 an accumulator battery capable of carrying the emergency electrical load without recharging or excessive voltage drop; or

- .2 a generator driven by a suitable prime mover with an independent fuel supply and starting to the satisfaction of the Administration.

8 Where the emergency source of electrical power is an accumulator battery, it shall be capable of automatically connecting to the emergency switchboard in the event of failure of the main source of electrical power. Where an automatic connection to the emergency switchboard is not practical, manual connection may be acceptable to the satisfaction of the Administration.

9 Where the emergency source of power is a generator, it shall be automatically started and connected to the emergency switchboard within 45 seconds of the loss of the main source of electrical power. It shall be driven by a prime mover with an independent fuel supply having a flash point of not less than 43°C. Automatic starting of the emergency generator will not be required where a transitional source of power is provided and to the satisfaction of the Administration.

### **Regulation 5**

#### *Special Considerations*

The Administration may waive any of the requirements specified in this chapter taking into account the requirements of electrical power for operating the propulsion machinery and the size of the ship.

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## CHAPTER V

### FIRE PROTECTION, DETECTION AND EXTINCTION

#### Regulation 1

##### *Application to Existing Ships*

The provisions of the present chapter shall apply to existing ships, within a period not exceeding three (3) years from the date of entry into force of the present Regulations, where they are regarded by the Administration as necessary and reasonable.

#### Regulation 2

##### *General*

1 Unless provided otherwise under the present chapter, the provisions on fire protection shall comply with the Fire Safety System Code, as amended, adopted by the IMO Maritime Safety Committee in Resolution MSC. 98 (73) and its subsequent amendments.

2 When the nature and conditions of the voyage are such that the application of the present Regulations is neither necessary nor reasonable, the Administration may adopt alternative arrangements if it is satisfied that they are as effective as the measures set out in the present chapter.

#### Regulation 3

##### *Types of bulkhead*

1 Wherever the words "steel or other equivalent material" occur, "equivalent material" means any non-combustible material which, by itself or due to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable exposure to the standard fire test (e.g. aluminum alloy with appropriate insulation).

2 "A 30" class divisions are those divisions formed by bulkheads and decks which comply with the following:

- .1 They shall be constructed of steel or other equivalent material;
- .2 They shall be suitably stiffened;
- .3 They shall be so constructed as to be capable of preventing the passage of smoke and flame to the end of the one-hour standard fire test;
- .4 They shall be insulated with approved non-combustible materials such that the average temperature of the unexposed side will not rise more than 139°C above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180°C above the original temperature, within a period of 30 minutes.

3 "F" class divisions are those divisions formed by bulkheads, decks, ceilings and linings which comply with the following

- .1 They shall be so constructed as to be capable of preventing the passage of flame to the end of the first half-hour of the standard fire test;
- .2 They shall have an insulation value such that the average

temperature of the unexposed side will not rise more than 139°C above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 225°C above the original temperature, to the end of the first half-hour of the standard fire test;

4 Divisions (decks and bulkheads) which separate machinery spaces in category A from cargo spaces, accommodation, service area, control stations shall be as far as possible:

- .1 of A.30 class for ships constructed of steel or equivalent material including aluminum alloys;
- .2 of F class for ships constructed of combustible materials.

A subdivision may be accepted as equivalent to an A class division if it consists of:

- .1 a steel panel coated with 50 mm of mineral wool; or
- .2 an aluminum panel coated with 80 mm or two separate layers of 40 mm of mineral wool.

A subdivision may be accepted as equivalent to an F class division if it consists of a combustible wall coated with a layer of 100 mm or two separate layers of 50 mm of mineral wool.

The mineral wool shall have a voluminal mass of at least 96 kg/m<sup>3</sup>.

The external surface of the mineral wool shall be suitably protected against splashes of oil and other flammable liquids.

5 The insulation shall extend downwards from the deck, over the hull, to a depth of 500 mm for a ship of steel and to the lightship water line for a ship constructed of another material.

6 Stairways which serve several decks shall be encased in bulkheads of steel or equivalent materials or F class materials.

7 In the case of F class bulkheading, the bulkheading around machinery spaces in category A shall prevent the passage of smoke.

8 Bulk heading shall only possess the characteristics of A.30 or F class bulk heading, as appropriate in respect of a fire arising in the machinery space.

9 Doors and hatches of other openings in bulkheads shall be constructed such as to maintain the integrity of the bulkheads in which they are located.

10 Bulkheads around galleys shall be of steel or equivalent material or F class bulkheading.

11 Stairways, escape companionways, etc., shall have a steel frame and, if they serve several decks, they shall be protected by a casing of steel or equivalent material or F class material. They shall have at least one closure as required by paragraph 5 to prevent fire spreading from one deck to another.

12 Pipes, ducts and controls which pass through a fire-resistant bulkhead shall not reduce its resistance to fire.

13 The Administration may exempt ships from some requirement of the present Regulation, if it considers that such requirement is neither reasonable nor

necessary taking into account the navigation in which such ships engage.

#### **Regulation 4**

##### *Fire Prevention*

- 1 Paints, varnishes or other substances with a nitro-cellulose or toxic base, or highly flammable products shall not be used.
- 2 Precautions shall be taken to avoid combustible substances or vapors coming into contact with parts reaching elevated temperatures. In particular:
  - .1 Arrangements shall be made to ensure that sparks or flames from smoke ducts such as those of cooking or heating appliances cannot penetrate ventilation ducts;
  - .2 Thermal insulation shall be provided in cargo spaces, fuel bunkers, control stations, accommodation and service areas for walls reaching high temperature such as boilers, smoke ducts, extraction ducts or galley chimneys;
  - .3 Appliances with naked flames or unprotected resistors for lighting and heating of accommodation shall be prohibited;
  - .4 Electric Cable shall comply with the requirements of Chapter IV.
- 3 Insulation materials shall be approved by the appropriate authority.
- 4 The fixing of combustible parts less than 60 cm from appliances such as ovens and furnaces shall be prohibited unless special precautions are taken to insulate them.
- 5 Materials readily rendered ineffective by heat shall not be used for overboard scuppers, discharges which are close to the water line or for accessories whose destruction in the event of fire would give rise to a risk of flooding.
- 6 Oil or oil fuel pipes shall be of steel or other authorized materials taking into account the risk of fire.
- 7 Air extraction ducts from bunkers and tanks containing combustible liquids shall be fitted with an effective fire-screen capable of being easily cleaned and which shall not significantly reduce the effective diameter of the air duct and shall comply with the provisions of paragraph 6.
- 8 Mechanical ventilation of closed ro-ro cargo spaces carrying motor vehicles with fuel in their tanks for their own propulsion and machinery spaces, if any, shall be capable of being stopped from a point easily accessible and identifiable located outside such spaces.
- 9 Ventilation ducts serving cargo spaces, closed ro-ro cargo spaces and machinery spaces shall be provided on their upper parts with non-combustible means of closing.
- 10 Other openings in machinery spaces shall be capable of being closed from outside those spaces.

#### **Regulation 5**

##### *Arrangements for Combustible Fuel, Lubricating Oil and Other Flammable Oils*

- 1 No combustible liquid shall be used as fuel whose flashpoint, determined by an approved test, is less than 60°C (closed crucible test), except in emergency

generators, in which case the flashpoint shall be not less than 43°C.

2 Safe and efficient means of ascertaining the amount of fuel contained in any tank shall be provided. If such means consist of sounding pipes, their upper ends shall be located in safe positions and fitted with appropriate shutoff devices.

3 If an oil-level gauge is used, it shall be fitted with a self-closing control cock at each end. All cocks shall be fixed directly to the walls of the tank.

4 The use of plastics for oil-level gauges is prohibited.

5 The use of refracting glass oil-level gauges is permitted provided that a protection against shocks is installed. Tighteners shall be fitted to prevent disconnection of oil-level gauges.

6 Precautions shall be taken to prevent any overpressure on tanks or in any part of the fuel supply system, including filling pipes. Outlet valves and air or overflow pipes shall discharge the fuel into a safe place in such a way that it gives rise to no danger.

7 Subject to approval by the Administration, fuel pipes which, if damaged, would allow oil to escape from storage, settling or daily service tank situated above the double bottom, shall be fitted with a cock or valve directly on the tank capable of being closed from a safe position outside the space concerned in the event of fire occurring in the space in which such tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel or similar space, valves shall be fitted on the deep tanks but control in the event of fire shall be capable of being effected by means of an additional valve on the pipe or pipes outside the tunnel or similar space. If such additional valve is fitted in the machinery space it shall be operated from a position outside this space.

8 Pumps which form part of the oil fuel lines shall be separate from any other lines and the inversion of the flow of such pumps shall be fitted with an effective, closed circuit, outlet valve.

