PHILIPPINE SHIP SAFETY RULES AND REGULATIONS (PSSRR)

FOR PASSENGER SHIPS PART A (500 GT AND ABOVE)

PHILIPPINE SHIP SAFETY

RULES AND REGULATIONS

(PSSRR)

PART A

500GT AND ABOVE

PASSENGER SHIPS, ROLL ON-ROLL OFF (RO-RO) SHIPS

2020

SUBJECT FOR FINAL REVIEW

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500GT AND ABOVE

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FOREWORD –

TO BE PROVIDED

Chapter I

Scope and Coverage

1 Unless expressly provided elsewhere the present Regulations apply to new ships.

2 Where the provisions in force of apply to ship on the present regulations :

.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 its 1997 Protocol

.5 International Regulations for Preventing Collisions at Sea (COLREG), 1972,

.6 International Tonnage Convention

.7 International Convention for the Control and Management of Ships' Ballast Water and Sediments

.8 International Convention on the Control of Harmful Anti-Fouling Systems on Ships

apply to the ships subject to the present Regulations, those provisions shall be considered to be part of the present Regulations and shall consequently apply.

Where the provisions of the aforecited conventions as listed is found impractical and unreasonable the Administration may exempt such ships, while the remaining provisions of the conventions not stipulated in this Regulations shall be in suppletory character.

When the provision stipulated in this regulations is impractical an alternative equivalency may be provided as to the satisfaction of this Administration.

3 Passenger ships engaged in international trade, regardless of type and size, shall comply with the above-mentioned Conventions.

4 Existing passenger ships which is covered under the PMMRR, 97 shall continue to comply with the requirement thereof unless expressly provided elsewhere or the ship undergoes alteration/conversion which affect the dimension of the ship or its cargo capacity, significantly increase the ship's life, the load line, change the ship's functionality, in which case such ship shall comply with the present regulation.

5 Existing ships registered in foreign country shall be regarded as a new ship when it registers in the Philippines.

Regulation 1
General

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

Regulation 2
Application

1 Unless expressly provided otherwise, this regulation shall apply to passenger ships, ro-ro and fast craft with 500GT and above or passenger ships of 24 meter in length and above or carrying 200 passengers or more intended for operating within the territorial waters of the Philippines, within the near coastal voyage of the Philippines, the keels of which are laid or which are at a similar stage of construction on or after 01 January 2021.

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

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

3 For the purpose of these Regulations:

.1 the expression “ships constructed” means ships the keels of which are laid or which are at a similar stage of construction;
.2 the expression “all ships” means passenger ships constructed before, on or after 01 January 2021;
.3 Unless expressly provided otherwise, for ships constructed before 01 January 2021 the Administration shall ensure that the requirements which are applicable under the Philippine Merchant Marine Rules & Regulations 1997 are complied with.

4 Repairs, alteration, modifications and outfitting.

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

Regulation 3
Definitions

"Steel Or Other Equivalent Material" Occur, "Equivalent Material" - refers to any non-combustible material which, by itself or due to insulation provided has structural and integrity properties equivalent to steel at the end of the applicable exposure to the standard fire test (e.g. aluminum alloy with appropriate insulation).

Accommodation Spaces - refers those used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, games and hobbies rooms, pantries containing no cooking appliances and similar spaces. Public spaces are those portions of the accommodation which are used for halls, dining rooms, lounges and similar permanently enclosed spaces.

Administration - refers to the Maritime Industry Authority (MARINA)

Alteration - refers to the process of changing the configuration of ships or ships dimensions which affect the original approved plans; lengthening; and other similar process.

Amidships - refers in the vicinity of the middle portion of a ship as distinguished from her ends or midway between bow and stern or in the middle of the length L.

Anniversary Date - refers to the day and month of each year which will correspond to the date of expiry of the certificate.

Approved - refers approved by the Administration or refers to approved by the Administration in accordance with these rules and Regulations.

Assigning Authority - refers to the Maritime Industry Authority (MARINA) as the Administration.

Automatic Identification System (AIS) - refers to an automatic tracking system used on ships and by vessel traffic services (VTS) for identifying and locating vessels by electronically exchanging data with other nearby ships, AIS base stations, and satellites.

Auxiliary - refers of steering is the equipment other than any part of the main steering gear necessary to steer the ship in the event of failure of the main steering gear but not including the tiller, quadrant or components serving the same purpose.

Auxiliary Steering Gear - refers to the equipment which is provided for effecting movement of the rudder for the purpose of steering the unit in the event of failure of the main steering gear.

Breadth (B) - refers to the maximum breadth of the ship, measured amidships to the moulded line of the frame in a ship with a metal shell and to the outer surface of the hull in a ship with a shell of any other material. The breadth (B) should be measured in meters; or refers to the extreme breadth, in meters, measured between the outer sides of the hull, excluding rubbing strakes or other projections.

Bridge-to-Bridge Communications - refers to safety communications between ships from the position from which the ships are normally navigated.

Bulkhead - refers to transverse watertight subdivision.

Bulkhead Deck - refers to the upper most deck to which watertight bulkheads and the watertight shell extends.

Cargo - refers to merchandise/goods conveyed on a ship.

Carriage - refers to the transportation of passenger and or goods/cargoes, which include the handling, and stowage of same.

Classification Society - refers to a non-stock, non-profit organization composed of committees represented by engine builders, shipowners, shipbuilders and underwriters.

Collision Bulkhead - refers to a watertight bulkhead fitted up to the freeboard deck. This is located at a distance from the forward perpendicular of not less than 5% and not more than 8% of the length of the ship.

COLREG - refers to the International Regulations for Preventing Collisions at Sea, 1972, as amended.

Company - refers to any shipowner/operator/manager, bareboat charterer and any other entity who has assumed the responsibility for the operation of a Philippine registered ship(s) and who on assuming such responsibility has agreed to take over all duties and responsibilities imposed by the ISM Code; or by this Authority.

Control Stations - refers to those spaces in which the craft radio or navigating equipment or the emergency source of power and emergency switchboard are located, or where the fire recording or fire control equipment is centralized, or where other functions essential to the safe operations of the craft, such as propulsion control, public access, stabilization systems, etc., are located.

Corrosive - refers to any dangerous article which when in contact with living tissues will cause severe damage of such tissue by chemical action, or in case of leakage will materially damage or destroy other freight by chemical action with organic matter or with certain chemicals.

Crew - refers to all persons carried on board the units to provide navigation and maintenance of the unit, its machinery, systems, and arrangements essential for propulsion and safe navigation or to provide services for other persons on board.

Damage Stability - refers to a ship in the assessed "Worst Intact Condition", analytically damaged by opening various combinations of watertight compartments to the sea. The number of compartments and their location are prescribed by IMO regulations, SOLAS conventions, or other applicable rules. Typically these conditions are identified by the compartment(s) damaged.

Dangerous Cargo - refers to goods or merchandise in the form of solids, gases or liquids, which exhibit dangerous properties and are taken on-board a ship.

Dead Ship Condition - refers to the condition under which the main propulsion plant, boilers and auxiliaries are not in operation due to the absence of power.

Deadweight (Dwt) - refers to use in these Rules, means the difference, in tonnes (tons), between the displacement of a ship in water of specific gravity 1.025 at the assigned summer load line and the lightweight of the ship.

Deletion - refers to the cancellation of a ship's registry from the Register of Philippine Ships and termination of its trading status in the domestic shipping trade.

Depth - refers to the molded depth, in meters (feet), measured at amidships from the molded baseline to the molded line of the strength deck plating at the side of the ship.

Detection - refers to the determination of the location of survivors or survival craft.

Document of Compliance (DOC) - refers to the document issued to a company complying with the requirements of the ISM Code.

Double Bottom - refers to general term for all watertight spaces contained between the outside bottom plating, the tank top, and the margin plates. The double bottom is subdivided into number of compartments called “tanks” which may contain water ballast, oil fuel, boiler feed water or drinking water according to requirements; or refers to the space between the bottom of cargo tanks and the moulded line of the bottom shell plating.

Emergency Source of Electrical Power - refers to a source of electrical power, intended to supply the emergency switchboard in the event of failure of the supply from the main source of electrical power.

Emergency Switchboard - refers to a switchboard which, in the event of failure of the main system of electrical power supply, is directly supplied by the emergency source of electrical power and/or the transitional source of emergency power and is intended to distribute electrical energy to the emergency services.

Enclosed Spaces - refers to a spaces delineated by floors, bulkheads and/or decks which may have doors or windows.

Existing ship - refers to a ship which is not a new ship.

Fast Craft - refers to a craft other than Category HSC that is:

1 capable of a maximum service speed below 25 knots;

2 in the event of damage, disabling any essential machinery and safety systems in one compartment, the craft retains the capability to navigate safely;

Flashpoint - refers to the temperature in degrees Celsius (closed cup test) at which a product will give off enough flammable vapor to be ignited, as determined by an approved flashpoint apparatus.

Freeboard - refers to the distance measured vertically, downwards amidships from the upper edge of the deck line to the upper edge of the assigned maximum load marking.

Freeboard Deck - refers to the uppermost deck having permanent means for 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.

Function - refers to a group of task, duties and responsibilities as specified in the STCW Code, necessary for ships operation, safety of life at sea or protection of the marine environment.

Gross Tonnage - refers to the tonnage as measured in accordance with the International Tonnage Convention, 1969, and for ships of less than 24 m in length in accordance with these Rules and Regulations.

Hazardous Areas - refers to all those areas where, due to the possible presence of a flammable atmosphere arising from the drilling operations, the use without proper consideration of machinery or electrical equipment may lead to fire hazard or explosion.

Hazardous Cargo - refers to any harmful, noxious or other substance, goods or merchandize in the form of solids, gases or liquids which exhibit dangerous properties which, if introduced to the sea, may cause pollution; or can be used in lieu of Dangerous Cargo.

Homeport - refers to the port where the ship is registered.

High Speed Crafts (HSC) – is a craft capable of maximum speed in meters per second (m/s) equal to exceeding.

$$3.70 \blacktriangledown^{0.1667}$$

where ▼ = Displacement corresponding to the design water line in M3. The above definition notwithstanding the minimum service speed of the craft shall at least be 25 knots. Existing craft constructed under the DSC Code may qualify as a HSC upon satisfaction of the foregoing definition.

IMDG Code - refers to the International Maritime Dangerous Goods Code, adopted by the Maritime Safety Committee by resolutions MSC.122 (75), as amended.

IMO - refers to the International Maritime Organization;

Inflammable/Flammable - refers to capable of being set on fire, easily kindled, combustible.

Inflatable Liferaft - refers to a life-saving appliance which depends upon non-rigid, gas-filled chambers for buoyancy and which is normally kept uninflated until ready for use.

International Safety Management (ISM) Code - refers to the International Safety Management Code for the Safe Operation of Ships and for Pollution Prevention as adopted by the IMO in Resolution A.741 (18); as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article Vlll of the present Convention concerning the amendment procedures applicable to the annex other than chapter I.

International Trade - refers to any operation of a ship outside Philippine waters.

Length (L) - refers to a measured in meter is 96% of the total length on a waterline at 85% of the least moulded depth measure from the top of the keel, or the length from the fore-side of the stern to the axis of the rudder stock on that waterline, if that be greater. In ships designed with a rake of keel the waterline on which this is measure shall be parallel to the designated waterline; or refers to the same meaning as defined in regulation 3 of the 1988 LL Protocol.

Load Line Certificate - refers to the Certificate issued by the Administration pursuant to these rules and regulations which indicate the assigned freeboards and load line marks.

Load line Assignor - refers to the Administration or its Recognized Organization to assign freeboard.

Locating - refers to the finding of ships, aircraft, units or persons in distress.

Machinery Space - refers to be taken as extending from the moulded base line to the margin line and between the extreme main transverse watertight bulkheads, bounding the spaces containing the main and auxiliary propulsion machinery, boilers serving the needs of propulsion, and all permanent bunker spaces; or refers to are all machinery spaces of category A and all other spaces containing propelling machinery, boilers and other fired processes, 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 - refers to those spaces and trunks to such spaces which contain:

1 internal combustion machinery used for main propulsion;

2 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 375 KW; or any oil-fired boiler or oil fuel unit.

3 and trunks to such spaces.

Main Source of Electrical Power - refers to a source intended to supply electrical power to main switchboard for distribution to all services necessary for maintaining the ship in normal operational and habitable condition.

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

Maritime Safety Information - refers to navigational and meteorological warnings, meteorological forecasts and other urgent safety related messages broadcast to ships.

Master - refers to the person having command of a ship.

Maximum Ahead Service Speed - refers to the greatest speed which the ship is designed to maintain in service at sea at the deepest seagoing draught.

Modification - refers to the process of replacing major propulsion machinery to include major auxiliaries; modifying the superstructure such as construction of additional deck above main deck; and other similar process.

Moulded Depth - refers to the vertical distance measure from the top of the keel to the top of the freeboard deck beam at side. In wood and composite ships the distance is measured from the lower edge of the keel rabbet. Where the form at the lower part of the midship section is of hollow character, or where thick garboards are fitted, the distance is measured from the point where the line of the flat of the bottom continued inwards cuts the side of the keel;

Near Coastal Voyage - refers to a short international voyage which covers a maximum distance of 200 nautical miles from the Philippine baseline on voyage which by reciprocal agreement of the Philippines and another state is considered or treated as coastwise voyage.

New Ship - refers to:

1 a ship the keel of which is laid down on or after the effectivity of these Rules and Regulations.

2 a ship changing to Philippine registry.

3 an existing ship which undergoes major conversion as to:

.1 substantially alter the dimensions or carrying capacity of the ship; or

.2 change the type of the ship; or

.3 which in the opinion of the Administration is substantially to prolong its life; or

.4 otherwise so alters the ship that, if it were a new ship, it would become subject to relevant provisions of these Rules and Regulations not applicable to it as an existing ship.

Non-Combustible Material - refers to a material which neither burns nor gives off flammable vapors in sufficient quantity for self-ignition when heated to approximately 750°C, this being determined to the satisfaction of the Administration by an established test procedure. Any other material is a combustible material, Fire Test Procedures Code.

Normal Operational and Habitable Conditions - refers to conditions under which the unit as a whole, its machinery, services, means and aids ensuring safe navigation when underway, safety when in the industrial mode, fire and flooding safety, internal and external communications and signals, means of escape and winches for rescue boats, as well as the means of ensuring the minimum comfortable conditions of habitability, are in working order and functioning normally; and drilling operations.

Officer - refers to a member of the crew, other than the master, who has been designated as such national law or section or, in the absence of such designation, by collective agreement or custom.

Oil Fuel Unit - refers to the equipment used for the preparation of oil fuel for delivery to an oil-fired boiler, or equipment used for the preparation for delivery of heated oil to an internal combustion engine, and includes any oil pressure pumps, filters and heaters dealing with oil at a pressure more than 0.18 N/m^2. Oil transfer pumps are not considered oil fuel units.

Operating Conditions - refers to conditions wherein a unit is on location for the purpose of conducting drilling operations, and combined environmental and operational loadings are within the appropriate design limits established for such operations. The unit may be either afloat or supported on the seabed, as applicable.

Operational Speed - refers to 90% of the maximum speed;

Organization - refers to the International Maritime Organization (IMO).

Package Form - refers to the forms of containment specified for harmful substances in the IMDG Code.

Passenger - refers to any person carried on board a ship except:

1 the master and the members of the crew or other persons employed or engaged in any capacity on board a ship on the business of that ship;

2 a person on board and carried either because of the obligation laid upon the master to carry shipwrecked, distressed or other person by reason of force majeure;

3 a child under one year of age.

Passenger Ship - refers to any ship authorized by the Administration to carry passengers.

Place of Refuge - refers to any naturally or artificially sheltered area which may be used as a shelter; by a craft under conditions likely to endanger its safety.

Plans and Specifications - refers to plans showing the detailed drawings of each specific plan of the ship.

Public Spaces - refers to those spaces allocated for the passengers and include bars, kiosks, smoke rooms, main seating areas, lounges, dining rooms, recreation rooms, lobbies, lavatories and similar permanently enclosed spaces allocated for passengers.

Radio Regulations - refers to the Radio Regulations annexed to, or regarded as being annexed to, the most recent National Regulations and International Telecommunication Convention which is in force at any time.

Rating - refers to a member of the ship's crew other than the master or an officer performing deck or engine watchkeeping duties.

Re-building - refers to an existing ship subjected to changes specifically there-plating of its hull/superstructure and replacement of its main engine in order to substantially prolong its operating life to such an extent of at least 85% of its total hull has been replaced including its main engine.

Recognized Organization- refers to the organization recognized by the Administration.

Rescue Boat - refers to a boat designed to rescue persons in distress and to marshal survival craft; or refers to the same meaning as defined in SOLAS regulation III/3.

Rooms Containing Furniture and Furnishings of Restricted Fire Risk - are those rooms containing furniture and furnishings of restricted fire risk (whether cabins, public spaces, offices or other types of accommodation) in which:

1 case furniture such as desks, wardrobes, dressing tables, bureaux, or dressers are constructed entirely of approved non-combustible materials, except that a combustible veneer not exceeding 2 mm may be used on the working surface of such articles;

2 free-standing furniture such as chairs, sofas, or tables are constructed with frames of non-combustible materials;

3 draperies, curtains and other suspended textile materials have qualities of resistance to the propagation of flame not inferior to those of wool having a mass of 0.8 kg/m^2, this being determined in accordance with the Fire Test Procedures Code;

4 floor coverings have low flame-spread characteristics;

5 exposed surfaces of bulkheads, linings and ceilings have low flame-spread characteristics;

6 upholstered Furniture has qualities of resistance to the ignition and propagation of flame, this being determined in accordance with the Fire Test Procedure Code; and

7 bedding components have qualities of resistance to the ignition and propagation of flame, this being determined in accordance with the Fire Test Procedures Code.

Ro-Ro Cargo Spaces - refers to spaces not normally subdivided in any way and normally extending to either a substantial length or the entire length of the ship in which motor vehicles with fuel in their tanks for their own propulsion and/or goods can be loaded and unloaded normally in a horizontal direction.

Safe Manning - refers to the number of qualified, competent, and certificated officers and ratings on-board a ship who can safely operate her at all times.

Safety Certificate - refers to a certificate issued after inspection and survey by the Administration to ships engaged in voyages in Philippines waters complying with these Rules and Regulations.

***Safety Management Certificate (SMC*)** - refers to the document issued to a ship after verification that the company and its shipboard management operate in accordance with the approved SMS.

Safety Management System (SMS) - refers to a structured and documented system enabling company personnel to effectively implement the company's safety and environmental protection policy.

Satisfaction of the Administration - refers to clarification or explanation concerning technical or other matters elaborated by an independent committee created by the Administration.

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

Ship or Vessel - may be used interchangeably and shall mean any kind, class or type of craft or artificial contrivance capable of floating in water, designed to be used, or capable of being used, as a means of floating in water transport in the domestic trade for the carriage of passengers or cargo, or both, utilizing its own motive power or that of another.

Special Category Spaces - refers to those enclosed vehicle spaces above and below the bulkhead deck, into and from which vehicles can be driven and to which passengers have access. Special category spaces may be accommodated on more than one deck provided that the total overall clear height for vehicles does not exceed 10 m.

Stability Booklet - refers to the booklet of stability information for intact and damage conditions provided onboard to enable the master obtain accurate data as to the stability of the ship under varying conditions of service.

Standard Fire Test - refers to the same meaning as defined in SOLAS regulation II-2/3.

STCW Convention - refers to the International Convention on Standards of Training, Certification and Watch keeping of Seafarers, 1978/95.

Steel or other 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).

Steering Gear Power Unit - refers to the case of:

1 electric steering gear, an electric motor and its associated electrical equipment;

2 electro hydraulic steering gear, an electric motor and its associated electrical equipment and connected pump;

3 other hydraulic gear, a driving engine and connected pump.

Superstructure - refers to 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 four percent of the breadth (B). A raised quarter deck is regarded as a superstructure.

Survival Craft - refers to a craft provided for accommodating the persons on board in the event of abandonment of the ship and includes lifeboats, liferafts and any other craft approved as suitable for the protection and preservation of persons in such circumstances; or refers to the same meaning as defined in SOLAS regulation III/3.

Ton - refers to the term Ton (Lt), as contained within these Rules, refers to a long ton of 2240 lbs.

Watertight **-** refers to capable of preventing the passage of water through the structure in any direction under a head of water for which the surrounding structure is designed.

Weathertight **-** refers to that in any sea condition water will not penetrate into the ship.

Working spaces - refers to those open or enclosed spaces containing equipment and processes, associated with drilling operations, which are not included in hazardous areas and machinery spaces.

Chapter II

Ship Surveys and Certifications

Regulation 1

General Aspects of Surveys/Inspections

1 The inspection and survey of ships, so far as regards the enforcement of the provisions of the present regulations and the granting of exemptions therefrom, shall be carried out by the Administration. The Administration may, however, entrust the inspections and surveys either to a surveyor nominated for the purpose or to a recognized organization.

2 The inspection, surveys and issuance of certificates for Philippine registered ships engage in international trade shall be in accordance with the inspection, survey and certification regime with applicable international Convention.

3 When the nominated surveyor or recognized organization determines that the condition of the ship or its equipment does not correspond substantially with the particulars of the ship safety certificates, or is such that the ship is not fit to proceed to sea without danger to the ship, or persons on board, such surveyor or organization shall immediately ensure that corrective action is taken and should, in due course, notify the Administration. If such corrective action is not taken, the relevant certificate shall be withdrawn immediately.

