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**Directive (13/2015)**

**National Requirements for Non-Convention Cargo Ships of more than 12 metres in Length**

Applicable to: Ship owners, Recognized Organizations, Shipping Companies, Flag State Surveyors

1. The Department of Marine Administration circulated this directive in the exercise of the power of Section 294(B), paragraph (b) of Myanmar Merchant Shipping Act.
2. Pursuant to the provision of section 213 (A) of Myanmar Merchant Shipping Act, the Department of Marine Administration provided this national requirements on safety of Myanmar ships engaged on international voyages.
3. The purpose of this directive is the Department of Marine Administration shall employ this prepared safety requirements as to be national directive for safety of Myanmar ships engaged on international voyages.

Maung Maung Oo

Director General

Department of Marine Administration

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## **REAMBLE**

1        The Safety Regulations for cargo ships of more than 12 m in overall length and for which the provisions of the 1974 SOLAS Convention do not apply, hereinafter called the Regulations, are proposed as a generic set of national regulations, recommended by IMO as minimum safety standards for new cargo ships, for the use of those countries which undertake to establish national regulations for this category of ships. Although applying only to new ships, as defined in Chapter 1, Regulation 1, the Administration should as far as practicable and reasonable, apply the same standards to existing ships.

2        The Administration may continue to authorize the operation of an existing ship designed on the basis of lower standards than those set out in the present Regulations. However, such ships should at least satisfy those provisions which, in the opinion of the Administration, are considered necessary to ensure the safety of the ship and its crew during the voyage or voyages that it is expected to make.

3        The present Regulations have been prepared taking into account the applicable provisions of the following International Conventions and their Protocols:

- .1        The International Convention for the Safety of Life at Sea (SOLAS), 1974, as modified by its Protocol of 1988;
- .2        The International Convention on Load Lines (LL), 1966, as modified by its Protocol of 1988;
- .3        The International Convention on Standards of Training, Certification and Watchkeeping (STCW), 1978, as amended;
- .4        The International Convention for the Prevention of Pollution from Ships (MARPOL), 1973/78; and
- .5        International Regulations for Preventing Collisions at Sea (COLREG), 1972.”

4        The present Regulations shall be regularly updated in the light of experience and developments in international maritime safety standards.

## **CHAPTER 1**

### **GENERAL PROVISIONS**

#### **Regulation 1**

##### **Application**

1 The present Regulations apply to new cargo ships, including barges, engaged in maritime navigation, whose length overall is 12 metres or over and for which the provisions of the Conventions listed in the following paragraph do not apply.

2 Where the provisions in force of:

- .1 The International Convention for the Safety of Life at Sea (SOLAS), 1974, as modified by its Protocol of 1988;
  - .2 The International Convention on Load Lines (LL), 1966, as modified by its Protocol of 1988;
  - .3 The International Convention on Standards of Training, Certification and Watchkeeping (STCW), 1978, as amended;
  - .4 The International Convention for the Prevention of Pollution from Ships (MARPOL), 1973/78; and
  - .5 International Regulations for Preventing Collisions at Sea (COLREG), 1972,
- apply to the ships, including barges, subject to the present Regulations, those provisions shall be considered to be part of the present Regulations and shall consequently apply.

#### **Regulation 2**

##### **Definitions**

For the purpose of the present Regulations, the definitions in Regulation 2 of the procedural regulations for ship safety certification and safe manning are applicable. Furthermore, the following definitions apply, unless expressly provided otherwise:

**Accommodation spaces** are those spaces used for public spaces, corridors, lavatories, cabins, offices, pantries containing no cooking appliances and similar spaces. Accommodation spaces also include stairways, chutes and exits serving such spaces.

**Amidships** is at the middle of the distance between the perpendiculars.

**Approved** means approved by the Administration.

**Barge** means a cargo ship without its own means of propulsion.

**Breadth (B)** is the greatest moulded breadth of the ship at or below the deepest draught.

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

**A cargo ship** is any ship which is not a passenger ship.

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

**Closed ro-ro cargo spaces** are ro-ro cargo spaces which are neither open ro-ro cargo spaces nor weather decks.

**Continuous watch** means that the radio watch concerned shall not be interrupted other than for brief intervals when the ship's receiving capacity is impaired or blocked by its own communications or when the facilities are under periodical maintenance or checks. However, with regard to the reception of EGC messages, the reception watch shall be at least 98 per cent as defined in the IMO "International SafetyNet " manual.

**A control station** is a space in which the ship's radio or main navigating equipment, or the emergency source of power is located or where fire recording or control equipment is centralized.

**COSPAS-SARSAT** means the organization established by intergovernmental agreement on 1 July 1988, operating a distress satellite system.

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

**Deck radio beacon** means an emergency position indicating radio beacon (EPIRB) operating on 406 MHz in the COSPAS-SARSAT system or by INMARSAT satellite in the 1.6 GHz band. It can float free. It is provided with a hydrostatic pressure launching system, and transmission may be activated manually or automatically when the radio beacon is released.

**Depth for Freeboard (D)** is the moulded depth amidships, plus the thickness of the freeboard deck stringer plate, where fitted, plus  $T(L-S) : L$  if the exposed freeboard deck is sheathed, where

- T is the mean thickness of the exposed sheathing clear of deck openings, and
- S is the total length of the superstructures.

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

**Direct-printing telegraphy** means automated telegraphy techniques which comply with the relevant Recommendations of the International Radio Consultative Committee (CCIR).

**Draught** is the vertical distance from the moulded base line amidships to the water line in question.

**Emergency source of electrical power** is a source of electrical power, intended to supply the emergency switchboard in the event of failure of the supply from the mains source of electrical power.

A **fishing vessel** is a vessel used for catching, harvesting or farming the living resources of the sea.

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

**Freeboard.** The freeboard assigned is the distance measured vertically downwards amidships from the upper edge of the deck line to the upper edge of the related load line.

**Freeboard deck.** The freeboard deck is normally the uppermost complete deck exposed to weather and sea, which has permanent means of closing all openings in the weather part thereof, and below which all openings in the sides of the ship are fitted with permanent means of watertight closing. In a ship having a discontinuous freeboard deck, the lowest line of the exposed deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck.

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

**Gross tonnage** means the measure of the overall size of a ship determined in accordance with the provisions of the International Convention on Tonnage Measurement of Ships, 1969

**Inflatable appliance** is an appliance which depends on non-rigid, gas-filled chambers for buoyancy and is kept inflated and ready for use at all times.

**International NAVTEX service** means the co-ordinated broadcast and automatic reception on 518 kHz of maritime safety information by means of narrow-band direct-printing telegraphy using English Language. (Reference should be made to the NAVTEX manual approved by the IMO).

**International SafetyNet Service** means the co-ordinated broadcast and automatic reception of maritime safety information by means of the INMARSAT enhanced group calling system (EGC).

**International voyage** means a voyage between ports in two different countries.

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

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

**Low flame spread** means that the surface thus described will adequately restrict the spread of flame, this being determined in accordance with a method based on a suitable test considered satisfactory by the Administration.

**INMARSAT** means the Organization established by the Convention on the International Maritime Satellite Organization (INMARSAT) adopted on 3 September 1976.

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

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

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

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

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

The **main switchboard** is a switchboard which is directly supplied by the main source of electrical power and is intended to distribute electrical energy to the ship's services.

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

**Maritime Safety Information (MSI)** means navigational and meteorological warnings, meteorological forecasts and other urgent safety related messages broadcast to ships.

**Maximum ahead service speed** is the greatest speed which the ship is designed to maintain in service at sea at the deepest seagoing draught.

**Maximum astern speed** is the speed at which it is estimated that the ship can attain at the designed maximum power astern at the deepest seagoing draught.

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

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

The **overall length (L<sub>o</sub>)** means the overall length of the ship's hull.

**Perpendiculars.** The forward and after perpendiculars shall be taken at the forward and after ends of the length (L). The forward perpendicular shall coincide with the foreside of the stem on the waterline on which the length is measured.

A **pleasure craft** means a craft not engaged in trade used for tourism or sport.

*The* **present Regulations** means the Safety Regulations for cargo ships of more than 12 m in overall length and for which the provisions of the 1974 SOLAS Convention do not apply.



**Polar orbiting satellite service** means a service which is based on polar-orbiting COSPAS-SARSAT satellites which received and relay distress alerts from emergency position indicating radio beacon (EPIRB) by satellite and which provides their position.

*The **Procedural Regulations*** are the Procedural regulations for ship safety and safe manning.

*The **present Regulations*** are the present safety regulations for non-SOLAS cargo ships of more than 12 metres in length, taking account of the general provisions set out in the *Procedural Regulations*

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

**Radiocommunications service** means each of the following satellite and terrestrial radio services:

- A radio communication service utilizing geostationary satellites in the INMARSAT mobile satellite service.
- A radio communication service utilizing polar orbiting satellites in the COSPAS- SARSAT mobile satellite service.
- The mobile maritime service on VHF in the bands between 156 MHz to 174 MHz
- The mobile maritime service on HF in the bands between 4,000 kHz and 27,500 kHz , and
- The mobile maritime service on MF in the bands between 1,605 kHz and 4,000 kHz and between 415 kHz and 526,5 kHz.

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

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

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

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

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

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

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

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

A **superstructure** is a decked structure on the freeboard deck, extending from side to side of the ship or with the side plating not being inboard of the shell plating more than 4 per cent of the breadth (B). A raised quarter deck is regarded as a superstructure.

**Survival beacon** means an emergency position indicating radio beacon operating on 406 MHz in the COSPAS-SARSAT system or the INMARSAT satellite system. It is located inside ships or survival craft.

A **tanker** is a cargo ship constructed or adapted for the carriage in bulk of liquid cargoes of an inflammable nature.

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

### **Regulation 3**

#### **Exceptions**

The present Regulations do not apply to:

- .1 existing cargo ships and barges, unless expressly provided otherwise;
- .2 ships belonging to the State and used for non-commercial purposes, ships of war and troopships;
- .3 passenger ships;
- .4 pleasure craft not engaged in trade;
- .5 fishing vessels;
- .6 wooden ships of primitive build; and

- .7 ships, including barges, whose overall length is less than 12 metres.

## **Regulation 4**

### **Carriage of goods**

1 Ships and barges which carry goods listed below shall comply with the provisions of Chapters VI and VII of the SOLAS Convention, Annexes I, II and III of MARPOL and the related Codes.

- .1 bulk grain;
- .2 dangerous goods in packaged form or in bulk;
- .3 liquid chemicals in bulk;
- .4 liquefied gases in bulk; and
- .5 other goods in bulk.

2 In so far as they do not conflict with the provisions of the present Regulations, the requirements for ships of 150 tonnes gross tonnage or over intended to carry liquid hydrocarbons, at ambient temperature and atmospheric pressure, shall apply to the ships covered by the present Regulations and intended to carry the same goods.

3 Exemptions may be allowed by the Administration to the extent that the requirements are neither reasonable nor necessary taking into account the ship and the voyage undertaken. Any Administration which allows any such exemption shall communicate the particulars of same and the reasons therefore to the other Administrations that have agreed to implement these Regulations on a regional basis.

## **CHAPTER 2**

### **SHIP SURVEYS AND SAFETY CERTIFICATES**

## **Regulation 1**

### **Surveys**

1 All ships to which the present Regulations apply shall be subject to surveys, in accordance with Regulations 15 and 16 of the Procedural Regulations.

## **Regulation 2**

### **Issue or endorsement of the Certificate**

1 A certificate called a "Safety Certificate for Cargo Ships not subject to the provisions of the IMO Conventions", hereinafter called the Certificate, shall be issued to a ship that complies with the provisions of the present Regulations after an initial or a renewal survey as specified in

Regulations 15 and 16 of the Procedural Regulations.

2 The Certificate issued under the provisions of paragraph 1 shall be accompanied by a Record of Equipment.

3 A certificate called a "Compliance Certificate for Offshore Support Vessels " shall be issued to ships of that type in accordance with IMO Resolution A.673 (16) on Guidelines for the transport and handling of limited amounts of hazardous and noxious substances in bulk in offshore support vessels

4 When an exemption is granted to a ship under and in accordance with the present Regulations, a certificate called an Exemption Certificate shall be issued in addition to the certificate prescribed in the present Regulations. The Exemption Certificate shall be attached to the Certificate.

5 The Safety Certificate for Cargo Ships not subject to the provisions of the IMO Conventions and the accompanying Record of Equipment, as well as the Exemption Certificate, if any, shall be drawn up in the form corresponding to the models given in the annex to the present Regulations. Additional certificates issued in application of the provisions of the present Regulations and the IMO provisions to which they refer shall be drawn up in the form specified in the relevant IMO Codes and Guidelines. The text shall be drawn up in the official language of XXX and, for ships undertaking voyages outside the area of application of the present Regulations, it shall include a translation into English, Spanish or French.

## **CHAPTER 3**

### **LOAD LINES**

#### **Regulation 1**

##### **General**

#### **1 Definitions**

- .1 In this chapter, Annex I of the International Convention on Load Lines, 1996, as amended, is called the "Convention".
- .2 The load line mark is defined in Regulation 5 of the Convention.

#### **2 General**

- .1 a load line shall be assigned to all ships, including barges, covered by the present Regulations.
- .2 Except as provided otherwise, ships covered by the present Regulations are subject to the provisions of the Convention

### **3 Load line certificate**

- .1 All ships subject to the present Regulations shall have a load line certificate.
- .2 The load line certificate shall be issued in accordance with the regulations under the Convention and the relevant requirements of this chapter.
- .3 At each renewal, a new load line certificate shall be issued after a survey to ensure that the structure, condition of the hull and superstructures, the watertight bulkheads, equipment, arrangements, materials and scantlings remain satisfactory in respect of load lines.
- .4 The load line certificate and copy of the load line survey report shall be available for inspection during annual or renewal surveys.
- .5 The authority responsible for the issue of the load line certificate shall provide the shipowner with a load line survey report showing clearly:
  - .1 all the points that were taken into consideration in assigning the load line;
  - .2 all the conditions accepted for the assignment of the load line.
- .6 For ships to which these Regulations apply, the model load line certificate is given in the Annex.

### **4 Issue of a national load line certificates**

The national load line certificate shall be issued by the Administration or by a recognized organization.

### **5 Load line mark**

- .1 Ships subject to the present Regulations shall show on their hull, amidships on each side, a load line mark clearly showing the upper limit of submersion resulting from the applications of the requirements of the present chapter on scantlings, subdivisions and stability.
- .2 The assigned freeboard is the distance measured vertically downwards amidships from the upper edge of the deck line and the upper edge of the load line mark.
- .3 The load line mark shall be affixed under the control of the authority responsible for the issue of the load line certificate.