9 No oil fuel tank shall be situated where spillage or leakage therefrom can constitute a hazard by falling on heated surfaces. Precautions shall be taken to prevent any oil that may escape under pressure from any pump, filter or heater from coming into contact with heated surfaces.

10 Oil fuel pipes and their valves and fittings shall be of steel or other approved material, except that the restricted use of flexible pipes may be permitted by the appropriate authority. Such flexible pipes and end attachments shall be of approved fire-resisting materials or coated with fire-resisting coatings, to the satisfaction of the appropriate authority.

11 When necessary, oil fuel lines shall be screened or otherwise suitably protected to avoid, as far as practicable, oil spray or oil leakages on to hot surfaces or into machinery air intakes. The number of joints in such piping systems shall be kept to a minimum.

12 As far as practicable, oil fuel tanks shall be part of the ship's structure and shall be located outside machinery spaces of category A. Where oil fuel tanks, other than double bottom tanks, are necessarily located adjacent to or within machinery spaces of category A, at least one of their vertical sides shall be contiguous to the machinery space boundaries, and shall preferably have a common boundary with

the double bottom tanks, and the area of the tank boundary common with the machinery spaces shall be kept to a minimum. Where such tanks are situated within the boundaries of machinery spaces of category A they shall not contain oil fuel having a flashpoint of less than 60°C (closed crucible test). In general, the use of free-standing oil fuel tanks shall be avoided in areas where there is a risk of fire and especially in machinery spaces of category A. When free-standing is 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.

13 The arrangements for the storage, distribution and utilization of oil used in the pressure lubrication systems shall be considered satisfactory by the appropriate authority. The arrangements made in machinery spaces of category A, and whenever practicable in other machinery spaces, shall at least comply with the provisions of paragraphs 1, 3, 6 and 7 and, in so far as the appropriate authority considers it to be necessary, with the provisions of paragraph 2 and 4. The use of sight-flow glasses in lubricating systems shall be permitted provided that they are shown by tests to have a suitable degree of fire resistance.

14 The arrangements for the storage, distribution and utilization of flammable oils other than those specified in paragraph 10 employed under pressure in power transmission systems, control and drive systems and heating systems shall be considered satisfactory of the appropriate authority. In locations where means of ignition are present, such arrangements shall at least comply with the provisions of paragraphs 2 and 6, and with the provisions of paragraphs 3 and 7 in respect of strength and construction.

15 Oil fuels, lubricating oils and other flammable oils shall not be carried in forepeak tanks. Furthermore, oil fuels shall not be stored forward of the collision bulkhead or its extension.

## **Regulation 6**

### *Storage and Use of Oil Fuels*

1 Air outlet pipes in oil fuel compartments and tanks shall terminate with an S-bend with a close-mesh metal cowl and a detachable closing device. A hole of 5 to 6 mm in diameter shall be pierced in the closing device.

The closing device may be replaced by a system such as an automatic ball-valve if it provides equivalent safety.

2 Compartments intended to contain oil fuels with a flashpoint less than 60°C but not less than 43°C shall be insulated from continuous compartments intended for liquids or oil fuels with different flashpoints by cofferdams with air pipes and sounding pipes.

3 Oil fuels with a flashpoint less than 60°C but not less than 43°C may be used subject to the agreement of the Administration to supply emergency fire-pump motors and auxiliary motors which are not situated in machinery spaces.

## **Regulation 7**

### *Pressurized Water Fire-Extinguishing Systems*

1 Any pressurized water fire-extinguishing system, required to be installed by the present chapter, shall consist of pipes fed by one or more pumps and serving nozzles through hydrants and hoses.

## 2 Fire pumps

- .1 Except as otherwise provided in the present chapter, fire pumps shall be mechanically driven by motors independent of the propulsion machinery.
- .2 Sanitary, ballast and bilge pumps, as well as general service pumps may be regarded as fire pumps, provided that they are not normally used for extraction of oil fuel.
- .3 Fire pumps shall be fitted with safety valves if they are capable of operating at a pressure exceeding that for which the pipes and their attachments have been calculated and tested.
- .4 Each mechanically powered pump, where required to be fitted by the present chapter, shall be capable of delivering for fire-fighting purposes a quantity of water, at the pressure specified in paragraph 3.2, not less than two-thirds of the quantity required to be dealt with by a bilge pump under the provisions of Regulation 4 of Chapter IV of BOOK I General Provision.

## 3 Fire mains

- .1 The diameter of the fire main shall be sufficient for the effective distribution of the maximum discharge of one fire pump.
- .2 Where a fire pump delivers the quantity of water specified in subparagraph 3.1 above through any adjacent fire hydrants, a pressure of at least 0.21 N/mm<sup>2</sup> (2.1 kg/cm<sup>2</sup>) shall be maintained at all hydrants affected.
- .3 The arrangement of the fire main shall be such that it is capable of delivering water very rapidly. The controls shall be easy to operate and readily accessible.

## 4 Pipes and hydrants

- .1 The number and position of hydrants shall be such that at least one jet of water may reach any part of the ship normally accessible to the crew while the ship is being navigated and any part of any cargo space when empty.
- .2 Pipes and hydrants shall be so placed that the fire hoses may be easily coupled to them. In ships where deck cargo may be carried, the positions of the hydrants shall be such that they are readily accessible and the pipes shall be arranged as far as practicable to avoid risk of damage by such cargo.
- .3 Cocks or valves shall be fitted to pipes such that any of the hydrants may be shut off while the pumps are in operation and continue to supply other hoses connected to other hydrants.
- .4 Fire hoses of materials readily affected by heat shall not be used unless suitably protected.

## 5 Hoses and nozzles

- .1 Fire hoses shall be of approved materials. They shall not exceed fifteen (15) meters in length. Hoses shall be fitted with the necessary

- couplings and attachments.
- .2 On open decks, a hose shall not be required for each hydrant, but the number of hoses installed shall be sufficient, in the area concerned, such that the jet required by the present Regulation can be delivered in all circumstances.
  - .3 Fire hoses and their attachments shall be maintained in a permanently serviceable condition.
  - .4 The diameter of nozzles (full jet) shall be not less than 10 mm.
  - .5 All nozzles shall be fitted with a shutoff device, as well as a sprinkler jet.

### **Regulation 8**

#### *Fixed Fire Extinguishing System*

- 1 A fixed fire-extinguishing system required in this Regulation may be any of the following systems:
  - .1 A fixed gas fire-extinguishing system complying with the provisions of the Fire Safety Systems Code.
  - .2 A fixed high-expansion foam fire-extinguishing system complying with the provisions of the Fire Safety Systems Code.
  - .3 A fixed pressure water-spraying fire-extinguishing system complying with the provisions of the Fire Safety Systems Code.
- 2 Where a fixed fire-extinguishing system not required by this Regulation is installed, it shall meet the requirements of the relevant regulations of this Regulations and the Fire Safety Systems Code.
- 3 Fixed halogenated hydrocarbon fire-extinguishing systems shall not be used.

### **Regulation 9**

#### *Gas Fire-Extinguishing Systems*

- 1 The use of a fire-extinguishing medium which under expected conditions of use, gives off toxic gases in such quantities as to endanger persons on board shall not be permitted.

The fire extinguishing systems shall be started by a deliberate manual operation.

- 2 The pipes for conveying the fire-extinguishing medium into protected spaces shall be provided with control valves:
  - .1 For which the spaces to which the pipes are led are clearly indicated;
  - .2 Where the open or closed position may be readily checked; and
  - .3 Which can only be operated locally (no remote control).
- 3 Means of manually activating chambers by percussion. In such case, the control shall be exercised from the spaces where the extinguishing medium is placed, except when it is placed in a protected space.
- 4 The piping shall be so positioned as to ensure efficient distribution of the gas. It shall be tested according to the regulations of an approved classification society.

5 Means shall be provided to close all openings which may admit air or allow gas to escape from a protected space. The ventilation of the protected space shall be shut off automatically or manually before the discharge of the extinguishing medium.

6 Verification

- .1 The operation of percussion devices and valves shall be periodically checked, as well as the quantity of gas available and the general state of the system.
- .2 Means shall be provided for safe blowing of the pipes leading from the control valves, one by one.
- .3 Means shall be provided for the crew to safely check the quantity of gas in the chambers.

7 Quantity of gas

To determine the quantity of gas, in cases where the safety valves or other safety devices on the air chambers to start the motors discharge within machinery spaces, the gross volume taken into account in calculating the minimum concentration of gas shall be increased by the volume of free air relating to such chambers.

8 Alarm

- .1 A sound signal shall announce the release of the extinguishing medium in any space in which personnel normally work or to which they have access.
- .2 The signal shall be supplied by the emergency source of power and shall be distinct from any other alarm.
- .3 The time between the giving of the alarm and the arrival of the gas in the protected space shall be such as to allow people to escape from the protected space. The system should be checked periodically to ensure that it is in good working order.