4 In any case, the Administration shall fully guarantee the completeness and efficiency of the inspections and surveys and shall undertake to ensure that necessary arrangements to satisfy this obligation are established.

Regulation 2

Surveys/Inspections

1 Ships to which these Rules and Regulations apply shall be subject to surveys. The general nature and the frequency of such surveys shall be as specified below.

.1 an initial survey, including an inspection of the outside of the ship's bottom, before the ship is put in service;

.2 an annual survey within three months before date of the Certificate;

.3 an occasional survey as the occasion arises;

.4 two inspections of the ship's hull, including an inspection of the outside of the ship's bottom, within a five-year period.

.5 periodical survey;

.6 intermediate survey.

2 The surveys referred to in paragraph 1 shall be carried out as follows:

.1 the initial survey before the ship is put into service shall be such as to ensure that arrangements, equipment and systems specified below comply fully with the requirements of these Rules and Regulations and the workmanship of all such parts and equipment is in all respects satisfactory:

.1 the arrangements, materials and scantlings of the structure;

.2 boilers and other pressure vessels;

.3 main and auxiliary machinery;

.4 fire safety systems and appliances and arrangements, navigational equipment, nautical publications, means of embarkation for pilots;

.5 radio installations including those used in life-saving appliances;

.6 arrangements for the control of discharge of oil and for the retention of oil on board;

.7 provision of the lights, shapes, means of making sound signals and distress signals as required by the provisions of COLREG;

.8 the arrangements, materials and scantlings fully comply with the requirements of Chapters V relating to the conditions for assignments of load lines;

.2 the renewal survey shall include an inspection of the equipment referred to in paragraph 2.1 to ensure that it complies with the relevant requirements of these Rules and Regulations and COLREG;

.3 the periodical survey shall include an inspection with tests where necessary of the equipment to ensure that the requirements relating to the life-saving appliances, fire appliances and the light and sound signals are complied with and that they are in satisfactory condition and are fit for the service for which the ship is intended. All certificates, record books, operating manuals and other instructions and documents specified shall be checked for their adequacy.

.4 the intermediate survey shall include an inspection of items relating to the following:

.1 Construction and Equipment
.2 Stability Requirements
.3 Machinery Installation
.4 Electrical Installation
.5 Fire Protection and Fire Extinction
.6 Fire Safety Measures
.7 Life Saving Appliances
.8 Prevention of Marine Pollution

of these Rules and Regulations to ensure that they are in satisfactory condition and fit for the service for which the ship is intended. When inspecting items of hull and machinery for detailed examination, due account shall be taken of any continuous survey schemes adopted;

.5 the annual survey shall include an inspection to ensure that:

.1 the equipment referred to in paragraph 2.1 remains satisfactory for the service for which the ship is intended;

.2 alterations have not been made to the hull or superstructures which would affect the calculations determining the position of the load lines;

.3 the fittings and appliances for the protection of openings, guard rails, freeing ports and means of access to crew's quarters are maintained in an effective condition;

.6 an occasional survey either general or partial, according to the circumstances, shall be made after a repair resulting from investigations whenever an accident occurs to a ship or a defect is discovered, either of which affects the safety of the ship or whenever any important repair or renewals are effectively made;

.7 Drydocking

All classed ships shall be drydocked twice within a period of five (5) years. The next scheduled drydocking of a ship shall be undertaken on the 24th month after the last drydocking. The scheduled drydocking period (24th month) may be extended to a period not exceeding six (6) months (30th month) provided that the result of the UWI justifies such extension. No extension of the drydocking schedule beyond the 5 year drydocking cycle reckoned from the Class Survey Status Report shall be permitted.

3 The annual surveys referred to in this Regulation shall warrant issuance the certificate.

4 Where a ship complies with this Regulation partially and complies with the relevant provisions of the international conventions specified in Regulation 2/1, the Administration shall ensure that prior to issue of any certificate under this Regulation, compliance with such provisions of the other Conventions is assured.

Regulation 3

Maintenance of Condition after Survey

1 The condition of the ship and its equipment shall be maintained by the master and company to conform with the provisions of these Rules and Regulations to ensure that the ship in all respects will remain fit to proceed to sea without danger to the ship, persons on and board or the marine environment.

2 After any survey of the ship under this Chapter is completed, no change shall be made in the structural arrangements, machinery, equipment and other items covered by the survey, without the sanction of the Administration.

3 Whenever an accident occurs to the ship or a defect is discovered, either of which affects the safety of the ship or the efficiency or completeness of its life-saving appliances or other equipment, the owner or the master shall immediately request Administration or the nominated surveyor or recognized organization for additional survey.

Regulation 4

Conversion, Alteration, Modification and Re-Building

1 Ships plans and specifications shall be submitted for approval by the Administration prior construction, conversion, alteration, modifications and re-building. Said Ship Plans shall be signed and sealed by Philippine Registered Naval Architect and Marine Engineer (RENAMARE) and Professional Electrical Engineer

(PEE) for electrical plans and must be submitted in three (3) copies (blue or white print copy including electronic copy).

2 As-built Plans shall be submitted to the Administration after completion of construction, conversion, alteration or modification of ships for approval. Any conversion, alteration, modification or re-building of ship shall be subjected to re-admeasurement, re-inclining Experiment Test, re-calculation of freeboard and other re-issuances as required by the Administration.

3 The Administration shall witness the sea trial of the ship after construction, conversion, alteration, modification or re-building that will be supervised and certified by the shipyard.

4 The ships plan and or proposed conversion, alteration, modification or re-building plans of ships intended to be acquired for importation shall be subjected to pre-evaluation by the Administration prior to the issuance of the Authority to Import. Pre-evaluation shall be governed by a checklist to be formulated by MARINA.

Regulation 5
Issuance or Endorsements of Certificates

1 Subject to the provisions of Regulation 2.4, a Passenger Ship Safety Certificate, hereinafter called the Certificate, shall be issued after an initial or renewal survey, and specified in Regulation 2.2, to a ship which complies with relevant requirements of these Rules and Regulations. In any case the Administration shall ensure the completeness of the inspections prior to the issue of any certificates.

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

3 When an exemption is granted by the Administration to a ship under and in accordance with the provisions of these Rules and Regulations, an Exemption Certificate shall be issued in addition to the Certificate prescribed in this Regulation. The Exemption Certificate shall be attached to the certificate to which it refers.

Regulation 6
Duration and Validity of Certificates

1 A passenger ship safety certificate shall be issued for a period not exceeding 12 months. An exemption certificate shall not be valid for longer than the period of the certificate to which it refers.

2 Notwithstanding the requirements of paragraph 1, when the renewal survey is completed within three months before the expiry date of the existing certificate, the new certificate shall be valid from the date of completion of the renewal survey to a date not exceeding 12 months from the date of expiry of the existing certificate.

3 When the renewal survey is completed after the expiry date of the existing certificate, the new certificate shall be valid from the date of completion of the renewal survey to a date not exceeding 12 months from the date of expiry of the existing certificate;

4 When the renewal survey is completed more than three months before the expiry date of the existing certificate, the new certificate shall be valid from the date of completion of the renewal survey to a renewal survey, a date not exceeding 12 months from the date of completion of the renewal survey;

5 If a certificate is issued for a period of less than 12 months, the administration may extend the validity of the certificate beyond the expiry date to the maximum period specified in paragraph 1, provided that the surveys referred to in regulation 2 applicable when a certificate is issued for a period of 12 months are carried out, as appropriate.

6 If a renewal survey has been completed and the new certificate cannot be issued or placed on board the ship before the expiry date of the existing certificate, the person or the organization authorized by the Administration may endorse the existing certificate and such certificate shall be accepted as valid for a further period which shall not exceed one month from the expiry date.

7 If an annual survey is completed before the period specified in the relevant regulations then:

.1 the anniversary date shown on the relevant certificate shall be amended by endorsement to a date which shall not be more than three months later than the date on which the survey was completed.

.2 the subsequent annual or periodical survey required by the relevant regulations shall be completed at the intervals prescribed by these Rules and Regulations using the new anniversary date;

.3 the expiry date may remain unchanged provided one or more annual or periodical surveys, as appropriate, are carried out so that the maximum intervals between the surveys prescribed by the relevant regulations are not exceeded.

8 A certificate issued under this Chapter shall cease to be valid in any of the following cases:

.1 if the relevant surveys and inspection are not completed within the periods specified in this Chapter;

.2 if the certificate is not endorsed in accordance with this Chapter;

.3 upon transfer of the ship to the flag of another State.

9 Upon transfer of a ship to Philippine flag, a new certificate shall only be issued when the Administration is fully satisfied that the ship is in compliance with the requirements of these Rules and Regulations.

10 In case of transfer of ownership to new owner domiciled in the Philippines a new certificate shall be issued under the name of the new owner valid up to the unexpired portion of the existing certificate subject to the required surveys and endorsement.

Regulation 7
Availability of Certificates

The certified true copy of the certificates issued under this Chapter shall be readily available on board for examination at all times.

CHAPTER III

Construction and Equipment

Regulation 1
Structural, mechanical and electrical requirements for ships

In addition to the requirements contained elsewhere in the present regulations, ships shall be designed, constructed and maintained in compliance with the structural, mechanical and electrical requirements of a classification society which is recognized by the Administration in accordance with the provisions of regulation XI-1/1 of SOLAS 2014 as amended, or with applicable national standards of the Administration which provide an equivalent level of safety.

Regulation 2
Emergency towing arrangements and procedures

Emergency towing procedures on ships

1 This regulation applies to all passenger ships, not later than 1 January 2010.

2 ships shall be provided with a ship-specific emergency towing procedure carried aboard the ship for use in emergency situations and shall be based on equipment available on board the ship.

3 The procedure shall include:

.1 drawings of fore and aft deck showing possible emergency towing arrangements;
.2 inventory of equipment on board that can be used for emergency towing;
.3 means and methods of communication; and
.4 sample procedures to facilitate the preparation for and conducting of emergency towing operations.

Regulation 3
New installation of materials containing asbestos

1 This regulation shall apply to materials used for the structure, machinery, electrical installations and equipment covered by the present Convention.

2 From 1 January 2011, for all ships, new installation of materials which contain asbestos shall be prohibited.

Regulation 4
Towing and mooring equipment

1 This regulation applies to ships constructed on or after 1 January 2007, but does not apply to emergency towing arrangements provided in accordance with regulation 3-4.

2 Ships shall be provided with arrangements, equipment and fittings of sufficient safe working load to enable the safe conduct of all towing and mooring operations associated with the normal operation of the ship.

3 Arrangements, equipment and fittings provided in accordance with paragraph 2 shall meet the appropriate requirements of the Administration or an organization recognized by the Administration under regulation II/1.

4 Each fitting or item of equipment provided under this regulation shall be clearly marked with any restrictions associated with its safe operation, taking into account the strength of its attachment to the ship's structure.

Regulation 5
Means of embarkation on and disembarkation from ships

1 Ships shall be provided with means of embarkation on and disembarkation from ships for use in port and in port-related operations, such as gangways and accommodation ladders, in accordance with paragraph 2, unless the Administration deems that compliance with a particular provision is unreasonable or impractical.

2 The means of embarkation and disembarkation required in paragraph 1 shall be constructed and installed.

3 For all ships the means of embarkation and disembarkation shall be inspected and maintained in suitable condition for their intended purpose, taking into account any restrictions related to safe loading. All wires used to support the means of embarkation and disembarkation shall be maintained as specified in regulation IX/6.3.

Regulation 6
Protection against noise

1 This regulation shall apply to ships of 1,500 gross tonnage and above unless the Administration deems that compliance with a particular provision is unreasonable or impractical.

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

Ships shall be constructed to reduce onboard noise and to protect personnel from the noise in accordance with the Code on noise levels on board ships.

Chapter IV

Stability Requirements

Regulation 1
General

1 The damage stability requirements in Chapter II-1 parts B-1 through B-4 of SOLAS 2014 as amended shall apply to all passenger ships regardless of length.

2 The Administration may, for a particular ship or group of ships, accept alternative methodologies if it is satisfied that at least the same degree of safety as represented by these regulations is achieved.

3 Ships shall be as efficiently subdivided as is possible having regard to the nature of the service for which they are intended. The degree of subdivision shall vary with the subdivision length of the ship and with the service, in such manner that the highest degree of subdivision corresponds with the ships of greatest subdivision length (L), primarily engaged in the carriage of passengers.

4 Where it is proposed to fit decks, inner skins or longitudinal bulkheads of sufficient tightness to seriously restrict the flow of water, the Administration shall be satisfied that proper consideration is given to beneficial or adverse effects of such structures in the calculations.

Regulation 2
Intact Stability

1 Every passenger ship regardless of size shall be inclined upon its completion and the elements of its stability determined in addition to any other applicable requirements of the present regulations.

2 Where any alterations are made to a ship so as to materially affect the stability information supplied to the master, amended stability information shall be provided. If necessary, the ship shall be re-inclined. The ship shall be re-inclined if anticipated deviations exceed one of the values specified in paragraph 3.

3 At periodical intervals not exceeding five years, a lightweight survey shall be carried out on all passenger ships to verify any changes in lightship displacement and longitudinal center of gravity. The ship shall be re-inclined whenever, in comparison with the approved stability information, a deviation from the lightship displacement exceeding 2% or a deviation of the longitudinal center of gravity exceeding 1% of L is found or anticipated.

4 Every ship shall have scales of draughts marked clearly at the bow and stern. In the case where the draught marks are not located where they are easily readable, or operational constraints for a particular trade make it difficult to read the draught marks, then the ship shall also be fitted with a reliable draught indicating system by which the bow and stern draughts can be determined.

Regulation 3
Inclining Tests and Stability Information

1 Domestic ships shall be subjected to an inclining test to be conducted by a duly licensed Naval Architect (RENA) or other qualified/trained technical personnel from the MARINA, with the needed notification and preparations to be made by the company/shipyard Naval Architect. If the inclining test for domestic ships is to be conducted by a recognized organization or accredited marine surveying company, it shall be undertaken under the supervision of a MARINA (RENA) or other qualified/ trained technical personnel, pursuant to Chapter 7, Sec. 7.3.1 of the Code on Intact Stability, to ensure compliance with the Code, with the concerned organization/company assuming the responsibility to ensure strict observance of this requirement.

2 Domestic ships covered and found to be in compliance with these rules and regulations, based on the result of the inclining test, together with the supporting plans, calculations, etc. shall be issued the required Certificate of Stability by the MARINA, with effectivity reckoned from the date the test/survey was conducted. If the test, calculations and evaluation of a domestic ship is undertaken by an accredited/recognized organization, the results thereof shall be submitted to the MARINA for validation, approval and subsequent issuance by the MARINA of the required Certificate of Stability valid for five (5) years reckoned from the date the test/ survey was conducted.

3 Ships not covered shall be issued by the MARINA an Exemption Certificate.

4 In the case of a ship already issued with a Certificate of Stability, where alterations are made affecting its light condition or the position of the center of gravity, or both, such ship shall be subjected to re-inclining test and its stability information amended.

5 The MARINA may allow the inclining test of a ship to be dispensed with, provided that reliable stability information for such ship can be obtained from a basic data available, or there are available reference to existing data for similar class of ships/sister ships and it is shown to the satisfaction of the Administration that reliable stability information for the exempted ship can be obtained from such basic data. In the case of ships especially designed for the carriage of liquids or ore in bulk, the required inclining test may be dispensed with by the MARINA when reference to existing data for similar ships clearly indicates that, due to the ship's proportions and arrangements, more than sufficient transverse metacentric height will be available in all probable loading conditions.

6 Intact Stability Booklets approved by the MARINA shall be supplied to the concerned ship to enable its Master to assess with ease and certainty the stability of the ship under various operating conditions, warning him of those operating conditions that could adversely affect either stability or the trim of the ship.

Regulation 4
Subdivision and Damage Stability

1 The requirements under Resolution MSC.216 (82) and MSC.281 (85), adopting the regulations on subdivision and damage stability as contained in SOLAS Chapter II-1 which are based on the probabilistic concept, using the probability of

survival as a measure of ships' safety in a damaged condition, and subsequent MARINA circulars, are hereby adopted.

2 All ships covered shall be subjected to, and be in compliance with standards, requirements and criteria provided under the Damage Stability Regulation (SOLAS Chapter II-1).

3 In the case of a ship with approved Damage Stability Booklet, where conversion, modifications and alterations are made affecting its righting moment of the ship, such ship shall be subjected to recalculation of damage stability.

4 All ships shall keep a copy of the approved Damage Stability Booklet on board at all times.

Regulation 5
Bilge Pumping Arrangements

1 An efficient bilge pumping arrangement shall be provided which under all practical conditions shall be capable of pumping from and draining any watertight compartment other than a space permanently appropriated for the carriage of fresh water, water ballast, oil fuel or other liquid for which other efficient means for pumping are provided. Where the Administration is satisfied that the safety of the ship is not impaired, the bilge pumping arrangements may be dispensed with in any particular compartment. Bilge pumping arrangement shall be of a type approved by the administration.

2 The arrangement of the bilge and ballast pumping system shall be such as to prevent possibility of water passing from the sea and from water ballast spaces into the cargo and machinery spaces, or from one compartment to another.

3 All distribution boxes and manually operated valves in connection with bilge pumping arrangements shall be in positions which are accessible under ordinary circumstances.

4 At least two bilge pumps connected to the main bilge system shall be provided, one of which may be driven by the propulsion machinery. The total capacity of the required bilge pumps shall not be less than 125 percent of the total capacity of the required main fire pump referred to these Rules and Regulations.

5 Sanitary, ballast and general services pumps provided with suitable connections for bilge suction may be accepted as independent power bilge pumps.

6 A bilge ejector in combination with an independently driven high-pressure sea-water pump may be installed, provided this arrangement is to the satisfaction of the Administration. Bilge pipes shall not be led through fuel oil, ballast or double bottom tanks, unless pipes are of heavy gauge steel construction.

Regulation 6
Stability information to be supplied to the master

1 The master shall be supplied with such information satisfactory to the Administration as is necessary to enable him by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service. A copy of the stability information shall be furnished to the Administration.

2 The information should include:

.1 curves or tables of minimum operational metacentric height (GM) versus draught which assures compliance with the relevant intact and damage stability requirements, alternatively corresponding curves or tables of the maximum allowable vertical center of gravity (KG) versus draught, or with the equivalents of either of these curves;

.2 instructions concerning the operation of cross-flooding arrangements; and

.3 all other data and aids which might be necessary to maintain the required intact stability after damage.

3 The stability information shall show the influence of various trims in cases where the operational trim range exceeds ± 0.5% of L.

4 For ships which have to fulfil the stability requirements of stability, information referred to in paragraph 2 is determined from considerations related to the subdivision index, in the following manner: Minimum required GM (or maximum permissible vertical position of center of gravity KG) for the three draughts d_s, d_p and $d_\backslash$ are equal to the GM (or KG values) of corresponding loading cases used for the calculation of survival factors. For intermediate draughts, values to be used shall be obtained by linear interpolation applied to the GM value only between the deepest subdivision draught and the partial subdivision draught and between the partial load line and the light service draught respectively. Intact stability criteria will also be taken into account by retaining for each draft the maximum among minimum required GM values or the minimum of maximum permissible KG values for both criteria. If the subdivision index is calculated for different trims, several required GM curves will be established in the same way.

When curves or tables of minimum operational metacentric height (GM) versus draught are not appropriate, the master should ensure that the operating condition does not deviate from a studied loading condition, or verify by calculation that the stability criteria are satisfied for this loading condition.

Chapter V

Assignment of Load Line

Regulation 1
General

1 The International Convention on Load Lines (ICLL) 1966, Protocol of 1988, as amended, are hereby adopted to apply to Philippine-registered international or domestic ships 15 meters and above in length. The value of 200 mm in the Convention's tabular freeboard for 24 meters in length shall also be adopted down to 15 meters in length.

2 Ships between 15 m and 24 m in length, to which this Chapter applies, shall not proceed to sea unless surveyed, marked and certified in accordance with the provisions of these Rules and Regulations

3 No domestic ship shall proceed to sea on domestic trading unless it has been surveyed and marked, and issued a Load Line Certificate by the MARINA.

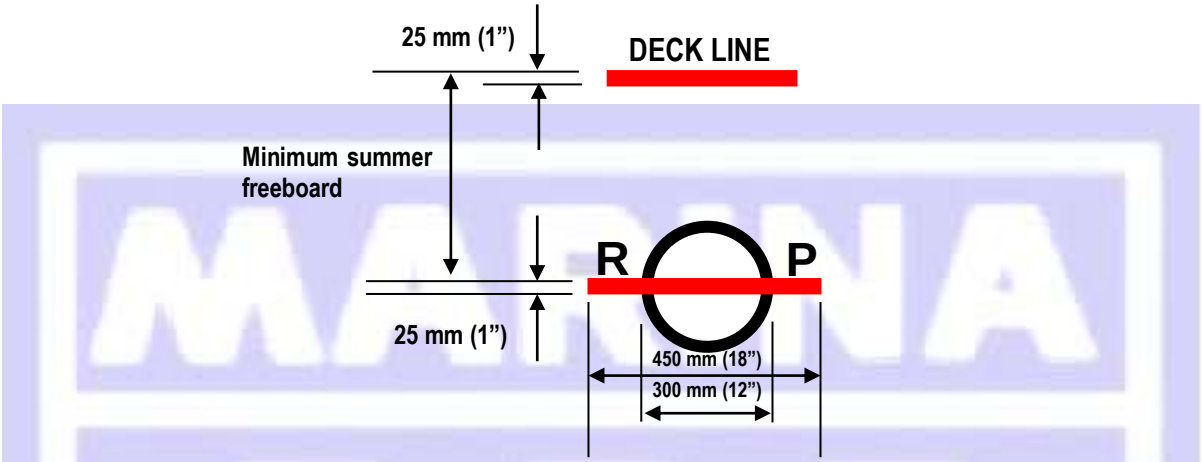
4 Details of Load Line Markings

.1 Deck Line – it is a horizontal line 300mm (12 inches) in length and 25mm (1 inch) in breadth. It shall be marked amidships on each side of the ship, and each upper edge shall normally pass through the point where the continuation outwards of the upper surface of the freeboard deck intersects the outer surface of the shell, provided that the deck line may be placed with reference to another fixed point on the ship on condition that the freeboard is correspondingly corrected. The location of the reference point and the identification of the freeboard deck shall in all cases be indicated on the Load Line Certificate. The ring, lines and letters shall be painted in white or yellow on a dark ground or in black on a light ground. They shall also be permanently marked on the sides of the ships to the satisfaction of the Administration. The marks shall be plainly visible and, if necessary, special arrangements shall be made for this purpose.