## **6 Surveys and inspections**

- .1 The annual survey shall be such as to ensure:
  - .1 that the condition of the ship and the conditions under which it is operated have not been altered in such a way as to affect the calculations determining the position of the load line;
  - .2 that the maintenance in an effective condition of watertight compartments, fittings and appliances for the protection of openings, guardrails, freeing ports and means of access to crew's quarters.
- .2 After completion of the survey, the load line certificate shall either be endorsed by the authority responsible for its renewal or withdrawn where alterations have been made that affect the calculations determining the position of the load line or when fittings and appliances have not been maintained in an effective condition to provide the safety that they gave when the load line certificate was issued.
- .3 During the inspection of the outside of the ship's bottom, the inlets, rudder, propulsion shaft openings and anchor chains shall be subject to particular examination.

## **7 Draught marks and scales**

All ships shall show on the bow and the stern, on each side, engraved or welded for steel ships, carved in the planking to a depth of at least 3 mm for wooden ships, shown in an equivalent manner for structures of materials other than steel and wood, painted in black on a light background, or in white or yellow on a dark background a draught scale, with ten-centimetre intervals, with figures of a height such that their complete submersion means an increase in draught of 10 cm.

### **Regulation 2**

#### **Structure and scantlings**

##### **1 General**

The strength of the structure shall be verified by the Administration or a recognized organization duly authorized by the Administration to issue load line certificates. Such verification shall concern the construction plans, conformity between such plans and shipyard construction and the quality of the welding, where appropriate.

## **2 Structure and scantlings**

- .1 The general structure, scantlings and construction of the main structural elements of the hull (bottoms, sides, decks, bulkheads, fore and aft frames, stem, stern, ....) shall be constructed taking into account:
  - .1 the nature and characteristics of the materials used, their application and method of assembly;
  - .2 the type of ship, its dimensions, its internal arrangements, and the permitted maximum operational draught;
  - .3 the conditions under which it is operated and any particular distribution of weight on board and the category of navigation.
- .2 the maximum permitted draught shall remain compatible with the freeboard.
- .3 the materials used shall be of good quality and used according to appropriate methods of application and assembly, such that the overall structure ensures sufficient strength for the intended service.
- .4 The provisions of paragraphs 2.1, 2.2 and 2.3 shall apply, in particular, to the scantlings of the main structure of the ship, closed superstructures and means of closure of openings therein, and the arrangement and construction of openings in the freeboard decks and superstructures, their means of closing, especially enclosures for machinery spaces, hatch covers, doorways, ventilators, and openings in the side of the ship.
- .5 When certain watertight components of the internal structure, such as bulkheads or decks, form part of the division of the ship, their construction shall comply with the requirements of the present part, also taking into account their resistance to local stress and their role in the ship's overall strength.

## **Regulation 3**

### **Conditions of assignment of load lines**

The conditions of assignment of load lines shall be those of the Convention, modified or supplemented as follows for ships of less than 24 metres in length (L).

#### **1 Doors**

Access doors within closed superstructures, and those protecting, directly or otherwise, access to spaces below the freeboard deck, shall be permanently fixed to the bulkhead. They shall be made of steel or equivalent material, with a weathertight system for securing them, opening outwards and so arranged that they can be operated from both sides of the bulkhead.

Their structure, reinforcement and installation shall be so designed that the whole structure is of equivalent strength to the unpierced bulkhead.

2 The door sills required under the prescriptions of paragraph 1 above shall be at least 600 mm above the freeboard deck. This height may be limited to 380 mm when the doors are in a space protected from the full force of the sea, subject to approval by the appropriate authority.

The height of the above-mentioned sills, for ships sailing less than 12 miles from shelter, shall be at least 380 mm above the freeboard deck.

### **3 Covers**

.1 Hatchway covers made of wood are not permitted.

.2 Covers used to close hatchways on the freeboard deck and superstructure decks shall have a strength, rigidity and weathertightness considered satisfactory by the appropriate authority.

These criteria shall be deemed to be satisfied when the covers are constructed in compliance with the regulations of a recognized classification society.

### **4 Coamings**

The coamings of hatchways shall be of substantial construction, and their height above the deck shall be at least 450 mm.

This height shall be reduced to at least 300 mm for coamings of hatchways in decks which form the ceiling of superstructures.

Nevertheless, the heights of coamings may be reduced or eliminated altogether if the Administration is satisfied that the safety of the ship is not thereby compromised in all sea conditions.

### **5 Ventilators and air pipes**

.1 Ventilators serving spaces below the freeboard deck or decks of enclosed superstructures shall have coamings of steel or other equivalent material, substantially constructed and efficiently secured to the deck.

.2 Parts of pipes passing through ballast and other tanks, casings or spaces extending above the freeboard or superstructure decks shall be of substantial construction. Means shall be provided for closing such pipes.

.3 Ventilator coamings shall be provided with efficient, weathertight closing



appliances, permanently attached thereto.

- .4 The height of the aforementioned coamings of ventilators and air pipes shall be at least:
- 760 mm above the freeboard deck;
  - 450 mm above enclosed superstructure decks.
- .5 In exposed positions, the Administration may require the height of coamings of ventilators to be increased.

## **6 Skylights**

Skylights shall be of substantial construction. They may comprise openings which may be closed by weathertight covers, permanently attached, when the lowest part of such openings is at least 450 mm above the deck. Alternatively, skylights may be in the form of opening side scuttles with deadlights.

## **7 Freeing ports**

- .1 For ships of less than 24 metres in length (L), the minimum freeing port area on each side of the freeboard deck shall be given by the formula:

$$A = 0.75 (0.7 + 0.035l) \text{ square metres}$$

Where l is the length of the bulwark in the well or the length of the superstructure.

- .2 The Administration may consider it necessary to increase the freeing port area for any ship where the sheer is insufficient.
- .3 the lower edges of the freeing ports shall be at deck level or as near the deck as possible.

Freeing ports over 300 mm in height shall be fitted with bars spaced not more than 230 mm apart or other appropriate protective appliances.

- .4 If freeing ports are fitted with hinged shutters, ample clearance shall be provided to prevent jamming. Hinge pins or bearings shall be of non-corrodible material and such shutters shall not have locking appliances.

## **Regulation 4**

### **Computation of freeboard**

1 The freeboard of decked ships shall be calculated using the Convention method, the freeboard tables of which shall be supplement by the assignment of a freeboard of 200 mm for ships of less than 24 metres in length (L).

2 It shall not be required that the bow shall be situated at a minimum height above the waterline corresponding to the freeboard assigned to ships of less than 24 metres in length (L).

3 Regulation 29 of the Convention which corrects the freeboard shall apply to ships of less than 24 metres in length (L).

4 Where the shipowner is unable to provide the Administration or the recognized organization with the information required to determine the summer freeboard, the latter shall be calculated as one tenth of the maximum breadth of the ship

## **Regulation 5**

### **Watertightness**

#### **1 General**

The watertightness of the structure and bulkheads shall be verified in connection with the issue of the load line certificate for ships subject to the present Regulations.

#### **2 Openings in the shell plating**

- .1 The arrangements and efficiency of the means of closing any opening in the ship's shell shall be consistent with its intended purpose and the position in which it is fitted.

The number of scuppers, sanitary discharges and other similar openings in the sides of ships shall be kept to the minimum, either by using each discharge opening for the maximum possible number of sewage and other pipes, or by any other means approved by the Administration or recognized organization.

- .2 Gangway doors, loading doors and fuel inlet doors whose lowest point would be below the load waterline are prohibited.
- .3 Side scuttles to spaces below the freeboard deck or to spaces within enclosed superstructures as defined in the Convention shall be fitted with efficient hinged internal deadlights, permanently attached, arranged so that they can be effectively closed and secured watertight.

Side scuttles and their closures which are not accessible while under way shall be closed and sealed before sailing. Side scuttles fitted below the freeboard shall be fixed and their lower edge shall be at least 500 mm above the load freeboard.

No side scuttle may be fitted in spaces used exclusively for the carriage of cargo.

- .4 All sea inlets, outlets, sanitary discharges shall be installed so that they cannot cause the accidental admission of water into the ship.

Each machinery inlet shall be fitted with a cut-off appliance and a detachable filter, fitted to the side in order, as far as possible, to prevent the entry of any foreign body which might interfere with the operation of the cut-off device. A detachable filter shall be fitted in front of the cut-off device.

Machinery space discharge outlets shall be fitted with a door or an automatic non-return valve which can be closed manually. These appliances shall be attached directly to the side or to water inlet or outlet casings or boxes.

All the controls shall be provided with an indicator showing whether the valve is open or closed. The controls and sea inlets and discharges shall be readily accessible.

On decked ships, cut-off appliances for sea inlets and discharges below the load freeboard in machinery spaces shall be controlled from a point above the freeboard deck except when the ship's wheelhouse has a device showing the presence of water in those spaces. In that case, the cut-off appliances shall be readily accessible above the deck boards.

- .5 Each separate sanitary discharge which passes through the side, either leading from spaces below the freeboard deck, or spaces in superstructures or deckhouses on the freeboard deck and closed by watertight steel doors, shall be provided with efficient and accessible means for preventing water passing inboard. Such means shall comply with the requirements of the Convention on board ships to which that conventions applies.

For ships of less than 24 metres in length (L), each sanitary discharge shall be fitted with an automatic non-return valve which can be operated directly from an accessible place. Nevertheless, such a valve may not be required if the Administration or recognized organization which examines the ship considers that the inboard passage of water through the discharge opening in the side of the ship is unlikely to result in dangerous flooding or if a flooding alarm is fitted.

- .6 The scuppers in superstructures which are not enclosed superstructures shall be

led overboard. Scuppers originating at any level and leading to the shell either more than 450 mm below the freeboard deck or less than 600 mm above the load waterline shall be provided with a non-return valve at the shell. This valve may be omitted if the appropriate authority considers that the thickness of the piping so justifies. This paragraph shall not apply to ships without decks.

Scuppers penetrating the shell which lead from enclosed superstructures used for the transport of cargoes are only permitted when the edge of the freeboard deck is not submersed at an angle of heel of 5° from one side to the other. In other cases, the closed cargo spaces on the freeboard deck shall be drained internally to one or more appropriate spaces with sufficient capacity, with an alarm that sounds when the water reaches a high level and provided with appropriate appliances for discharge into the sea.

- .7 All valves and shell fittings required in compliance with the foregoing shall be of steel, bronze or other equivalent shock-resistant material.

All pipes used for the purposes specified in paragraph 2 shall be of steel or any other appropriate material and shall not comprise more than two short flexible joints. Such flexible joints may only be fitted below the load waterline in spaces provided with a flooding alarm.

- .8 Parts of sea inlet, outlet or discharge pipes penetrating the shell below the freeboard deck shall include an elbow section or equivalent device of substantial construction but sufficiently flexible to withstand docking or grounding. Such elbow section should be placed between the fixing of the pipe to the shell or the sea inlet or outlet port and the first fixing point, deck or bulkhead, appliance or collector to which the pipe is to be connected. These pipe sections, and any divisions in them, shall be suitably protected against shocks.

### **3 Tests of watertightness of ships**

- .1 Decks, watertight bulkhead, trunks, tunnels and watertight doors shall be checked for watertightness by means of a hose test at a pressure of at least 0.2 N/mm<sup>2</sup>.
- .2 The fore and after peaks and double bottom compartments shall be subject to a test in which they are filled to a water level corresponding to the load line mark

or the height indicated below if greater.

When such compartments are intended to contain liquids, they shall be tested at a water pressure up to the highest level that the liquid may reach in operation in the overflow pipe with at least 900 mm below the ceiling. However, in the case of an inflammable liquid, such minimum height of the head of water shall be increased to 2.40 metres for combustible liquids with a flashpoint equal to or greater than 60°C and 3.60 metres for combustible liquids with a flashpoint less than 60°C but equal to or greater than 43°C.

- .3 The test in paragraph 3.2 is not compulsory for the other main compartments.
- .4 All compartments intended to be filled by communication with the sea shall be subject to a flooding test to a depth of water limited to the maximum load waterline.

## **Regulation 6**

### **Means of escape and arrangements outside the ship**

1 Stairways and ladders shall be provided from all crew accommodation and other spaces other than machinery spaces and shafts where the crew is normally employed to allow rapid means of escape from each such space to the open deck.

The normal means provided for access from the open deck to a space or compartment shall be considered as means of escape.

The continuity and dimensions of stairways and ladders allowing escape to the open deck shall be to the satisfaction of the Administration or recognized organization.

2 The compartment containing the propulsion machinery shall be provided with a main means of escape and an emergency exit.

These two means of escape shall be placed as far apart as possible, to the satisfaction of the Administration or a recognized organization.

However, if the length of the compartment is less than 6 metres, an emergency exit shall not be required.

3 Stairways and ladders from the propulsion machinery compartment shall be of steel or equivalent material.

4 The ship shall be equipped with bulkheads, guard-rails, lifelines, gangways, ladders,

etc., arranged so as to facilitate the working of the ship while ensuring the safety of its personnel and complying with the applicable regulations under the Convention and regulation 3 of the present chapter.

## **Regulation 7**

### **Sounding and ventilation pipes**

1 Arrangements shall be made to allow soundings of spaces intended to hold liquids, and any spaces not easily accessible at all times

2 As a general rule, sounding pipes shall lead above the freeboard deck to easily accessible places and shall have efficient means of closure. Sounding pipes which do not lead above the freeboard deck shall be provided with automatic closing appliances.

In any case, in machinery spaces and tunnels, when it is not possible to implement this requirement, the sounding pipes may lead above the decking into easily accessible places. When such sounding pipes serve tanks containing fuel or lubricating oil, they shall not lead near boilers, generators, electric motors or switchboards and shall be provided with automatic closing appliances. In addition, an automatic closing narrow gauge control tap shall be provided below the pipe closing appliance for double-bottomed fuel tanks.

3 For spaces intended to contain liquids, the sounding pipes may be replaced by a system of indicator gauges allowing the level to be measured at all times.

4 For double-bottomed spaces, ventilators shall also be provided to act as overflows leading above the freeboard deck, provided that they do not derogate from the regulations under the Convention.

The division, number and position of air pipes shall be arranged so as to avoid, as far as possible, air locks and superpressure during filling operations. Release of air shall, moreover, be arranged to avoid any accidental admission of water to the fuel

The same shall apply to compartments situated outside the double bottom, if they can be filled by a pumping system.

5 Sounding pipes, whose circuit shall be as direct as possible, shall be suitably protected throughout their length against damage and accidental shocks. Those passing through refrigerated spaces shall also be appropriately lagged. Precautions shall be taken to ensure that repeated soundings do not give rise to excessive local deterioration of the shell plating.

## **CHAPTER 4**

### **STRUCTURE, SUBDIVISION AND EQUIPMENT**

#### **Regulation 1**

##### **General**

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

2 For all ships, new installation of materials which contain asbestos shall be prohibited except for:

- .1 vanes used in rotary vane compressors and rotary vane vacuum pumps;
- .2 watertight joints and linings used for the circulation of fluids when, at high temperature (in excess of 350° C) or pressure (in excess of  $7 \times 10^6$  Pa), there is a risk of fire, corrosion or toxicity; and
- .3 supple and flexible thermal insulation assemblies used for temperatures above 1,000° C.