9 The means of control of any fixed gas fire-extinguishing system shall be readily accessible, simple to operate and shall be grouped together at positions where they are not likely to be cut off by a fire in the protected space and shall have clear instructions relating to the operation of the system having regard to the safety of personnel.

10 Where several locations are protected by the same system, the quantity of gas shall be sufficient for the largest of those locations. Several locations which are not completely separate from each other shall be regarded as forming a single location.

11 Pressurized gas fire-extinguisher chambers shall be approved by the appropriate authority and tested every ten years.

12 Pressurized gas fire-extinguisher chambers shall not be positioned forward of the collision bulkhead.

They shall be kept in locations reserved exclusively for that purpose, situated in a safe readily accessible and well ventilated position. Any entrance to such locations shall preferably be from the open deck and in any case shall be separate from the

entrance to the protected space. Access doors shall open outwards. Bulkheads, decks and doors which form the boundaries between such places and adjoining closed spaces shall be of steel or equivalent material or F class except when such chambers are installed above the freeboard deck.

All access doors to the locations of chambers shall carry a sign clearly showing the type of extinguishing medium and the notice "Danger".

13 The air in the protected place shall be changed, after extinction of the fire, within a period compatible with the safety of the ship.

14 Carbon dioxide systems

For machinery spaces the quantity of carbon dioxide delivered by the piping shall be sufficient to give a minimum volume of free gas equal to 30% of the gross volume of the largest machinery space so protected, including the housing.

The volume of free carbon dioxide shall be calculated as  $0.56 \text{ m}^3/\text{kg}$ .

The fixed piping shall be such that 85% of the gas can be discharged into the space within 2 minutes.

### **Regulation 10**

#### *Fixed High-Expansion Foam Fire-Extinguishing Systems in Machinery Spaces*

1 Any required fixed high-expansion fire extinguishing systems in machinery spaces shall be capable of rapidly discharging through fixed discharge outlets a quantity of foam sufficient to fill the greatest space to be protected at a rate of at least 1 m in depth per minute, after deducting the volumes of the plant or equipment, or 1.5 m in depth if such volumes are not deducted.

The quantity of foam-forming liquid available shall be sufficient to produce a volume of foam equal to five times the volume of the largest space to be protected. The expansion ratio of the foam shall not exceed 1,000 to 1.

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

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

3 Foam-producing units shall be of an approved type.

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

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

### **Regulation 11**

#### *Fixed Pressure Water-Spraying Fire-Extinguishing Systems in Machinery Spaces*

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

2 The number and arrangement of the sprinkler jets shall be to the satisfaction of the Administration and shall be such as to ensure an effective

average distribution of water of at least 5 liters per square meter per minute in the spaces to be protected. This distribution may be reduced to 3.5 liters per square meter per minute when the ceiling height of the space to be protected is less than 2.5 meters.

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

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

5 The pump may be driven by an independent internal combustion engine. If, however, it is dependent upon power being supplied from the emergency generator fitted in compliance with the provisions of Chapter IV, that source shall be readily accessible and simple to operate in the event of failure of the main source of electrical power. When the pump is driven by an independent internal combustion engine it shall be so situated that a fire in the protected space will not affect the air supply to the engine.

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

## **Regulation 12**

### *Fire Protection*

#### 1 Pressurized water extinguishing systems

- .1 A fire main shall be provided in compliance with the requirements of Regulation 7.
- .2 The fire system shall be supplied by a main pump situated in the propulsion machinery space and an independent emergency pump. Such pumps shall comply with the requirements of Regulation 7.
- .3 The main pump may be coupled to the propulsion machinery, in which case it shall have a clutch mechanism.
- .4 In the case of multi-hulled ships with two independent propulsion spaces, the main pump and emergency pump referred to in paragraph 1.2 may be replaced by two fire pumps with a clutch mechanism coupled to each propulsion engine and supplying the same fire main.
- .5 In addition to the hose and nozzle referred to in paragraph 6, at least two hoses with nozzles shall be provided.
- .6 The following shall be installed in the propulsion space:
  - .1 a fire hydrant permanently coupled to a hose with a nozzle; and
  - .2 a receptacle containing a powdery material such as sand or sawdust impregnated with caustic soda and a shovel. A portable extinguisher of an approved type may be accepted as an equivalent.

#### 2 Machinery spaces

In addition to the provisions of paragraph 1, machinery spaces containing oil-fired fuel, oil fuel units or internal combustion machinery for the purposes of propulsion of ships shall be provided, to the satisfaction of the Administration, with any one of the following fixed fire- extinguishing systems:

- .1 a gas system complying with the provisions of Regulation 9.
- .2 a high-expansion foam system complying with the provisions of Regulation 10.
- .3 a pressure water-spraying system complying with the provisions of Regulation 11.

### **Regulation 13**

#### *Fixed Fire Detection and Alarm Systems in Propulsion Machinery Spaces*

- 1 A fixed fire detection system of an approved type shall be installed in spaces containing internal combustion machinery used for the main propulsion of ships.
- 2 The detectors shall be operated by smoke or other products of combustion and initiate an audible and visual alarm, distinct from any other device that does not indicate a fire, to the wheelhouse.
- 3 The system shall be tested to the satisfaction of the Administration.

### **Regulation 14**

#### *Fire Extinguishers*

- 1 All fire extinguishers shall be of an approved type.
- 2 A portable foam applicator unit shall consist of an air-foam nozzle of an inductor-type capable of being connected to the main by a fire hose, together with a portable tank containing at least 20 liters of foam-making liquid and one spare tank. The nozzle shall be capable of producing effective foam suitable for extinguishing an oil fire, at the rate of 1.5 m<sup>3</sup>/min.
- 3 One of the portable fire extinguishers intended for use in any space shall be stowed near the entrance to that space, preferably outside.
- 4 The number of spare charges shall be determined by the Administration to the extent that recharging of used extinguishers may be effected.
- 5 Ships shall be provided with at least three portable extinguishers, at least one of which being appropriate to extinguish an oil fire.

### **Regulation 15**

#### *Fire Drills*

Fire drills shall be conducted under the same conditions as those required by Regulation 3 of Chapter VI, in order to check the condition of fire-fighting equipment and train the crew in its use.

### **Regulation 16**

#### *Ready Availability of Fire-Extinguishing Appliances*

- 1 Fire-extinguishing appliances shall be kept in good order and be available for immediate use at all times.
- 2 Equipment and systems shall be subject to periodic tests to ensure that

they are in good working order or special checks depending on their nature, at least once a year. The date and purpose of such inspections shall be recorded in a maintenance and test log, and noted in the ship's log.

### **Regulation 17**

#### *Substitutes*

Where in this chapter any special type of appliance, apparatus, extinguishing medium or arrangement is specified, in any new and existing vessels, any other type of appliance, etc., may be allowed if the Administration is satisfied that it is not less effective.

### **Regulation 18**

#### *Carriage of Dangerous Goods*

The provisions of Chapter VII of the SOLAS Convention shall apply to the carriage of dangerous goods in containers.

### **Regulation 19**

#### *Detection and Alarm*

#### 1 Fire Detection System

- .1 Areas of major and moderate fire hazard and other enclosed spaces not regularly occupied within public spaces such as toilets, stairway enclosures, corridors and escape routes shall be provided with an approved automatic smoke detection system and manually operated call points to indicate at the control station the location of outbreak of a fire in all normal operating conditions of the installations. Detectors operated by heat instead of smoke may be installed in galleys.
- .2 Main propulsion machinery room(s) shall in addition have detectors sensing other than smoke and be supervised by CCTV cameras monitored from the operating compartment. Manually operated call points shall be installed throughout the public spaces, corridors and stairway enclosures, service spaces and where necessary control stations. One manually operated call point shall be located at each exit from these spaces and from areas of major fire hazard.

#### 2 General requirements

- .1 Any required fixed fire-detection and fire alarm system with manually operated call points shall be capable of immediate operation at all times.
- .2 Power supplies and electric circuits necessary for the operation of the system shall be monitored for loss of power or fault conditions as appropriate. Occurrence of a fault condition shall initiate a visual and audible fault signal at the control panel which shall be distinct from a fire signal.
- .3 There shall be not less than two sources of power supply for the electrical equipment used in the operation of the fixed fire-detection and fire alarm system, one of which shall be an emergency source. The supply shall be provided by separate feeders reserved solely for that purpose. Such feeders shall run to an automatic change-over

switch situated in or adjacent to the control panel for the fire-detection system.