.2 Load Line Mark – The load line mark shall consist of a ring 300mm (12 inches) in outside diameter and 25mm (1 inch) wide which is intersected by a horizontal line 450mm (18 inches) in length and 25mm (1 inch) in breadth, the upper edge of which passes through the center of the ring. The center of the ring shall be placed amidships and at a distance equal to the assigned summer freeboard measured vertically below the upper edge of the deck line.

.3 The Ring – The ring, lines and letters shall be painted in white or yellow on a dark background or in black on a light background. They shall also be permanently marked on the sides of the ships to the satisfaction of the Administration. The marks shall be plainly visible and, if necessary, special arrangements shall be made for this purpose.

.4 Load Line Mark Illustration :



5 In cases where a MARINA authorized Load Line Assignor or Recognized Organization undertake the survey, assignment and marking of load line, it shall guarantee the completeness and efficiency of the survey, inspection and marking, subject to the verification and approval by the Administration. A MARINA Surveyor shall be present during the conduct of the survey by the authorized load line assignor/recognized organization to ensure compliance with the ILCC and this Circular, with the concerned load line assignor/recognized organization assuming the responsibility to ensure strict observance of this requirement.

6 A new Load Line Certificate shall be issued if there are changes in the ship's name, distinctive numbers or letters, homeport and length.

7 A Load Line Certificate shall be valid for a period not exceeding five (5) years from the date of issue. It shall be endorsed annually by the MARINA, and ceases to be valid if no endorsement has been made. A Load Line Certificate issued upon recommendation of a recognized organization shall likewise be endorsed by the Administration.

8 A Certificate not endorsed after three (3) months of its anniversary date of issuance shall cease to be valid, in which case, a new Certificate will need to be issued upon application and completion of an afloat survey, and the new Certificate to be issued shall have the same expiry as the previous Certificate.

9 Other Safety Certificate(s) shall not be issued/ renewed if the ship has no Load Line Certificate or if the Load Line Certificate ceases to be valid.

10 If the Load Line Certificate ceases to be valid or cancelled by virtue of Article 19, Sec. 3 of the ILLC, as officially ordered by the Administration, the other Safety Certificate(s) issued to the ship is/are deemed automatically suspended and the ship is under a "no sail condition". The cessation of validity of the Load Line Certificate and suspension of other Safety Certificate(s) is effected by the issuance of an Order by the MARINA, based on the report and recommendation of the MARINA Central Service Units and MARINA Regional Offices or the Enforcement Service, as endorsed by the former.

11 The Master of the ship under a “no sail condition” is under obligation to warrant that such ship shall not proceed to voyage.

Regulation 2
Submersion

1 Except as provided in Regulation 1.4, the appropriate load lines on the sides of the ship corresponding to the season of the year and the zone or area in which the ship may be, shall not be submerged at any time when the ship is put to sea, during the voyage or on arrival.

2 When a ship is in fresh water of unit density, the appropriate load line may be submerged by the amount of fresh water allowance shown on the appropriate certificate issued under the provision of these Rules and Regulations. Where the density is other than unity, an allowance shall be made proportional to the difference between 1.025 and the actual density.

3 When a ship departs from a port situated on a river or inland waters, deeper loading shall be permitted corresponding to the weight of fuel and all other materials required for consumption between the point of departure and the sea.

Regulation 3
Survey and Certification

1 The Administration shall henceforth principally undertake the conduct of survey/inspection, assignment and marking of load lines and issuance of Load Line Certificates, through its Registered Naval Architect (RENA).

2 The MARINA and its duly- authorized entities shall ensure that ships holding a valid Load Line Certificate is not loaded beyond the limit allowed in the Certificate, and the position of the Load Line of the ship also corresponds with the specification in the Certificate.

3 MARINA or the accredited Load Line Assignor shall survey the ship to ascertain the following:

.1 Whether the ship complies with the requirements as applicable to the ship, as well as such other data as may be necessary for assignment of freeboard to the ship in accordance with freeboard requirement per International Convention on Load Line, 1966 as modified by the Protocol of 1988.

.2 In the course of the survey to be carried out, the ship and any of its fittings or equipment shall be subjected to such tests if necessary, in the opinion of the MARINA RENA or Load Line Assignor.

.3 Test carried out as to stability shall be subject to the requirements of Regulation 10 of ICLL 1966 as modified by the Protocol of 1988.

.4 A ship shall be subjected to survey/inspection as specified below;

.1 A survey before the ship is put to service to ensure that the arrangements, materials and scantlings fully comply with the requirements of the ICLL 1966 as amended;

.2 A periodical inspection within three (3) months before and after the annual anniversary date of the Load Line Certificate to

verify marking and ensure that alterations have not been made to the hull or superstructure of the ship which would affect the calculations determining the position of the Load Line marking. 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 as 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.

.3 Survey also includes the effective maintenance conditions of fittings and appliance for;

.1 Protection of openings
.2 Freeing ports
.3 Other openings
.4 Guard rails
.5 Means of access going to deck below main deck.

.4 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.

.5 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.

Regulation 4
Draught Marks and Scales

All ships shall show on the bow and the stern, on each side, engraved or welded for steel ships, shown in an equivalent manner for structures of materials other than steel, 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 5
Strength of the Ship

The general structural strength of the ship shall be sufficient for the draught corresponding to the freeboard assigned to the satisfaction of the Administration. Ships built and maintained in conformity with the requirements of a classification society accredited by the Administration, may be considered to possess adequate strength.

Regulation 6
Assumptions

This regulation assumes that the nature and stowage of the cargo, ballast, etc. are such as to; secure sufficient stability of the ship and the avoidance of excessive structural stress and that applicable international requirements relating to stability or subdivision, are complied with.

Regulation 7
Marks of Assigning Authority

The mark of the authority by whom the load lines are assigned may be indicated alongside the load line ring above the horizontal line which passes through the center of the ring, or above and below it. This mark shall consist of two initials consist of letters R and P to identify the authority's name, each measuring approximately 115 mm in height and 75 mm in width.

Regulation 8
Verification of Marks

The Load Line Certificate shall not be issued to the ship until the MARINA Surveyor has certified that the marks are correctly and permanently indicated on the ship's sides.

Regulation 9
Information to be Supplied to the Master

1 The master of each new ship which is not already provided with stability information, shall be supplied with sufficient information, in an approved form, to enable him to arrange for the loading and ballasting of his ship in such a way as to avoid the creation of any unacceptable stresses in the ship's structure, provided that this requirement need not apply to any particular length, design or class of ship where the Administration considers it to be unnecessary.

2 Stability information approved by the Administration shall be supplied to ships to enable the master to assess with ease and certainty the stability of the ship under various operating conditions. Such information shall include specific instructions to the master warning him of those operating conditions which could adversely affect either stability or the trim of the ship. In particular, the information recommended in the Code shall be included as appropriate.

3 The approved stability information shall be kept on board, readily accessible at all times and inspected at the periodical surveys of the ship to ensure that it has been approved.

Regulation 10
Superstructure End Bulkheads

Bulkheads at exposed ends of the enclosed superstructures shall be of substantial construction and shall be to the satisfaction of the Administration.

Regulation 11
Doors

1 All access openings in bulkheads at ends of enclosed superstructures shall be fitted with doors of steel or other equivalent material, permanently and strongly attached to bulkhead, and framed, stiffened and fitted so that the whole structure is of equivalent strength to the unpierced bulkhead and weathertight when closed. The means for securing these doors weathertight shall consist of gaskets and clamping devices or equivalent means and shall be permanently attached to the bulkheads or to the doors themselves. The doors shall be so arranged that they can be operated from both sides of the bulkhead.

2 Except as otherwise provided, the height of the sill of access openings in bulkheads at ends of enclosed superstructures shall be at least 300 mm above the deck.

Regulation 12
Position of Hatchways, Doorways and Ventilators

For the purpose of this regulation, two positions of hatchways, doorways and ventilators are defined as follows:

1 Position 1 - Upon exposed freeboard and raised quarter decks, and upon exposed superstructure decks situated forward of a point located a quarter of the ship's length from the forward perpendicular.

2 Position 2 - Upon exposed superstructure decks situated abaft a quarter of the ship's length from the forward perpendicular.

Regulation 13
Cargo and Other Hatchways

1 The construction and the means for securing the weather-tightness of cargo and other hatchways in positions 1 and 2 shall be at least equivalent to the requirements of these Regulations.

2 Coamings and hatchway covers to exposed hatchways on decks above the superstructure deck shall comply with the requirements of the Administration.

Regulation 14
Hatchways Closed by Portable Covers and Secured Weathertight by Tarpaulins and Battening Devices

1 The coamings of hatchways closed by portable covers secured weathertight by tarpaulins and battening devices shall be of substantial construction, and their height above the deck shall be at least as follows:

.1 450 mm if in position 1;

.2 300 mm if in position 2.

2 The width of each bearing surface for hatchway covers shall be at least 65 mm.

3 Where covers are made of wood, the finished thickness shall be at least 60 mm in association with a span of not more than 1.5 m.

4 Where covers are made of mild steel the strength shall be calculated with assumed loads of not less than 1 metric tons per square meter on hatchways in position 1, and not less than 0.75 metric tons per square meter on hatchways in position 2, and the product of the maximum stress thus calculated and the factor 4.25 shall not exceed the minimum ultimate strength of the material. They shall be so designed as to limit the deflection to not more than 0.0028 times the span under these loads.

5 Cleats shall be set to fit the taper of the wedges. They shall be at least 65 mm wide and spaced not more than 600 mm center to center, the cleats along each side or end shall be not more than 150 mm from the hatch comers.

6 Battens and wedges shall be efficient and in good condition. Wedges shall be of tough wood or other equivalent material. They shall have a taper of not more than 1 in 6 and shall be not less map 13 mm thick at the toes.

7 At least two layers of tarpaulin in good condition shall be provided for each hatchway in position 1 or 2. The tarpaulins shall be of waterproof and of ample strength. They shall be of a material of at least an approved standard weight and quality.

8 For all hatchways in position 1 or 2, steel bars or other equivalent means shall be provided in order to secure efficiently and independently each section of hatchway covers after the tarpaulins are battened down. Hatchway covers of more than 1.5 m in length shall be secured by at least two such securing appliances.

Regulation 15

Hatchways Closed by Weathertight Covers of Steel or Other Equivalent Material Fitted with Gaskets and Clamping Devices

1 At positions 1 and 2, the height above the deck of hatchway coamings fitted with weathertight hatch covers of steel or other equivalent material fitted with gaskets and clamping devices shall be as specified. The height of these coamings may be reduced, or the coamings omitted entirely, on condition that the safety of the ship is not thereby impaired in any sea conditions to the satisfaction of the Administration. Where coamings are provided they shall be of substantial construction.

2 Where weathertight covers are of mild steel, the strength shall be calculated as provided.

3 The strength and stiffness of covers made of materials other than mild steel shall be equivalent to those of mild steel to the satisfaction of the Administration.

The means for securing and maintaining weather-tightness shall be to the satisfaction of the Administration. The arrangements shall ensure that the tightness can be maintained in any sea condition, and for this purpose, tests for tightness shall be required at the initial survey, and may be required at periodical surveys and at annual inspections or at more frequent intervals.

Regulation 16
Machinery Space Openings

1 Machinery space openings in positions 1 and 2 shall be properly framed and efficiently enclosed by steel casings of any ample strength. Access openings in such casings shall be fitted with doors complying with the requirements, the sills of which shall be at least 450 mm above the deck if in position 1, and at least 300 mm above the deck if in position 2. Other openings in such casings shall be fitted with equivalent covers, permanently attached in their proper positions.

2 Coamings of any fiddley, funnel, or machinery space ventilator in an exposed position on the freeboard or superstructure deck shall be as high above the deck as is reasonable and practicable. Fiddley openings shall be fitted with strong covers of steel or other equivalent material permanently attached in their proper positions and capable of being secured weathertight.

Regulation 17
Openings in Freeboard and Superstructure Decks

1 Manholes and flush scuttles in position 1 or 2 or within superstructures other than enclosed superstructures shall be closed by substantial covers capable of being made watertight. Unless secured by closely spaced bolts, the covers shall be permanently attached.

2 Openings in freeboard decks other than hatchways, machinery space openings, manholes and flush scuttles shall be protected by an enclosed superstructure, or by a deckhouse or companionway of equivalent strength and weather-tightness. Any such opening in an exposed superstructure deck or in the top of a deckhouse on the freeboard deck which gives access to a space below the freeboard deck or a space within an enclosed superstructure shall be protected by an efficient deckhouse or companionway. Doorways in such deckhouses or companionways shall be fitted with doors complying with the requirements.

3 In position 1, the height above the deck of sills to the doorways in companionways shall be at least 450 mm. In position 2, it shall be at least 300 mm.

Regulation 18
Ventilators

1 Ventilators in position 1 or 2 to spaces below freeboard decks or decks of enclosed superstructures shall have coamings of steel or other equivalent material, substantially constructed and efficiently connected to the deck. Where the coaming of any ventilator exceeds 760 mm in height it shall be specially supported.

2 Ventilators passing through superstructures other than enclosed superstructures shall have substantially constructed coamings of steel or other equivalent material at the freeboard deck.

3 Ventilators in position 1 of the coamings of which extend to more than 2.5 m above the deck; and in position 2 the coamings of which extend to more than 1.0 m above the deck, need not be fitted with closing arrangements unless specifically required by the Administration.

4 Ventilators in position 1 shall have coamings of a height of at least 600 mm above the deck; in position 2 of the coaming shall be of a height at least 300 mm above the deck. They shall be provided with efficient weathertight closing appliances which shall be conveniently stowed near the ventilators to which they are to be fitted.

5 In exposed position, the height of coamings may be required to be increased to the satisfaction of the Administration.

Regulation 19
Air Pipes

Where air pipes to ballast and other tanks extend above the freeboard or superstructure decks, the exposed parts of the pipes shall be of substantial construction; the height from the deck to the point where water may have access below shall be at least 600 mm on the freeboard deck and 300 mm on the superstructure deck. Where these heights may interfere with the working of the ship, a lower height may be approved, provided the Administration is satisfied that the closing arrangements and other circumstances justify a lower height. Satisfactory means permanently attached shall be provided for closing the openings of the air pipes.

Regulation 20
Cargo Ports and Other Similar Openings

1 Cargo ports and other similar openings in the sides of ships below the freeboard deck shall be fitted with doors so designed as to ensure water tightness and structural integrity commensurate with the surrounding shell plating. The number of such openings shall be the minimum compatible with the design and proper working of the ship.

2 Unless permitted by the Administration, the lower edge of such openings shall not be below a line drawn parallel to the freeboard deck at side, which has at its lowest point the upper edge of the uppermost load line.

Regulation 21
Scuppers, Inlets and Discharges

1 Discharges led through the shell either from spaces below the freeboard deck or from within superstructures and deckhouses on the freeboard deck fitted with doors complying with the requirements shall be fitted with efficient and accessible means for preventing water from passing inboard. Normally each separate discharge shall have one automatic non-return valve with a positive means of closing it from a position above the freeboard deck. The means for operating the positive action valve shall be readily accessible and be provided with an indicator showing whether the valve is open or closed. The open inboard end of any discharge system shall be above the deepest operating waterline at an angle of heel satisfactory to the Administration.

2 In manned machinery spaces, main and auxiliary sea inlets and discharges in connection with the operation of machinery may be controlled locally. The controls

shall be readily accessible and shall be provided with indicators showing whether the valves are open or closed.

3 Scuppers and discharge pipes originating at any level and penetrating the shell either more than 450 mm below the freeboard deck or less than 600 mm above the summer load waterlines shall be provided with a non-return valve at the shell. This valve, unless required in paragraph 1, may be omitted if the piping is of substantial thickness.

4 Scuppers leading from superstructures or deckhouses not fitted with doors complying with the requirements shall be led overboard.

5 All valves and shell fittings required by this Regulation shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable. All pipes to which this Regulation refers shall be of steel or other equivalent material to the satisfaction of the Administration.

Regulation 22
Side Scuttles, Windows and Other Openings

1 Side scuttles to spaces below the freeboard deck or to spaces within enclosed superstructures shall be fitted with efficient hinged inboard deadlights arranged so that they can be effectively closed and secured watertight.

2 No side scuttle shall be fitted in a position so that its sill is below a line drawn parallel to the freeboard deck at side and having its lowest point 500 mm above the load waterline.

3 The side scuttles, together with their glasses, if fitted, and deadlights shall be of substantial and approved construction.

4 The Administration may accept side scuttles and windows without deadlights in side or aft bulkheads of superstructures located on or above the freeboard deck if satisfied that the safety of the ship will not be impaired.

5 The number of openings in the side of the ship below the freeboard deck shall be the minimum compatible with the design and proper working of the ship and such openings shall be provided with closing arrangement of adequate strength to ensure water-tightness and the structural integrity of the surrounding structure.

Regulation 23
Freeing Ports

1 Where bulwarks on the weather portions of freeboard or superstructure decks form wells, ample provision shall be made for rapidly freeing the decks of water and for draining them. Except as provided in this Regulation, the minimum freeing port area (A) on each side of the ship for each well on the freeboard deck shall be that given by the following formula in cases where the sheer in way of the well is standard or greater than standard. The minimum area of each well on superstructure decks shall be one-half of the area given by the formula:

Where the length of bulwark (1) in the well is 20 m or less:

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

where exceeds 20 m:

A = 0.07 (1) square meters.

(1) need in no case be taken as greater than 0.7 L.

If the bulwark is more than 1.2 m in average height, the required area shall be increased by 0.004 square meters per meter of length of well for each 0.1 m difference in height. If the bulwark is less than 0.9 m in average height, the required area may be decreased by 0.004 square meters per meter of length of well for each 0.1 difference in height.

2 In ships with no sheer, the area calculated according to paragraph 1 shall be increased by fifty percent (50%). Where the sheer is less than the standard, the percentage shall be obtained by interpolation.

3 Where a ship is fitted with a trunk and open rails are not fitted on the weather part of the freeboard deck in way of the trunk for at least half their length or where continuous or substantially continuous hatchway side coamings are fitted between detached superstructures, the minimum area of the freeing port openings shall be calculated from the following table:

BREADTH OF HATCHWAY OR TRUNK IN RELATION TO THE BREADTH OF SHIP	AREA OF FREEING PORTS IN RELATION TO THE TOTAL AREA OF THE BULWARKS
40 percent or less	20 percent
75 percent or more	10 percent

The area of freeing ports at intermediate breadths shall be obtained by linear interpolation.

4 In ships having superstructures which are open at either or both ends, adequate provision for freeing the space within such superstructures shall be provided to the satisfaction of the Administration.

5 The lower edges of the freeing ports shall be as near the deck as practicable. Two-thirds of the freeing port area required shall be provided in the half of the well nearest the lowest point of the sheer curve.

6 All such openings in bulwarks shall be protected by rails or bars spaced approximately 230 mm apart. If shutters are fitted to freeing ports, ample clearance shall be provided to prevent jamming. Hinges shall have pins or bearings of non-corrosive material. If shutters are fitted with securing appliances, these appliances shall be of approved construction.

Regulation 24
Protection of the Crew and Passengers

1 The strength of the deckhouses used for the accommodations shall be to the satisfaction of the Administration.

2 Efficient guard rails or bulwarks shall be fitted on all exposed parts of the freeboard and superstructure decks. The height of the bulwarks or guard rails shall be at least 1m from the deck, provided that where this height would interfere with the normal operation of the ship, a lesser height may be approved if the Administration is satisfied that adequate protection is provided but in no case a height of less than 600 mm shall be permitted.

3 The opening below the lowest course of the guard rails shall not exceed 230 mm. The other courses shall be not more than 380 mm apart. In the case of ships with rounded gunwales the guard rail supports shall be placed on the flat of the deck.

4 Satisfactory means (in the form of guard rails, life lines, gangways or underdeck passages etc.) shall be provided for the protection of the crew in getting to and from their quarters, the machinery space and all other parts used in the necessary work of the ship.

5 Deck cargo carried on any passenger ship shall be so stowed that any opening which is in way of the cargo and which gives access to and from the crew's quarters, the machinery space and all other parts used in the necessary work of the ship, can be properly closed and secured against the admission of water. Effective protection for the crew in the form of guard rails or life lines shall be provided above the deck cargo if there is no convenient passage on or below the deck of the ship.