#### **Regulation 2**

##### **Structure**

1 The strength and method of construction of the shell, superstructures, deckhouses, machinery trunks, doors and other structures as well as the equipment shall allow the ship to withstand any of the conditions foreseeable in the service for which it is intended and shall be considered satisfactory by the Administration. A ship constructed and maintained in conformity with the standards recognized by the Administration may be considered to comply with the requirements of the present Regulation.

2 Power-driven ships shall have a collision bulkhead which complies with the requirements of Regulation 3 and the machinery space shall be surrounded by watertight bulkheads. Such bulkheads shall extend to the freeboard deck. Wooden ships shall also be provided with such bulkheads, which shall, as far as possible, be watertight.

3 Propulsion shafts, bearings and stern tubes shall not be placed elsewhere than the machinery spaces containing the means of propulsion, unless they are enclosed in watertight positions or spaces to the satisfaction of the Administration. The Administration may exempt from the requirements of the present paragraph ships which are subject to space constraints or whose voyages are in sheltered waters, provided that it is shown that initial flooding of the spaces concerned can easily be controlled and that the ship's safety is not endangered.

4 The packing boxes shall be positioned in places which are easily accessible at any time for checks and maintenance.

### **Regulation 3**

#### **Collision bulkheads**

1 For the purposes of this Regulation, the expressions freeboard deck, length of ship and perpendiculars (forward and after) have the meanings as defined in Regulation 2 of Chapter 1.

2 Cargo ships shall be fitted with a collision bulkhead which shall be watertight up to the freeboard deck. This bulkhead shall be located, as far as possible, at a distance from the forward perpendicular of not less than 5% of the length (L) of the ship but not more than 8% of the length (L) of the ship. If it is shown to the satisfaction of the Administration that it is not possible to locate the collision bulkhead at a distance from the forward perpendicular at 8% of the length (L) of the ship, the Administration may authorize a greater distance, provided that, if the volume forward of the bulkhead is penetrated when the ship is fully loaded the waterline does not exceed a line drawn on the shell 76 mm below the upper edge of the watertight deck.

3 The collision bulkhead may have steps or recesses provided they are within the limits prescribed in paragraph 2. The number of pipes piercing the collision bulkhead shall be as small as possible. Such pipes shall be fitted with suitable valves operable from above the freeboard deck and the valve chest shall be secured at the bulkhead inside the forepeak. The Administration may authorize the fitting of such valves on the rear of the collision bulkhead provided that the valves are readily accessible at any time under all service conditions and the space in which they are located is not cargo space. All valves shall be of a material approved by the Administration.

4 Where a long forward superstructure is fitted the collision bulkhead shall be extended weathertight to the deck next above the freeboard deck. The extension, subject to the



provisions of paragraph 3, shall be located within the limits specified in paragraph 2.

5 Where bow doors are fitted and a sloping loading ramp forms part of the extension of the collision bulkhead above the freeboard deck, the part of the ramp which is more than 2.3 m, or any other length specified by the Administration, above the freeboard deck may not extend more than 1 m forward of the limit specified in paragraph 2. The ramp shall be weathertight over its complete length.

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

7 No manhole, door, hatchway, ventilation duct or any other opening shall be authorized in the collision bulkhead below the freeboard deck. When a chain locker is located aft of the collision bulkhead or extends into the forepeak, it shall be watertight and provided with efficient means of pumping dry.

8 The chain locker shall not be used for any purpose other than storing anchor chains.

#### **Regulation 4**

##### **Watertight bulkheads, decks, doors, cofferdams, etc...**

1 The present Regulation shall apply to new power-driven ships. They shall not apply to wooden-hulled ships.

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

3 Steps and recesses in bulkheads shall be watertight and as strong 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.

5 The number of openings in watertight bulkheads shall be reduced to the minimum compatible with the design and proper working of the ship. Means shall be provided for closing these openings to the satisfaction of the Administration. Watertight doors shall be as

strong as the adjacent unpierced bulkhead.

6 Watertight decks, trunks, tunnels, duct keels and ventilation trunks shall be of a type equivalent to the watertight bulkheads located at the same level. The method of construction used to ensure that such elements are watertight, and the arrangements adopted to allow closing of the openings, shall be to the satisfaction of the Administration. Watertight ventilation ducts and trunks shall extend at least to the level of the freeboard deck.

7 The flooding test of main compartments is not compulsory. When a flooding test is not carried out, a hose test is compulsory. Such test shall be carried out as late as possible in the fitting out of the ship. A detailed inspection of the watertight bulkhead shall, in any case, be carried out.

8 The forepeak, double bottom (including duct keels) and double hulls shall be tested to a pressure corresponding to the requirements of paragraph 2.

9 Tanks intended to contain liquids and which form part of the subdivision of the ship, shall be tested to verify that they are watertight under a load of water corresponding to 2/3 of the space measured from the top of the keel to the margin line, through the tank. In any case, the height of load above the top of the tank shall in no case be less than 0.9 m.

10 The tests referred to in paragraphs 8 and 9 are intended to verify that the bulkheads are structurally watertight and shall not be regarded in any way as approving the suitability of any compartment to accept combustible liquids or to be used for other specific purposes for which a more rigorous test may be required, bearing in mind the height that the liquid may reach in the tank concerned or in the pipes that serve it.

## **Regulation 5**

### **Mooring gear**

1 Every ship shall be fitted with two mooring cables, unless otherwise authorized by the Administration, depending on the intended voyage.

2 On ships of 35 m or more in length (L), the two mooring cables shall be installed in position with their anchors ready to drop, with an appropriate means of weighing and braking.

3 On ships of less than 35 m in length (L), one of the mooring cables shall have an anchor in position, ready to drop, and an appropriate means of braking. This cable shall be a chain for ships of 24 m or more in length (L). On ships of less than 24 m in length (L), it may consist of a chain of at least 20 m and a hawser of at least 100 m. The second mooring cable

shall consist of a chain of at least 20 m and a hawser.

4 The weight of anchors, diameter and strength of chains and hawsers and controls on such appliances, depending on the type and size of the ship concerned, shall be to the satisfaction of the Administration.

5 Windlasses, capstans, winches, bollards, mooring posts and other means necessary for anchoring, mooring, towing or lifting the ship shall be:

- .1 designed to meet operating requirements and conditions that it may encounter,
- .2 properly fitted, and
- .3 fixed to a part of its structure with adequate strength.

## **Regulation 6**

### **Special provisions applicable to towing and pushing**

1 The towing hook intended for towing vessels shall consist of an efficient appliance to allow at any time, if the towline is taut, to release it immediately, locally and from the wheelhouse, regardless of the heel.

2 The towing hook on ships intended to turn ships in manoeuvres at sea or in port shall be of an approved type and shall fulfil the following three conditions:

- .1 they shall be mounted in an efficient manner on a rotating guide system so as to considerably reduce the propensity to capsize when the tug is towing at an angle and such that the traction force, in a longitudinal direction, is at all times at the smallest possible distance above the tug's centre of gravity.
- .2 Easy release of the hook, without excessive force, when the tug heels more than 30° from the horizontal.
- .3 Remote control of the release system from the bridge and also, if possible, from the deckhouse, in order to avoid exposing crew to serious risk.

3 All tugs shall have a second towing hook, ready for use if the first is damaged, or an equivalent appliance similar to the hook capable of fixing the tow.

4 Pushing vessels shall be equipped with an efficient remote system for releasing the system of mooring to the ship being pushed allowing them, in the event of danger, to free themselves immediately

5 Tugs and pushing vessels shall be provided on each side with an axe of sufficient size to be able to cut the tow and moorings in an emergency.

## **Regulation 7**

### **Towing and mooring gear on barges**

1 Towing and mooring gear on barges shall be such as to reduce as much as possible any danger to personnel during towing or mooring operations. Such gear shall be appropriate to each barge and have sufficient strength. Its design and fitting shall be to the satisfaction of the Administration and shall take account of emergency situations that may arise.

2 Spare parts allowing, if necessary, a complete replacement of the towing and mooring gear shall be available aboard the tug or barge.

3 Emergency towing gear shall also be provided aboard the barge so that it can rapidly be recovered by the tug if the towline breaks or the associated equipment breaks down.

4 In addition to the present Regulations, tugs and barges shall comply with the applicable provisions recommended by the IMO for the safety of ships and other towed floating vessels.

## **Regulation 8**

### **Protective gear and equipment**

1 Hinged covers on hatchways, manholes and other openings shall be provided with appliances to prevent their accidental closure. In particular, heavy covers placed over hatchways which are escape exits shall be fitted with a counterweight and so constructed that they can be opened from both sides of the panel.

2 The dimensions of hatchways shall be such that a person can escape rapidly and easily to a safe place in an emergency. Where possible, the dimension of hatchways in cargo spaces and machinery spaces shall be such as to facilitate escape operations.

3 The bulwarks, hand rails and lifelines shall be of sufficient size and strength, to the satisfaction of the Administration, to provide protection of persons when the ship is rolling and pitching violently.

4 Skylights and other similar openings shall be provided with protective bars not more than 350 mm apart. The Administration may exempt small openings from this requirement.

## CHAPTER 5

### STABILITY AND BILGE PUMPING ARRANGEMENTS

#### Regulation 1

##### Intact stability for cargo ships other than offshore support vessels

1 The intact stability booklet shall be endorsed by the Administration or by the recognized organization which issues the load line.

2 The following minimum stability criteria shall be met unless the Administration is satisfied that operating experience justifies departure there from:

- .1 the area under the righting lever curve (GZ curve) shall not be less than 0.055 m-rad up to 30° angle of heel and not less than 0.09 m-rad up to 40° or the angle of flooding  $\phi_f$  if this angle is less than 40°. Additionally, the area under the righting lever curve (GZ curve) between the angles of heel of 30° and 40° or between 30° and  $\phi_f$ , if this angle is less than 40°, shall not be less than 0.03 m-rad.  $\phi_f$  is the angle of heel at which openings in the hull, superstructures or deckhouses which cannot rapidly be closed watertight commence to immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open;
- .2 the righting lever GZ shall be at least 200 mm at an angle of heel equal to or greater than 30°. The righting lever GZ may be reduced to the satisfaction of the Administration but in no case by more than 2(24 - L<sub>0</sub>)%, where L<sub>0</sub>, in metres, is the overall length;
- .3 the maximum righting lever GZ max shall occur at an angle of heel preferably exceeding 30° but not less than 25°; and
- .4 the initial metacentric height GM<sub>0</sub> shall not be less than 350 mm.

3 Where ballast is provided to ensure compliance with paragraph 1, its nature and arrangement shall not impaired the safety of the vessel. Ballast shall be secured in the vessel in such a way that it will not move even if the vessel is inclined to 90°.

4 When, in the opinion of the Administration, the characteristics of the ship are such that they do not permit, for practical reasons, the application of the provisions of paragraph 2, the stability criteria specified in paragraph 2.5.2 of IMO Resolution A.469(12) on Guidelines for the design and construction of offshore supply vessels may be applied.

5 The intact stability of barges only carrying cargo on deck, without openings or holds opening on to the deck except for small manholes closed by covers, without machinery, accommodation or services, shall comply with the provisions of paragraph 4.7 of the Code referred to in paragraph 2 above. Intact stability criteria for barges carrying cargoes below deck or having machinery, accommodation or services shall be determined by the Administration or a recognized organization taking into account the design and arrangement of cargo spaces, machinery, equipment, accommodation and superstructures.

## **Regulation 2**

### **Stability test and stability booklet**

1 A plan showing draughts or position of load lines shall be notified to the Administration, then filed in the ship's booklet.

2 The calculations shall be endorsed by the Administration or the recognized organization that issues the load line certificate for ships, giving the position of the base line, hydrostatic details and intact stability. These documents shall be included in the ship's booklet.

3 Following their completion, and as far as possible, the finished ship, life-saving appliances in position, ships shall undergo a stability test to determine the actual displacement of the lightweight ship and the coordinates of its centre of gravity.

4 The stability test shall be carried out and its results shall be evaluated by a qualified person, specifically designated by the shipyard or the shipowner

It shall be carried out in the presence of a representative of the Administration or the recognized organization authorized to assign the load line, who shall verify that the stability test is carried out properly.

5 The stability test shall be carried out taking all normal precautions so as to obtain the most accurate results possible. Such precautions shall relate in particular to the weather conditions at the time of the test, the ship's position, its mooring, the location and distribution of weights to be removed or added, the installation of life-saving appliances.

In particular, the presence of liquid ballast should be avoided, or, if that is not possible, the results shall be corrected accordingly.

Movable weights shall be weighed carefully.

Fuel or water tanks shall be isolated to prevent the movement of liquid from one side to the

other during inclining.

Particular care shall be given to the placing of the measuring apparatus. In the case of a pendulum, the length shall be not less than 3 m and shall not as far as possible be installed inside the ship. Excessively rigid suspension wires shall not be used.

Measures, weight displacement, reading of the measuring apparatus or extension of the pendulum, length of pendulum, position on board of weights to be removed or added, etc. are taken together with the representative of the Administration or the recognized organization. The same shall apply to measurements of the submersion of the ship for weighing.

6 Four inclining tests should be carried out, inclining the ship to an angle of at least 2 degrees and not more than 3 degrees. The ship shall not be inclined by transferring liquids. However, the Administration may accept a stability test where the ship is only inclined twice when weather conditions and the measurements specified in paragraph 5 above do not give rise to any observations.

7 The test as such allows the ship's displacement and centre of gravity to be determined in its state at the time of the test.

The displacement, lightship centre of gravity and the range shall be determined from the results obtained from the test by correcting for foreign weights to be removed and missing weights to be added. The value and position of such weights shall be calculated as precisely as possible at the time of the test.

8 The expert shall evaluate the results of the stability test and prepare a report of the test giving the results and the related calculations. This report shall be sent to the Administration.

9 The results obtained shall conform to an acceptable degree to the information, displacement and position of the centre of gravity, as evaluated in the provisional stability booklet such that it may be considered as the final booklet. Failing this, in particular when the GM observed from the test is lower than the provisional GM by 10% or when the increase in displacement is greater than 10%, the stability booklet shall be revised based on the details, displacement and centre of gravity observed from the test.

The Administration shall approve, if appropriate, the provisional booklet or the new booklet calculated after the test. This document shall become the ship's final stability booklet. It shall be kept on board, readily accessible at all times and inspected at the periodical surveys of the ship.

10 If a ship undergoes alterations which have the effect of altering aspects of its stability such that the new GM is reduced by 10% or the new displacement has increased by 10%, a new stability test shall be required and, if appropriate, a new booklet shall be submitted to the Administration.

### **Regulation 3**

#### **Bilge pumping arrangements**

##### **1 General**

- .1 All ships shall be provided with appliances or means of draining water from all compartments and bilges.
- .2 Arrangements shall be made such that the water in the compartment concerned can flow freely to the suction outlet or outlets.

##### **2 Bilge pumps**

- .1 Ships shall be fitted with at least two bilge pumps, each powered by a different mechanical power source, one of which may be driven by the propulsion machinery.

All necessary steps shall be taken to ensure that the water from at least one of the bilge pumps can be used normally if the compartment is flooded in any way.