- .4 Detectors and manually operated call points shall be grouped into sections. The activation of any detector or manually operated call point shall initiate a visual and audible fire signal at the control panel and indicating units. If the signals have not received attention within two minutes an audible alarm shall be automatically sounded throughout the crew accommodation and service spaces, control stations and machinery spaces. There shall be no time delay for the audible alarms areas when all the control stations are unattended. The alarm sounder system need not be an integral part of the detection system.
- .5 The control panel shall be located in the operating compartment or in the main fire control station.
- .6 Indicating units shall, as a minimum, denote the section in which a detector or manually operated call point has operated. At least one unit shall be so located that it is easily accessible to responsible members of the crew at all times, when at sea or in port, except when the ships is out of service. One indicating unit shall be located in the operating compartment if the control panel is located in the space other than the operating compartment.
- .7 Clear information shall be displayed on or adjacent to each indicating unit about the spaces covered and the location of the sections.
- .8 Where the fire-detection system does not include means of remotely identifying each detector individually, no section covering more than one deck within public spaces, corridors, service spaces and control stations shall normally be permitted except a section which covers an enclosed stairway. In order to avoid delay in identifying the source of fire, the number of enclosed spaces included in each section shall be limited as determined by the Administration.
- .9 A section of fire detectors which covers a control station, a service space, a public space, and corridor or stairway enclosure shall not include a machinery space of major fire hazard.
- .10 Detectors shall be operated by heat, smoke or other products of combustion, flame, or any combination of these factors. Detectors operated by other factors indicative of incipient fires may be considered by the Administration provided that they are no less sensitive than such detectors. Flame detectors shall only be used in addition to smoke or heat detectors.
- .11 Suitable instructions and component spares for testing and maintenance shall be provided.
- .12 The function of the detection system shall be periodically tested by means of equipment producing hot air at the appropriate temperature, or smoke or aerosol particles having the appropriate range of density or particle size, or other phenomena associated with incipient fires to which the detector is designed to respond. All detectors shall be of a

type such that they can be tested for correct operation and restored to normal surveillance without the renewal of any component.

- .13 The fire-detection system shall not be used for any other purpose, except that closing of fire doors and similar functions may be permitted at the control panel.

### 3 Installation requirements

- .1 Manually operated call points shall be readily accessible in the corridors of each deck such that no part of the corridor is more than 20 m from a manually operated call point.
- .2 Where a fixed fire-detection and fire alarm system is required for the protection of spaces other than stairways, corridors and escape routes, at least one detector shall be installed in each such space.
- .3 The maximum spacing of detectors shall be in accordance with the table below:

Type of detector	Maximum floor area per detector	Maximum distance apart between centers	Maximum distance away from bulkheads
Heat	37 m <sup>2</sup>	9 m	4.5 m
Smoke	74 <sup>2</sup>	m	1.1 m

- .4 The Administration may require or permit other spacing based upon test data which demonstrate the characteristics of the detectors.
- .5 Electrical wiring which forms parts of the system shall be so arranged as to avoid machinery spaces of major fire hazard, and other enclosed spaces of major fire hazard except, where it is necessary, to provide for fire detection or fire alarm in such spaces or to connect to the appropriate power supply.

### 4 Design Requirements

- .1 The system and equipment shall be suitably designed to withstand supply voltage variation and transients, ambient temperature changes, vibration, humidity, shock, impact and corrosion normally encountered in ships.
- .2 Smoke detectors shall be installed in spaces within the sensitivity limits to the satisfaction of the Administration having regard to the avoidance of detector insensitivity or over-sensitivity.
- .3 At higher temperature rates of temperature rise, the heat detector shall operate within temperature limits having regard to the avoidance of detector insensitivity or over sensitivity.
- .4 At the discretion of the Administration, the permissible temperature of operation of heat detectors may be increased to 30 degrees Celsius above the maximum deckhead temperature in drying rooms and similar spaces of a normal high ambient temperature.

- .5 Flame detectors shall have a sensitivity sufficient to determine flame against an illuminated space background and a false signal identification system.
- 5 Fire detection for periodically unattended/unmanned machinery spaces
- .1 A fixed fire-detection and fire alarm system for periodically unattended machinery spaces shall comply with the following requirements:
    - .1 The fire-detection system shall be so designed and the detectors so positioned as to detect rapidly the onset of fire in any part of those spaces and under any normal conditions of operation of the machinery and variations of ventilation as required by the possible range of ambient temperatures. Except in spaces of restricted height and where their use is specially appropriate, detection systems using only thermal detectors shall not be permitted. The detection system shall initiate audible and visual alarms distinct in both respects from the alarms of any other system not indicating fire, in sufficient places to ensure that the alarms are heard and observed on the navigating bridge and by a responsible engineer officer. When the operating compartment is unmanned the alarm shall sound in a place where a responsible member of the crew is on duty.
    - .2 After installation, the system shall be tested under varying conditions of engine operation and ventilation.
  - .2 A fixed fire detection system of an approved type shall be installed in spaces containing internal combustion machinery used for the main propulsion of ships.
  - .3 The detectors shall be operated by smoke or other products of combustion and initiate an audible and visual alarm, distinct from any other device that does not indicate a fire, to the wheelhouse.
- 6 The system shall be tested to the satisfaction of the Administration

#### **Regulation 20**

##### *Portable Fire Extinguishers*

- 1 Control stations, public spaces, corridors and service spaces shall be provided with portable fire extinguishers of approved type and design. At least five (5) portable extinguishers shall be provided, and so positioned, as to be readily available for immediate use.
- 2 In addition, at least one extinguisher suitable for machinery space fires shall be positioned outside each machinery space entrance.

#### **Regulation 21**

##### *Fire-fighters Fireman's Outfit*

- 1 All ships shall carry at least one firefighter's outfits complying with the requirements of paragraph 4.
- 2 The Administration may require additional sets of personal equipment and breathing apparatus, having due regard to the size and type of the ships.

3 The firefighter's outfits or sets of personal equipment shall be so stored as to be easily accessible and ready for use and, where more than one firefighter's outfit or more than one set of personal equipment is carried, they shall be stored in widely separated positions.

4 A firefighter's outfit shall consist of:

.1 Personal equipment comprising:

- .1 Protective clothing of material to protect the skin from the heat radiating from the fire and from burns and scalding by steam or gases. The outer surface shall be water-resistant;
- .2 Boots and gloves of rubber or other electrically non-conductive material;
- .3 A rigid helmet providing effective protection against impact;
- .4 An electric safety lamp (hand lantern) of an approved type with a minimum burning period of 3 hrs; and
- .5 An axe.

.2 A breathing apparatus of an approved type which may be either:

- .1 A smoke helmet or smoke mast, which shall be provided with a suitable air pump and a length of air hose sufficient to reach from the open deck, well clear of hatch or doorway, to any part of the holds or machinery spaces. If, in order to comply with this subparagraph, an air hose exceeding 36 m in length would be necessary, a self-contained breathing apparatus shall be substituted or provided in addition, as determined by the Administration; or
- .2 A self-contained compressed-air-operated breathing apparatus the volume of air contained in the cylinders of which shall be at least 1,200 l, or other self-contained breathing apparatus, which shall be capable of functioning for at least 30 min. A number of spare charges, suitable for use with the apparatus provided, shall be available on board.
- .3 For each breathing apparatus a fireproof lifeline of sufficient length and strength shall be provided capable of being attached by means of a snap hook to the harness of the apparatus or to a separate belt

## **Regulation 22**

### *Control of Smoke Spread*

1 Release of smoke from machinery spaces:

- .1 The provisions of this paragraph shall apply to machinery spaces of category A and, where the Administration considers it desirable, to other machinery spaces.
- .2 Suitable arrangements shall be made to permit the release of smoke, in the event of fire, from the space to be protected, subject to the number of skylights, doors, ventilators, openings in funnels to permit exhaust ventilation and other openings to machinery spaces shall be reduced to a minimum consistent with the needs of ventilation and the

proper and safe working of the ship. The normal ventilation systems may be acceptable for this purpose.

- .3 Means of control shall be provided for permitting the release of smoke and such controls shall be located outside the space concerned so that they will not be cut off in the event of fire in the space they serve.

### **Regulation 23**

#### *Fire Control Plan*

- 1 All passenger ship shall be provided a permanently exhibited fire control plan duly approved by the Administration.
- 2 Fire control plan shall be kept up-to-date. Description in such plan shall be in the English language.
- 3 In addition, instructions concerning the maintenance and operation of all the equipment and installations on board for the fighting and containment of fire shall be kept under one cover, readily available in an accessible position.

### **Regulation 24**

#### *Notification of Crew and Passengers*

- 1 General emergency alarm system  
All ship shall be provided with a general emergency alarm system approved by the Administration which will be used for notifying crew and passengers of a fire.
- 2 Public address system  
A public address system or other effective means of communication shall be available throughout the accommodation and service spaces and control stations and open decks.
- 3 Provision shall be made on board for embarkation station to be properly equipped for evacuation of passengers into life-saving appliances. Such provision shall include handholds, anti-skid treatment of the embarkation deck, and adequate space which is clear of cleats, bollards and similar fittings.