Regulation 25
Cancellations

An International Load Line Certificate shall cease to be valid if any of the following circumstances exist:

1 material alterations have taken place in the hull or superstructures of the ship such as would necessitate the assignment of an increased freeboard;
2 the fittings and appliances are not maintained in an effective condition;
3 the certificate is not endorsed to show that the ship has been surveyed;
4 the structural strength of the ship is lowered to such an extent that the ship is unsafe;
5 tampering of load line marks.

CHAPTER VI

Machinery Installations and Equipment

Regulation 1
General Requirements

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

2 The Administration shall give special consideration to the reliability of single essential propulsion components and may require a separate source of propulsion power sufficient to give the ship a navigable speed, especially in the case of unconventional arrangements.

3 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 steam supply;
.3 the boiler feedwater systems;
.4 the fuel oil supply systems for boilers or engines;
.5 the sources of lubricating oil pressure;
.6 the sources of water pressure;
.7 a condensate pump and the arrangements to maintain vacuum in condensers;
.8 the mechanical air supply for boilers;
.9 an air compressor and receiver for starting or control purposes;
.10 the hydraulic, pneumatic or electrical means for control in main propulsion machinery including controllable pitch propellers.

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

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

5 All boilers, all parts of machinery, all steam, hydraulic, pneumatic and other systems and their associated fittings which are under internal pressure shall be subjected to appropriate tests including a pressure test before being put into service for the first time.

6 Main propulsion machinery and all auxiliary machinery essential to the propulsion and the safety of the ship shall, as fitted in the ship, be designed to

operate when the ship is upright and when inclined at any angle of list up to and including 15° either way under static conditions and 22.5° under dynamic conditions (rolling) either way and simultaneously inclined dynamically (pitching) 7.5° by bow or stern. The Administration may permit deviation from these angles, taking into consideration the type, size and service conditions of the ship.

7 Provision shall be made to facilitate cleaning, inspection and maintenance of main propulsion and auxiliary machinery including boilers and pressure vessels.

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

9 Non-metallic expansion joints in piping systems, if located in a system which penetrates the ship's side and both the penetration and the non-metallic expansion joint are located below the deepest load waterline, shall be inspected as part of the surveys and replaced as necessary, or at an interval recommended by the manufacturer.

10 Operating and maintenance instructions and engineering drawings for ship machinery and equipment essential to the safe operation of the ship shall be written in a language understandable by those officers and crew members who are required to understand such information in the performance of their duties.

11 Location and arrangement of vent pipes for fuel oil service, settling and lubrication oil tanks shall be such that in the event of a broken vent pipe this shall not directly lead to the risk of ingress of seawater splashes or rainwater. Two fuel oil service tanks for each type of fuel used on board necessary for propulsion and vital systems or equivalent arrangements shall be provided on each new ship, with a capacity of at least 8 h at maximum continuous rating of the propulsion plant and normal operating load at sea of the generator.

Regulation 2
Machinery

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

2 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.

3 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, and due consideration shall be given to the type of engines by which they are driven or of which they form part.

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

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

Regulation 3
Means of 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 maneuver with one or more propellers inoperative, shall be available on board for the use of the master or designated personnel.

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

Regulation 4
Steering gear

1 Unless expressly provided otherwise, every ship shall be provided with a main steering gear and an auxiliary steering gear to the satisfaction of the Administration. The main steering gear and the auxiliary steering gear shall be so arranged that the failure of one of them will not render the other one inoperative.

2 All the steering gear components and the rudder stock shall be of sound and reliable construction to the satisfaction of the Administration. Special consideration shall be given to the suitability of any essential component which is not duplicated. Any such essential component shall, where appropriate, utilize antifriction bearings such as ball-bearings, roller-bearings or sleeve-bearings which shall be permanently lubricated or provided with lubrication fittings.

3 The design pressure for calculations to determine the scantlings of piping and other steering gear components subjected to internal hydraulic pressure shall be at

least 1.25 times the maximum working pressure to be expected under the operational conditions specified in paragraph 5.2, taking into account any pressure which may exist in the low-pressure side of the system. At the discretion of the Administration, fatigue criteria shall be applied for the design of piping and components, taking into account pulsating pressures due to dynamic loads.

4 Relief valves shall be fitted to any part of the hydraulic system which can be isolated and in which pressure can be generated from the power source or from external forces. The setting of the relief valves shall not exceed the design pressure. The valves shall be of adequate size and so arranged as to avoid an undue rise in pressure above the design pressure.

5 The main steering gear and rudder stock shall be:

.1 of adequate strength and capable of steering the ship at maximum ahead service speed which shall be demonstrated;

.2 capable of putting the rudder over from 35° on one side to 35° on the other side with the ship at its deepest seagoing draught and running ahead at maximum ahead service speed and, under the same conditions, from 35° on either side to 30° on the other side in not more than 28 s;

.3 operated by power where necessary to meet the requirements of paragraph 5.2 and in any case when the Administration requires a rudder stock of over 120 mm diameter in way of the tiller, excluding strengthening for navigation in ice; and

.4 so designed that they will not be damaged at maximum astern speed; however, this design requirement need not be proved by trials at maximum astern speed and maximum rudder angle.

6 The auxiliary steering gear shall be:

.1 of adequate strength and capable of steering the ship at navigable speed and of being brought speedily into action in an emergency;

.2 capable of putting the rudder over from 15° on one side to 15° on the other side in not more than 60 s with the ship at its deepest seagoing draught and running ahead at one half of the maximum ahead service speed or 7 knots, whichever is the greater; and

.3 operated by power where necessary to meet the requirements of paragraph 6.2 and in any case when the Administration requires a rudder stock of over 230 mm diameter in way of the tiller, excluding strengthening for navigation in ice.

7 Main and auxiliary steering gear power units shall be:

.1 arranged to restart automatically when power is restored after a power failure; and

.2 capable of being brought into operation from a position on the navigation bridge. In the event of a power failure to any one of the steering gear power units, an audible and visual alarm shall be given on the navigation bridge.

8 Where the main steering gear comprises two or more identical power units, an auxiliary steering gear need not be fitted, provided that:

.1 in a passenger ship, the main steering gear is capable of operating the rudder as required by paragraph 5.2 while any one of the power units is out of operation;

.2 the main steering gear is so arranged that after a single failure in its piping system or in one of the power units the defect can be isolated so that steering capability can be maintained or speedily regained.

9 The Administration may, until 1 September 1986, accept the fitting of a steering gear which has a proven record of reliability but does not comply with the requirements of paragraph 8.2 for a hydraulic system.

10 Steering gears, other than of the hydraulic type, shall achieve standards equivalent to the requirements of this paragraph to the satisfaction of the Administration.

11 Steering gear control shall be provided:

.1 for the main steering gear, both on the navigation bridge and in the steering gear compartment;

.2 where the main steering gear is arranged in accordance with paragraph 6, by two independent control systems, both operable from the navigation bridge. This does not require duplication of the steering wheel or steering lever. Where the control system consists of a hydraulic telemotor, a second independent system need not be fitted;

.3 for the auxiliary steering gear, in the steering gear compartment and, if power-operated, it shall also be operable from the navigation bridge and shall be independent of the control system for the main steering gear

12 Any main and auxiliary steering gear control system operable from the navigation bridge shall comply with the following:

.1 if electric, it shall be served by its own separate circuit supplied from a steering gear power circuit from a point within the steering gear compartment, or directly from switchboard busbars supplying that steering gear power circuit at a point on the switchboard adjacent to the supply to the steering gear power circuit;

.2 means shall be provided in the steering gear compartment for disconnecting any control system operable from the navigation bridge from the steering gear it serves;

.3 the system shall be capable of being brought into operation from a position on the navigation bridge;

.4 in the event of a failure of electrical power supply to the control system, an audible and visual alarm shall be given on the navigation bridge; and

.5 short circuit protection only shall be provided for steering gear control supply circuits.

13 The electrical power circuits and the steering gear control systems with their associated components, cables and pipes shall be separated as far as is practicable throughout their length.

14 A means of communication shall be provided between the navigation bridge and the steering gear compartment.

15 The angular position of the rudder shall:

.1 if the main steering gear is power-operated, be indicated on the navigation bridge. The rudder angle indication shall be independent of the steering gear control system;
.2 be recognizable in the steering gear compartment.

16 Hydraulic power-operated steering gear shall be provided with the following:

.1 arrangements to maintain the cleanliness of the hydraulic fluid taking into consideration the type and design of the hydraulic system;
.2 a low-level alarm for each hydraulic fluid reservoir to give the earliest practicable indication of hydraulic fluid leakage. Audible and visual alarms shall be given on the navigation bridge and in the machinery space where they can be readily observed; and
.3 a fixed storage tank having sufficient capacity to recharge at least one power actuating system including the reservoir, where the main steering gear is required to be power-operated. The storage tank shall be permanently connected by piping in such a manner that the hydraulic systems can be readily recharged from a position within the steering gear compartment and shall be provided with a contents gauge.

17 The steering gear compartments shall be:

.1 readily accessible and, as far as practicable, separated from machinery spaces; and
.2 provided with suitable arrangements to ensure working access to steering gear machinery and controls. These arrangements shall include handrails and gratings or other nonslip surfaces to ensure suitable working conditions in the event of hydraulic fluid leakage.

18 Where the rudder stock is required to be over 230 mm diameter in way of the tiller, excluding strengthening for navigation in ice, an alternative power supply, sufficient at least to supply the steering gear power unit which complies with the requirements of paragraph 6.2 and also its associated control system and the rudder angle indicator, shall be provided automatically, within 45 s, either from the emergency source of electrical power or from an independent source of power located in the steering gear compartment. This independent source of power shall be used only for this purpose. In every ship of 10,000 gross tonnage and upwards, the alternative power supply shall have a capacity for at least 30 min of continuous operation and in any other ship for at least 10 min.

Regulation 5
Additional requirements for electric and electrohydraulic steering gear

1 Means for indicating that the motors of electric and electrohydraulic steering gear are running shall be installed on the navigation bridge and at a suitable main machinery control position.

2 Each electric or electrohydraulic steering gear comprising one or more power units shall be served by at least two exclusive circuits fed directly from the main switchboard; however, one of the circuits may be supplied through the emergency switchboard. An auxiliary electric or electrohydraulic steering gear associated with a main electric or electrohydraulic steering gear may be connected to one of the circuits supplying this main steering gear. The circuits supplying an electric or electrohydraulic steering gear shall have adequate rating for supplying all motors which can be simultaneously connected to them and may be required to operate simultaneously.

3 Short circuit protection and an overload alarm shall be provided for such circuits and motors. Protection against excess current, including starting current, if provided, shall be for not less than twice the full load current of the motor or circuit so protected, and shall be arranged to permit the passage of the appropriate starting currents. Where a three-phase supply is used an alarm shall be provided that will indicate failure of any one of the supply phases. The alarms required in this paragraph shall be both audible and visual and shall be situated in a conspicuous position in the main machinery space or control room from which the main machinery is normally controlled.

4 When in a ship of less than 1,600 gross tonnage an auxiliary steering gear which is required by regulation 4.6.3 to be operated by power is not electrically powered or is powered by an electric motor primarily intended for other services, the main steering gear may be fed by one circuit from the main switchboard. Where such an electric motor primarily intended for other services is arranged to power such an auxiliary steering gear, the requirement of paragraph 3 may be waived by the Administration if satisfied with the protection arrangement together with the requirements of regulation 4.5.1 and .2 and 4.11.3 applicable to auxiliary steering gear.

Regulation 6
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 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 maneuvering;

.2 the remote control shall be performed, for each independent propeller, by a control device so designed and constructed that its operation does not require particular attention to the operational details of the machinery. Where multiple propellers are designed to operate simultaneously, they may be controlled by one control device;

.3 the main propulsion machinery shall be provided with an emergency stopping device on the 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 maneuvering platform as appropriate;

.5 remote control of the propulsion machinery shall be possible only from one location at a time; at such locations interconnected control positions are permitted. At each location there shall be an indicator showing which location is in control of the propulsion machinery. The transfer of control between the 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 for starting locally.

3 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; for this purpose regulations VI/13 shall apply as appropriate. Particular consideration shall be given to protect such spaces against fire and flooding.

4 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.

5 Ships constructed on or after 1 July 1998 shall comply with the requirements of paragraphs 1 to 4, as amended, as follows:

.1 paragraph 1 is replaced by the following:
"1 Main and auxiliary machinery essential for the propulsion, control and safety of the ship shall be provided with effective means for its operation and control. All control systems essential for the propulsion, control and safety of the ship shall be independent or designed such that failure of one system does not degrade the performance of another system.";

.2 in the second and third lines of paragraph 2, the words "and the machinery spaces are intended to be manned" are deleted;

.3 the first sentence of paragraph 2.2 is replaced by the following:
".2 the control shall be performed by a single control device for each independent propeller, with automatic performance of all associated services, including, where necessary, means of preventing overload of the propulsion machinery.";

.4 paragraph 2.4 is replaced by the following:
".4 propulsion machinery orders from the navigation bridge shall be indicated in the main machinery control room and at the maneuvering platform;

.5 a new sentence is added at the end of paragraph 2.6 to read as follows: "It shall also be possible to control the auxiliary machinery, essential for the propulsion and safety of the ship, at or near the machinery concerned;" and

.6 paragraphs 2.8, 2.8.1 and 2.8.2 are replaced by the following:
".8 indicators shall be fitted on the navigation bridge, the main machinery control room and at the maneuvering platform, for:
.8.1 propeller speed and direction of rotation in the case of fixed pitch propellers; and
.8.2 propeller speed and pitch position in the case of controllable pitch propellers;"

6 Ships constructed on or after 1 July 2004 shall comply with the requirements of paragraphs 1 to 5, as amended, as follows:

a new subparagraph .10 is added to paragraph 2 to read as follows:
".10 automation systems shall be designed in a manner which ensures that threshold warning of impending or imminent slowdown or shutdown of the propulsion system is given to the officer in charge of the navigational watch in time to assess navigational circumstances in an emergency. In particular, the systems shall control, monitor, report, alert and take safety action to slow down or stop propulsion while providing the officer in charge of the navigational watch an opportunity to manually intervene, except for those cases where manual intervention will result in total failure of the engine and/or propulsion equipment within a short time, for example in the case of overspeed."

Regulation 7
Steam boilers and boiler feed systems

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

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

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

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

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

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

Regulation 8
Steam pipe systems

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

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

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

Regulation 9
Air pressure systems

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

2 The main starting air arrangements for main propulsion internal combustion engines shall be adequately protected against the effects of backfiring and internal explosion in the starting 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 10
Ventilating systems in machinery spaces

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

Regulation 11
Bilge pumping arrangements

1 This regulation applies to ships constructed on or after 1 January 2009
2 An efficient bilge pumping system shall be provided, capable of pumping from and draining any watertight compartment other than a space permanently appropriated for the carriage of fresh water, water ballast, oil fuel and for which other efficient means of pumping are provided, under all practical conditions. Efficient means shall be provided for draining water from insulated holds.
3 Sanitary, ballast and general service pumps may be accepted as independent power bilge pumps if fitted with the necessary connections to the bilge pumping system.
4 All bilge pipes used in or under coal bunkers or fuel storage tanks or in boiler or machinery spaces, including spaces in which oil-settling tanks or oil fuel pumping units are situated, shall be of steel or other suitable material.
5 The arrangement of the bilge and ballast pumping system shall be such as to prevent the possibility of water passing from the sea and from water ballast spaces into the cargo and machinery spaces, or from one compartment to another. Provision shall be made to prevent any deep tank having bilge and ballast

connections being inadvertently flooded from the sea when containing cargo, or being discharged through a bilge pump when containing water ballast.

6 All distribution boxes and manually operated valves in connection with the bilge pumping arrangements shall be in positions which are accessible under ordinary circumstances.

7 Provision shall be made for the drainage of enclosed cargo spaces situated on the freeboard deck, provided that the Administration may permit the means of drainage to be dispensed with in any particular compartment of any ship or class of ship if it is satisfied that by reason of size or internal subdivision of those spaces the safety of the ship is not thereby impaired

8 Where the freeboard to the bulkhead deck or the freeboard deck, respectively, is such that the deck edge is immersed when the ship heels more than 5°, the drainage shall be by means of a sufficient number of scuppers of suitable size discharging directly overboard, fitted in accordance with the requirements of the International Convention on Load Lines in force.

9 Where the freeboard is such that the edge of the bulkhead deck or the edge of the freeboard deck, respectively, is immersed when the ship heels 5° or less, the drainage of the enclosed cargo spaces on the bulkhead deck or on the freeboard deck, respectively, shall be led to a suitable space, or spaces, of adequate capacity, having a high water level alarm and provided with suitable arrangements for discharge overboard. In addition it shall be ensured that:

.1 the number, size and disposition of the scuppers are such as to prevent unreasonable accumulation of free water;

.2 the pumping arrangements required by this regulation for passenger ships, take account of the requirements for any fixed pressure water-spraying fire extinguishing system;

.3 water contaminated with petrol or other dangerous substances is not drained to machinery spaces or other spaces where sources of ignition may be present; and

.4 where the enclosed cargo space is protected by a carbon dioxide fire-extinguishing system the deck scuppers are fitted with means to prevent the escape of the smothering gas.

10 At least two power pumps connected to the main bilge system shall be provided, one of which may be driven by the propulsion machinery. If the Administration is satisfied that the safety of the ship is not impaired, bilge pumping arrangements may be dispensed with in particular compartments.

Regulation 12

Protection against noise

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

Regulation 13
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 which provides visual indication of the orders and responses both in the machinery space and on the navigation bridge. Appropriate means of communication shall be provided to any other positions from which the engines may be controlled.

2 For ships constructed on or after 1 October 1994 the following requirements apply in lieu of the provisions of paragraph 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 speed and direction of thrust of the propellers are normally controlled; one of these shall be an engine-room telegraph which provides visual indication of the orders and responses both in the machinery spaces and on the navigation bridge. Appropriate means of communication shall be provided from the navigation bridge and the engine-room to any other position from which the speed or direction of thrust of the propellers may be controlled.

Regulation 14
Engineers' alarm

An engineers' alarm shall be provided to be operated from the engine control room or at the maneuvering platform as appropriate, and shall be clearly audible in the engineers' accommodation.

CHAPTER VII
Electrical Installations

Regulation 1
General

1 Electrical installations shall be such that:

.1 all electrical auxiliary services necessary for maintaining the ship in normal operational and habitable conditions will be ensured without recourse to the emergency source of electrical power;

.2 electrical services essential for safety will be ensured under various emergency conditions; and

.3 the safety of passengers, crew and ship from electrical hazards will be ensured.

2 The Administration shall take appropriate steps to ensure uniformity in the implementation and application of the provisions of this part in respect of electrical installations.

Regulation 2
Main source of electrical power and lighting systems

1 A main source of electrical power of sufficient capacity to supply all those services mentioned in regulation 1.1.1 shall be provided. This main source of electrical power shall consist of at least two generating sets.

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. Minimum comfortable conditions of habitability shall also be ensured which include at least adequate services for cooking, heating, domestic refrigeration, mechanical ventilation, sanitary and fresh water.

The arrangements of the ship's main source of electrical power shall be such that the services referred to in regulation 1.1.1 can be maintained regardless of the speed and direction of rotation of the propulsion machinery or shafting.

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 generating sets shall be capable of providing the electrical services necessary to start the main propulsion plant from a dead ship condition. The emergency source of electrical power may be used for the purpose of starting from a dead ship condition if its capability either alone or combined with that of any other source of electrical power is sufficient to provide at the same time those services required to be supplied by regulations 3.2.1 to 3.2.3.

Where transformers constitute an essential part of the electrical supply system required by this paragraph, the system shall be so arranged as to ensure the same continuity of the supply as is stated in this paragraph.

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

The arrangement of the main electric lighting system shall be such that a fire or other casualty in spaces containing the main source of electrical power, associated transforming equipment, if any, the main switchboard and the main lighting switchboard, will not render the emergency electric lighting system required by regulations 3.2.1 and 3.2.2 inoperative.

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

3 The main switchboard shall be so placed relative to one main generating station that, as far as is practicable, the integrity of the normal electrical supply may be affected only by a fire or other casualty in one space. An environmental enclosure for the main switchboard, such as may be provided by a machinery control room situated within the main boundaries of the space, is not to be considered as separating the switchboards from the generators.

4 Where the total installed electrical power of the main generating sets is in excess of 3 MW, the main bus bars shall be subdivided into at least two parts which shall normally be connected by removable links or other approved means; so far as is practicable, the connection of generating sets and any other duplicated equipment shall be equally divided between the parts. Equivalent arrangements may be permitted to the satisfaction of the Administration.

5 in addition to paragraphs 1 to 3, shall comply with the following:

.1 where the main source of electrical power is necessary for propulsion and steering of the ship, the system shall be so arranged that the electrical supply to equipment necessary for propulsion and steering and to ensure safety of the ship will be maintained or immediately restored in the case of loss of any one of the generators in service;

.2 load shedding or other equivalent arrangements shall be provided to protect the generators required by this regulation against sustained overload;

.3 where the main source of electrical power is necessary for propulsion of the ship, the main bus bar shall be subdivided into at least two parts which shall normally be connected by circuit breakers or other approved means; so far as is practicable, the connection of generating sets and other duplicated equipment shall be equally divided between the parts; and .2 need not comply with paragraph 4.

6 In passenger ships supplementary lighting shall be provided in all cabins to clearly indicate the exit so that occupants will be able to find their way to the door. Such lighting, which may be connected to an emergency source of power or have a self-contained source of electrical power in each cabin, shall automatically illuminate when power to the normal cabin lighting is lost and remain on for a minimum of 30 minutes.