- .2 Pumps shall be connected to a bilge tank.
- .3 When the bilge pumps do not pump from the peak, chain locker or other small compartments, pumping shall be by hand pumps, operated from a point located above the freeboard deck.
- .4 Each bilge pump shall be placed aft of the collision bulkhead and placed so as to pump water from any compartment except as specified in paragraph 2.3. Special appliances shall be installed, where necessary, to start the pumps.
- .5 Each bilge pump shall be driven by an engine capable of pumping water to the installed bilge main at a speed of at least 2 m/s.

However, in ships of less than 35 m in length (L), this speed may be reduced to 1.2 m/s.

- .6 Sanitary, general service pumps and fire pumps may be accepted as bilge pumps if connected to the bilge pumping system and if their outflow complies



with paragraph 2.6.

### **3 Bilge pipes**

- .1 The arrangement of the bilge and ballast pumping system shall be such as to prevent the possibility of water passing from the sea into the various ship's compartments or from one compartment to another.
- .2 In machinery spaces, bilge pipes and accessories shall be of steel, copper or any other material the characteristics of which are accepted as equivalent for the intended application. Flexible couplings may only be used subject to the conditions specified in Regulation 5 of Chapter 3.
- .3 The various parts of the pumping system shall be suitably fixed to the structure of the ship and efficiently protected against accidental shocks where they pass through exposed areas while remaining sufficiently accessible for maintenance purposes. Expansion bellows or other appliances shall be provided, if appropriate, taking account of the dimensions of the ship and the system of pipes concerned.
- .4 The pipes servicing pumping systems in machinery spaces or cargo holds shall be completely separate up to the pump suction inlets of the pipes normally used for filling or emptying compartments intended to hold water or liquid fuel.
- .5 The diameter of the bilge main shall be that of the nearest normally used pipe closest to the diameter calculated by the following formula:

#### **Formula**

where  $d$  is the internal diameter of the bilge main in millimetres and  $L$ ,  $B$ ,  $C$ , expressed in metres, are the length, breadth and moulded depth respectively of the ship.

### **4 Direct suction by pumps**

- .1 In the machinery compartment, at least one suction duct shall be directly connected to a bilge pump.
- .2 The diameter of this duct shall be at least equal to that of the bilge main.
- .3 Such direct suction may be via a fixed pipe or flexible hose. When the suction is through a fixed pipe, it shall be placed as low as possible. It shall be

accessible for cleaning and fitted with a non-return valve.

## **5 Bilge circuit accessories**

- .1 Suction ducts shall, as far as possible, be placed at the lowest points in the corresponding compartments. They shall be fitted with grills of substantial construction, placed so as to be readily visible and cleaned, without it being necessary to first dismantle the connections in the suction ducting.
- .2 The diameter of the grill holes shall not exceed 10 mm and the total net diameter shall not be less than twice that of the corresponding suction duct

## **6 Plan of the bilge-pump and water drainage system**

- .1 On board each ship, a detailed plan of the bilge pump system shall be clearly exhibited in a place where qualified personnel can consult it easily. The graphic symbols used shall conform to standards in force unless the meaning of the symbols used is clearly indicated.
- .2 Scuppers or appropriate arrangements shall be provided in areas of the ship where water is likely to accumulate dangerously during fire-fighting operations.

# **CHAPTER 6**

## **MACHINERY INSTALLATIONS**

(not applicable to unmanned barges)

### **Regulation 1**

#### **General**

- 1 All boilers, all parts of machinery, all steam, hydraulic, pneumatic and other systems and their associated fittings which are under pressure shall be subjected to appropriate tests including a pressure test before being put into service for the first time. Such tests shall be conducted under the control of 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 Provision shall be made to facilitate cleaning, inspection and maintenance of main propulsion and auxiliary machinery including boilers and pressure vessels.
- 4 Where risk from overspeeding 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 subject to internal pressure and may be subject to dangerous overpressure, means shall be provided where practicable 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 will withstand the maximum working stresses to which they may be subjected in all service conditions. Due consideration shall be given to the type of engines by which they are driven or of which they form part.

7 Main 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 rapidly lead 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 a crankcase volume of at least 0.6 m<sup>3</sup> shall be provided with crankcase explosion relief valves of a suitable type with a sufficient relief area. The relief valves shall be arranged or provided with means to ensure that the 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 operation of propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative. Special consideration shall be given to the malfunctioning of:

- .1 a generating set which serves as a main source of electrical power
- .2 the sources of lubricating oil pressure
- .3 the fuel supply systems for engines
- .4 the sources of water pressure
- .5 an air compressor and receiver for starting purposes
- .6 the hydraulic, pneumatic or electrical means for control in main propulsion

- machinery including controllable pitch propellers, and
- .7      boilers and feed systems, if any.

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

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

### **Regulation 3**

#### **Remote control of propulsion machinery**

1            Where remote control of propulsion machinery from the navigation 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 navigation bridge under all sailing conditions, including manoeuvring.
- .2          The remote control shall be performed, for each independent propeller, by a control device so designed and constructed that its operation does not require particular attention to the operational details of the machinery. Where multiple propellers are designed to operate simultaneously, they may be controlled by one control device.
- .3          The main propulsion machinery shall be provided with an emergency stopping device on the navigation bridge which shall be independent of the navigation bridge control system.
- .4          Propulsion machinery orders from the navigation bridge shall be indicated in the main machinery control room or at the manoeuvring platform as appropriate.
- .5          Remote control of the propulsion machinery shall be possible only from one location at a time. At such locations interconnected control positions are permitted. At each location there shall be an indicator showing which location is in control of the propulsion machinery. The transfer of control between the navigation 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 navigation 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 on the navigation bridge and in the machinery space to indicate low starting air pressure which shall be set at a level to permit further main engine starting operations. If the remote control system of the propulsion machinery is designed for automatic starting, the number of automatic consecutive attempts which fail to produce a start shall be limited in order to safeguard sufficient starting air pressure or low voltage for starting locally.

2 Where the main propulsion and associated machinery, including sources of main electrical supply, are provided with various degrees of automatic or remote control and are under continuous 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 the protection of such spaces against fire and flooding.

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

#### **Regulation 4**

##### **Periodically unattended machinery spaces**

1 Ships in which machinery spaces are operated while periodically unattended shall, in

so far as the Administration considers it reasonably practicable, comply with the applicable provisions of the SOLAS Convention for such spaces.

2 When different solutions are adopted, the Administration shall ensure that:

- .1 the safety of ships in all sailing conditions, including manoeuvring, is equivalent to that of a ship having the machinery spaces manned,
- .2 appropriate documents indicating that the solution satisfies these safety requirements shall be provided.

## **Regulation 5**

### **Air pressure systems**

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

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

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

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

## **Regulation 6**

### **Ventilating systems in machinery spaces**

1 Machinery spaces of category A shall be adequately ventilated so as to ensure that when the 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, the ventilation of machinery spaces shall be adequate, under normal conditions, to prevent the accumulation of hydrocarbon vapour.

## **Regulation 7**

### **Protection against noise**

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

## **Regulation 8**

### **Going astern**

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

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

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

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

## **Regulation 9**

### **Steering gear**

1 Ships shall be provided with a main steering gear and an auxiliary steering gear considered satisfactory by the Administration. The main steering gear and the auxiliary steering gear shall be so arranged, in so far as is reasonably practicable, that the failure of one of them will not render the other one inoperative

2 Where the main steering gear comprises two or more identical power units, an auxiliary steering gear need not be fitted, provided that the main steering gear is capable of operating the rudder as required by paragraph 10 when one of the power units is inoperative. Each power unit shall be controlled by a separate system.

3 If the rudder is power-operated, its position shall be indicated in the wheelhouse. The rudder angle indication shall be independent of the steering control system. A rudder angle indicator shall be visible in the tiller compartment.

4 In the case of failure of the power supply to any of the power units, an alarm shall be given to the wheelhouse.

5 Means for indicating that the motors of all electric and electro-hydraulic steering gear shall be installed in the wheelhouse. Short circuit protection and an overload alarm shall be provided for such circuits and motors, as well as a power failure alarm. Protection against excess current, if provided, shall be for not less than twice the full load current of the motor circuit to be protected, and shall be arranged to permit the passage of the appropriate starting loads.

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

7 The main steering gear and rudder stock shall be capable of putting the rudder over from 35 degrees on one side to 35 degrees on the other side with the ship at its deepest seagoing draught and running at maximum service speed. The time taken by the movement from 35 degrees on one side to 35 degrees on the other side shall not exceed 28 seconds under the same conditions. The main steering gear shall be operated by a source of power where necessary to meet these conditions.

8 The main steering gear power unit shall be arranged to restart either automatically or manually from a position on the navigation bridge after a power failure.

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

10 The auxiliary steering gear and rudder stock shall be capable of putting the rudder over from 15 degrees on one side to 15 degrees on the other side with the ship at its deepest seagoing draught and running at the lower of maximum service speed or 7 knots. The auxiliary steering gear shall be operated by a source of power where necessary to meet these conditions.

11 If the means of operation is other than a rudder, the movement from full helm on one side to full helm on the other shall be capable of being effected in a maximum of 30 seconds.

12 Steering gear shall be provided with an effective device enabling the tiller to be



immobilized rapidly in an emergency, in particular when the auxiliary gear is activated.

If the steering gear is operated by electro-hydraulic power, it may be immobilized by closure of valves in the pressure cylinders where fitted.

13 A notice stating simply the manoeuvres to be carried out to start the auxiliary steering gear and immobilize the rudder shall be placed in a clearly visible position in the steering gear compartment or near the tiller.

Controls shall be clearly marked on the steering gear.

## **Regulation 10**

### **Communication between navigation bridge and machinery space**

1 At least two independent means shall be provided for communicating orders from the navigation bridge to the position in the machinery space or in the control room from which the engines are normally controlled. One of these shall be an engine-room telegraph. The installation of such means shall be to the satisfaction of the Administration.

2 A ship may be exempt from the installation of an engine-room telegraph as specified in paragraph 1 if the main means of propulsion is directly controlled from the navigation bridge under normal service conditions.

3 Any ship of length (L) less than 24 m may, instead of the provisions of paragraph 1, be provided with only one of the means specified in paragraph 1 if, to the satisfaction of the Administration, two means of communications are considered unnecessary bearing in mind the proximity of the navigation bridge to the position of the control room of the main propulsion machinery.

4 Appropriate means of communication shall be provided to any other positions, part from the navigating bridge, from which the engines may be controlled.

5 Similarly, appropriate means of communication shall be provided between the bridge and the tiller position.

## **Regulation 11**

### **Engineers' alarm**

An engineers' alarm shall be provided to be operated from the engine control room or at the manoeuvring platform as appropriate, and shall be clearly audible in the engineers' accommodation. The Administration may exempt the ship from this requirement if it

considers that such an alarm is not necessary taking account of the form of manning of the engine department or the close proximity of the engine control room to the engineers' accommodation.

## **CHAPTER 7**

### **ELECTRICAL INSTALLATIONS**

#### **Regulation 1**

##### **General**

- 1 Subject to the provisions of Regulation 5, electrical installations of ships and manned barges shall comply with the provisions of the present Chapter.
- 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 power;
  - .2 electrical services essential for safety will be ensured under various emergency conditions; and
  - .3 the crew and ship will be protected from electrical hazards.

#### **Regulation 2**

##### **Safety precautions**

- 1 All exposed metal parts of electrical machines or equipment which are not intended to be live but which are liable under fault conditions to become live shall be earthed unless the machines or equipment are:
  - .1 supplied at a voltage not exceeding 55 V direct current or 55 V root mean square between conductors. Auto-transformers shall not be used for the purpose of achieving this voltage, or
  - .2 supplied at a voltage not exceeding 250 V by safety isolating transformers supplying only 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 so constructed and 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 as may be needed to apparatus and equipment without danger to personnel. The sides and the rear and, where necessary, the front of switchboards shall be suitably guarded. Exposed live parts having voltages to earth exceeding a voltage of 55 V 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 for any purpose in a tanker or a barge carrying flammable liquids in bulk.

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;
- .3 limited and locally earthed circuit board systems. If the Administration considers that the equipotentiality of the system is adequately protected, circuit board hull return systems may be used without the restriction imposed in paragraph 5; or
- .4 insulation level monitoring devices, provided the circulation current does not exceed 30 mA under the most unfavourable conditions.

7 Where the hull return system is used, all final subcircuits, i.e. all circuits fitted after the last protective device, shall be two-wire and special precautions shall be taken such as considered satisfactory by the Administration.

8 Earthed distribution systems shall not be used in a tanker or a barge carrying flammable liquids in bulk. The Administration may authorize the use of the following earthed systems:

- .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 that the current in the hull is limited to not more than 5 A in both normal and 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 networks of 1000 V (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 armour of cables shall be electrically continuous and shall be earthed.

11 All electric cables and wiring external to equipment shall be at least of flame-retardant type and shall be so installed as not to impair their original flame-retarding properties. Where necessary for particular applications the Administration may permit the use of special types of cable 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 housings and other high fire risk areas. Cables connecting fire pumps to the emergency switchboard shall be of the fire-resistant type where they pass through high fire risk areas. Where practicable all such cables should be run in such a manner as to preclude their being rendered unserviceable by heating of the bulkheads that may be caused by a fire in an adjacent space.

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 risks shall be taken such as are considered satisfactory by 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 cable.

16 Each separate circuit shall be protected against short circuit and against overload except the electrical 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 temperature 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 vapours shall not be permitted in these compartments except as permitted in paragraph 22.

21 Accumulator batteries shall not be located in sleeping quarters, except batteries used in a specially adapted lighting unit.

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

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

23 Lightning conductors shall be installed on masts and mastheads constructed of non-conducting materials. If the ship is constructed of non-conducting materials, the lightning conductors shall be connected to copper plates fitted to the ship's hull and running well below the water line.

### **Regulation 3**

#### **Main source of electrical power**

1 A main source of electrical power of sufficient capacity to supply all the services mentioned in Regulation 1.2.1 shall be provided. This main source of electrical power shall consist of at least two generating sets (at least one of which shall be capable of being connected

to the main engine) and shall satisfy the following requirements:

- .1 the capacity of these generating sets shall be such that in the event of any one generating set being stopped it will still be possible to supply those services necessary to provide normal operational conditions of propulsion and safety;
- .2 the arrangements of the ship's main source of electrical power shall be such that the services mentioned in Regulation 1.2.1 can be maintained regardless of the speed and direction of rotation of the propulsion machinery or shafting;
- .3 in addition, the generating sets shall be such as to ensure that with any one generator or its primary source of power out of operation, the remaining generator sets shall be capable of providing the electrical services necessary to start the main propulsion plant from a dead ship condition. The emergency source of electrical power may be used for the purpose of starting from a dead ship condition if its capability is sufficient to provide at the same time the services required to be supplied under Regulation 4.5.

2 A main electric lighting system which shall provide illumination throughout those parts of the ship normally accessible to the 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 accident 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 4.5 inoperative.

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

## **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 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 as authorized by the Administration in exceptional circumstances.