### **Regulation 25**

#### *Means of Escape*

- 1 In order to ensure immediate assistance from the crew in an emergency situations, the crew accommodation, including any cabins, shall be located with due regard to easy, safe and quick access to the public spaces from inside the ships. For the same reason, easy, safe and quick access from the operating compartment to the public spaces shall be provided.
- 2 The design of the ships shall be such that all occupants may safety evacuated the ships into survival crafts under all emergency conditions, by the day or by night. The positions of all exists which may be used in an emergency and of all life saving appliances, the practicability of the evacuation procedure, and evacuation time to evacuate all passengers and crew shall be demonstrated.
- 3 Public spaces, evacuation routes, exits, lifejacket stowage (under passenger seats), survival crafts stowage, and the embarkation stations shall be clearly and permanently marked and illuminated.

4 Each enclosed public space and similar permanently enclosed space allocated to passengers or crew shall be provided with at least two exits, as widely separated as practical. All exits shall clearly indicate the directions to the evacuation station and safe areas.

- .1 Exit doors shall be capable of being readily operated from inside and outside the ships in daylight and in darkness. The means of operation shall be obvious, rapid and of adequate strength. Doors along escape route should where appropriate, open in the direction of escape flow from the space served.
- .2 The ships shall have sufficient number of exits which are suitable to facilitate the quick and unimpeded escape of persons wearing approved lifejackets in emergency conditions, such as collision damage or fire.
- .3 Sufficient space for a crew member shall be provided adjacent to exits for ensuring the rapid evacuation of passengers.
- .4 All exits, together with their means opening, shall be adequately marked for the guidance of passengers, Adequate marking shall be provided for the guidance of rescue personnel outside the ships.
- .5 The width of corridor, doorways and stairways which form part of the evacuation path shall be not less than 900 mm for passenger ships and 700 mm for cargo ships. This width may be reduced to 600mm for corridors, doorways, and stairways, serving spaces where persons are not normally employed. There shall be no protrusions in evacuation paths which could cause injury, ensnare clothing, damage lifejackets or restrict evacuation.

#### **Regulation 26**

##### *Evacuation Time*

1 The provisions for evacuation shall be designed such that the ship can be evacuated under controlled conditions in a time of one third of the structural fire protection time for areas of major fire hazard after subtracting a period of 7 min for initial detection and extinguishing action.

$$\text{Evacuation time} = \frac{(\text{SFP} - 7)}{3} \text{ (min)}$$

2 The evacuation time shall be verified by an evacuation demonstration which shall be performed using the survival crafts and exits on one side, for which the evacuation analysis indicates the greatest evacuation time, with the passengers and crews allocated to them.

#### **Regulation 27**

##### *Fire Protection Requirements for Ships of Less Than 24 Meters*

1 The minimum number of portable fire extinguishers on board shall be as follows:

<b>Length of Vessel</b>	<b>Number of Extinguishers</b>
Not over 10 m	2

Over 10 m but not over 15 m	3
Over 15 m but not over 24 m	5
Over 24 m	*

\*The ship's approved fire control plan shall be the basis in determining the minimum number of portable fire extinguishers required.

- 2 All ship shall be provided with fire buckets as follows:
  - .1 At least three fire buckets shall be provided which shall be of a material which is not readily flammable. They shall be painted red, clearly marked with the word "FIRE" and provided with lanyards of sufficient length, having regard to the size of the ship;
  - .2 The capacity of each of the fire buckets referred to in this part shall be at least nine liters;
  - .3 Fire buckets provided in compliance with this Regulation shall not be used for any other purpose than extinguishing fire;
- 3 Where the provision of fixed fire extinguishing systems is considered to be impracticable, the Administration may accept alternate arrangements.

DRAFT  
24 JANUARY 2019

## **CHAPTER VI**

### *LIFE-SAVING APPLIANCE*

#### **Regulation 1**

##### *General Requirements*

1 Life-saving appliances and equipment shall be of the approved type and shall be acquired from an accredited manufacturer/supplier or serviced by an accredited servicing entity. Life-saving appliances and equipment on board ships acquired from abroad must also be type-approved and proof thereof to be checked and certified by the Administration.

2 In areas where the approval of the Administration is impracticable, a surveyor from the Administration shall conduct actual testing of the rigid life raft, buoyant apparatus and life jacket. The surveyor shall provide a description of the appliances and equipment and the testing made indicating there in the observations and findings resulting from the testing conducted and should be recorded in the log book provided by the company

3 The Administration may, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of this Regulation unreasonable or unnecessary. Approved alternative specifications that are considered equally effective under circumstances may be allowed.

4 Where novel life-saving appliances or arrangements are to be approved, the Administration shall ensure that they provide the same safety standards as specified herein and such appliances and arrangements are evaluated and tested in accordance with the recommendations of the Organization.

#### **Regulation 2**

##### *Rationalized Safety Requirements*

1 Lifeboats, liferafts, lifefloats, lifebuoy, buoyant apparatus and life preservers shall be readily available in case of emergency and shall be kept in good working order and ready for immediate use at all times when the ship is being navigated, or in so far as reasonable and practicable when the ship is, not being navigated.

2 Type-approved lifejackets shall be provided in each and every passenger accommodation, which shall be stored or located within reach of the passengers and can be used immediately at the time of emergency.

3 The decks on which lifeboats, liferafts, lifefloats, buoyant apparatus and life preservers are carried shall be kept clear of cargo or any other obstructions which may interfere with the immediate launching of the life-saving appliances.

4 Sufficient ladders, as applicable, shall be provided to facilitate embarkation into the lifeboats and liferafts when waterborne;

5 Lifeboats, liferafts, lifefloats buoyant apparatus, life preservers and lifebuoys shall be clearly marked with the name of the ship as well as the approved maximum number of persons for each applicable life-saving appliances.

6 Lifeboats, liferafts, lifefloats, buoyant apparatus and preservers shall be stored in such a manner that:

- .1 They are capable of being launched in the shortest possible time;

- .2 They shall not impede the launching or handling of other lifesaving appliances;
  - .3 They shall not impede the marshalling of persons at the embarkation stations or their embarkation; and
  - .4 They shall be capable of being put in the water safely and rapidly even under unfavorable condition of list and trim.
- 7 Lifejackets shall be provided in every passenger accommodation:
- .1 Passenger accommodation with lying/bunker arrangements - lifejackets shall be stowed immediately overhead or under the bed, in each accommodation. Lifejackets in first class accommodations may be stowed in properly marked cabinets.
  - .2 Passenger accommodation with seating arrangements - lifejackets shall be stowed immediately overhead or under the seat.
  - .3 Every common area shall be provided with additional lifejackets the number of which should be equivalent to at least twenty five percent (25%) of the total passenger capacity such area can accommodate, stored in a properly marked cabinet easily seen by and accessible to the passengers at all times.
  - .4 No lifejacket locker/cabinet shall be permanently locked during voyage.
  - .5 The number of lifejacket in every locker/cabinet shall be clearly indicated.
  - .6 Lifejacket for children and infants shall be distributed during embarkation and collected upon arrival.
  - .7 Proper safety information and signage (regarding stowage location, donning procedures, etc.) Shall be provided in all conspicuous places and should be clear and easily understood. Actual demonstration of the donning of lifejacket or showing of safety film/video on passenger ships shall be conducted prior departure.
  - .8 Number of type-approved lifejackets on board ships:
    - .1 Every ship shall carry type-approved lifejackets equivalent to the total number of authorized persons on board.
    - .2 In passenger ships, additional 10% and 5% of the actual number of persons allowed on-board shall be provided for children and infants, respectively or such greater number as maybe required to provide a lifejacket for each child.
    - .3 Additional lifejackets shall be required at each of the common areas.
    - .4 Additional lifejackets shall also be provided for every officer/crew at each watch/work stations.

**Table 2.1 – Lifejacket Sizing Criteria Lifejacket Marking Infant, Child and Adult**

Lifejacket marking		Infant	Child	Adult
User's size:				
	Weight (kg)	less than 15	15 or more but less than 43	43 or more
	Height (cm)	less than 100	100 or more but less than 155	155 or more

**Regulation 3**

*Training and Abandon Ship Drills*

- 1 Every crew member shall be trained in launching and maneuvering life-saving appliances
- 2 The method and instructions for use of life-saving appliances and arrangements shall be exhibited at muster stations and common crew areas.
- 3 Muster stations and embarkation stations for lifeboats shall be provided with lighting supplied by the emergency source of power.
- 4 Every crew member shall participate in at least one abandon ship drill and one fire drill every month. Each drill shall be the occasion of a training session on the use of the corresponding equipment.
- 5 The conduct of the above drills and corresponding training shall be recorded in an official logbook.