Regulation 3
Emergency source of electrical power

(Paragraphs 2.6.1 and 4.2 of this regulation apply to ships constructed on or after 1 February 1992)

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

The emergency source of electrical power, associated transforming equipment, if any, transitional source of emergency power, emergency switchboard and emergency lightning 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.

The location of the emergency source of electrical power and associated transforming equipment, if any, the transitional source of emergency power, the emergency switchboard and the emergency electric lightning switchboard in relation to the main source of electrical power, associated transforming equipment, if any, and casualty in spaces containing the main source of electrical power, associated transforming equipment, if any, and the main switchboard or in any machinery spaces category A will not interfere with the supply, control and distribution of emergency electrical power. As far as practicable, the space containing the emergency source of electrical power, associated transforming equipment, if any, the transitional source of emergency electrical power and the emergency switchboard shall not be contiguous to the boundaries of machinery spaces of category A or those spaces containing the main source of electrical power, associated transforming equipment, if any, or the main switchboard.

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.

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

.1 For a period of 24 h, emergency lighting:

.1 at every muster and embarkation station and over the sides;
.2 in alleyways, stairways and exits giving access to the muster and embarkation stations;
.3 in all service and accommodation alleyways, stairways and exits, personnel lift cars;
.4 in the machinery spaces and main generating stations including their control positions;
.5 in all control stations, machinery control rooms, and at each main and emergency switchboard;
.6 at all stowage positions for firemen’s outfits;

.7 at the steering gear; and

.8 at the fire pump, the sprinkler pump and the emergency bilge pump referred to in paragraph 2.4 and at the starting position of their motors.

.2 For a period of 24 h:

.1 the navigation lights and other Collisions at Sea in force; and required by the Regulations for Preventing Collisions at sea in force; and

.2 on ships constructed on or after 1 February 1995, the VHF radio installation required by this regulation and, if applicable:

.1 MF radio installation;

.2 ship earth station; and

.3 MF/HF radio installation.

.3 For a period of 24 h:

.1 all internal communication equipment required in an emergency;

.2 the ship borne navigational equipment, where such provision is unreasonable or impracticable the Administration may waive this requirement for ships of less than 5,000 gross tonnage;

.3 the fire detection and fire alarm system, and the fire door holding and release system; and

.4 for intermittent operation of the daylight signaling lamp, the ship's whistle, the manually operated call points, and all internal signals that are required in an emergency;

unless such services have an independent supply for the period of 24 h from an accumulator battery suitably located for use in an emergency.

.4 For a period of 24 h:

.1 one of the fire pumps;

.2 the automatic sprinkler pump, if any; and

.3 the emergency bilge pump and all the equipment essential for the operation of electrically powered remote controlled bilge valves.

.5 For the period of time required by regulation 4.6.3 the steering gear if required to be so supplied by this regulation.

.6 For a period of half an hour:

.1 any watertight doors below waterline to be power-operated together with their indicators and warning signals;

.2 the emergency arrangements to bring the lift cars to deck level for the escape of persons. The passenger lift cars may be brought to deck level sequentially in an emergency.

.7 ln a ship engaged regularly on voyages of short duration, the Administration if satisfied that an adequate standard of safety would be attained may accept a lesser period than the 24 h period specified in paragraphs 2.1 to 2.5 but not less than 12 h.

3 The emergency source of electrical power may be either a generator or an accumulator battery, which shall comply with the following:

.1 Where the emergency source of electrical power is a generator, it shall be:

.1 driven by a suitable prime mover with an independent supply of fuel having a flashpoint (closed cup test) of not less than 43° C;

.2 started automatically upon failure of the electrical supply from the main source of electrical power and shall be automatically connected to the emergency switchboard; those services referred to in paragraph 4 shall then be transferred automatically to the emergency generating set. The automatic starting system and the characteristic of the prime mover shall be such as to permit the emergency generator to carry its full rated load as quickly as is safe and practicable, subject to a maximum of 45 s; unless a second independent means of starting the emergency generating set is provided, the single source of stored energy shall be protected to preclude its complete depletion by the automatic starting system; and

.3 provided with a transitional source of emergency electrical power according to paragraph 4.

.2 Where the emergency source of electrical power is an accumulator battery, it shall be capable of:

.1 carrying the emergency electrical load without recharging while maintaining the voltage of the battery throughout the discharge period within 12% above or below its nominal voltage;

.2 automatically connecting to the emergency switchboard in the event of failure of the main source of electrical power; and

.3 immediately supplying at least those services specified in paragraph 4.

.3 The following provisions in paragraph 3.1.2 shall not apply to ships constructed on or after 1 October 1994:

Unless a second independent means of starting the emergency generating set is provided, the single source of stored energy shall be protected to preclude its complete depletion by the automatic starting system.

.4 For ships constructed on or after 1 July 1998, where electrical power is necessary to restore propulsion, the capacity shall be sufficient to restore propulsion to the ship in conjunction with other machinery, as appropriate, from a dead ship condition within 30 min after blackout.

4 The transitional source of emergency electrical power required by paragraph 3.1.3 shall consist of an accumulator battery suitably located for use in an emergency which shall operate without recharging while maintaining the voltage of the battery throughout the discharge period within 12% above or below its nominal voltage and be of sufficient capacity and so arranged as to supply automatically in the event of failure of either the main or emergency source of electrical power at least the following services, if they depend upon an electrical source for their operation

.1 for half an hour:

.1 the lighting required by paragraphs 2.1 and 2.2;

.2 all services required by paragraphs 2.3.1, 2.3.3 and 2.3.4 unless such services have an independent supply for the period specified from an accumulator battery suitably located for use in an emergency.

.2 Power to operate the watertight doors, as required by MSC Circular 1/1380, but not necessarily all of them simultaneously, unless an independent temporary source of stored energy is provided. Power to the control, indication and alarm circuits for half an hour.

5 The emergency switchboard shall be installed as near as is practicable to the emergency source of electrical power.

Where the emergency source of electrical power is a generator, the emergency switchboard shall be located in the same space unless the operation of the emergency switchboard would thereby be impaired.

No accumulator battery fitted in accordance with this regulation shall be installed in the same space as the emergency switchboard. An indicator shall be mounted in a suitable place on the main switchboard or in the machinery control room to indicate when the batteries constituting either the emergency source of electrical power or the transitional source of emergency electrical power referred to in paragraph 3.1.3 or 4 are being discharged.

The emergency switchboard shall be supplied during normal operation from the main switchboard by an interconnector feeder which is to be adequately protected at the main switchboard against overload and short circuit and which is to be disconnected automatically at the emergency switchboard upon failure of the main source of electrical power. Where the system is arranged for feedback operation, the interconnector feeder is also to be protected at the emergency switchboard at least against short circuit.

In order to ensure ready availability of the emergency source of electrical power, arrangements shall be made where necessary to disconnect automatically non-emergency circuits from the emergency switchboard to ensure that power shall be available to the emergency circuits.

6 The emergency generator and its prime mover and any emergency accumulator battery shall be so designed .and arranged as to ensure that they will function at full rated power when the ship is upright and when inclined at any angle of list up to 22.5^{o} or when inclined up to 10^{o} either in the fore or aft direction, or is in any combination of angles within those limits.

7 Provision shall be made for the periodic testing of the complete emergency system and shall include the testing of automatic starting arrangements.

Regulation 4
Supplementary emergency lighting for ro-ro passenger ships

(This regulation applies to all passenger ships with ro-ro cargo spaces or special category spaces as defined in regulation VIII-3.2.2.

In addition to the emergency lighting required by regulation 3.2, on every passenger ship with ro-ro cargo spaces or special category spaces as defined in regulation VIII-3.2.2:

1 all passenger public spaces and alleyways shall be provided with supplementary electric lighting that can operate for at least 3h when all other sources of electrical power have failed and under any condition of heel. The illumination provided shall be such that the approach to the means of escape can be readily seen. The source of power for the supplementary lighting shall consist of accumulator batteries located within the lighting units that are continuously charged, where practicable, from the emergency switchboard. Alternatively, any other means of lighting which is at least as effective may be accepted by the Administration. The supplementary lighting shall be such that any failure of the lamp will be immediately apparent. Any accumulator battery provided shall be replaced at intervals having regard to the specified service life in the ambient conditions that they are subject to in service; and

2 a portable rechargeable battery operated lamp shall be provided in every crew space alleyway, recreational space and every working space which is normally occupied unless supplementary emergency lighting, as required by paragraph 1 is provided.

Regulation 5
Starting arrangements for emergency generating sets

1 Each emergency generating set arranged to be automatically started shall be equipped with starting devices approved by the Administration with a stored energy capability of at least three consecutive starts. A second source of energy shall be provided for an additional three starts within 30 min unless manual starting can be demonstrated to be effective.

The source of stored energy shall be protected to preclude critical depletion by the automatic starting system, unless a second independent means of starting is provided. In addition, a second source of energy shall be provided for an additional three starts within 30 min unless manual starting can be demonstrated to be effective.

2 The stored energy shall be maintained at all times, as follows:

.1 electrical and hydraulic starting systems shall be maintained from the emergency switchboard;

.2 compressed air starting systems may be maintained by the main or auxiliary compressed air receivers through a suitable non-return valve or by an emergency air compressor which, if electrically driven, is supplied from the emergency switchboard;

.3 all of these starting, charging and energy storing devices shall be located in the emergency generator space; these devices are not to be used for any purpose other than the operation of the emergency

generating set. This does not preclude the supply to the air receiver of the emergency generating set from the main or auxiliary compressed air system through the non-return valve fitted in the emergency generator space.

3 Where automatic starting is not required, manual starting is permissible, such as manual cranking, inertia starters, manually charged hydraulic accumulators, or powder charge cartridges, where they can be demonstrated as being effective.

When manual starting is not practicable, the requirements of paragraphs 2 and 3 shall be complied with except that starting may be manually initiated.

Regulation 6
Precautions against shock, fire and other hazards of electrical origin

(Paragraphs 10 and 11 of this regulation apply to ships constructed on or after 1 January 2007)

1 Exposed metal parts of electrical machines or equipment which are not intended to be live but which are liable under fault conditions to become live shall be earthed unless the machines or equipment are:

.1 supplied at a voltage not exceeding 50 V direct current or 50 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 one consuming device; or
.3 constructed in accordance with the principle of double insulation.

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.
All electrical apparatus shall be so constructed and so installed as not to cause injury when handled or touched in the normal manner.

2 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 to be specified by the Administration shall not be installed on the front of such switchboards. Where necessary, non-conducting mats or gratings shall be provided at the front and rear of the switchboard.

3 The hull return system of distribution shall not be used for power, heating, or lighting in any ship of 1,600 gross tonnage and upwards.

The requirement of paragraph 3.1 does not preclude under conditions approved by the Administration the use of:

.1 impressed current cathodic protective systems;
.2 limited and locally earthed systems; or
.3 insulation level monitoring devices provided the circulation current does not exceed 30 mA under the most unfavorable conditions.

For ships constructed on or after 1 October 1994, the requirement of paragraph 3.1 does not preclude the use of limited and locally earthed systems, provided that any possible resulting current does not flow directly through any dangerous spaces.

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

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

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

Cables and wiring serving essential or emergency power, lighting, internal communications or signals shall so far as practicable be routed clear of galleys, laundries, machinery spaces of category A and their casings and other high fire risk areas. In ro-ro passenger ships, cabling for emergency alarms and public address systems installed. Cables connecting fire pumps to the emergency switchboard shall be of a fire-resistant type where they pass through high fire risk areas. Where practicable all such cables should be run in such a manner as to preclude their being rendered unserviceable by heating of the bulkheads that may be caused by a fire in an adjacent space.

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 to the satisfaction of the Administration.

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

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.

5 Each separate circuit shall be protected against short circuit and against overload, except as permitted in regulations VI/4-5 or 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.

6 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.

7 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.

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

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 9.

Accumulator batteries shall not be located in sleeping quarters except where hermetically sealed to the satisfaction of the Administration.

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

.1 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.

10 In a passenger ship, distribution systems shall be so arranged that fire in any main vertical zone as is defined in this regulation II will not interfere with services essential for safety in any other such zone. This requirement will be met if main and emergency feeders passing through any such zone are separated both vertically and horizontally as widely as is practicable.

CHAPTER VIII

Fire Protection, Detection and Extinction

Part A Prevention of Fire and Explosion

Regulation 1
Probability of ignition

1 Purpose

The purpose of this regulation is to prevent the ignition of combustible materials or flammable liquids. For this purpose, the following functional requirements shall be met:

.1 means shall be provided to control leaks of flammable liquids;
.2 means shall be provided to limit the accumulation of flammable vapours;
.3 the ignitability of combustible materials shall be restricted;
.4 ignition sources shall be restricted; and
.5 ignition sources shall be separated from combustible materials and flammable liquids.

2 Arrangements for oil fuel, lubrication oil and other flammable oils

.1 Limitations in the use of oils as fuel

The following limitations shall apply to the use of oil as fuel:

.1 except as otherwise permitted by this paragraph, no oil fuel with a flashpoint of less than 60°C shall be used;
.2 in emergency generators, oil fuel with a flashpoint of not less than 43°C may be used;
.3 the use of oil fuel having a flashpoint of less than 60°C but not less than 43°C may be permitted (e.g., for feeding the emergency fire pump's engines and the auxiliary machines which are not located in the machinery spaces of category A) subject to the following:
.1 fuel oil tanks except those arranged in double bottom compartments shall be located outside of machinery spaces of category A;
.2 provisions for the measurement of oil temperature are provided on the suction pipe of the oil fuel pump;
.3 stop valves and/or cocks are provided on the inlet side and outlet side of the oil fuel strainers;
.4 pipe joints of welded construction or of circular cone type or spherical type union joint are applied as much as possible; and

.2 Arrangements for oil fuel

In a ship in which oil fuel is used, the arrangements for the storage, distribution and utilization of the oil fuel shall be such as to ensure the safety of the ship and persons on board and shall at least comply with the following provisions.

.1 Location of oil fuel systems

As far as practicable, parts of the oil fuel system containing heated oil under pressure exceeding 0.18 N/mm^2 shall not be placed in a concealed position such that defects and leakage cannot readily be observed. The machinery spaces in way of such parts of the oil fuel system shall be adequately illuminated.

.2 Ventilation of machinery spaces

The ventilation of machinery spaces shall be sufficient under normal conditions to prevent accumulation of oil vapour.

.3 Oil fuel tanks

.1 Fuel oil, lubrication oil and other flammable oils shall not be carried in forepeak tanks.

.2 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. In general, the use of free-standing oil fuel tanks shall be avoided. When such tanks are employed their use shall be prohibited in category A machinery spaces on passenger ships. Where 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.

.3 No oil fuel tank shall be situated where spillage or leakage therefrom can constitute a fire or explosion hazard by falling on heated surfaces.

.4 Oil fuel pipes, which, if damaged, would allow oil to escape from a storage, settling or daily service tank having a capacity of 500*L* and above 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 a fire occurring in the space in which such tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel or similar space, valves on the tank shall be fitted, but control in the event of fire may be effected by means of an additional valve on the pipe or pipes outside the tunnel or similar space. If such an additional valve is

fitted in the machinery space, it shall be operated from a position outside this space. The controls for remote operation of the valve for the emergency generator fuel tank shall be in a separate location from the controls for remote operation of other valves for tanks located in machinery spaces.

.5 Safe and efficient means of ascertaining the amount of oil fuel contained in any oil fuel tank shall be provided.

.1 Where sounding pipes are used, they shall not terminate in any space where the risk of ignition of spillage from the sounding pipe might arise. In particular, they shall not terminate in passenger or crew spaces. As a general rule, they shall not terminate in machinery spaces. However, where the Administration considers that these latter requirements are impracticable, it may permit termination of sounding pipes in machinery spaces on condition that all of the following requirements are met:

.1 an oil-level gauge is provided meeting the requirements of paragraph 2.2.3.5.2;

.2 the sounding pipes terminate in locations remote from ignition hazards unless precautions are taken, such as the fitting of effective screens, to prevent the oil fuel in the case of spillage through the terminations of the sounding pipes from coming into contact with a source of ignition; and

.3 the terminations of sounding pipes are fitted with self-closing blanking devices and with a small diameter self-closing control cock located below the blanking device for the purpose of ascertaining before the blanking device is opened that oil fuel is not present. Provisions shall be made so as to ensure that any spillage of oil fuel through the control cock involves no ignition hazard.

.2 Other oil-level gauges may be used in place of sounding pipes, such gauges shall not require penetration below the top of the tank and their failure or overfilling of the tanks shall not permit release of fuel; and

.3 The means prescribed in paragraph 2.2.3.5.2 which are acceptable to the Administration shall

be maintained in the proper condition to ensure their continued accurate functioning in service.

.4 Prevention of overpressure

Provisions shall be made to prevent overpressure in any oil tank or in any part of the oil fuel system, including the filling pipes served by pumps on board. Air and overflow pipes and relief valves shall discharge to a position where there is no risk of fire or explosion from the emergence of oils and vapour and shall not lead into crew spaces, passenger spaces nor into special category spaces, closed ro-ro spaces, machinery spaces or similar spaces.

.5 Oil fuel piping

.1 Oil fuel pipes and their valves and fittings shall be of steel or other approved material, except that restricted use of flexible pipes shall be permissible in positions where the Administration is satisfied that they are necessary.* Such flexible pipes and end attachments shall be of approved fire-resisting materials of adequate strength and shall be constructed to the satisfaction of the Administration. For valves fitted to oil fuel tanks and under static pressure, steel or spheroidal-graphite cast iron may be accepted. However, ordinary cast iron valves may be used in piping systems where the design pressure is lower than 7 bar and the design temperature is below 60°C.

.2 External high-pressure fuel delivery lines between the high-pressure fuel pumps and fuel injectors shall be protected with a jacketed piping system capable of containing fuel from a high-pressure line failure. A jacketed pipe incorporates an outer pipe into which the high-pressure fuel pipe is placed, forming a permanent assembly. The jacketed piping system shall include a means for collection of leakages and arrangements shall be provided with an alarm in case of a fuel line failure.

.3 Oil fuel lines shall not be located immediately above or near units of high temperature, including boilers, steam pipelines, exhaust manifolds, silencers or other equipment required to be insulated by paragraph 2.2.6. As far as practicable, oil fuel lines shall be arranged far apart from hot surfaces, electrical installations or other sources of ignition and shall be screened or otherwise suitably protected to avoid oil spray or oil leakage onto the sources of ignition. The number of joints in such piping systems shall be kept to a minimum.

.4 Components of a diesel engine fuel system shall be designed considering the maximum peak pressure which will be experienced in service, including any high-pressure pulses which are generated and transmitted

back into the fuel supply and spill lines by the action of fuel injection pumps. Connections within the fuel supply and spill lines shall be constructed having regard to their ability to prevent pressurized oil fuel leaks while in service and after maintenance.

.5 In multi-engine installations which are supplied from the same fuel source, means of isolating the fuel supply and spill piping to individual engines shall be provided. The means of isolation shall not affect the operation of the other engines and shall be operable from a position not rendered inaccessible by a fire on any of the engines.

.6 Where the Administration may permit the conveying of oil and combustible liquids through accommodation and service spaces, the pipes conveying oil or combustible liquids shall be of a material approved by the Administration having regard to the fire risk.

.6 Protection of high-temperature surfaces

.1 Surfaces with temperatures above 220°C which may be impinged as a result of a fuel system failure shall be properly insulated.

.2 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.

.3 Arrangements for lubricating oil

.1 The arrangements for the storage, distribution and utilization of oil used in pressure lubrication systems shall be such as to ensure the safety of the ship and persons on board. 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 2.2.1, 2.2.3.3, 2.2.3.4, 2.2.3.5, 2.2.4, 2.2.5.1, 2.2.5.3 and 2.2.6, except that:

.1 this does not preclude the use of sight-flow glasses in lubricating systems provided that they are shown by testing to have a suitable degree of fire resistance; and

.2 sounding pipes may be authorized in machinery spaces; however, the requirements of paragraphs 2.2.3.5.1.1 and 2.2.3.5.1.3 need not be applied on condition that the sounding pipes are fitted with appropriate means of closure.

.2 The provisions of paragraph 2.2.3.4 shall also apply to lubricating oil tanks except those having a capacity less than 500 L, storage tanks on which valves are closed during the normal operation mode of the ship, or where it is determined that an unintended operation of a quick-closing valve on the oil

lubricating tank would endanger the safe operation of the main propulsion and essential auxiliary machinery.

.4 Arrangements for other flammable oils

The arrangements for the storage, distribution and utilization of other flammable oils employed under pressure in power transmission systems, control and activating systems and heating systems shall be such as to ensure the safety of the ship and persons on board. Suitable oil collecting arrangements for leaks shall be fitted below hydraulic valves and cylinders. In locations where means of ignition are present, such arrangements shall at least comply with the provisions of paragraphs 2.2.3.3, 2.2.3.5, 2.2.5.3 and 2.2.6 and with the provisions of paragraphs 2.2.4 and 2.2.5.1 in respect of strength and construction.

.5 Arrangements for oil fuel in periodically unattended machinery spaces

In addition to the requirements of paragraphs 2.1 to 2.4, the oil fuel and lubricating oil systems in a periodically unattended machinery space shall comply with the following:

.1 where daily service oil fuel tanks are filled automatically, or by remote control, means shall be provided to prevent overflow spillages. Other equipment which treats flammable liquids automatically (e.g., oil fuel purifiers) which, whenever practicable, shall be installed in a special space reserved for purifiers and their heaters, shall have arrangements to prevent overflow spillages; and

.2 where daily service oil fuel tanks or settling tanks are fitted with heating arrangements, a high temperature alarm shall be provided if the flashpoint of the oil fuel can be exceeded.