3 The location of the emergency source of electrical power, associated transforming equipment, if any, and emergency switchboard in relation to the main source of electrical power, associated transforming equipment, if any, and the main switchboard shall be such that the Administration is satisfied that a fire or other accident in spaces containing the main source of electrical power, associated transforming equipment, if any, and the main switchboard or in any machinery space of category A will not interfere with the supply, control and distribution of emergency electrical power.

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 situation, 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 3 h, emergency lighting at every muster and embarkation station and over the sides as required by the provisions of Chapter 10;
- .2 For a period of 12 h, emergency lighting
  - .1 in all service and accommodation stairways, companionways and exits,
  - .2 in the machinery spaces and main generating stations including their control positions,
  - .3 in all control stations, machinery control rooms and at each main and emergency switchboard,
  - .4 at all stowage positions for firemen's outfits,
  - .5 at the steering gear, and
  - .6 at the fire pump and the starting positions of their motors.
- .3 For a period of 12 h, the navigation lights and other lights required by the COLREG Convention;
- .4 For a period of 12 h,

- .1 all means of communication for transmitting distress and safety messages, including the ship's whistle and internal communication as required in an emergency situation,
    - .2 the fire detection and alarm system, and
    - .3 the fire pumps if electrically powered.
  - .5 In a ship engaged only in voyages of short duration, the Administration may accept periods less than 12 h if it is satisfied that the safety of the ship is not put at risk. However, this period shall not be less than 3 h.
- 6 The emergency source of electrical power may be
- .1 an accumulator battery capable of carrying the emergency electrical load without recharging, or
  - .2 a generator driven by a motor with an independent supply of fuel and method of starting to the satisfaction of the Administration.
- 7 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 automatic connection with the emergency switchboard is not possible, a manual connection to the satisfaction of the Administration may be accepted.
- 8 Where the emergency source of electrical power is a generator, it shall start automatically and be connected to the emergency switchboard within 45 seconds following the failure of the main source of electrical power. It shall be driven by a motor with an independent supply of fuel with a flashpoint not less than 43°C. Automatic starting of the emergency generator shall not be required if there is a transitional source of power to the satisfaction of the Administration.

## **Regulation 5**

### **Special provisions**

The Administration may exempt from any requirement in the present chapter that it regards as neither necessary nor applicable any ship of less than 24 m in length (L) which does not navigate more than 12 miles from the coast.



## **CHAPTER 8**

### **FIRE PROTECTION**

#### **Regulation 1**

##### **Application to existing ships**

The provisions of the present chapter shall apply to existing ships, within a period not exceeding two 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 it is 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).

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. aluminium 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;

#### **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 vapours coming into contact with parts reaching elevated temperatures.

- .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 temperatures 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 radiators shall comply with the requirements of Chapter 7

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 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.

- .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 temperatures 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 radiators shall comply with the requirements of Chapter

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.

## **11 Divisions**

- .1a Divisions (decks and bulkheads) which separate machinery spaces of category A from cargo spaces, accommodation, service areas, control stations on ships of 24 metres in length (L) or more, shall be:
  - .1 of A.30 class for ships constructed of steel or equivalent material including aluminium alloys;
  - .2 of F class for ships constructed of combustible materials.
- .1b Decks and bulkheads which separate ro-ro cargo spaces from accommodation spaces or control stations shall be of A.30 class for ships built of steel, and of F

class for ships built of flammable materials.

.1c 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 aluminium 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  $96 \text{ kg/m}^3$ .

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

.2 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.

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

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

.4 Bulkheading shall only possess the characteristics of A.30 or F class bulkheading, as appropriate in respect of a fire arising in the machinery space.

.5 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.

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

.7 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.

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

- .9 The Administration may exempt ships less than 24 metres in length (L) which do not sail more than 12 miles from the nearest land from any 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 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.

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.

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

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.

3 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.

4 Subject to approval by the appropriate authority, 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 spaced, 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.

5 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.

6 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.

7 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.

8 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.

9 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 are permitted, they shall be placed in an oil-tight spill tray of ample size having a suitable drain pipe leading to a suitably sized spill oil tank.

10 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 paragraphs 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.

11 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.

12 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 of category A.

## **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 3 of Chapter 5.

### **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  $0.2 \text{ N/mm}^2$  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, ro-ro 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 20 metres in length. In addition, they shall not exceed half the length (L) of the ship, except that they shall not be required to be less than 10 metres in length. Hoses shall be fitted with the necessary couplings and attachments.
- .2 In accommodation, service and machinery spaces in ships of 24 metres or more in length (L), a fire hose shall be provided for each fire hydrant installed in compliance with the present chapter and shall be permanently coupled. 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 12 mm for ships of 24 metres or more in length (L) and not less than 10 mm for other ships.
- .5 All nozzles shall be fitted with a shutoff device.

## Regulation 8

### Gas fire-extinguishing systems

1 The use of a fire-extinguishing medium which, in the opinion of the Administration, 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 a recognized 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 before the discharge of the extinguishing medium. For ships of less than 24 metres in length (L), such ventilation may be shut off manually.

## **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 An sound and luminous signal shall announce the release of the extinguishing medium in any space in which personnel normally work or to which they have access.
- .2 They 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. For ships of a length (L) less than 24 metres, the visual signal shall not be required.

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 on ships of a length (L) less than 35 metres 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**

- .1 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.

- .2 For closed ro-ro cargo spaces for motor transport with fuel in their tanks for their own propulsion, the quantity of carbon dioxide delivered by the piping shall be sufficient to give a minimum volume of free gas equal to 45% of the gross volume of the largest cargo space of that type capable of being made gastight.

The arrangements shall be such that they ensure the delivery of at least two thirds of the required gas into the location concerned within 10 minutes.

## **Regulation 9**

### **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.

Foam-producing units shall be of an approved type.

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

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

## **Regulation 10**

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

#### **1 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 appropriate authority and shall be such as to ensure an effective average distribution of water of at least 5 litres per square metre per minute in the spaces to be protected. This distribution may be reduced to 3.5 litres per

square metre per minute when the ceiling height of the space to be protected is less than 2.5 metres.

- .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 7, 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.

## **2 Closed ro-ro cargo spaces carrying motor vehicles with fuel in their tanks for their own propulsion**

Such spaces shall comply with the following provisions

- .1 The sprinkler jets shall be of an approved single aperture type. They shall be arranged such as to ensure an effective distribution of water in the spaces to be protected. For this purpose, the system shall be capable of delivering at least 3.5 litres of water per square metre per minute in the spaces with a height of 2.5 metres or less, and 5 litres per square metre per minute in spaces of a greater height;
- .2 The sections of the system shall be situated in an easily accessible position adjacent to but outside the space to be protected, which is not likely to be rapidly cut off by a fire in the protected space;
- .3 The water supply to the system shall be from the fire main.

The output from each approved fire pump shall be sufficient to supply all the

sprinklers in the system and a fire hose with nozzle at the required pressure;  
and

- .4 The main fire pump or pumps shall be capable of being started by remote control (which may be hand-operated) from the location of the section valves.

## **Regulation 11**

### **Fire protection**

#### **1 Pressurized water extinguishing systems**

- .1 A fire main shall be provided in compliance with the requirements of Regulation 6.
- .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 6.
- .3 In ships of less than 35 metres in length (L), 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, the following shall be provided:
  - .1 in ships of 24 metres or more in length (L), at least three hoses with nozzles;
  - .2 in ships of least than 24 metres in length (L), at least two hoses with nozzles.
- .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 of over 24 metres in length (L) 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 7;
- .2 a high-expansion foam system complying with the provisions of Regulation 8;
3. **Closed ro-ro cargo spaces carrying motor vehicles with fuel in their tanks for**  
In addition to the provisions in paragraph 1, such spaces shall be provided, to the satisfaction of the appropriate authority, with any one of the following fixed fire-extinguishing systems:

- .1 a gas system complying with the provisions of Regulation 7.14.2; or
- .2 a pressure water-spraying system complying with the provisions of Regulation 9.2.

## **Regulation 12**

### **Protection measures applicable to tankers**

In the case of tankers, the special provisions relating to fire protection on board tankers of 500 gross tonnes or more shall apply.

## **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 of over 24 metres in length (L).
- 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 litres 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 The number and distribution of portable extinguishers shall comply with the following requirements:

.1 Ships sailing more than 12 miles from the nearest land:

.1 In all machinery spaces of category A, at least two portable extinguishers capable of extinguishing an oil fire shall be provided. When such spaces contain machinery whose total power is at least 250kW or oil-fired boilers, at least one additional extinguisher shall be provided or the portable foam extinguisher specified in paragraph 2 above;

.2 All control stations, accommodation and service spaces shall be provided with a sufficient number of portable fire extinguishers such that at least one extinguisher of an appropriate type is ready for use in any part of such spaces. At least three such extinguishers shall be provided.

.2 Ships sailing not more than 12 miles from the nearest land shall be provided with an appropriate number of portable extinguishers, at least one of which shall be appropriate to extinguish an oil fire. At least three portable extinguishers shall be provided.

## **Regulation 15**

### **Fireman's outfit**

1 On board ships of 35 metres in length (L) or over, two fireman's outfits shall be provided in compliance with the requirements of paragraph 2.

2 A fireman's outfit shall consist of:

.1 Personal equipment of an approved type comprising:

.1 Protective clothing of material to protect the skin from the heat radiating from the fire and from burns and scalding by steam. The outfit shall be water-resistant,

.2 Boots and gloves of rubber or other electrically non-conducting material,

.3 A rigid helmet providing effective protection against impact;

.4 An electric safety lamp (hand lantern) of an approved type with a minimum burning period of 3 hours, and

.5 An axe considered satisfactory by the Administration; and

.2 A breathing apparatus of an approved type which may be a self-contained compressed-air-operated apparatus, the volume of air contained in the



cylinders of which shall be at least 1,200 litres, or other self-contained breathing apparatus which shall be capable of functioning for at least 30 minutes. A number of spare cylinders, suitable for use with the apparatus provided, shall be available on board as considered sufficient by the Administration.

The spare cylinders shall be such as to allow a period of working of three hours. If there is a plant for recharging compressed air bottles on board, this period may be reduced to two hours.

3 For each breathing apparatus a fireproof lifeline of sufficient length and strength shall be provided capable of being attached by means of a snaphook to the harness of the apparatus or to a separate belt in order to prevent the breathing apparatus becoming detached when the lifeline is operated.

4 The fireman's outfits or sets of personal equipment shall be so stored as to be easily accessible and ready for use and, where the ship carries more than one fireman's outfit or more than one set of personal equipment, they shall be stored in widely separated positions.

5 On ships of between 24 and 35 metres in length (L), the following equipment shall be provided:

- .1 a hose-type breathing apparatus with an external air intake on the deck, fitted with a fire-resisting tube and of sufficient length,
- .2 a torch,
- .3 a pair of rubber gloves in fire-resisting material,
- .4 a fireman's line,
- .5 a pick, and
- .6 a safety helmet.

## **Regulation 16**

### **Emergency escape breathing devices**

Ships of more than 35 m in length shall carry at least two emergency escape breathing devices (EEBD) within accommodation spaces.

## **Regulation 17**

### **Fire muster lists. Fire patrols. Fire drills**

1 Ships of 24 metres or more in length (L) shall have a fire roster, drawn up and updated before sailing. The muster lists shall contain all specific tasks. In particular, it shall show call signals and the station to which each man shall report and the tasks he shall perform in the event

of fire. It shall be permanently displayed in several parts of the ships, especially in places used by the crew.

2 An efficient system of fire patrols, including ro-ro cargo spaces, shall be organized at sea and in port such as to ensure rapid detection of any fire hazard.

3 Fire drills shall be conducted under the same conditions as those required by Regulation 8 of chapter 9, in order to check the condition of fire-fighting equipment and train the crew in its use.

### **Regulation 18**

#### **Fire control plans**

Ships of 24 metres or more in length (L) shall have a fire control plan permanently exhibited to the satisfaction of the Administration.

### **Regulation 19**

#### **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 20**

#### **Substitutes**

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

### **Regulation 21**

#### **Carriage of dangerous goods**

The provisions of Chapter VII of the SOLAS Convention shall apply to the carriage of dangerous goods in containers, or in bulk in the case of solid cargoes.

## **CHAPTER 9**

### **LIFE-SAVING APPLIANCES AND ARRANGEMENTS**

#### **Regulation 1**

##### **Application**

- 1 Unless otherwise provided, the present chapter shall apply to new ships and barges
- 2 Life-saving appliances and arrangements aboard existing ships shall be in conformity with recognized standards. Existing appliances and the launching arrangements should, as far as practicable, have sufficient capacity to allow all persons on board to evacuate the ship from one side or the other.
- 3 Existing ships and barges shall comply with the provisions of the present chapter within two years from the entry into force of the present Regulations, with respect to the following appliances:
  - .1 life jackets,
  - .2 lifebuoys,
  - .3 liferafts and hydrostatic release units,
  - .4 abandon ship drills,
  - .5 positioning devices conforming to the Global Maritime Distress Satellite System (GMDSS).

#### **Regulation 2**

##### **General**

- 1 The provisions on life-saving appliances and arrangements under the present chapter shall comply with the International Life-Saving Appliance (LSA) Code adopted by the IMO Maritime Safety Committee in Resolution MSC 48(66)
- 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 this chapter.
- 3 The Administration may exempt from any requirement in this chapter that it regards as neither necessary nor applicable any ship which does not navigate more than 12 miles from the coast.

#### **Regulation 3**

##### **Approval of life-saving appliances and arrangements and their equipment**

- 1 The life-saving appliances and arrangements and their equipment required by this

chapter shall be approved by the Administration. Before giving approval to life-saving appliances and arrangements and their equipment, the Administration shall ensure that such life-saving appliances and arrangements and their equipment comply with the requirements of the Recommendations of the IMO.

2 Before giving approval to novel life-saving appliances and arrangements and their equipment, the Administration shall ensure that they provide the same degree of safety as existing standards. For that purpose, life-saving appliances and arrangements and their equipment shall have undergone tests in accordance with Recommendations of the IMO..

#### **Regulation 4**

##### **Communications**

Apart from the means of alarm and communications set out in chapters 10 and 11 of the present Regulations, any ship or manned barge shall have on board:

1 An emergency means comprising either fixed or portable equipment or both shall be provided for two-way communication between emergency control stations, muster and embarkation stations and strategic positions on board.

2 A general emergency alarm system capable of giving the signal to go to muster stations consisting of seven or more short blasts followed by a long blast on the ship's siren or whistle supplied by the main or emergency source of power. The system shall be capable of being controlled from the ship's bridge and shall be audible in all accommodation and spaces used by the crew.

#### **Regulation 5**

##### **Line-throwing appliances**

1 Ships engaged in navigation more than 12 miles from the coast shall have a line-throwing appliance of an approved type.

2 The rocket, in the case of a rocket fired from a pistol, or the whole appliance, in the case of a combined rocket and line, shall be stowed in a water-resisting package. In addition, in the case of a rocket fired from a pistol, the line and rockets and the ignition device shall be stowed in a weathertight box.