**Regulation 4**

*Stowage, Launching and Recovery of Survival Craft*

- 1 Survival craft shall be stowed such that:
  - .1 neither the survival craft nor its launching gear will interfere with the operation of any other survival crafts at any other launching station,
  - .2 they are as near the water surface as is safe and practicable
  - .3 they are kept in a state of continuous readiness and that two members of the crew can carry out preparations for embarkation and launching in less than five minutes.
- 2 The arrangements for the recovery of survival craft shall be to the satisfaction of the Administration.
- 3 Survival craft which are not stowed under davits or equivalent systems shall be stowed such that they are secured to the ship by hydrostatic release units.

**Regulation 5**

*Marking of Survival craft*

All survival craft shall be marked in capital letters in the Roman alphabet with:

- 1 the name of the ship and its homeport.
- 2 the maximum number of persons for which it is approved to carry.

**Regulation 6**

## *Operational Readiness, Maintenance and Inspections*

### 1 Operational readiness

Before the ship leaves port and at all times during the voyage, all life-saving appliances shall be in good working order and ready for immediate use.

### 2 Maintenance

Instructions for maintenance on board of survival craft and rescue boats shall be posted and easily understood.

### 3 Weekly inspection

The following tests and inspections shall be carried out weekly:

- .1 All survival crafts, rescue boats and launching appliances shall be visually inspected to ensure that they are ready for use; and
- .2 the general emergency alarm system shall be tested.

### 4 Monthly inspections

Inspection of the life-saving appliances, including lifeboat equipment, shall be carried out monthly using a checklist to ensure that they are complete and in good order. A report of the inspection shall be entered in the logbook.

### 5 Servicing of inflatable liferafts, and inflated rescue boats and hydrostatic release units.

Every inflatable liferaft, inflated rescue boat and hydrostatic release units shall be serviced at intervals not exceeding twelve months in a servicing station approved by the Administration. In case of difficulty, the Administration may authorize a seventeen months interval.

## **Regulation 7**

### *Public Address Systems*

1 Except as noted in paragraph 5, ships shall be equipped with a public address system.

2 On a ship of 20 m or more in length, the public address system shall be a fixed installation and be audible during normal operating conditions throughout the accommodation spaces and all other spaces normally manned by crew members.

3 A ship with more than one passenger deck or with overnight accommodation shall have the public address system operable from the operating station.

4 On a ship of less than 20 m in length, a battery powered bullhorn may serve as the public address system where it can be demonstrated to be audible throughout the accommodation spaces of the ship during normal operating conditions. The bullhorn's batteries shall be continually maintained at a fully charged level by use of a battery charger or other means acceptable to the Administration.

5 On a ship of less than 20 m in length carrying less than 50 passengers, a public address system is not required where the Administration is satisfied that a public announcement made from the operating station without amplification can be heard throughout the accommodation spaces of the vessel during normal operating conditions.

## **Regulation 8**

### *Record of Passengers*

The master of a ship shall keep an accurate list of all passengers, which shall be recorded in the passenger manifest.

### **Regulation 9**

#### *Passenger safety*

1 Before getting underway on a voyage where passengers are carried, the master of a ship shall ensure that suitable public announcements are made informing all passengers of the following, as applicable to the vessel's operations and arrangement:

- .1 a general explanation of emergency procedures;
- .2 the location of emergency exits and survival crafts embarkation areas;
- .3 the stowage location of lifejackets;
- .4 the proper method of putting on and adjusting lifejackets of the type carried on the vessel including a demonstration of the proper donning of a lifejacket;
- .5 the location of the instruction placards for lifejackets and other lifesaving devices; and
- .6 that all passengers will be required to wear lifejackets when possible hazardous conditions exist, as directed by the master.

2 As an alternative to an announcement that complies with 1, the master or other designated person may:

- .1 prior to getting underway, deliver to each passenger or, on a ship that does not carry vehicles and that has seats for each passenger, place near each seat, a card or pamphlet that has the information listed in .1.1 to .1.6; and
- .2 make an abbreviated announcement consisting of:
  - .1 a statement that passengers should follow the instructions of the crew in an emergency;
  - .2 the location of lifejackets; and
  - .3 that further information concerning emergency procedures including the donning of lifejackets, location of other emergency equipment, and emergency evacuation procedures are located on the card or pamphlet that was given to each passenger or is located near each seat.

3 Ferries operating on short runs of less than 15 minutes may substitute bulkhead placards or signs for the announcement required in .1 and .2 where the Administration determines that the announcements are not practical due to the ship's unique operation.

### **Regulation 10**

#### *Communications*

1 Each ship covered by this regulation shall carry:

- .1 at least two two-way VHF radio-telephone apparatus;

- .2 at least one radar transponder. Such radar transponder shall be so stowed that it can be rapidly placed in any survival crafts;
- .3 an emergency means comprising either fixed or portable equipment or both for two-way communications between emergency control stations, muster and embarkation stations and strategic positions on board;
- .4 a general emergency alarm system for summoning the crew to muster stations capable of sounding a signal consisting of seven or more short blasts followed by a long blast on the ship's whistle or siren which shall be powered from the ship's main or the emergency power. The system shall be operated from the ship's bridge and be audible throughout all the accommodation and normal crew spaces.

## **Regulation 11**

### *Minimum Requirements of Life-Saving Appliances and Equipment*

#### **1 Ships Engaged In Coastal Waters**

- .1 Survival crafts: (To cover the total number of persons the ship is authorized to carry)
  - .1 Lifeboat or combination of liferaft and lifeboat, or
  - .2 Liferaft (Inflatable/Rigid Type)
    - 100% inflatable/rigid type or combination of equivalent approved-type liferaft which shall cover up to 50% of the total number of persons the ship is authorized to carry;
- .2 Rescue Boats:
  - .1 One (1) rescue boat or equivalent approved-type rescue boat of ships of 500 GT and above.
- .3 Lifebuoys:
  - .1 Four (4) Lifebuoys for ships less than 20 meters in length;
  - .2 Six (6) lifebuoys for ships 20 meters but less than 40 in length;
  - .3 Eight (8) lifebuoys for ships 40 meters but less than 60 meters in length;
  - .4 Ten (10) lifebuoys for ships 60 meters but less than 120 meters in length; and
  - .5 50% of the required lifebuoys, and in no case less than two (2), shall be fitted with self igniting lights with at least one (1) of which shall be fitted with self activated smoke signal as well as a buoyant line of at least 25 meters in length.
- .4 Lifejackets:
  - .1 Every ship shall carry at least one (1) approved-type lifejacket for each and every person authorized on board with an additional 10% and 5% of the total number of persons allowed on-board, suitable for children and infants respectively.
  - .2 In addition to the requirement above, sufficient number of lifejackets for persons on watch at work station shall be

provided. In addition, a sufficient number of lifejackets shall be carried for persons on watch and which should be stowed on navigating bridge, in the engine room or control stations and in any other manned watch station.

.5 Distress Flares:

- .1 Every ship shall carry at least four (4) rocket parachute flares.

2 Ships Engaged In Protected Waters

.1 Survival crafts: (To cover the total number of persons the ship is authorized to carry)

- .1 Lifeboat or combination of liferaft, or

- .2 Liferaft (Inflatable/Rigid Type)

- 100% inflatable/rigid type or combination of equivalent approved-type liferaft which shall cover up to 50% of the total number of persons the ship is authorized to carry;

.2 Lifebuoys:

- .1 Two (2) Lifebuoys for ships less than 20 meters in length;
- .2 Four (4) lifebuoys for ships 20 meters but less than 40 meters in length;
- .3 Six (6) lifebuoys for ships 40 meters but less than 60 meters in length;
- .4 Eight (8) lifebuoys for ships 60 meters but less than 120 meters in length;
- .5 Ten (10) lifebuoys for ships 120 meters and over in length; and
- .6 50% of the required lifebuoys, shall be fitted with self igniting lights with at least one (1) of which shall be fitted with self activated smoke signal as well as a buoyant line of at least 25 meters in length.

.3 Lifejackets:

- .1 Every ship shall carry at least one (1) approved-type lifejacket for each and every person authorized on board with an additional 10% and 5% of the total number of persons allowed on-board, suitable for children and infants respectively.
- .2 In addition to the requirement above, sufficient number of lifejackets for persons on watch at work station shall be provided. In addition, a sufficient number of lifejackets shall be carried for persons on watch and which should be stowed on navigating bridge, in the engine room or control stations and in any other manned watch station.

.4 Distress Flares:

- .1 Every ship shall carry at least two (2) rocket parachute flares if and when allowed for nighttime navigation.