2 Arrangements for gaseous fuel for domestic purposes

Gaseous fuel systems used for domestic purposes shall be approved by the Administration. Storage of gas bottles shall be located on the open deck or in a well-ventilated space which opens only to the open deck.

3 Miscellaneous items of ignition sources and ignitability

.1 Electric radiators

Electric radiators, if used, shall be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiators shall be fitted with an element so exposed that clothing, curtains, or other similar materials can be scorched or set on fire by heat from the element.

.2 Waste receptacles

Waste receptacles shall be constructed of non-combustible materials with no openings in the sides or bottom.

.3 Insulation surfaces protected against oil penetration

In spaces where penetration of oil products is possible, the surface of insulation shall be impervious to oil or oil vapours.

.4 Primary deck coverings

Primary deck coverings, if applied within accommodation and service spaces and control stations, or if applied on cabin balconies of passenger ships constructed on or after 01 January 2021 , shall be of approved material which will not readily ignite, this being determined in accordance with the Fire Test Procedures Code.

Regulation 2
Fire growth potential

1 Purpose

The purpose of this regulation is to limit the fire growth potential in every space of the ship. For this purpose, the following functional requirements shall be met:

.1 means of control for the air supply to the space shall be provided;
.2 means of control for flammable liquids in the space shall be provided; and
.3 the use of combustible materials shall be restricted.

2 Control of air supply and flammable liquid to the space

.1 Closing appliances and stopping devices of ventilation

.1 The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated. The means of closing shall be easily accessible as well as prominently and permanently marked and shall indicate whether the shut-off is open or closed.

.2 Power ventilation of accommodation spaces, service spaces, cargo spaces, control stations and machinery spaces shall be capable of being stopped from an easily accessible position outside the space being served. This position shall not be readily cut off in the event of a fire in the spaces served.

.3 Ships carrying more than 36 passengers, power ventilation, except machinery space and cargo space ventilation and any alternative system which may be required under regulation 4.8.2, shall be fitted with controls so grouped that all fans may be stopped from either of two separate positions which shall be situated as far apart as practicable. Fans serving power ventilation systems to cargo spaces shall be capable of being stopped from a safe position outside such spaces.

.2 Means of control in machinery spaces

.1 Means of control shall be provided for opening and closure of skylights, closure of openings in funnels which normally allow exhaust ventilation and closure of ventilator dampers.

.2 Means of control shall be provided for stopping ventilating fans. Controls provided for the power ventilation serving machinery

spaces shall be grouped so as to be operable from two positions, one of which shall be outside such spaces. The means provided for stopping the power ventilation of the machinery spaces shall be entirely separate from the means provided for stopping ventilation of other spaces.

.3 Means of control shall be provided for stopping forced and induced draught fans, oil fuel transfer pumps, oil fuel unit pumps, lubricating oil service pumps, thermal oil circulating pumps and oil separators (purifiers). However, paragraphs 2.2.4 and 2.2.5 need not apply to oily water separators.

.4 The controls required in paragraphs 2.2.1 to 2.2.3 and in regulation 4.2.2.3.4 shall be located outside the space concerned so they will not be cut off in the event of fire in the space they serve.

.5 Ships, the controls required in paragraphs 2.2.1 to 2.2.4 and in regulations 8.3.3 and 9.5.2.3 and the controls for any required fire-extinguishing system shall be situated at one control position or grouped in as few positions as possible to the satisfaction of the Administration. Such positions shall have a safe access from the open deck.

.3 Additional requirements for means of control in periodically unattended machinery spaces

.1 For periodically unattended machinery spaces, the Administration shall give special consideration to maintaining the fire integrity of the machinery spaces, the location and centralization of the fire extinguishing system controls, the required shutdown arrangements (e.g., ventilation, fuel pumps, etc.) and that additional fire-extinguishing appliances and other fire-fighting equipment and breathing apparatus may be required.

.2 Ships, these requirements shall be at least equivalent to those of machinery spaces normally attended.

3 Fire protection materials

.1 Use of non-combustible materials

.1 Insulating materials

Insulating materials shall be non-combustible, except in cargo spaces, mail rooms, baggage rooms and refrigerated compartments of service spaces. Vapour barriers and adhesives used in conjunction will insulation, as well as the insulation of pipe fittings for cold service systems, need not be of non-combustible materials, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall having low flame-spread characteristics.

.2 Ceilings and linings

Except in cargo spaces, all linings, grounds, draught stops and ceilings shall be of non-combustible material except in mail

rooms, baggage rooms, saunas or refrigerated compartments of service spaces.

.3 Partial bulkheads and decks on passenger ships

.1 Partial bulkheads or decks used to subdivide a space for utility or artistic treatment shall be of nor combustible materials.

.2 Linings, ceilings and partial bulkheads or decks used to screen or to separate adjacent cab: balconies shall be of non-combustible materials. Cabin balconies on passenger ships constructed before 01 January 2021 shall comply with the requirements of this paragraph by the first survey after 01 January 2021.

.2 Use of combustible materials

.1 General

Class "A", "B" or "C" in accommodation and service spaces and cab balconies which are faced with combustible materials, facings, mouldings, decorations and veneers shall comply with the provisions of paragraphs 3.2.2 to 3.2.4 and regulation 6. However, traditional wood benches and wooden linings on bulkheads and ceilings are permitted in saunas and such materials need not be subject to the calculations prescribed in paragraphs 3.2.2 and 3.2.3. However, the provisions paragraph 3.2.3 need not be applied to cabin balconies.

.2 “A” class divisions are those divisions formed by bulkheads and decks which comply with the following criteria:

.1 they are constructed of steel or other equivalent material;

.2 they are suitably stiffened;

.3 they are insulated with approved non-combustible materials such that the average temperature of the unexposed side will not rise more than 140^{o} C above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180^{o} C above the original temperature, within the time listed below:

class “A-60”	60 min
class “A-30”	30 min
class “A-15”	15 min
class “A- 0”	0 min

.4 they are so constructed as to be capable of preventing the passage of smoke and flame to the end of the one-hour standard fire test and

.5 the Administration required a test of a prototype bulkhead or deck in accordance with the Fire Test Procedures Code to ensure that it meets the above requirements for integrity and temperature rise.

.3 Atriums are public spaces within a single main vertical zone spanning three or more open decks.

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

.1 they are constructed of approved non-combustible materials and all materials used in the construction and erection of "B" class divisions are non-combustible, with the exception that combustible veneers may be permitted provided they meet other appropriate requirements of this chapter;

.2 they have an insulation value such that the average temperature of the unexposed side will not rise more than 140°C above the original temperature, nor will the temperature at any one point, including any joint, rise more than 225°C above the original temperature, within the time listed below:

class "B-15"	15 min
class "B- 0"	0 min

.3 they are 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; and

.4 the Administration required a test of a prototype division in accordance with the Fire Test Procedures Code to ensure that it meets the above requirements for integrity and temperature rise.

.5 Low flame-spread characteristics of exposed surfaces

The following surfaces shall have low flame-spread characteristics in accordance with the Fire Test Procedures Code in passenger ships:

.1 exposed surfaces in corridors and stairway enclosures and of bulkhead and ceiling linings in accommodation and service spaces (except saunas) and control stations;

.2 surfaces and grounds in concealed or inaccessible spaces in accommodation and service spaces and control stations; and

.3 exposed surfaces of cabin balconies, except for natural hard wood decking systems.

.3 Furniture in stairway enclosures of passenger ships

Furniture in stairway enclosures shall be limited to seating. It shall be fixed, limited to six seats on each deck in each stairway enclosure, be of restricted fire risk determined in accordance with the Fire Test Procedures Code, and shall not restrict the passenger escape route. The Administration may permit additional seating in the main reception

area within a stairway enclosure if it is fixed, non-combustible and does not restrict the passenger escape route. Furniture shall not be permitted in passenger and crew corridors forming escape routes in cabin areas. In addition to the above, lockers of non-combustible material, providing storage for non-hazardous safety equipment required by these regulations, may be permitted. Drinking water dispensers and ice cube machines may be permitted in corridors provided they are fixed and do not restrict the width of the escape routes. This applies as well to decorative flower or plant arrangements, statues or other objects of art such as paintings and tapestries in corridors and stairways.

.4 Furniture and furnishings on cabin balconies of passenger ships

Furniture and furnishings on cabin balconies shall comply with this regulations unless such balconies are protected by a fixed pressure water-spraying and fixed fire detection and fire alarm systems complying with regulations 4.10. Ships constructed before 01 January 2021 shall comply with the requirements of this paragraph by the first survey after 01 January 2021.

Regulation 3

Smoke generation potential and toxicity

The purpose of this regulation is to reduce the hazard to life from smoke and toxic products generated during a fire in spaces where persons normally work or live. For this purpose, the quantity of smoke and toxic products released from combustible materials, including surface finishes, during fire shall be limited.

1 Paints, varnishes and other finishes

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

Ships constructed on or after 01 January 2021, paints, varnishes and other finishes used on exposed surfaces of cabin balconies, excluding natural hard wood decking systems, shall not be capable of producing excessive quantities of smoke and toxic products, this being determined in accordance with the Fire Test Procedures Code.

2 Primary deck coverings

Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of approved material which will not give rise to smoke or toxic or explosive hazards at elevated temperatures, this being determined in accordance with the Fire Test Procedures Code.

Ships constructed on or after 01 January 2021, primary deck coverings on cabin balconies shall not give rise to smoke, toxic or explosive hazards at elevated temperatures, this being determined in accordance with the Fire Test Procedures Code.

Part B Suppression of Fire

Regulation 4

Detection and alarm

1 Purpose

The purpose of this regulation is to detect a fire in the space of origin and to provide for alarm for safe escape and fire-fighting activity. For this purpose, the following functional requirements shall be met:

.1 fixed fire detection and fire alarm system installations shall be suitable for the nature of the space, fire growth potential and potential generation of smoke and gases;

.2 manually operated call points shall be placed effectively to ensure a readily accessible means of notification; and

.3 fire patrols shall provide an effective means of detecting and locating fires and alerting the navigation bridge and fire teams.

2 General requirements

.1 A fixed fire detection and fire alarm system shall be provided in accordance with the provisions of this regulation.

.2 A fixed fire detection and fire alarm system and a sample extraction smoke detection system required in this regulation and other regulations in this part shall be of an approved type and comply with the Fire Safety Systems Code.

.3 Where a fixed fire detection and fire alarm system is required for the protection of spaces other than those specified in paragraph 5.1, at least one detector complying with the Fire Safety Systems Code shall be installed in each such space.

3 Initial and periodical tests

.1 The function of fixed fire detection and fire alarm systems required by the relevant regulations of this chapter shall be tested under varying conditions of ventilation after installation.

.2 The function of fixed fire detection and fire alarm systems shall be periodically tested to the satisfaction of the Administration by means of equipment producing hot air at the appropriate temperature, or smoke or aerosol particles having the appropriate range of density or particle size, or other phenomena associated with incipient fires to which the detector is designed to respond.

4 Protection of machinery spaces

.1 Installation

A fixed fire detection and fire alarm system shall be installed in:

.1 periodically unattended machinery spaces; and

.2 machinery spaces where:

.1 the installation of automatic and remote control systems and equipment has been approved in lieu of continuous manning of the space; and

.2 the main propulsion and associated machinery, including the main sources of electrical power, are provided with

various degrees of automatic or remote control and are under continuous manned supervision from a control room.

.2 Design

The fixed fire detection and fire alarm system required in paragraph 4.1.1 shall be so designed and the detectors so positioned as to detect rapidly the onset of fire in any part of those spaces and under any normal conditions of operation of the machinery and variations of ventilation as required by the possible range of ambient temperatures. Except in spaces of restricted height and where their use is specially appropriate, detection systems using only thermal detectors shall not be permitted. The detection system shall initiate audible and visual alarms distinct in both respects from the alarms of any other system not indicating fire, in sufficient places to ensure that the alarms are heard and observed on the navigation bridge and by a responsible engineer officer. When the navigation bridge is unmanned, the alarm shall sound in a place where a responsible member of the crew is on duty.

5 Protection of accommodation and service spaces and control stations

.1 Smoke detectors in accommodation spaces

Smoke detectors shall be installed in all stairways, corridors and escape routes within accommodation spaces as provided in paragraphs 5.2, 5.3 and 5.4. Consideration shall be given to the installation of special purpose smoke detectors within ventilation ducting.

A fixed fire detection and fire alarm system shall be so installed and arranged as to provide smoke detection in service spaces, control stations and accommodation spaces, including corridors, stairways and escape routes within accommodation spaces. Smoke detectors need not be fitted in private bathrooms and galleys. Spaces having little or no fire risk such as voids, public toilets, carbon dioxide rooms and similar spaces need not be fitted with a fixed fire detection and alarm system.

There shall be installed throughout each separate zone, whether vertical or horizontal, in all accommodation and service spaces and, where it is considered necessary by the Administration, in control stations, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc., either:

.1 a fixed fire detection and fire alarm system so installed and arranged as to detect the presence of fire in such spaces and providing smoke detection in corridors, stairways and escape routes within accommodation spaces; or

.2 an automatic sprinkler, fire detection and fire alarm system of an approved type complying with the relevant requirements of the Fire Safety Systems Code and so installed and arranged as to protect such spaces and, in addition, a fixed fire detection and

fire alarm system and so installed and arranged as to provide smoke detection in corridors, stairways and escape routes within accommodation spaces.

.2 Protection of atriums

The entire main vertical zone containing the atrium shall be protected throughout with a smoke detection system.

6 Protection of cargo spaces

A fixed fire detection and fire alarm system or a sample extraction smoke detection system shall be provided in any cargo space which, in the opinion of the Administration, is not accessible, except when the ship is engage on voyages not more than 2 hours.

7 Manually operated call points

Manually operated call points complying with the Fire Safety Systems Code shall be installed throughout the accommodation spaces, service spaces and control stations. One manually operated call point shall be located at each exit. Manually operated call points shall be readily accessible in the corridors of each deck such that no part of the corridor is more than 20m from a manually operated call point.

8 Fire patrols

.1 Fire patrols

An efficient patrol system shall be maintained so that an outbreak of fire may be promptly detected. Each member of the fire patrol shall be trained to be familiar with the arrangements of the ship as well as the location and operation of any equipment he may be called upon to use.

.2 Inspection hatches

The construction of ceilings and bulkheads shall be such that it will be possible, without impairing the efficiency of the fire protection, for the fire patrols to detect any smoke originating in concealed and inaccessible places, except where in the opinion of the Administration there is no risk of fire originating in such places.

.3 Two-way portable radiotelephone apparatus

Each member of the fire patrol shall be provided with a two-way portable radiotelephone apparatus.

9 Fire alarm signaling systems

.1 Ships shall at all times when at sea, or in port (except when out of service), be so manned or equipped as to ensure that any initial fire alarm is immediately received by a responsible member of the crew.

.2 The control panel of fixed fire detection and fire alarm systems shall be designed on the fail-safe principle (e.g., an open detector circuit shall cause an alarm condition).

.3 Ships shall have the fire detection alarms for the systems required by paragraph 5.2 centralized in a continuously manned central control station. In addition, controls for remote closing of the fire doors and

shutting down the ventilation fans shall be centralized in the same location. The ventilation fans shall be capable of reactivation by the crew at the continuously manned control station. The control panels in the central control station shall be capable of indicating open or closed positions of fire doors and closed or off status of the detectors, alarms and fans. The control panel shall be continuously powered and shall have an automatic change-over to standby power supply in case of loss of normal power supply. The control panel shall be powered from the main source of electrical power and the emergency source of electrical power defined by regulation VII/3 unless other arrangements are permitted by the regulations, as applicable.

.4 A special alarm, operated from the navigation bridge or fire control station, shall be fitted to summon the crew. This alarm may be part of the ship's general alarm system and shall be capable of being sounded independently of the alarm to the passenger spaces.

10 Protection of cabin balconies on passenger ships

A fixed fire detection and fire alarm system complying with the provisions of the Fire Safety Systems Code shall be installed on cabin balconies of ships to which regulation 5.3.4 applies, when furniture and furnishings on such balconies are not as defined in this regulation.

Regulation 5

Control of smoke spread

1 Purpose

The purpose of this regulation is to control the spread of smoke in order to minimize the hazards from smoke. For this purpose, means for controlling smoke in atriums, control stations, machinery spaces and concealed spaces shall be provided.

2 Protection of control stations outside machinery spaces

Practicable measures shall be taken for control stations outside machinery spaces in order to ensure that ventilation, visibility and freedom from smoke are maintained so that, in the event of fire, the machinery and equipment contained therein may be supervised and continue to function effectively. Alternative and separate means of air supply shall be provided and air inlets of the two sources of supply shall be so disposed that the risk of both inlets drawing in smoke simultaneously is minimized. At the discretion of the Administration, such requirements need not apply to control stations situated on, and opening onto, an open deck or where local closing arrangements would be equally effective.

3 Release of smoke from machinery spaces

.1 The provisions of this paragraph shall apply to machinery spaces of category A and, where the Administration considers it desirable, to other machinery spaces.

.2 Suitable arrangements shall be made to permit the release of smoke, in the event of fire, from the space to be protected, subject to the provisions of regulation 6.5.2.1. The normal ventilation systems may be acceptable for this purpose.

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

.4 The controls required by paragraph 3.3 shall be situated at one control position or grouped in as few positions as possible to the satisfaction of the Administration. Such positions shall have a safe access from the open deck.

4 Draught stops

Air spaces enclosed behind ceilings, paneling or linings shall be divided by close-fitting draught stops spaced not more than 14 m apart. In the vertical direction, such enclosed air spaces, including those behind linings of stairways, trunks, etc., shall be closed at each deck.

5 Smoke extraction systems in atriums of passenger ships

Atriums shall be equipped with a smoke extraction system. The smoke extraction system shall be activated by the required smoke detection system and be capable of manual control. The fans shall be sized such that the entire volume within the space can be exhausted in 10 min or less.

Regulation 6

Containment of fire

1 Purpose

The purpose of this regulation is to contain a fire in the space of origin. For this purpose, the following functional requirements shall be met:

.1 the ship shall be subdivided by thermal and structural boundaries;

.2 thermal insulation of boundaries shall have due regard to the fire risk of the space and adjacent spaces; and

.3 the fire integrity of the divisions shall be maintained at openings and penetrations.

2 Thermal and structural boundaries

.1 Thermal and structural subdivision

Ships of all types shall be subdivided into spaces by thermal and structural divisions having regard to the fire risks of the spaces.

.2 Passenger ships

.1 Main vertical zones and horizontal zones

.1 The hull, superstructure and deckhouses shall be subdivided into main vertical zones by "A-60" class divisions. Steps and recesses shall be kept to a minimum, but where they are necessary they shall als o be "A-60" class divisions. Where a category (5), (9) or (10) space defined in paragraph 2.2.3.2.2 is on one side or where fuel oil tanks are on both sides of the division the standard may be reduced to "A-0".

.2 In ships carrying not more than 36 passengers, the hull, superstructure and deckhouses in way of accommodation and service spaces shall be subdivided into main vertical zones by "A" class divisions. These divisions shall have insulation values in accordance with tables in paragraph 2.6.

.2 As far as practicable, the bulkheads forming the boundaries of the main vertical zones above the bulkhead deck shall be in line with watertight subdivision bulkheads situated immediately below the bulkhead deck. The length and width of main vertical zones may be extended to a maximum of 48m in order to bring the ends of main vertical zones to coincide with watertight subdivision bulkheads or in order to accommodate a large public space extending for the whole length of the main vertical zone provided that the total area of the main vertical zone is not greater than 1,600 m^2 on any deck. The length or width of a main vertical zone is the maximum distance between the furthermost points of the bulkheads bounding it.

.3 Such bulkheads shall extend from deck to deck and to the shell or other boundaries.

.4 Where a main vertical zone is subdivided by horizontal "A" class divisions into horizontal zones for the purpose of providing an appropriate barrier between a zone with sprinklers and a zone without sprinklers, the divisions shall extend between adjacent main vertical zone bulkheads and to the shell or exterior boundaries of the ship and shall be insulated in accordance with the fire insulation and integrity values given in table 9.4.

.5 Bulkheads within a main vertical zone

.1 Bulkheads which are not required to be "A" class divisions shall be at least "B" class or "C" class divisions as prescribed in the tables in paragraph 2.2.3.

.2 For ships carrying not more than 36 passengers, bulkheads within accommodation and service spaces which are not required to be "A" class divisions shall be at least "B" class or "C" class divisions as prescribed in the tables in paragraph 2.2.4. In addition, corridor bulkheads, where not required to be "A" class, shall be "B" class divisions which shall extend from deck to deck except:

.1 when continuous "B" class ceilings or linings are fitted on both sides of the bulkhead, the portion of the bulkhead behind the continuous ceiling or lining shall be of material which, in thickness and composition, is acceptable in the construction of "B" class divisions, but which shall be required to meet "B" class integrity standards only in so far as

is reasonable -and practicable in the opinion of the Administration; and

.2 in the case of a ship protected by an automatic sprinkler system complying with the provisions of the Fire Safety Systems Code, the corridor bulkheads may terminate at a ceiling in the corridor provided such bulkheads and ceilings are of "B" class standard in compliance with paragraph 2.2.4. All doors and frames in such bulkheads shall be of non-combustible materials and shall have the same fire integrity as the bulkhead in which they are fitted.