#### **Regulation 6**

##### **Retro-reflective tapes for life-saving appliances**

All rescue boats, lifeboats or liferafts, immersion suits, life jackets and lifebuoys shall be

fitted with retro-reflective tapes in a manner considered satisfactory by the appropriate authority.

IMO Resolution A.658(16) on Use and fitting of retro-reflective materials on life-saving appliances shall apply.

## **Regulation 7**

### **Personal life-saving appliances**

#### **1 Lifebuoys**

- .1 Lifebuoys shall be installed on board at readily accessible positions for all persons on board. They shall be capable of being rapidly cast loose and not permanently secured in any way.
- .2 Ships of 24 metres or more in length (L) shall have at least 4 lifebuoys, two of which shall be fitted with an automatic light, and one of the buoys also fitted with an automatic smoke signal.  
Two buoys, one on each side, shall be provided with a floating lifeline of 20 metres in length.
- .3 While the ship is in port or in the roads, one of the lifebuoys provided with a lifeline shall be placed permanently at the gangway.
- .4 Ships of less than 24 metres in length (L) shall have at least two lifebuoys, one of which shall be fitted with an automatic light.
- .5 Each lifebuoy shall be marked in capital Roman letters with the name and port of registration of the ship on which it is placed.

#### **2 Life jackets**

Any ship or manned barge shall have on board a sufficient number of life jackets for every person on board the ship. In addition, they shall have a sufficient number of lifejackets for persons on watch. Each lifejacket shall be provided with a whistle and a light complying with the requirements of the above-mentioned LSA Code.

#### **3 Immersion suits**

For ships operating in areas where low water or air temperature can be expected, an approved immersion suit of an appropriate size shall be provided for every person on board. If the Administration deems it impractical due to the size of the vessel, consideration shall be given to alternate provisions.

## **Regulation 8**

### **Training and abandon ship drills**

- 1 Every crew member shall be trained in launching and manoeuvring 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 a log specified by the Administration.

## **Regulation 9**

### **Survival craft**

- 1 Cargo ships other than oil tankers, chemical tankers and gas carriers, and manned barges, shall comply with the following requirements:
  - .1 they shall carry, on each side, one or more survival craft conforming to the above-mentioned LSA Code, and have a total capacity sufficient to carry all the persons on board;
  - .2 except where the survival craft required by paragraph 1.1 can be rapidly transferred from one side of the ship to the other to be launched, additional survival craft shall be provided such that the total capacity on each side is sufficient to accommodate 125% of the total number of persons on board.
- 2 Any tanker carrying oil or petroleum products with a flashpoint less than 60°C, any tanker carrying chemical products and any gas carrier shall, in addition to complying with the requirements of paragraph 1, carry at least one rigid power-driven rescue boat unless:
  - .1 all the required survival craft consist of lifeboats, or
  - .2 at least one of the required lifeboats is a rescue boat as defined in the above taking into account:
    - .1 the area of navigation,
    - .2 the distance from the nearest safe haven, and

- .3 the search and rescue services available in the area

## **Regulation 10**

### **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 craft at any other launching station,
  - .2 they are as near the water surface as is safe and practicable, and
  - .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 11**

### **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 port of registration,
- .2 the name of the authority which approved the craft, and
- .3 the maximum number of persons for which it is approved.

## **Regulation 12**

### **1 Operational readiness Operational readiness, maintenance and inspections**

Before the ship leaves port and at all times during the voyage, and in the case of barges, at any time when they are manned, all life-saving appliances shall be in working order and ready for immediate use.

### **2 Maintenance**

Instructions for maintenance on board of rigid survival craft shall be exhibited and such maintenance shall be effected in accordance with such instructions

### **3 Weekly inspection**

The following tests and inspections shall be carried out weekly:

- .1 all survival craft 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**

Every inflatable liferaft and inflated rescue boat 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.

#### **6 Servicing of hydrostatic release units**

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.

## **CHAPTER 10 RADIOCOMMUNICATIONS**

### **Regulation 1**

#### **Application**

1 The general principle of the Global Maritime Distress Satellite System (GMDSS), as provided in Chapter IV of the SOLAS Convention, shall apply to ships subject to the present Regulations and any manned barge, which shall have aboard the radio installations indicated in the present chapter.

2 Existing ships shall comply with the provisions of this chapter not later than two years from the entry into force of the present Regulations.

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

4 Manned barges, when under tow by a tug or an offshore support vessel, shall be subject to the special regulations established by the Administration taking into account the available means of communication between the two ships. However, they shall comply with the provisions on VHF communications, radar transponder and EPIRB.

### **Regulation 2**



## **Exemptions**

1 Considering that, in the GMDSS context, it is highly desirable not to deviate from the requirements of this chapter, the Administration may grant partial or conditional exemptions to individual ships from the requirements of Regulations 7 to 9 provided:

- .1 such ships comply with the functional requirements of Regulation 3; and
  - .2 the Administration has taken into account the effect which such exemptions may have upon the general efficiency of the service for the safety of all ships.
- 2 An exemption may be granted under paragraph 1 only:
- .1 if the conditions affecting safety are such as to render the full application of Regulations 7 to 9 unreasonable or unnecessary; or
  - .2 in exceptional circumstances, for a single voyage outside the sea area or sea areas for which the ship is equipped.

## **Regulation 3**

### **Functional requirements**

1 Every ship or manned barge, while at sea, shall be equipped with radio installations capable of the functions specified in paragraph 2 throughout the duration of the intended voyage regardless of the sea area or sea areas crossed.

- 2 Every ship, while at sea, shall be capable:
- .1 of transmitting ship-to-shore distress alerts by at least two separate and independent means, each using a different radiocommunication service,
  - .2 of receiving shore-to-ship distress alerts,
  - .3 of transmitting and receiving ship-to-ship distress alerts,
  - .4 of transmitting and receiving search and rescue co-ordinating communications,
  - .5 of transmitting and receiving on-scene communications,
  - .6 of transmitting and, where applicable, receiving signals for locating,
  - .7 of transmitting and receiving maritime safety information,
  - .8 of transmitting and receiving general radiocommunications to and from shore-based radio systems or networks, and
  - .9 of transmitting and receiving bridge-to-bridge communications.

## **Regulation 4**

### **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 5**

#### **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.

### **Regulation 6**

#### **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 7**

### **Radio equipment: General**

- 1 Every ship shall be provided with:
  - .1 a VHF radio installation capable of transmitting and receiving:
    - .1 DSC on the frequency 156.525 MHz (channel 70) and maintaining a continuous DSC watch on this channel. It shall be possible to initiate the transmission of distress alerts on channel 70 from the navigation bridge. Ships navigating exclusively in Sea Area A2 may be exempted from this requirement if they maintain a continuous VHF radio watch on channel 16 from the navigation bridge,
    - .2 radiotelephony on the frequencies 156.300 MHz (channel 6), 156.560 MHz (channel 13) and 156.800 MHz (channel 16);
  - .2 a radar transponder capable of operating in the 9 GHz band, which shall be located in the immediate vicinity of the navigation bridge so that it can be easily utilized and ready for transfer to any survival craft;
  - .3 subject to the provisions of Regulation 8.3, a satellite emergency position-indicating radio beacon (satellite EPIRB) which shall be:
    - .1 capable of transmitting a distress alert either through the polar orbiting satellite service operating in the 406 MHz band or the INMARSAT-E geostationary satellite coverage operating in the 1.6 GHz band,
    - .2 installed in an easily accessible position,
    - .3 ready to be manually released and capable of being carried by one person into a survival craft,
    - .4 capable of floating free if the ship sinks and of being automatically activated when afloat, and
    - .5 capable of being activated manually;
  - .4 a receiver capable of receiving international NAVTEX service broadcasts if the ship is engaged on voyages in which an international NAVTEX service is provided; and
  - .5 if a NAVTEX service is not provided, a radio facility for reception of:
    - .1 maritime safety information broadcast by the INMARSAT enhanced

group calling system, or

- .2 maritime safety information broadcast by HF direct-printing telegraphy.

2 Ships whose voyages do not normally exceed 12 hours may be exempted by the Administration from the obligation to keep watch on the international NAVTEX service provided that they are capable of receiving maritime safety information including meteorological forecasts before sailing.

## **Regulation 8**

### **Radio equipment: Sea area A1**

1 In addition to meeting the requirements of Regulation 7, every ship engaged on voyages exclusively in sea area A1 shall be provided with a radio installation capable of initiating the transmission of ship-to-shore distress alerts from the position from which the ship is normally navigated, operating either:

- .1 on VHF using DSC; this requirement may be fulfilled by the EPIRB prescribed by paragraph 3, either by installing the EPIRB close to, or by remote activation from, the position from which the ship is normally navigated;
- .2 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by Regulation 7.1.3, either by installing the EPIRB close to, or by remote activation from, the position from which the ship is normally navigated;
- .3 if the ship is engaged on voyages within coverage of MF coast stations equipped with DSC, on MF using DSC;
- .4 on HF using DSC;
- .5 through the INMARSAT geostationary satellite service; this requirement may be fulfilled by:
  - .1 an INMARSAT ship earth station, or
  - .2 the satellite EPIRB, required by Regulation 7.1.3, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the ship is normally navigated.

2 The VHF radio installation, required by Regulation 7.1.1 shall also be capable of transmitting and receiving general radio communications using radiotelephony.

3 Ships engaged on voyages exclusively in sea area A1 may carry, in lieu of the satellite EPIRB required by Regulation 7.1.3, and EPIRB which shall be:

- .1 capable of transmitting a distress alert using DSC on VHF channel 70 and providing locating by means of a radar transponder operating in the 9 GHz band,
- .2 installed in an easily accessible position,
- .3 ready to be manually released and capable of being carried by one person into a survival craft,
- .4 capable of floating free if the ship sinks and of being automatically activated when afloat, and
- .5 capable of being activated manually.

## **Regulation 9**

### **Radio equipment: Sea area A2**

1 In addition to meeting the requirements of Regulation 7, every ship engaged on voyages beyond sea area A1, but remaining within sea area A2, shall be provided with:

- .1 an MF radio installation capable of transmitting and receiving, for distress and safety purposes, on the frequencies:
  - .1.1 2,187.5 kHz using DSC, and
  - .1.2 2,182 kHz using radiotelephony;
- .2 a radio installation capable of maintaining a continuous DSC watch, on the frequency 2,187.5 kHz which may be separate from, or combined with, that required by subparagraph 1.1; and
- .3 means of initiating the transmission of ship-to-shore distress alerts by a radio service other than MF operating either:
  - .3.1 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by Regulation 7.1.3, either by installing the EPIRB close to, or by remote activation from, from the position from which the ship is normally navigated; or
  - .3.2 on HF using DSC; or
  - .3.3 through the INMARSAT geostationary satellite service; this requirement may be fulfilled by:
    - .3.3.1 the equipment specified in paragraph 3.2, or

.3.3.2 the satellite EPIRB, required by Regulation 7.1.3, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the ship is normally navigated.

2 It shall be possible to initiate transmission of distress alerts by the radio installations specified in paragraphs 1.1 and 1.3 from the position from which the ship is normally navigated.

3 The ship shall in addition, be capable of transmitting and receiving general radiocommunications using radiotelephony or direct-printing telegraphy either by:

- .1 a radio installation operating on working frequencies in the bands between 1,605 kHz and 4,000 kHz or between 4,000 kHz and 27,500 kHz. This requirement may be fulfilled by the addition of this capability in the equipment required by paragraph 1.1; or
- .2 an INMARSAT ship earth station.

4 The Administration may exempt ships constructed before 1 February 1997, and engaged exclusively in voyages within sea area 2, from the requirements of Regulations 7.1.1.1 and 7.1.2 provided such ships maintain, when practicable, a continuous listening watch on VHF channel 16. This watch shall be kept at the position from which the ship is normally navigated.

## **Regulation 10**

### **Radio equipment: Sea area A3**

1 In addition to meeting the requirements of Regulation 7, every ship engaged on voyages beyond sea area A1 and A2, but remaining within sea area A3, shall be provided with an Inmarsat ship-earth station capable of:

- .1 transmitting and receiving distress and safety communications using either radiotelephony;
- .2 initiating and receiving distress priority calls;
- .3 maintaining watch for shore-to-ship distress alerts, including those directed to specifically defined geographical areas;
- .4 transmitting and receiving general radiocommunications, using either radiotelephony or direct-printing telegraphy.

2 In addition to meeting the requirements of regulations 7, every ship engaged on voyages beyond sea areas A1 and A2, but remaining within sea area A3, shall, if it does not

comply with the requirements of paragraph 10.1, be provided with:

- .1 an MF/HF radio installation capable of transmitting and receiving, for distress and safety purposes, on all distress and safety frequencies in the bands between 1,609 kHz and 4,000 kHz and between 4,000 kHz and 27,500 kHz:
    - .1 using DSC; and
    - .2 using radiotelephony;
  - .2 equipment capable of maintaining DSC watch on 2,187.5 kHz, 8,414.5 kHz and on at least one of the distress and safety DSC frequencies 4,207.5 kHz, 6,312 kHz, 12,577 kHz or 16,804.5 kHz; at any time, it shall be possible to select any of these DSC distress and safety frequencies.
  - .3 a radio installation operating on working frequencies in the bands between 1,605 kHz and 4,000 kHz or between 4,000 kHz and 27,500 kHz. This requirement may be fulfilled by the addition of this capability in the equipment required by paragraph 2.1.
- 3 It shall be possible to initiate transmission of distress alerts by the radio installations specified in paragraphs 1 and 2 from the position from which the ship is normally navigated.
- 4 The Administration may exempt ships constructed before 1 February 1997, and engaged exclusively in voyages within sea area 3, from the requirements of Regulations 7.1.1.1 and 7.1.2 provided such ships maintain a continuous listening watch on VHF channel 16. This watch shall be kept at the position from which the ship is normally navigated.

## **Regulation 11**

### **Sources of energy**

- 1 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, as required by Regulation 4.5.4 of chapter 7.
- 2 A reserve source or sources of energy shall be provided on every ship, to supply radio installations, for the purpose of conducting distress and safety radiocommunications, in the event of failure of the ship's main and emergency sources of electrical power.

## **Regulation 12**

### **Radio personnel**

1 Every ship shall carry personnel whose qualifications for distress and safety radiocommunication purposes shall be considered satisfactory by the Administration. The personnel shall be holders of certificates specified in the Radio Regulations as appropriate, any one of whom shall be designated to have primary responsibility for radiocommunications, especially during distress incidents.

2 Every ship navigating in sea area A1 shall carry on board at least one person holding a restricted operator's certificate.

3 Every ship navigating in sea areas A2 and A3 shall carry on board at least one person holding a general operator's certificate.

## **Regulation 13**

### **Radio records**

A record shall be kept, to the satisfaction of the Administration and as required by the Radio Regulations, of all incidents connected with the radiocommunication service which appear to be of importance to safety of life at sea and prevention of pollution.