## **Regulation 12**

### *Manning and Survival Procedures*

- 1 All persons manning such ships shall be trained in launching and operating the survival crafts.
- 2 Illustrations and instructions relating to the use of life-saving appliances in appropriate languages shall be posted at muster stations and other crew spaces.
- 3 Posters or signs shall be provided on or in a vicinity of survival crafts and their launching controls.
- 4 Muster stations shall be provided close to the embarkation stations. Both shall be adequately illuminated by lighting supplied from the emergency source of electric power.
- 5 Each member of the crew shall participate in at least one abandon ship drill and one fire drill every month. On board training in the use of life-saving appliances, including survival crafts equipment shall be provided at such drills.
- 6 Records shall be maintained relating to abandon ship drills, fire drills and on board training, in such-log-books as may be prescribed by the Administration.

## **Regulation 13**

### *Muster List and Emergency Instructions*

- 1 Clear instructions to be followed in the event of an emergency shall be provided of each person on board.
- 2 Muster lists shall specify the tails of the general emergency alarm, public address system and action to be taken by the crew and passenger when this alarm is sounded. It shall be exhibited in conspicuous places throughout the ship, including the control compartment, engine room and crew accommodation spaces.
- 3 Illustrations and instructions in appropriate languages shall be posted in public spaces and be conspicuously displayed at assembly stations at other passenger spaces and near each seat to inform passengers of:
  - .1 their assembly station;
  - .2 the essential actions they must take in an emergency; and
  - .3 the method of donning lifejackets.
- 4 Posters or signs shall be provided on or in a vicinity of survival crafts and their launching controls.
- 5 Muster stations shall be provided close to the embarkation stations. Both shall be adequately illuminated by lighting supplied from the emergency source of electric power.
- 6 Each member of the crew shall participate in at least one abandon ship drill and one fire drill every month. On board training in the use of life-saving appliances, including survival crafts equipment shall be provided at such drills.
- 7 Records shall be maintained relating to abandon ship drills, fire drills and on board training in such deck/engine logbook as may be prescribed by the Administration.

## CHAPTER VII

### *Radio Communications*

#### **Regulation 1**

##### *General Requirements*

1 The national regulations on radio Communications issued by the National Telecommunications Commission (NTC) apply to all ships covered by this book.

2 No provision in this Regulation shall prevent the use by any ship or person in distress, of any means at their disposal to attract attention, make known their position and obtain help.

#### **Regulation 2**

##### *Functional Requirements*

1 Ships while at sea shall be provided with radio installations capable of complying with the functional requirements identified in this Regulation throughout its intended voyage.

2 Ships, while at sea, shall be capable of:

- .1 transmitting ship-to-shore distress alerts by at least two separate and independent means, each using a different radio communication service;
- .2 receiving shore-to-ship distress alerts;
- .3 transmitting and receiving ship-to-ship distress alerts;
- .4 transmitting and receiving search and rescue coordinating communications;
- .5 transmitting and receiving on-scene communications;
- .6 transmitting and where applicable receiving signals for locating;
- .7 transmitting and receiving maritime safety information;
- .8 transmitting and receiving general radio communications to and from shore-based radio systems or networks; and
- .9 transmitting and receiving bridge-to-bridge communications.

#### **Regulation 3**

##### *Ship Requirements*

1 Every radio installation shall:

- .1 be so located that no harmful interference of mechanical, electrical or other origin affects its proper use or that of other equipment;
- .2 be so located as to ensure the greatest possible degree of safety and operational availability;
- .3 be protected against the harmful effects of water, extremes of temperature and other adverse environmental conditions;
- .4 be provided with reliable, efficient and permanently installed electric lighting;
- .5 be clearly marked with the call sign, the ship station identity and other

codes as applicable.

2 Control of the VHF radiotelephone channels, required for navigational safety, shall be immediately available on the navigation bridge.

#### **Regulation 4**

##### *Watches*

1 Every ship, while at sea, shall maintain a continuous watch on the distress frequencies corresponding to the sea area in which the ship is navigating.

2 Every ship, while at sea, shall maintain a radio watch for broadcasts of maritime safety information on the appropriate frequency or frequencies on which such information is broadcast for the sea area in which the ship is navigating.

3 Each ship, while at sea, shall maintain a continuous listening watch on:

- .1 VHF Channel 16;
- .2 radiotelephone distress frequency 2,182KHz.

#### **Regulation 5**

##### *Maintenance Requirements*

1 The Administration shall ensure that radio equipment required by this chapter is maintained to provide the availability of the functional requirements and to meet the recommended performance standards of such equipment.

2 Adequate information shall be provided to enable the equipment to be properly operated and maintained.

3 The availability of the radio equipment shall be ensured by using one of the following method:

- .1 duplication of equipment
- .2 shore-based maintenance, or
- .3 at-sea electronic maintenance capability.

#### **Regulation 6**

##### *Radio Equipment – General*

1 All ships shall be provided with the following radio communication equipment:

- .1 Ships operating in the protected areas:
  - .1 VHF radio Installation;
- .2 Ships operating in coastwise voyage:
  - .1 VHF, MF/HF SSB Radio Installation (20 – 100 watts power output);
  - .2 GPS (150 GT and above);
  - .3 AIS (300 GT and above).

#### **Regulation 7**

##### *Sources of Energy*

There shall be available at all times, while the ship is at sea, a supply of electrical energy sufficient to operate the radio installations and to charge any batteries used

as part of a reserve source or sources of energy for the radio installations for a period of 18 hours as specified in these Rules and Regulations.

### **Regulation 8**

#### *Radio Logs*

1 A radio log shall be maintained in accordance with the Radio Regulations in a ship which is fitted with a GMDSS radio communication station. Every qualified operator, master, officer or crew member maintaining a listening watch in accordance with Regulation 4 shall enter in the log his name and the details of all incidents connected with the radio service which occur during his watch which may appear to be of importance to safety of life at sea. In addition, there shall be entered in the log:

- .1 details required by the Radio Regulations;
- .2 the time listening watch begins when the ship leaves port, and the time at which it ends when the ship reaches port;
- .3 the time at which listening watch was discontinued for any reason together with the reason thereof, and the time at which listening watch was resumed thereafter; and
- .4 details of the maintenance of the batteries (if provided), including a record of the charging required.

2 Radio logs shall be available for inspection by the officers authorized by the Administration to make such inspection.

## CHAPTER VIII

### *Safety of Navigation*

#### **Regulation 1**

##### *Danger Messages*

1 The master of each ship which meets with dangerous derelict, or any other direct danger to navigation, or a tropical storm (signal no. 2 and above) or winds of force 10 or above on the Beaufort scale shall communicate such information by all the means at his disposal to ships in the vicinity and to the competent authorities at the first point on the coast with which he can communicate.

2 All radio messages issued under this Regulation shall be preceded by the safety signal, using the procedure as prescribed by the Radio Regulations.

3 The information to be transmitted shall be as complete as practicable and may be sent in plain language preferably in English.

4 The following information is required in danger messages:

- .1 Derelicts and other direct dangers to navigation:
  - .1 The kind of derelict or danger observed.
  - .2 The position of the derelict or danger when last observed.
  - .3 The time and date when the danger was last observed.
- .2 Tropical cyclones (storms):
  - .1 A statement that a tropical cyclone has been encountered. This obligation should be interpreted in a broad spirit, and information transmitted whenever the master has good reason to believe that a tropical cyclone is developing or exists in the neighborhood.
  - .2 Time, date and position of ship when the observation was taken.
  - .3 As much of the following information as is practicable should be included in the message:
    - .1 barometric pressure, preferably corrected (stating millibars, millimeters, or inches, and whether corrected or uncorrected);
    - .2 barometric tendency (the change in barometric pressure during the past three hours);
    - .3 true wind direction;
    - .4 wind force (Beaufort scale);
    - .5 state of the sea (smooth, moderate, rough, high);
    - .6 swell (slight, moderate, heavy) and the true direction from which it comes. Period or length of swell (short, average, long) would also be of value;
    - .7 true course and speed of ship.

- .3 When a Master has reported a tropical cyclone or other dangerous storm, it is desirable, but not obligatory, that further observations be made and transmitted hourly, if practicable, but in any case at intervals of not more than 3 hours, so long as the ship remains under the influence of the storm.
- .4 Winds of force 10 or above on the Beaufort scale for which no storm warning has been received. This is intended to deal with storms other than the tropical cyclones referred to in paragraph 2; when such a storm is encountered, the message should contain similar information to that listed under the paragraph but excluding the details concerning sea and swell.

## **Regulation 2**

### *Misuse of Distress Signals*

The use of any distress signal, except for the purpose of indicating that a ship, aircraft or person is in distress, and the use of any signal, which may be confused with any international distress signal, is prohibited.

## **Regulation 3**

### *Distress Messages: Obligations and Procedures*

1 The master at sea, on receiving a signal from any source that another ship or aircraft or survival craft thereof is in distress, is bound to proceed with all speed to the assistance of the persons in distress informing them if possible that he is doing so. If he is unable or, in the special circumstances of the case, considers it unreasonable or unnecessary to proceed to their assistance, he must enter in the log-book the reason for failing to proceed to the assistance of the persons in distress.