.3 Bulkheads required to be "B" class divisions, except corridor bulkheads as prescribed in paragraph 2.2.2.2, shall extend from deck to deck and to the shell or other boundaries. However, where a continuous "B" class ceiling or lining is fitted on both sides of a bulkhead which is at least of the same fire resistance as the adjoining bulkhead, the bulkhead may terminate at the continuous ceiling or lining.

.6 Fire integrity of bulkheads and decks in ships carrying more than 36 passengers

.1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks of passenger ships, the minimum fire integrity of all bulkheads and decks shall be as prescribed in tables 9.1 and 9.2. Where, due to any particular structural arrangements in the ship, difficulty is experienced in determining from the tables the minimum fire integrity value of any divisions, such values shall be determined to the satisfaction of the Administration.

.2 The following requirements shall govern application of the tables:

.1 Table 9.1 shall apply to bulkheads not bounding either main vertical zones or horizontal zones. Table 9.2 shall apply to decks not forming steps in main vertical zones nor bounding horizontal zones.

.2 For determining the appropriate fire integrity standards to be applied to boundaries between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (14) below. Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this regulation, or where it is possible to assign two or more

classifications to a space, it shall be treated as a space within the relevant category having the most stringent boundary requirements. Smaller, enclosed rooms within a space that have less than 30% communicating openings to that space are considered separate spaces. The fire integrity of the boundary bulkheads and decks of such smaller rooms shall be as prescribed in tables 9.1 and 9.2. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

.1 Control stations

Spaces containing emergency sources of power and lighting.

Wheelhouse and chartroom.

Spaces containing the ship's radio equipment.

Fire control stations.

Control room for propulsion machinery when located outside the propulsion machinery space.

Spaces containing centralized fire alarm equipment.

Spaces containing centralized emergency public address system stations and equipment.

.2 Stairways

Interior stairways, lifts, totally enclosed emergency escape trunks, and escalators (other than those wholly contained within the machinery spaces) for passengers and crew and enclosures thereto.

In this connection, a stairway which is enclosed at only one level shall be regarded as part of the space from which it is not separated by a fire door.

.3 Corridors

Passenger and crew corridors and lobbies.

.4 Evacuation stations and external escape routes

Survival craft stowage area.

Open deck spaces and enclosed promenades forming lifeboat and liferaft embarkation and lowering stations.

Assembly stations, internal and external.

External stairs and open decks used for escape routes.

The ship's side to the waterline in the lightest seagoing condition, superstructure and deckhouse sides situated below and adjacent to the liferaft and evacuation slide embarkation areas.

.5 Open deck spaces

Open deck spaces and enclosed promenades clear of lifeboat and liferaft embarkation and lowering stations. To be considered in this category, enclosed promenades shall have no significant fire risk, meaning that furnishings shall be restricted to deck furniture. In addition, such spaces shall be naturally ventilated by permanent openings.

Air spaces (the space outside superstructures and deckhouses).

.6 Accommodation spaces of minor fire risk

Cabins containing furniture and furnishings of restricted fire risk.

Offices and dispensaries containing furniture and furnishings of restricted fire risk.

Public spaces containing furniture and furnishings of restricted fire risk and having a deck area of less than 50 m.

.7 Accommodation spaces of moderate fire risk

Spaces as in category (6) above but containing furniture and furnishings of other than restricted fire risk.

Public spaces containing furniture and furnishings of restricted fire risk and having a deck area of 50 m^2 or more.

Isolated lockers and small store-rooms in accommodation spaces having areas less

than 4 m^2 (in which flammable liquids are not stowed).

Sale shops. Motion picture projection and film stowage rooms. Diet kitchens (containing no open flame).

Cleaning gear lockers (in which flammable liquids are not stowed).

Laboratories (in which flammable liquids are not stowed).

Pharmacies.

Small drying rooms (having a deck area of 4 m^2 or less).

Specie rooms.

Operating rooms.

.8 Accommodation spaces of greater fire risk

Public spaces containing furniture and furnishings of other than restricted fire risk and having a deck area of 50 m^2 or more.

Barber shops and beauty parlours.

Saunas.

.9 Sanitary and similar spaces

Communal sanitary facilities, showers, baths, water closets, etc.

Small laundry rooms.

Indoor swimming pool area.

Isolated pantries containing no cooking appliances in accommodation spaces.

Private sanitary facilities shall be considered a portion of the space in which they are located.

.10 Tanks, voids and auxiliary machinery spaces having little or no fire risk

Water tanks forming part of the ship's structure.

Voids and cofferdams.

Auxiliary machinery spaces which do not contain machinery having a pressure lubrication system and where storage of combustibles is prohibited, such as ventilation and air-conditioning rooms;

windlass room; steering gear room; stabilizer equipment room; electrical propulsion motor room; rooms containing section switchboards and purely electrical equipment other than oil-filled electrical transformers (above 10 kVA); shaft alleys and pipe tunnels; and spaces for pumps and refrigeration machinery (not handling or using flammable liquids).

Closed trunks serving the spaces listed above.

Other closed trunks such as pipe and cable trunks.

Table 9.1 - Bulkheads Not Bounding either Main Vertical Zones or Horizontal Zones

Spaces		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control Stations	(1)	B-0[a]	A-0	A-0	A-0	A-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60
Stairways	(2)		A-0[a]	A-0	A-0	A-0	A-0	A-15	A-15	A-0c	A-0	A-15	A-30	A-15	A-30
Corridors	(3)			B-15	A-60	A-0	B-15	B-15	B-15	B-15	A-0	A-15	A-30	A-0	A-30
Evacuations stations and external escape routes	(4)					A-0	A-60[b,d]	A-60[b,d]	A-60[b,d]	A-0[d]	A-0	A-60[b]	A-60[b]	A-60[b]	A-60[b]
Open deck spaces	(5)						A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of minor fire risk	(6)						B-0	B-0	B-0	C	A-0	A-0	A-30	A-0	A-30
Accommodation spaces of moderate fire risk	(7)							B-0	B-0	C	A-0	A-15	A-60	A-15	A-60
Accommodation spaces of grater fire risk	(8)								B-0	C	A-0	A-30	A-60	A-15	A-60
Sanitary and similar spaces	(9)									C	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk	(10)										A-0a	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk	(11)											A-0[a]	A-0	A-0	A-15
Machinery spaces and main galleys	(12)												A-0[a]	A-0	A-60
Store rooms, workshop, pantries and etc.	(13)													A-0[a]	A-0
Other spaces in which flammable liquids are stowed	(14)														A-30

Table 9.2 - Decks Not Forming Steps in Main Vertical Zones nor Bounding Horizontal Zones

Spaces below ↓ Spaces above →		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control Stations	(1)	A-30	A-30	A-15	A-0	A-0	A-0	A-15	A-30	A-0	A-0	A-0	A-60	A-0	A-60
Stairways	(2)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A—0	A-0	A-0	A-0	A-30	A-0	A-30
Corridors	(3)	A-15	A-0	A-0[a]	A-60	A-0	A-0	A-15	A-15	A-0	A-0	A-0	A-30	A-0	A-30
Evacuations stations and external escape routes	(4)	A-0	A-0	A-0	A-0	-	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Open deck spaces	(5)	A-0	A-0	A-0	A-0	-	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of minor fire risk	(6)	A-60	A-15	A-0	A-60	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of moderate fire risk	(7)	A-60	A-15	A-15	A-60	A-0	A-0	A-15	A-15	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of grater fire risk	(8)	A-60	A-15	A-15	A-60	A-0	A-15	A-15	A-30	A-0	A-0	A-0	A-0	A-0	A-0
Sanitary and similar spaces	(9)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk	(10)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0[a]	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk	(11)	A-60	A-60	A-60	A-60	A-0	A-0	A-15	A-30	A-0	A-0	A-0[a]	A-0	A-0	A-30
Machinery spaces and main galleys	(12)	A-60	A-60	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0	A-30	A-30[a]	A-0	A-60
Store rooms, workshop, pantries and etc.	(13)	A-60	A-30	A-15	A-60	A-0	A-15	A-30	A-30	A-0	A-0	A-0	A-0	A-0	A-0
Other spaces in which flammable liquids are stowed	(14)	A-60	A-60	A-60	A-60	A-0	A-30	A-60	A-60	A-0	A-0	A-0	A-0	A-0	A-0

Notes: To be applied to tables 9.1 and 9.2 as appropriate.

[a] Where adjacent spaces are in the same numerical category and superscript “a” appears, a bulkhead or deck between such spaces need not be fitted if deemed unnecessary by the Administration. For example, in category (12) a bulkhead need not be required between a gallery and its annexed pantries provided the pantry bulkhead and decks maintain the integrity of the gallery boundaries. A bulkhead is, however, required between a gallery and machinery space even though both spaces are in category (12).

[b] The ship’s side, to the waterline in the lightest seagoing condition, superstructure and deckhouse sides situated below and adjacent to liferafts and evacuation slides may be reduced to “A-30”.

[c] Where public toilets are installed completely within the stairway enclosure, the public toilet bulkhead within the stairway enclosure can be of “B” class integrity.

[d] Where spaces of categories (6) (7) (8) and (9) are located completely within the outer perimeter of the assembly station, the bulkheads of these spaces are allowed to be of “B-0” class integrity. Control positions for audio, video and light installations may be considered as part of the assembly station.

.11 Auxiliary machinery spaces, cargo spaces, and other similar spaces of moderate fire risk

Cargo holds and trunkways

Refrigerated chambers.

Oil fuel tanks (where installed in a separate space with no machinery).

Shaft alleys and pipe tunnels allowing storage of combustibles.

Auxiliary machinery spaces as in category (10) which contain machinery having a pressure lubrication system or where storage of combustibles is permitted.

Oil fuel filling stations.

Spaces containing oil-filled electrical transformers (above 10 kVA).

Spaces containing turbine and reciprocating steam engine driven auxiliary generators and small internal combustion engines of power output up to 110 kW driving generators, sprinkler, drencher or fire pumps, bilge pumps, etc.

Closed trunks serving the spaces listed above.

.12 Machinery spaces and main galleys

Main propulsion machinery rooms (other than electric propulsion motor rooms) and boiler rooms.

Auxiliary machinery spaces other than those in categories (10) and (11) which contain internal combustion machinery or other oil-burning, heating or pumping units.

Main galleys and annexes.

Trunks and casings to the spaces listed above.

.13 Store-rooms, workshops, pantries, etc.

Main pantries not annexed to galleys.

Main laundry.

Large drying rooms (having a deck area of more than 4 m^2).

Miscellaneous stores.

Mail and baggage rooms.

Garbage rooms.

Workshops (not part of machinery spaces, galleys, etc.).

Lockers and store-rooms having areas greater than 4 m^2, other than those spaces that have provisions for the storage of flammable liquids.

.14 Other spaces in which flammable liquids are stowed

Paint lockers.

Store-rooms containing flammable liquids (including dyes, medicines, etc.).

Laboratories (in which flammable liquids are stowed).

.3 Where a single value is shown for the fire integrity of a boundary between two spaces, that value shall apply in all cases.

.4 Notwithstanding the provisions of paragraph 2.2.2, there are no special requirements for material or integrity of boundaries where only a dash appears in the tables.

.5 The Administration shall determine in respect of category (5) spaces whether the insulation values in table 9.1 shall apply to ends of deckhouses and superstructures, and whether the insulation values in table 9.2 shall apply to weather decks. In no case shall the requirements of category (5) of tables 9.1 or 9.2 necessitate enclosure of spaces which in the opinion of the Administration need not be enclosed.

.3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

.4 Construction and arrangement of saunas

.1 The perimeter of the sauna shall be of "A" class boundaries and may include changing rooms, showers and toilets. The sauna shall be insulated to "A-60" standard against other spaces except those inside of the perimeter and spaces of categories (5), (9) and (10).

.2 Bathrooms with direct access to saunas may be considered as part of them. In such cases, the

door between sauna and the bathroom need not comply with fire safety requirements.

.3 The traditional wooden lining on the bulkheads and ceiling are permitted in the sauna. The ceiling above the oven shall be lined with a non-combustible plate with an air gap of at least 30 mm. The distance from the hot surfaces to combustible materials shall be at least 500 mm or the combustible materials shall be protected (e.g., non-combustible plate with an air gap of at least 30 mm).

.4 The traditional wooden benches are permitted to be used in the sauna.

.5 The sauna door shall open outwards by pushing.

.6 Electrically heated ovens shall be provided with a timer.

.7 Fire integrity of bulkheads and decks in ships carrying not more than 36 passengers

.1 In addition to complying with the specific provisions for fare integrity of bulkheads and decks of passenger ships, the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 9.3 and 9.4.

.2 The following requirements shall govern application of the tables:

.1 Tables 9.3 and 9.4 shall apply respectively to the bulkheads and decks separating adjacent spaces.

.2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) below. Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this regulation, or where it is possible to assign two or more classifications to a space, it shall be treated as a space within the relevant category having the most stringent boundary requirements. Smaller, enclosed rooms within a space that have less than 30% communicating openings to that space are considered separate spaces. The fire integrity of the boundary bulkheads and decks of such smaller rooms shall be as prescribed in tables 9.3 and 9.4. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

.1 Control stations

Spaces containing emergency sources of power and lighting.

Wheelhouse and chartroom.

Spaces containing the ship's radio equipment.

Fire control stations.

Control room for propulsion machinery when located outside the machinery space.

Spaces containing centralized fire alarm equipment.

.2 Corridors

Passenger and crew corridors and lobbies.

.3 Accommodation spaces

Spaces as defined in regulation 3.1 excluding corridors.

.4 Stairways

Interior stairways, lifts, totally enclosed emergency escape trunks, and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connection, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

Spaces		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations	(1)	A-0[C]	A-0	A- 60	A-0	A- 15	A- 60	A- 15	A- 60	A-60	*	A-60
Corridors	(2)		C[e]	B-0[e]	A-0[a] B-0[e]	B-0[e]	A- 60	A-0	A-0	A-15 A-0[d]	*	A-30[g]
Accommodation spaces	(3)			C[e]	A-0[a] B-0[e]	B-0[e]	A- 60	A-0	A-0	A-15 A-0[d]	*	A-30 A-0[d]
Stairways	(4)				A-0[a] B-0[e]	A-0[a] B-0[e]	A- 60	A-0	A-0	A-15 A-0[d]	**	A-30[g]
Service spaces (low risk)	(5)					C[e]	A- 60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A	(6)						*	A-0	A-0	A-60	*	A-60
Other machinery spaces	(7)							A-0[b]	A-0	A-0	*	A-0
Cargo spaces	(8)								*	A-0	*	A-0
Service spaces (high risks)	(9)									A-0[b]	*	A-30
Open decks	(10)										*	A-0
Special category spaces and ro-ro spaces	(11)											A-30[g]

Table 9.3 – Fire Integrity of Bulkheads Separating Adjacent Spaces

Table 9.4 - Fire Integrity of Decks Separating Adjacent Spaces

Spaces below ↓ Spaces above →		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations	(1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*	A-60[g]
Corridors	(2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30[g]
Accommodation spaces	(3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30 A-0[d]
Stairways	(4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	**	A-30[g]
Service spaces (low risk)	(5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A	(6)	A-60	A- 60	A-60	A-60	A-60	*	A-60[f]	A-30	A-60	*	A-60
Other machinery spaces	(7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*	A-0
Cargo spaces	(8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*	A-0
Service spaces (high risks)	(9)	A-60	A-30 A-0[d]	A-30 A-0[d]	A-30 A-0[d]	A-0	A- 60	A-0	A-0	A-0	*	A-30
Open decks	(10)	*	*	*	*	*	*	*	*	*	-	A-0
Special category spaces and ro-ro spaces	(11)	A-60	A-30[g]	A-30 A-0[d]	A-30[g]	A-0	A-60[g]	A-0	A-0	A-30	A-0	A-30[g]

Notes: To be applied to both tables 9.3 and 9.4 as appropriate.

[a] For clarification as to which applies, see paragraphs 2.2.2 and 2.2.5.

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

[c] Bulkhead separating the wheelhouse and chartroom from each other may have a "B-0" rating. No fire rating is required for those partitions separating the navigation bridge and the safety centre when the latter is within the navigation bridge.

[d] See paragraphs 2.2.4.2.3 and 2.2.4.2.4.

[e] For the application of paragraph 2.2.1.1.2, "B-0" and "C", where appearing in table 9.3, shall be read as "A-0".

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

[g] Ships constructed before 1 July 2014 shall comply, as a minimum, with the previous requirements applicable at the time the ship was constructed, as specified in regulation 12.

* Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material, but is not required to be of “A” class standard. However, where a deck, except in a category (10) space, is penetrated for the passage of electric cables, pipes and vent ducts, such penetration shall be made tight to prevent the passage of flame and smoke. Division between control stations (emergency generators) and open decks may have air intake openings without means for closure, unless a fixed gas fire-extinguishing system is fitted. For the application of paragraph 2.2.1.1.2, an asterisk, where appearing in table 9.4, except for categories (8) and (10), shall be read as “A-0”.

.5 Service spaces (low risk)

Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m^2 and drying rooms and laundries.

.6 Machinery spaces of category A

Spaces as defined in regulation 3.31.

.7 Other machinery spaces

Electrical equipment rooms (auto-telephone exchange, air-conditioning duct spaces).

Spaces as defined in regulation 3.30 excluding machinery spaces of category A.

.8 Cargo spaces

All spaces used for cargo and trunkways and hatchways to such spaces, other than special category spaces.

.9 Service spaces (high risk)

Galleys, pantries containing cooking appliances, paint lockers, lockers and store-rooms having areas of 4 m^2 or more, spaces for the storage of flammable liquids, saunas and workshops other than those forming part of the machinery spaces.

.10 Open decks

Open deck spaces and enclosed promenades having little or no fire risk. To be considered in this category, enclosed promenades shall have no significant fire risk, meaning that furnishing shall be restricted to deck furniture. In addition, such spaces shall be naturally ventilated by permanent openings.

Air spaces (the space outside superstructures and deckhouses).

.11 Special category and ro-ro spaces

Spaces as defined in regulations 3.41 and 3.46.

.3 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is not protected by an automatic sprinkler system

complying with the provisions of the Fire Safety Systems Code or between such zones neither of which is so protected, the higher of the two values given in the tables shall apply.

.4 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is protected by an automatic sprinkler system complying with the provisions of the Fire Safety Systems Code or between such zones both of which are so protected, the lesser of the two values given in the tables shall apply. Where a zone with sprinklers and a zone without sprinklers meet within accommodation and service spaces, the higher of the two values given in the tables shall apply to the division between the zones.

.3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

.4 External boundaries which are required in regulation 11.2 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries of passenger ships to have "A" class integrity. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be constructed of materials which are to the satisfaction of the Administration.

.5 Saunas shall comply with paragraph 2.2.3.4.

.8 Protection of stairways and lifts in accommodation area

.1 Stairways shall be within enclosures formed of "A" class divisions, with positive means of closure at all openings, except that:

.1 a stairway connecting only two decks need not be enclosed, provided the integrity of the deck is maintained by proper bulkheads or self-closing doors in one 'tween-deck space. When a stairway is closed in one 'tween-deck space, the stairway enclosure shall be protected in accordance with the tables for decks in paragraphs 2.2.3 or 2.2.4; and

.2 stairways may be fitted in the open in a public space, provided they lie wholly within the public space.

.2 Lift trunks shall be so fitted as to prevent the passage of smoke and flame from one 'tween-deck to another and

shall be provided with means of closing so as to permit the control of draught and smoke. Machinery for lifts located within stairway enclosures shall be arranged in a separate room, surrounded by steel boundaries, except that small passages for lift cables are permitted. Lifts which open into spaces other than corridors, public spaces, special category spaces, stairways and external areas shall not open into stairways included in the means of escape.

.9 Arrangement of cabin balconies

On passenger ships constructed on or after 1 July 2008, non-load-bearing partial bulkheads which separate adjacent cabin balconies shall be capable of being opened by the crew from each side for the purpose of fighting fires.

3 Penetrations in fire-resisting divisions and prevention of heat transmission

.1 Where "A" class divisions are penetrated, such penetrations shall be tested in accordance with the Fire Test Procedures Code, subject to the provisions of paragraph 4.1.1.5. In the case of ventilation ducts, paragraphs 7.1.2 and 7.3.1 apply. However, where a pipe penetration is made of steel or equivalent material having a thickness of 3 mm or greater and a length of not less than 900 mm (preferably 450 mm on each side of the division), and there are no openings, testing is not required. Such penetrations shall be suitably insulated by extension of the insulation at the same level of the division.

.2 Where "B" class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts, etc., or for the fitting of ventilation terminals, lighting fixtures and similar devices, arrangements shall be made to ensure that the fire resistance is not impaired, subject to the provisions of paragraph 7.3.2. Pipes other than steel or copper that penetrate "B" class divisions shall be protected by either:

.1 a fire-tested penetration device suitable for the fire resistance of the division pierced and the type of pipe used; or

.2 a steel sleeve, having a thickness of not less than 1.8 mm and a length of not less than 900 mm for pipe diameters of 150 mm or more and not less than 600 mm for pipe diameters of less than 150 mm (preferably equally divided to each side of the division). The pipe shall be connected to the ends of the sleeve by flanges or couplings; or the clearance between the sleeve and the pipe shall not exceed 2.5 mm; or any clearance between pipe and sleeve shall be made tight by means of non-combustible or other suitable material.

.3 Uninsulated metallic pipes penetrating "A" or "B" class divisions shall be of materials having a melting temperature which exceeds 950°C for "A-0" and 850°C for "B-0" class divisions.