## **CHAPTER 11**

### **SAFETY OF NAVIGATION**

## **Regulation 1**

### **General**

1 The provisions of Chapter V of the SOLAS Convention on safety of navigation and the following provisions shall apply to ships covered by the present Regulations.

2 Existing ships shall comply with the provisions of this chapter not later than two years from the entry into force of the present Regulations.

## **Regulation 2**

### **Shipborne navigational equipment**

1 Ships subject to the present Regulations shall carry the equipment, instruments and nautical documents shown in tables 1, 2, 3, 4 and 5 below.

2 The Administration may exempt ships from carrying the equipment, instruments and nautical documents marked with an asterisk if it is satisfied that they are neither reasonable



nor necessary for the safety of the ship.

3 Equipment for ships navigating exclusively in ports, roads and sheltered bays shall be determined by the Administration during the inspection prior to entry into service.

**Table 1. Nautical instruments**

Item	Remarks
1 radar	Capable of operating in the 9 GHz frequency band
1 GNSS receiver	Or a terrestrial radionavigation system
2 protractors*	Or equivalent instruments
2 dividers	
2 binnacle clocks or 1 centralized clock system	1 on the bridge, with indication of periods of silence; and 1 in the engine room
1 barometer	A second barometer shall be required on board ships navigating more than 200 miles from a port, one of them shall be a recording barometer  No barometer is required for ships engaged in voyages in sheltered waters.
2 thermometers*	One mounted in the engine room
1 pair of binoculars	7 x 50. An additional pair of binoculars shall be required on board ships navigating more than 200 miles from a port.
A spare binnacle for the navigating compass with pivots and magnetic gear*	
1 pelorus*	
1 set of spares and maintenance for gyro-compass	Equipment specified by the maker of the compass when the ship is fitted with a gyro-compass.
1 log*	Or equivalent device
1 hand sounding lead	Of at least 50 metres
1 echo sounder*	This instrument shall have a scale of at least 0 to 300 metres. It shall not be compulsory for ships of less than 24 metres in length (L).

**Table 2. Miscellaneous equipment**

Item	Remarks
6 distress signals of an approved type	These signals shall be of the parachute type. They shall be stowed in damp-proof containers placed close to the bridge or within it
2 floating smoke signals of an approved type*	Emitting smoke for a period of not less than 3 minutes.
1 complete set of flags and pennons of international Code of signals*	Ships not navigating more than 12 miles from the shore which are exempted from carrying the complete set of floating signals shall carry flags N and C of the international Code of signals.
1 table of flags and pennons*	This table shall be exhibited.
1 distinctive signal (flags)	
1 national flag	
2 halyards for flags and pennons*	
1 daytime signalling lamp*	For ships not carrying the lamp required by Regulation 19.2.2.2 of Chapter V of the SOLAS Convention.  Ships not navigating more than 12 miles from the closest shore shall carry such a lamp or an electric lamp allowing the sending of Morse signals.

**Table 3. Nautical publications and documents**

(The publications and documents shall be made available to the officer concerned)

Item	Remarks
1 set of charts, nautical instructions, books of lights and charts of traffic separation schemes for the intended voyage	These documents shall be included in the list of marine charts and nautical books and shall be updated by means of information provided by a recognized hydrographic service. The list shall be established at the inspection prior to entry into service.
1 International Code of signals	
1 list of coastal stations or  1 list of coastal stations with which the ship is likely to have communications.	
1 chart of zones for the application of load lines	Compulsory on board ships that change zones
1 copy of Regulations for the Prevention of Collisions at Sea in force	An illustrated table summarizing the lights and signals to be carried by ships to prevent collisions at sea shall be exhibited.
1 copy of rescue signals*	An illustrated table shall be exhibited

1 copy of current laws and regulations in force on safety of maritime navigation*	
1 International Convention on Safety of Life at Sea in force	Compulsory on board ships engaged in international navigation, in order to inform the master of his obligations abroad.
1 International Maritime Dangerous Goods Code (IMDG Code)	For ships or voyages concerned.
1 IMO "IAMSAR" manual, volume 3	For ships navigating more than 12 miles from the nearest land.
1 international maritime French/English vocabulary	
1 copy of azimuth tables	

**Table 4. Ship's stores**

Item	Remarks
Lines, cables and mooring ropes	The number, sizes, breaking strain and tests of such materials shall be decided by the Administration, in accordance with the type and size of ship,.
Beams and planks	In sufficient quantity for the ship concerned.
Carpenter's tools and caulk	With tow, pitch and mastic
Quick-setting glue	
Wooden plugs and canvas cowls or other devices for closing air vents exposed to the sea.	A complete set. These plugs and cowls shall be marked and stored in a place well known and readily accessible to the personnel
Gangway ladder or access gangway*	<p>During a stay in a port or roads, a means of access to the ship shall be installed.</p> <p>Where there is a risk of falling, the means of access shall be protected by a net, where such an arrangement is effective.</p> <p>Efficient lighting shall be provided at night.</p> <p>Where it is possible for a man to fall between the ship and the quay, guard-rails of sufficient thickness shall be installed. In addition, a lifebuoy and a throwing line shall be immediately available near at hand.</p>
A block and tackle to operate the rudder*	One set.

**Table 5. Spare parts. Deck**

Item	Remarks
Anchor chain assembly shackles	One per chain
Anchor coupling shackle	One per anchor
Spare tarpaulins	One for each cover, where applicable (in addition to two regulation tarpaulins).
Mobile wooden covers	One of each sort of cover per hold.
Spare parts for metal covers	Hemp braids, rubber joints, bearings, pins, etc.
Hold wedges	15% more than the number needed to close the holds.
Assorted ropes and cables for normal manoeuvres and mooring	A steel cable for mooring the ship. Boat falls for a quarter of boats, and for at least one boat. Assortment of small diameter ropes and wires, with pulleys, shackles, cable-clamps, bolts, etc.
Mast pulleys*	2 per mast if necessary

**Regulation 3****Magnetic compass**

1 Every magnetic compass required by Regulation 19 of Chapter V of the SOLAS Convention shall be properly compensated and its table or curve of residual deviations shall be available at all times.

2 The Administration may, when it considers it necessary, require the adjustment of the magnetic compasses referred to in paragraph 3.1 to be checked by a qualified specialist.

**Regulation 4****Means of signalling to prevent collisions at sea**

1 Ships shall be provided with the signalling lamps and other visual and audible means of signalling required by the regulations in force to prevent collisions at sea, applicable to their type and size.

All signalling lamps, and audible means of signalling shall be of an approved type. Their positioning on board shall comply with the requirements of the regulations on preventing collisions at sea.

2 When the above-mentioned electric signalling lamps are not provided with two light sources, emergency electrical lamps shall be provided. Such emergency means are only required for masthead, side and stern lights.

3 The electric lamps shall be supplied in compliance with the provisions of Chapter 7.

4 The lamps shall be controlled from a lighting switchboard in the wheelhouse or other

control post, equipped with a switch and indicator light.

5 The whistle required by the regulations in force to prevent collisions at sea shall be capable of being supplied by 2 sources of power. No obstacle shall interfere with the projection of the sound forward.

If there is an automatic device to activate the whistle, it shall be possible to override the automatic whistle control.

## **Regulation 5**

### **Plans and documents to be carried on board**

1 Ships shall carry the following plans and documents in the working language of the crew:

- an overall plan of the ship
- a plan or diagram of capacities
- a load schedule
- a trim and stability specification
- an engine room plan
- a plan or diagram of the bilge-pumping systems
- a plan or diagram of the steam and fuel lines
- a plan or diagram of the electrical installations
- a plan or diagram of the fire safety systems

The graphic symbols used shall conform to standards in force unless the meaning of the symbols used is clearly indicated.

The information required for two or more of the above headings may be combined in a single document, provided that clarity and readability are not affected. Plans and documents shall include a note of their source and the date of production.

2 The list of plans and documents required on board ships not navigating more than 12 miles from the nearest land shall be determined by the Administration.

## **Regulation 6**

### **Ship's log**

1 Every ship shall maintain a ship's log, with numbered pages and initialled with all entries being made in ink and signed each day by the master. The navigation log, the engine-room log and the radio log shall constitute the ship's log.

3 Matters relating to the safety of the ship, in all circumstances, shall be entered in chronological order in the navigation log, as well as meteorological conditions and any incidents relating to safety of life at sea.

.1 Information about the navigation of the ship and continuous dead reckoning shall be entered in precise detail.

.2 The master shall enter his orders for the use of navigation officers of the watch.

.3 The chief engineer shall be responsible for keeping the engine room log. It shall record in chronological order all matters concerning the operation and maintenance of the propulsion and auxiliary machinery. Ships which have machinery which allows automatic recording of information to be included in the engine-room log shall not be required to reproduce such information in the engine-room log. When the effective power of the engine, in continuous operation, is less than 300 kW, a log is not required for that engine, but in such case the master shall record in the navigation log any significant matters concerning the operation of the engine which the chief engineer shall report to him.

4 The logs shall also contain entries of information and other matters required by regulations on safety, pollution prevention, work, discipline on board, etc.

5 On ships of less than 24 metres in length (L) which do not navigate more than 12 miles from the nearest land, the bridge, engine-room and radio logs may be replaced by a single ship's log in which shall be recorded the main events relating to the voyage and safety of life at sea.

## **Regulation 7**

### **Ship's stores and spare parts**

1 Every ship shall be provided with parts, such as bollards and cleats and be equipped with ropes, hawsers, towlines, etc., allowing it to receive assistance, if necessary.

2 Ships carrying wood or various crates on deck, wheeled vehicles on the deck or steerage deck, and other such loads, shall have a sufficient number of securing devices and mobile equipment necessary to secure them effectively, and documentation on securing cargo, to the satisfaction of the Administration.

3 Spare parts for the main and auxiliary engines, steering gear and manoeuvring gear shall be determined by the Administration or the recognized organization during the

inspection prior to entry into service.

## **CHAPTER 12**

### **PREVENTION OF POLLUTION**

#### **Regulation 1**

##### **Certificates**

1 Ships of 400 gross tonnage and upwards, engaged in international voyages and subject to the present Regulations, shall be issued the following certificates according to the relevant provisions of the International Convention for the Prevention of Pollution from Ships, 1973, as amended by the Protocol of 1978, hereinafter referred to as MARPOL:

.1 an International Oil Pollution Prevention Certificate,

.2 *an International Air Pollution Prevention Certificate,*

.3 for the ships certified to carry noxious liquid substances in bulk, an International pollution Prevention Certificate for the carriage of Noxious Liquid Substances in Bulk.

2. Ships of less than 400 gross tonnage, engaged in international voyages and certified to carry more than 15 persons shall be issued an International Sewage pollution Prevention Certificate.

3 Oil tankers of 150 gross tonnage and above shall be issued an International Oil Pollution Prevention Certificate.

4 Every ship subject to certification under paragraphs 1 to 3 complies with all the relevant requirements of the relevant Annex to MARPOL.

#### **Regulation 2**

##### **Discharge at sea**

1 Any discharge into the sea of oil or oily mixtures from ships shall be prohibited, except when the following provisions are satisfied :

.1 the ship is proceeding en route;

.2 the ship has in operation equipment of a design approved by the Administration that ensures that the oil content of the effluent without dilution does not exceed 15 parts per million;

.3 the oily mixture does not originate from cargo pump room bilges on oil tankers; and

.4 the oily mixture, in case of oil tankers, is not mixed with oil cargo residues.

2 Disposal of garbage at sea is prohibited, except food waste at a distance of more than

12 nautical miles from the nearest land.

### **Regulation 3**

#### **Retention on board**

1 Ships shall be provided with a tank or tanks of adequate capacity, having regard to the type of machinery and length of voyage, to receive the oil residues (sludge) which cannot be dealt with otherwise in accordance with the requirements of regulation 2.1, such as those resulting from the purification of fuel and lubricating oils and oil leakages in the machinery spaces.

2 The crew and passengers shall be notified, by placards or another information mode, of the disposal prohibition defined in Regulation 2.2. They shall be informed on the locations where garbage they could detain or generate may be stored on board.

### **Regulation 4**

#### **Disposal ashore and record keeping**

1 Substances or garbage that are retained on board shall be disposed of ashore in accordance with the relevant national or local regulations.

2 Record shall be kept on the ship's log book prescribed in Regulation 11/6.1 of any discharge of oil or oily substances:

- .1 either at sea in accordance with Regulation 2.1, with indication of the amount discharged and conditions,
- .2 or in a shore reception facility, the receipt shall be kept for a minimum duration of 3 months.

## **CHAPTER 13**

### **OCCUPATIONAL HEALTH AND SAFETY, CREW ACCOMMODATION**

#### **PART 1**

#### **CREW ACCOMMODATION**

### **Regulation 1**

#### **General**

1 Before the construction of a ship, and before the crew accommodation of an existing ship is substantially altered or reconstructed, detailed plans of, and information concerning, the accommodation shall be submitted to the Administration for approval in accordance with Regulation 10 of the Procedural Regulations.



2 Location, structure and arrangement of crew accommodation spaces and means of access thereto shall be such as to ensure adequate security, protection against weather and sea and insulate from heat and cold, condensation, undue noise, vibration or effluvia from other spaces. In particular, the insulation material to be applied to bulkheads and deckheads of machinery spaces adjacent to crew accommodation shall be of a type approved by the Administration. Sleeping rooms shall be placed aft the collision bulkhead.

3 Where practical, noise measurements may be taken by the Administration on completion of construction of a new vessel. Similar measurements may also be taken following a refit or major alterations to an existing ship if it is considered that noise levels might have been influenced.\*

4 Bulkheads and decks between accommodation spaces and machinery spaces, fuel tanks, galleys, engine, deck and other store rooms, drying rooms, communal wash-places or water closets shall be so constructed as to prevent the infiltration of fumes and odours. Direct openings into sleeping rooms from such places shall be avoided whenever reasonable or practicable.

5 Where passageways are provided in crew accommodation these shall be as wide as possible, but the clear width shall not be less than 700 mm. Where doors open outwards into a passageway, there shall be sufficient space to pass the door when it is open at a right angle to the passageway.

6 Accommodation spaces shall be adequately insulated to prevent loss of heat, condensation or overheating.

7 In the choice of materials used for construction of accommodation spaces, account shall be taken of properties potentially harmful to the health of personnel or likely to harbour vermin and mould. Surfaces, including decks, of accommodation and furnishings shall be of a kind easily kept clean and hygienic, as well impervious to damp. Bulkhead and deckhead surfaces, if painted, shall be light in colour and the paint specification shall be to the approval of the Administration. Other surface coverings, such as lime wash, shall not be used.

8 Where appropriate, access to ordinary exits and emergency exits shall be marked with direction indicators. Exits shall be marked in a conspicuous manner above or beside the door.

9 Where the deck covering is of composition material, the connection to the side of the ship, bulkheads and partitions shall be rounded to avoid crevices.

10 All practical measures shall be taken to protect crew accommodation and furnishings against the admission of insects and other pests.

11 Overhead exposed decks over crew accommodation shall be sheathed with wood or equivalent insulation.

12 The electrical switchboard shall be so arranged that when the shore power connection is made, power would be available for crew accommodation lighting, ventilation systems and, where applicable, heating and cooking facilities.