2 The master shall be released from the obligation imposed by paragraph 1 if he is informed by the persons in distress or by the master of another ship which has reached such persons that assistance is no longer necessary. If the Master of a ship receives such release, this has to be documented by him from the duty to render assistance.

3 A ship which receives any kind of distress message, shall simultaneously report this immediately to the nearest Coast Guard, Ports Authority or Coastal Radio Station under providing all relevant data to introduce immediate life-saving actions.

## **Regulation 4**

### *Safe Navigation and Avoidance of Dangerous Situations*

1 Prior to proceeding to sea, the master shall ensure that the intended voyage has been planned using the appropriate nautical charts and nautical publications for the area concerned.

2 The voyage plan shall identify a route which:

- .1 takes into account any relevant ships routing systems;
- .2 ensures sufficient sea room for the safe passage of the ship throughout the voyage;
- .3 anticipates all known navigational hazards and adverse weather conditions; and takes into account the marine environmental protection

measures that apply, and avoids, as far as possible, actions and activities which could cause damage to the environment.

## **Regulation 5**

### *Navigational Equipment*

The information provided by navigational systems and equipment shall be so displayed that the probability of misreading is reduced to a minimum. Navigational system and equipment shall be capable of giving readings to optimum accuracy.

## **Regulation 6**

### *Marine Magnetic Compass with Light*

- 1 ships shall be fitted with:
  - .1 a standard magnetic compass, except as provided in paragraph .4
  - .2 a steering magnetic compass, unless heading information provided by the standard compass required under paragraph 1 is made available and is clearly readable by the helmsman at the main steering position;
  - .3 adequate means of communication between the standard compass position and the normal navigation control position to the satisfaction of the Administration; and
  - .4 means for taking bearings as nearly as practicable over an arc of the horizon of 360°.
- 2 Each compass referred to in subparagraph 1 shall be properly adjusted and its table or curve of residual deviations shall be available at all times.
- 3 A spare magnetic compass, interchangeable with the standard compass, shall be carried, unless the steering compass mentioned in paragraph 1.2 or a gyro-compass is fitted.
- 4 The Administration, if it considers it unreasonable or unnecessary to require a standard magnetic compass, may exempt individual ships or classes of ships from these requirements if the nature of the voyage, the ship's proximity to land or the type of ship does not warrant a standard compass, provided that a suitable steering compass is in all cases carried.
- 5 All ships shall be fitted with a steering compass and have means for taking bearings.

## **Regulation 7**

### *Navigation Lights/Signal Lights*

- 1 Designs and installations of navigational lights/signal lights shall be in conformity with the color, height and angle of visibility prescribed under COLREG.
- 2 Requirements of Regulation V/19 of SOLAS 74, as amended, relating to the provision of an efficient daylight signaling lamp not solely dependent upon the ship's main source of electrical power are applicable to ships of over 150 GT. The Administration may extend this requirement to all ships to which these Rules and Regulations apply.

## **Regulation 8**

### *Radars*

1 All ships shall, as far as practicable, be fitted with a Radar installation capable of operating in the 9 GHz frequency band. A ship may be exempted from compliance with the requirements of paragraph 5.2 at the discretion of the Administration, provided that the equipment is fully compatible, with the radar transponder for search and rescue.

2 All equipment fitted in compliance with this Regulation shall be of type-approved by the Administration. Equipment installed on board passenger ships conform to appropriate performance standards not inferior to those adopted by the Organization. Equipment fitted prior to the adoption of related performance standards may be exempted from full compliance with those standards at the discretion of the Administration having due regard to the recommended criteria which the Organization might adopt in connection with the standards concerned.

### **Regulation 9**

#### *Speed and Distance Indicator*

All ships shall be fitted with a device to indicate speed and distance.

### **Regulation 10**

#### *Rudder Angle Indicator*

All ships constructed shall be fitted with indicators showing the rudder angle, the rate of revolution of each propeller and in addition, if fitted with variable pitch propellers or lateral thrust propellers, the pitch and operational mode of such propellers. All these indicators shall be readable from the conning position.

### **Regulation 11**

#### *Life-Saving Signals*

Life-saving signals shall be used by ships when communicating with ships or persons in distress or when communicating with life-saving stations, maritime rescue units and airships engaged in search and rescue operations. An illustrated table describing the life-saving signals shall be readily available to the officer of the watch of every ship. Life-saving signals maybe in the form of sounds, lights and/or any device approved in maritime practice.

### **Regulation 12**

#### *Global Positioning Systems (GPS)*

All ships shall be fitted with a global positioning device (GPS).

### **Regulation 13**

#### *Automatic Identification System (AIS)*

All passenger ships of 300 GT and above shall be fitted with a Class "A" Automatic Identification System (AIS).

### **Regulation 14**

#### *Regulations on Deck and Engine Logs*

All ships shall maintain a deck log where the condition of the atmosphere, the prevailing winds, the course sailed, the rigging carried and or the number of boilers in use and steam pressure carried and or the number of engines used and the engine speeds the distance covered, the maneuvers executed and other incidents of navigation. Entries related to any damage to the hull, engines, riggings and tackles, that may occur and the cause, as well as such injuries and damages as may occur to

the cargo, and the amount and value of jettisoned cargo, if any, shall be entered in the deck or engine logbook.

**Regulation 15**

*Nautical Publications*

1 All ships shall carry adequate and up-to-date nautical charts and nautical publications to plan and display the ship's route for the intended voyage and to plot and monitor positions throughout the voyage.

2 An electronic chart display and information system (ECDIS) is also accepted as meeting the chart carriage requirements.

**Regulation 16**

*International Code of Signals*

Ships required to carry radio installations shall carry the International Code of Signals. This publication may also be carried by any other ship, which, in the opinion of the Administration, has a need to use it.

**Regulation 17**

*Routeing*

Ships shall comply with the traffic separation schemes or routeing requirements applicable to the area including avoidance of passage through areas designated as areas to be avoided by Ships or certain classes of ships.

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24 JANUARY 2010

## **CHAPTER IX**

### **HIGH SPEED CRAFT**

#### **Regulation 1**

##### *General*

These Chapter hereby adopts the International Code of Safety for High Speed Craft (HSC Code) adopted by the Maritime Safety Committee of the Organization by resolution MSC .36 (63) and MSC.97 (73) as may be amended by the Organization.

#### **Regulation 2**

##### *Application*

1 This chapter applies to high speed craft constructed on or after 1 January 1996, as follows:

- .1 Passenger craft which do not proceed in the course of their voyage more than 4 h at operational speed from a place of refuge when fully laden; and
- .2 Cargo craft which do not proceed in the course of their voyage more than 8 hours at operational speed from a place of refuge when fully laden.

#### **Regulation 3**

##### *General Provision*

1 Compliance with structural standards of a classification society recognized by the Administration may be accepted as satisfactory proof of the structural adequacy of a craft.

2 The management of the company operating the craft shall exercise strict control over its operation and maintenance through a safety management system.

3 The management shall ensure that only persons duly qualified and certificated to operate the specific type of craft used on the intended route are employed:

4 The distances covered and the worst intended conditions in which operations are permitted will be restricted by the imposition of the following operational limits:

- .1 The craft will at all times be in reasonable proximity to a place of refuge, depending on the following conditions:
  - .1 Passenger craft should do not proceed in the course of its voyage more than four hours at operational speed from a place of refuge when fully laden;
  - .2 Cargo craft should not proceed in the course of its voyage more than eight hours at operational speed from a place of refuge when fully laden;
- .2 Adequate communications facilities, weather forecasts and maintenance facilities are available within area of operation;
- .3 In the intended area of operation, there will be suitable rescue facilities readily available;
- .4 Efficient facilities are provided for the rapid and safe evacuation of all persons into survival craft:

5 The areas of high fire risk, such as machinery spaces and special category spaces, shall be protected with fire resistant materials and fire extinguishing systems to ensure, as far as practicable, containment and rapid extinguishment of fire.

6 All passengers and crew must be provided with fixed seats with belts as necessary.

7 There shall be no enclosed sleeping berths for passenger.

8 Existing crafts engaged in the domestic trade shall comply with this Chapter to a degree determined by the Administration.

#### **Regulation 4**

##### *Equivalent*

1 Where the HSC Code requires that a particular fitting, material, appliance or apparatus, or type thereof should be fitted or carried in a craft, or that any particular provision should be made, the Administration may allow any other fitting, material, appliance or apparatus, or type thereof, to be fitted or carried, or any other provision to be made in the craft, if it is satisfied by trial thereof or otherwise that such fitting, materials, appliance or apparatus, or type thereof, or provision, is at least as effective as that required by the Code.

2 Where compliance with any of the requirements of the HSC Code would be impractical for the particular design of the craft, the Administration may substitute those with alternative requirements provided that equivalent safety is achieved.

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