## **Regulation 2**

### **Lighting, heating and ventilation**

1 All crew accommodation spaces shall be adequately lighted, as far as possible, by natural lighting. Such spaces shall also be equipped with adequate artificial light. Artificial light shall be in accordance with accepted standards of visual comfort in living spaces. The minimum standards for natural lighting in crew accommodation shall be such as to permit a person with normal vision to read an ordinary newspaper on a clear day.

2 If there are no two independent sources of electricity for lighting, additional lighting shall be provided by properly constructed lamps or lighting apparatus for emergency use.

3 Methods of lighting shall not endanger the health or safety of the crew or the safety of the ship.

4 Adequate heating facilities in crew accommodation spaces shall be provided as required by climatic conditions. Heating facilities shall be capable of maintaining a satisfactory air temperature in crew accommodation under normal conditions of service. The accommodation shall be capable of being heated sufficiently to maintain a minimum temperature of +22°C in all day rooms at an outside temperature of -15°C.

5 Facilities for heating shall be designed so as not to endanger health or safety of the crew or safety of the ship.

6 Heating by means of open fires shall be prohibited.

7 Accommodation spaces shall be adequately ventilated at all times when the crew is expected to remain on board. Ventilation systems shall be capable of control so as to maintain the air in a satisfactory condition and to ensure a sufficiency of air movement in all conditions of weather and climate. The ventilation of galleys and sanitary spaces shall be to

the open air and, unless fitted with a mechanical ventilation system, be independent from that for other crew accommodation.

8 Accommodation spaces of ships regularly engaged on voyages in the tropics and under similar conditions, except in deckhouses with satisfactory natural ventilation, shall be equipped with mechanical ventilation and, if necessary, with additional electric fans or air conditioning, in particular, mess rooms and sleeping quarters.

9 Drying rooms or lockers for working clothes and oilskin lockers shall have adequate ventilation that is separate from other spaces. The exhaust from such spaces shall be well clear of the air intakes of the ventilation systems for other spaces.

### **Regulation 3**

#### **Sleeping rooms**

1 Sleeping rooms shall be so planned and equipped as to ensure reasonable comfort for the occupants and to facilitate tidiness. The clear headroom shall, whenever possible, be not less than 2 m.

2 Wherever reasonable and practical, the floor area of sleeping rooms per person accommodated therein, excluding space occupied by berths and lockers, shall not be less than 1 m<sup>2</sup>.

3 Each member of the crew shall be provided with an individual berth, the inside dimensions of which shall be not less than 1.9 m by 700 mm.

4 Berths shall not be placed side by side in such a way that access to one berth can be obtained only over another. Berths shall not normally be arranged in tiers of more than two. The lower berth in a double tier shall be not less than 300 mm above the deck; the upper berth shall be placed approximately midway between the bottom of the lower berth and the lower side of the deck head beams.

5 Where the upper berth in a tier overlaps a lower berth, the underside of the upper berth shall be fitted with a dust proof bottom of wood, canvas or other material.

6 If tubular frames are used for the construction of berths, they shall be completely sealed and without perforations that would give access to vermin.

7 Suitable bedding shall be provided for the crew. Mattresses shall not be of a type that is liable to develop toxic fumes in cases of fire nor of a type that will attract pests or insects. Mattresses shall be provided with a cover of fire retardant material.

8 Whenever reasonable and practicable, having regard to the size, type or intended service of the ship, the furnishings of sleeping rooms shall include both a fitted cupboard preferably with an integral lock and a drawer for each occupant. A table or desk, adequate seating, a mirror, cabinet for toilet requisites, a book rack and coat hooks shall also be provided. Where fitted, tables or desks of the pull-out type shall be to the approval by the Administration.

9 The maximum number of persons to be accommodated in any sleeping room shall be clearly and indelibly marked in the room where it can be conveniently seen.

#### **Regulation 4**

##### **Mess rooms**

1 Wherever reasonable and practicable, mess room accommodation separate from sleeping quarters shall be provided.

2 The mess room shall be as close as practicable to the galley.

3 The dimensions and equipment of each mess room shall be sufficient for the number of persons likely to use it at any one time.

4 The furnishings of mess rooms shall include tables and approved seats sufficient for the number of persons likely to use them at any one time. The tops of tables and seats shall be free of sharp edges and shall be of damp resisting material without cracks and easily kept clean.

5 Where pantries are not accessible from mess rooms, adequate lockers for mess utensils and proper facilities for washing shall be provided.

6 Mess rooms shall be planned, furnished and equipped to provide appropriate facilities for recreation.

#### **Regulation 5**

##### **Sanitary facilities**

1 Sufficient sanitary facilities, including wash-basins, shower-baths and water-closets, shall be provided to the satisfaction of the Administration, having due regard to the intended service of the ship

2 Soil and waste discharge pipes shall not pass through fresh water or drinking water tanks or, where practicable, provision stores. Neither shall they, where practicable, pass overhead in mess rooms or sleeping accommodation. Such pipes shall be fitted with

anti-syphon closures.

3 In general, water-closets shall be situated convenient to, but separate from, sleeping rooms, mess rooms and wash-rooms.

4 The deck area of wash places shall have a covering of durable material, easily cleaned, impervious to damp and properly drained. The deck covering shall be carried up the sides of the compartment to a height of not less than 0.2 m and be adequately sealed at all joints to prevent the ingress of water and damp.

5 The bulkheads shall be of steel or other approved material and shall be watertight to a height of at least 0.25 m above the deck to allow for effective sealing of the deck covering where it meets the bulkheads.

6 Facilities for washing and drying clothes shall be provided on a scale appropriate to the number of the crew and the duration of intended voyages.

7 In general, international standards concerning shipboard sanitary facilities contained in the WHO Guide to Ship Sanitation, 1967 as amended may serve as guidance.

## **Regulation 6**

### **Potable water facilities**

Filling, storage and distribution arrangements for potable water shall be designed to preclude any possibility of water contamination or overheating. Tanks shall be designed to allow internal cleaning.

## **Regulation 7**

### **Provision stores**

Having regard to the intended service of the ship, store rooms of adequate capacity shall be provided which can be kept cool, dry and well ventilated in order to avoid deterioration of the stores. Where possible, refrigerators or other low-temperature storage shall be provided, to the satisfaction of the Administration. Where refrigerating or freezing rooms are fitted, the access doors shall be capable of being opened from either side. An alarm system shall be arranged from the refrigerating and freezing room to the galley or other appropriate location if such rooms are large enough for personnel to enter them.

## **Regulation 8**

### **Cooking facilities**

1 Having regard to the intended service of the ship, satisfactory cooking appliances and equipment shall be provided and shall, wherever practicable, be fitted in a separate galley.

2 Galleys shall be of adequate dimensions for the purpose and have sufficient storage space and satisfactory drainage.

3 The galley shall be provided with cooking utensils, the necessary number of cupboards, shelves, sinks and dish racks of rustproof material and with satisfactory drainage. Drinking water shall be supplied to the galley by means of pipes. Where it is supplied under pressure, the system shall be protected against backflow. Where hot water is not supplied to the galley, a water heater shall be fitted.

4 The galley shall be fitted with suitable facilities for the preparation of hot drinks for the crew at all times.

5 Cooking appliances shall be fitted with fail-safe devices in the event of failure of the power source or fuel. Supplies of fuel in the form of gas or oil shall not be stored in the galley.

6 Galleys shall be provided with guard rails and hand rails.

7 Cooking stoves shall be fitted with guards to retain cooking utensils.

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

## **Regulation 9**

### **Medicine chest, radio-medical services and hospital accommodation**

1 First aid equipment and instructions as required by the competent authorities shall be provided in ships. International standards relating to first aid at sea laid down in the International Medical Guide for Ships, prepared by the International Labour Organization, the International Maritime Organization and the World Health Organization, may serve as a guide. In addition, in recent years regional guidelines have also been developed.<sup>†</sup>

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

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

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

5 Appropriate instructions and equipment shall be provided to enable appropriate personnel to consult effectively with radio-medical services ashore.

6 Appropriate hospital accommodation shall be provided in accordance with international instruments.

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

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

## **PART 2**

### **OCCUPATIONAL SAFETY**

#### **Regulation 10**

##### **Accident prevention**

1 Appropriate provisions shall be taken in view of the prevention of occupational accidents or diseases, covering in particular the following matters:

1. machinery;
2. special safety measures on and below deck;
3. loading and unloading equipment;
4. fire prevention and fire-fighting;
5. anchors, chains and lines;
6. dangerous cargo and ballast;
7. personal protective equipment for seafarers.

2 Any obligation on the shipowner to provide protective equipment or other accident prevention safeguards shall be accompanied by written instructions posted in the appropriate locations, to the effect that such equipment and safeguards are actually used by seafarers when exposed at specific risk.

#### **Regulation 11**

##### **Safety of movement on board**

1 Ships shall be so fitted out that the crew can move about and work easily. Where necessary, moving parts and openings in the deck shall be protected by safety devices, plating, guard rails and handrails. Winches and towing hooks shall be designed to ensure safety at work. All installations required for work on board shall be so designed, sited and protected as to make on-board manoeuvres, maintenance and repairs safe and easy.

2 Decks in the vicinity of winches and bollards, as well as side-decks, engine-room floors, landings, companionways and the top of the side-deck bollards shall be non-slip.

3 The tops of side-deck bollards and any obstacles in areas where crew move about (eg the treads of companionways), shall be marked by light-coloured paint.

4 Appropriate devices shall be provided for anchoring stacked hatch covers.

5 The size and arrangement of passageways, accesses and corridors for the movement of persons and cargo shall be such that they may be negotiated without risk of accident.

6 The design and layout of doors shall be such as not to endanger the persons opening or



closing them.

7 Structures for passage from one level to another, particularly companionways, ladders and rungs shall be such that their use is free of hazard.

## **Regulation 12**

### **Safety of working stations**

1 Working stations shall be readily and safely accessible.

2 Companionways, ladders, rungs or similar devices shall be provided where there is a difference of over 500 mm in the levels of accesses, exits and passageways. Companionways shall be provided where the level of permanently manned working stations differs by more than 1m from the levels from which access is to be gained.

3 Emergency exits shall be clearly marked as such.

4 Closed spaces in which work is carried out, with the exception of storerooms, shall be ventilated. The ventilation devices shall be arranged so as not to cause draughts and shall provide an adequate and regularly renewed supply of air to the working stations for the persons in them. Where the natural rate of air renewed is inadequate, mechanical ventilation shall be provided. The rate of renewal may be considered adequate if it is carried out at least five times per hour.

5 Working stations close to the water or in positions involving differences in level of more than 1m shall be equipped so as to prevent crew slipping or falling.

## **Regulation 13**

### **Dimensions of working stations**

1 Working stations shall be of dimensions such that each crew member working in them has adequate freedom of movement.

2 Permanently manned working stations shall be of sufficient dimensions to ensure:

- .1 a net volume of air not less than 7 m<sup>3</sup>, except for the wheelhouse of vessels of 40 m in length and less;
- .2 a free floor area and headroom for each working station that gives adequate freedom of movement for operation and inspection and for ordinary maintenance and repair work.

3 The clear width of side-decks shall be not less than 600 mm; except that this width may be reduced around mooring bollards.

## **Regulation 14**

### **Lighting in working spaces and areas**

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

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

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

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

5 Portable watertight lights shall be provided as necessary and fitted with heavy-duty cables, bulb guards and lanyards. Such lights for use in spaces, which may contain explosive gases, shall be either explosive proof or otherwise intrinsically safe.

6 Where necessary to prevent danger, electric lamps shall be protected by guards.

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

## **CHAPTER 14**

### **INTERNATIONAL SAFETY MANAGEMENT CODE**

#### **(ISM CODE)**

## **Regulation 1**

### **Application**

The provisions of the International Management Code for the Safe Operation of Ships and for Pollution Prevention (International Safety Management - ISM Code), adopted by the IMO in resolution A.741(18), as amended, may be applied voluntarily to ships covered by the present Regulations.

## **CHAPTER 15**

### **SHIP SECURITY**

#### **Regulation 1**

##### **Application**

The regulations of the present chapter shall apply to new and existing ships, taking into account the security environment and the risk area related to the operating area and the security risk that may be encountered during the intended voyage, as evaluated by the Administration.

#### **Regulation 2**

##### **Ship security Searching**

1 Ships shall be searched after having been left unattended to ensure that nothing has been placed aboard while the ship was unattended and for the purpose of concealing trespassing persons and articles placed on board for illegal purposes. To the extent possible, checks shall include all spaces accessible to non-authorized persons while the ship was unattended, e.g., any crew areas stores, holds, under-water hull, if concern prevails and areas that could conceal persons or articles that may be used for illegal purposes.

##### **Securing**

2 With due regard to the need to facilitate escape in the event of an emergency, where possible external doors, hatches and storage areas shall be kept locked and windows secured while the ship is left unattended. If the ship is left unattended for a lengthy period of time such as overnight, it is recommended that the engine is disabled to prevent theft/unauthorized use.

##### **Preventing unauthorized access to ships**

3 Measures preventing unauthorized access to ships shall be implemented and maintained. Such measures may be:

- .1 over-the-side lighting which gives an even distribution of light on the whole hull and waterline;
- .2 keeping a good watch from the deck;
- .3 challenging all approaching boats; if unidentified, they shall, where possible, be prevented from coming alongside; and
- .4 all visitors and contractors shall report to the master, or other responsible person to notify them of their arrival.

### **Regulation 3**

#### **Contingency measures for security alerts**

1 Contingency measures shall be in place for dealing with emergency navigational and health and safety alerts on board ships. These plans may be adapted to include procedures for security alerts and incidents.

2 If a suspicious device or package is found while a ship is at sea, the master shall take into account:

- .1 the size and location of the device;
- .2 the credibility of the threat;
- .3 the ship's location and the time it will take for security services and other assistance to arrive;
- .4 the need to keep everyone well clear of the suspect device; and
- .5 the need for all on board to keep clear of all doors, trunks and hatches leading from the space containing the device to avoid possible blast injuries.

### **Regulation 4**

#### **Reporting security incidents**

1 Procedures and processes for reporting and recording security incidents shall be implemented. The master shall be provided with contact information for authorities responsible for emergency response, the national response centre(s) (if appropriate) and any other authorities that may need to be notified.

2 Reports of security incidents on board a ship shall be reported to the master or the person designated by him.

3 In the event of a security incident occurring while the ship is at sea the master, in addition to activating an appropriate response, shall alert the nearest coastal State or authorities and/or ships in vicinity and provide details of the incident.

### **Regulation 5**

#### **Training**

1 The master shall be made aware of basic security requirements contained in chapter XI-2 of the SOLAS Convention, as amended, as well as in the International Code for the Security of Ships and of Port Facilities (ISPS Code), adopted by the IMO in resolution A.924(22), as amended.

2        Every new member of the crew, when embarking on board the ship for the first time, shall be briefed on security risks and how to report any suspicious situation he may encounter.