.4 In approving structural fire protection details, the Administration shall have regard to the risk of heat transmission at intersections and

terminal points of required thermal barriers. The insulation of a deck or bulkhead shall be carried past the penetration, intersection or terminal point for a distance of at least 450 mm in the case of steel and aluminum structures. If a space is divided with a deck or a bulkhead of "A" class standard having insulation of different values, the insulation with the higher value shall continue on the deck or bulkhead with the insulation of the lesser value for a distance of at least 450 mm.

4 Protection of openings in fire-resisting divisions

.1 Openings in bulkheads and decks

.1 Openings in "A" class divisions

.1 Except for hatches between cargo, special category, store, and baggage spaces, and between such spaces and the weather decks, openings shall be provided with permanently attached means of closing which shall be at least as effective for resisting fires as the divisions in which they are fitted.

.2 The construction of doors and door frames in "A" class divisions, with the means of securing them when closed, shall provide resistance to fire as well as to the passage of smoke and flame equivalent to that of the bulkheads in which the doors are situated, this being determined in accordance with the Fire Test Procedures Code. Such doors and door frames shall be constructed of steel or other equivalent material. Watertight doors need not be insulated.

.3 It shall be possible for each door to be opened and closed from each side of the bulkhead by one person only.

.4 Fire doors in main vertical zone bulkheads, galley boundaries and stairway enclosures other than power-operated watertight doors and those which are normally locked shall satisfy the following requirements:

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

.2 the approximate time of closure for hinged fire doors shall be no more than 40 s and no less than 10 s from the beginning of their movement with the ship in upright position. The approximate uniform rate of closure for sliding doors shall be of no more than 0.2 m/s and no less than 0.1 m/s with the ship in upright position;

.3 the doors, except those for emergency escape trunks, shall be capable of remote release from the continuously manned central control station, either simultaneously or in groups, and shall be

capable of release also individually from a position at both sides of the door. Release switches shall have an on-off function to prevent automatic resetting of the system;

.4 hold-back hooks not subject to central control station release are prohibited;

.5 a door closed remotely from the central control station shall be capable of being re-opened from both sides of the door by local control. After such local opening, the door shall automatically close again;

.6 indication shall be provided at the fire door indicator panel in the continuously manned central control station whether each door is closed;

.7 the release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system or central power supply;

.8 local power accumulators for power-operated doors shall be provided in the immediate vicinity of the doors to enable the doors to be operated at least ten times (fully opened and closed) after disruption of the control system or central power supply using the local controls;

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

.10 remote-released sliding or power-operated doors shall be equipped with an alarm that sounds at least 5 s but no more than 10 s, after the door is released from the central control station and before the door begins to move and continues sounding until the door is completely closed;

.11 a door designed to re-open upon contacting an object in its path shall re-open not more than 1 m from the point of contact;

.12 double-leaf doors equipped with a latch necessary for their fire integrity shall have a latch that is automatically activated by the operation of the doors when released by the system;

.13 doors giving direct access to special category spaces which are power-operated and automatically closed need not be equipped with the alarms and remote-release mechanisms required in paragraphs 4.1.1.4.3 and 4.1.1.4.10;

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

.15 power-operated doors shall be provided with a control system of an approved type which shall be able to operate in case of fire and be in accordance with the Fire Test Procedures Code. This system shall satisfy the following requirements:

.1 the control system shall be able to operate the door at the temperature of at least 200°C for at least 60 min, served by the power supply;

.2 the power supply for all other doors not subject to fire shall not be impaired; and

.3 at temperatures exceeding 200°C, the control system shall be automatically isolated from the power supply and shall be capable of keeping the door closed up to at least 945°C.

.5 In ships carrying not more than 36 passengers, where a space is protected by an automatic sprinkler fire detection and fire alarm system complying with the provisions of the Fire Safety Systems Code or fitted with a continuous "B" class ceiling, openings in decks not forming steps in main vertical zones nor bounding horizontal zones shall be closed reasonably tight and such decks shall meet the "A" class integrity requirements in so far as is reasonable and practicable in the opinion of the Administration.

.6 The requirements for "A" class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles, provided that there is no requirement for such boundaries to have "A" class integrity in paragraph 4.1.3.3. The requirements for "A" class integrity of the outer boundaries of the ship shall not apply to exterior doors, except for those in superstructures and deckhouses facing lifesaving appliances, embarkation and external assembly station areas, external stairs and open decks used for escape routes. Stairway enclosure doors need not meet this requirement.

.7 Except for watertight doors, weathertight doors (semi-watertight doors), doors leading to the open deck and doors which need to be reasonably gastight, all "A" class doors located in stairways, public spaces and main vertical zone bulkheads in escape routes shall be

equipped with a self-closing hose port. The material, construction and fire resistance of the hose port shall be equivalent to the door into which it is fitted, and shall be a 150 mm square clear opening with the door closed and shall be inset into the lower edge of the door, opposite the door hinges or, in the case of sliding doors, nearest the opening.

.8 Where it is necessary that a ventilation duct passes through a main vertical zone division, a fail-safe automatic closing fire damper shall be fitted adjacent to the division. The damper shall also be capable of being manually closed from each side of the division. The operating position shall be readily accessible and be marked in red light-reflecting color. The duct between the division and the damper shall be of steel or other equivalent material and, if necessary, insulated to comply with the requirements of paragraph 3.1. The damper shall be fitted on at least one side of the division with a visible indicator showing whether the damper is in the open position.

.2 Openings in "B" class divisions

.1 Doors and door frames in "B" class divisions and means of securing them shall provide a method of closure which shall have resistance to fire equivalent to that of the divisions, this being determined in accordance with the Fire Test Procedures Code except that ventilation openings may be permitted in the lower portion of such doors. Where such opening is in or under a door, the total net area of any such opening or openings shall not exceed 0.05 m. Alternatively, a non-combustible air balance duct routed between the cabin and the corridor, and located below the sanitary unit, is permitted where the cross sectional area of the duct does not exceed 0.05 m^2. All ventilation openings shall be fitted with a grill made of non-combustible material. Doors shall be non-combustible.

.2 Cabin doors in "B" class divisions shall be of a self-closing type. Hold-back hooks are not permitted.

.3 The requirements for "B" class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles. Similarly, the requirements for "B" class integrity shall not apply to exterior doors in superstructures and deckhouses. For ships carrying not more than 36 passengers, the Administration may permit the use of combustible materials in doors separating cabins from the individual interior sanitary spaces such as showers.

.4 In ships carrying not more than 36 passengers, where an automatic sprinkler system complying with the provisions of the Fire Safety Systems Code is fitted:

.1 openings in decks not forming steps in main vertical zones nor bounding horizontal zones shall be closed reasonably tight and such decks shall meet the "B" class integrity requirements in so far as is reasonable and practicable in the opinion of the Administration; and

.2 openings in corridor bulkheads of "B" class materials shall be protected in accordance with the provisions of paragraph 2.2.2.

.3 Windows and sidescuttles

.1 Windows and sidescuttles in bulkheads within accommodation and service spaces and control stations other than those to which the provisions of paragraphs 4.1.1.6 and 4.1.2.3 apply shall be so constructed as to preserve the integrity requirements of the type of bulkheads in which they are fitted, this being determined in accordance with the Fire Test Procedures Code.

.2 Notwithstanding the requirements of tables 9.1 to 9.4, windows and sidescuttles in bulkheads separating accommodation and service spaces and control stations from weather shall be constructed with frames of steel or other suitable material. The glass shall be retained by a metal glazing bead or angle.

.3 Windows facing life-saving appliances, embarkation and assembly stations, external stairs and open decks used for escape routes, and windows situated below liferaft and escape slide embarkation areas shall have fire integrity as required in table 9.1. Where automatic dedicated sprinkler heads are provided for windows, "A-0" windows may be accepted as equivalent. To be considered under this paragraph, the sprinkler heads shall either be:

.1 dedicated heads located above the windows, and installed in addition to the conventional ceiling sprinklers; or

.2 conventional ceiling sprinkler heads arranged such that the window is protected by an average application rate of at least 5 //min/m~ and the additional window area is included in the calculation of the area of coverage.

Windows located in the ship's side below the lifeboat embarkation area shall have fire integrity at least equal to "A-0" class.

5 Protection of openings in machinery space boundaries

.1 Application

The provision of this paragraph shall apply to machinery spaces of category A and, where the Administration considers it desirable, to other machinery spaces.

.2 Protection of openings in machinery space boundaries

.1 The number of skylights, doors, ventilators, openings in funnels to permit exhaust ventilation and other openings to machinery spaces shall be reduced to a minimum consistent with the needs of ventilation and the proper and safe working of the ship.

.2 Skylights shall be of steel and shall not contain glass panels.

.3 Means of control shall be provided for closing power-operated doors or actuating release mechanisms on doors other than power-operated watertight doors. The controls shall be located outside the space concerned, where they will not be cut off in the event of fire in the space it serves.

.4 The means of control required in paragraph 5.2.3 shall be situated at one control position or grouped in as few positions as possible, to the satisfaction of the Administration. Such positions shall have safe access from the open deck.

.5 Doors, other than power-operated watertight doors, shall be so arranged that positive closure is assured in case of fire in the space by power-operated closing arrangements or by the provision of self-closing doors capable of closing against an inclination of 3.5° opposing closure, and having a fail-safe hold-back arrangement, provided with a remotely operated release device. Doors for emergency escape trunks need not be fitted with a fail-safe hold-back facility and a remotely operated release device.

.6 Windows shall not be fitted in machinery space boundaries. However, this does not preclude the use of glass in control rooms within the machinery spaces.

6 Protection of cargo space boundaries

.1 Ships carrying more than 36 passengers, the boundary bulkheads and decks of special category and ro-ro spaces shall be insulated to "A-60" class standard. However, where a category (5), (9) or (10) space, as defined in paragraph 2.2.3, is on one side of the division, the standard may be reduced to "A-0". Where fuel oil tanks are below a special category space, the integrity of the deck between such spaces may be reduced to "A-0" standard.

.2 Ships carrying not more than 36 passengers, the boundary bulkheads of special category spaces shall be insulated as required for category (11) spaces in table 9.3 and the horizontal boundaries as required for category (11) spaces in table 9.4.

.3 Ships carrying not more than 36 passengers, the boundary bulkheads and decks of closed and open ro-ro spaces shall have a fire integrity as required for category (8) spaces in table 9.3 and the horizontal boundaries as required for category (8) spaces in table 9.4.

.4 Ships, indicators shall be provided on the navigation bridge which shall indicate when any fire door leading to or from the special category spaces is closed.

7 Ventilation systems

.1 Ducts and dampers

.1 Ventilation ducts shall be of non-combustible material. However, short ducts, not generally exceeding 2 m in length and with a free cross-sectional area* not exceeding 0.02 nT, need not be noncombustible, subject to the following conditions:

.1 the ducts are made of a material which has low flame-spread characteristics;

.2 the ducts are only used at the end of the ventilation device; and

.3 the ducts are not situated less than 600 mm, measured along the duct, from an opening in an "A" or "B" class division, including continuous "B" class ceiling.

.2 The following arrangements shall be tested in accordance with the Fire Test Procedures Code:

.1 fire dampers, including their relevant means of operation; and

.2 duct penetrations through "A" class divisions. However, the test is not required where steel sleeves are directly joined to ventilation ducts by means of riveted or screwed flanges or by welding.

.2 Arrangement of ducts

.1 The ventilation systems for machinery spaces of category A, vehicle spaces, ro-ro spaces, galleys, special category spaces and cargo spaces shall, in general, be separated from each other and from the ventilation systems serving other spaces, except that the galley ventilation systems on cargo ships of less than 4,000 gross tonnage and in passenger ships carrying not more than 36 passengers need not be completely separated, but may be served by separate ducts from a ventilation unit serving other spaces. In any case, an automatic fire damper shall be fitted in the galley ventilation duct near the ventilation unit. Ducts provided for the ventilation of machinery spaces of category A, galleys, vehicle spaces, ro-ro spaces or special category spaces shall not pass through accommodation spaces, service spaces or control stations unless they comply with the conditions specified in paragraphs 7.2.1.1.1 to 7.2.1.1.4 or 7.2.1.2.1 and 7.2.1.2.2 below:

.1 the ducts are constructed of steel having a thickness of at least 3 mm and 5 mm for ducts the widths or diameters of which are up to and including 300 mm and 760 mm and over respectively and, in the case of such ducts, the widths or diameters of which are between 300 mm and 760 mm, having a thickness obtained by interpolation;

.2 the ducts are suitably supported and stiffened;

.3 the ducts are fitted with automatic fire dampers close to the boundaries penetrated; and

.4 the ducts are insulated to "A-60" class standard from the machinery spaces, galleys, vehicle spaces, ro-ro spaces or special category spaces to a point at least 5 m beyond each fire damper;

or

.1 the ducts are constructed of steel in accordance with paragraphs 7.2.1.1.1 and 7.2.1.1.2; and

.2 the ducts are insulated to "A-60" class standard throughout the accommodation spaces, service spaces or control stations;

except that penetrations of main zone divisions shall also comply with the requirements of paragraph 4.1.1.8.

.2 Ducts provided for ventilation to accommodation spaces, service spaces or control stations shall not pass through machinery spaces of category A, galleys, vehicle spaces, ro-ro spaces or special category spaces unless they comply with the conditions specified in paragraphs 7.2.2.1.1 to 7.2.2.1.3 or 7.2.2.2.1 and 7.2.2.2.2 below:

.1 the ducts, where they pass through a machinery space of category A, galley, vehicle space, ro-ro space or special category space, are constructed of steel in accordance with paragraphs 7.2.1.1.1 and 7.2.1.1.2;

.2 automatic fire dampers are fitted close to the boundaries penetrated; and

.3 the integrity of the machinery space, galley, vehicle space, ro-ro space or special category space boundaries is maintained at the penetrations;

or

.1 the ducts, where they pass through a machinery space of category A, galley, vehicle space, ro-ro space or special category space, are constructed of steel in accordance with paragraphs 7.2.1.1.1 and 7.2.1.1.2; and

.2 the ducts are insulated to "A-60" standard within the machinery space, galley, vehicle space, ro-ro space or special category space; except that penetrations of main zone divisions shall also comply with the requirements of paragraph 4.1.1.8.

.3 Details of duct penetrations

.1 Where a thin plated duct with a free cross-sectional area equal to, or less than, 0.02 m^2 passes through "A" class bulkheads or decks, the opening shall be lined with a steel sheet sleeve having a thickness of at least 3 mm and a length of at least 200 mm, divided preferably into 100 mm on each side of the bulkhead or, in the case of the deck, wholly laid on the lower side of the decks pierced. Where ventilation ducts with a free cross-sectional area exceeding 0.02 m^2 pass through "A" class bulkheads or decks, the opening shall be lined with a steel sheet sleeve. However, where such ducts are of steel construction and pass through a deck or bulkhead, the ducts and sleeves shall comply with the following:

.1 The sleeves shall have a thickness of at least 3 mm and a length of at least 900 mm. When passing through bulkheads, this length shall be divided preferably into 450 mm on each side of the bulkhead. These ducts, or sleeves lining such ducts, shall be provided with fire insulation. The insulation shall have at least the same fire integrity as the bulkhead or deck through which the duct passes; and

.2 Ducts with a free cross-sectional area exceeding 0.075 m^2 shall be fitted with fire dampers in addition to the requirements of paragraph 7.3.1.1. The fire damper shall operate automatically, but shall also be capable of being closed manually from both sides of the bulkhead or deck. The damper shall be provided with an indicator which shows whether the damper is open or closed. Fire dampers are not required, however, where ducts pass through spaces surrounded by "A" class divisions, without serving those spaces, provided those ducts have the same fire integrity as the divisions which they pierce. Fire dampers shall be easily accessible. Where they are placed behind ceilings or linings, these ceilings or linings shall be provided with an inspection door on which a plate reporting the identification number of the fire damper is provided. The fire damper identification number shall also be placed on any remote controls required.

.2 Ventilation ducts with a free cross-sectional area exceeding 0.02 m^2 passing through "B" class bulkheads shall be lined with steel sheet sleeves of 900 mm in length, divided preferably into

450 mm on each side of the bulkheads unless the duct is of steel for this length.

.4 Ventilation systems for passenger ships carrying more than 36 passengers

.1 The ventilation system of a passenger ship carrying more than 36 passengers shall be in compliance with the following additional requirements.

.2 In general, the ventilation fans shall be so disposed that the ducts reaching the various spaces remain within the main vertical zone.

.3 Where ventilation systems penetrate decks, precautions shall be taken, in addition to those relating to the fire integrity of the deck required by paragraphs 3.1 and 4.1.1.5, to reduce the likelihood of smoke and hot gases passing from one tween-deck space to another through the system. In addition to insulation requirements contained in paragraph 7.4, vertical ducts shall, if necessary, be insulated as required by the appropriate tables 9.1 and 9.2.

.4 Except in cargo spaces, ventilation ducts shall be constructed of the following materials:

.1 ducts not less than 0.075 m^2 in free cross-sectional area and all vertical ducts serving more than a single 'tween-deck space shall be constructed of steel or other equivalent material;

.2 ducts less than 0.075 m^2 in free cross-sectional area, other than the vertical ducts referred to in paragraph 7.4.4.1, shall be constructed of non-combustible materials. Where such ducts penetrate "A" or "B" class divisions, due regard shall be given to ensuring the fire integrity of the division; and

.3 short lengths of duct, not in general exceeding 0.02 m^2 in free cross-sectional area nor 2m in length, need not be non-combustible provided that all of the following conditions are met:

.1 the duct is constructed of a material which has low flame-spread characteristics;

.2 the duct is used only at the terminal end of the ventilation system; and

.3 the duct is not located closer than 600 mm measured along its length to a penetration of an "A" or "B" class division, including continuous "B" class ceilings.

.5 Stairway enclosures shall be ventilated and served by an independent fan and duct system which shall not serve any other spaces in the ventilation systems.

.6 Exhaust ducts shall be provided with hatches for inspection and cleaning. The hatches shall be located near the fire dampers.

.5 Exhaust ducts from galley ranges

.1 Requirements for passenger ships carrying more than 36 passengers

Exhaust ducts from galley ranges shall meet the requirements of paragraphs 7.2.1.2.1 and 7.2.1.2.2 and shall be fitted with:

.1 a grease trap readily removable for cleaning unless an alternative approved grease removal system is fitted;

.2 a fire damper located in the lower end of the duct which is automatically and remotely operated and, in addition, a remotely operated fire damper located in the upper end of the duct;

.3 a fixed means for extinguishing a fire within the duct;

.4 remote-control arrangements for shutting off the exhaust fans and supply fans, for operating the fire dampers mentioned in paragraph 7.5.1.2 and for operating the fire-extinguishing system, which shall be placed in a position close to the entrance to the galley. Where a multi-branch system is installed, a remote means located with the above controls shall be provided to close all branches exhausting through the same main duct before an extinguishing medium is released into the system; and

.5 suitably located hatches for inspection and cleaning.

.2 Requirements for passenger ships carrying not more than 36 passengers

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

.1 a grease trap readily removable for cleaning;

.2 a fire damper located in the lower end of the duct;

.3 arrangements, operable from within the galley, for shutting off the exhaust fans; and

.4 fixed means for extinguishing a fire within the duct.

Regulation 7
Fire fighting

1 Purpose

The purpose of this regulation is to suppress and swiftly extinguish a fire in the space of origin. For this purpose, the following functional requirements shall be met:

.1 fixed fire-extinguishing systems shall be installed, having due regard to the fire growth potential of the protected spaces; and

.2 fire-extinguishing appliances shall be readily available.

2 Water supply systems

Ships shall be provided with fire pumps, fire mains, hydrants and hoses complying with the applicable requirements of this regulation.

.1 Fire mains and hydrants

.1 General

Materials readily rendered ineffective by heat shall not be used for fire mains and hydrants unless adequately protected. The pipes and hydrants shall be so placed that the fire hoses may be easily coupled to them. The arrangement of pipes and hydrants shall be such as to avoid the possibility of freezing. Suitable drainage provisions shall be provided for fire main piping. Isolation valves shall be installed for all open deck fire main branches used for purposes other than firefighting. In ships where deck cargo may be carried, the positions of the hydrants shall be such that they are always readily accessible and the pipes shall be arranged as far as practicable to avoid risk of damage by such cargo.

.2 Ready availability of water supply

The arrangements for the ready availability of water supply in passenger ships shall:

.1 of 1,000 gross tonnage and upwards such that at least one (1) effective jet of water is immediately available from any hydrant in an interior location and so as to ensure the continuation of the output of water by the automatic starting of one required fire pump;

.2 of less than 1,000 gross tonnage by automatic start of at least one (1) fire pump or by remote starting from the navigation bridge of at least one fire pump. If the pump starts automatically or if the bottom valve cannot be opened from where the pump is remotely started, the bottom valve shall always be kept open; and

.3 . if fitted with periodically unattended machinery spaces in accordance with regulation II-1/54, the Administration shall determine provisions for fixed water fire-extinguishing arrangements for such spaces equivalent to those required for normally attended machinery spaces;

.3 Diameter of fire mains

The diameter of the fire main and water service pipes shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously.

.4 Isolating valves and relief valves

.1 Isolating valves to separate the section of the fire main within the machinery space containing the main fire pump or pumps from the rest of the fire main shall be fitted in an easily accessible and tenable position outside the machinery spaces. The fire main shall be so arranged that when the isolating valves are shut all the hydrants on the ship, except those in the machinery space referred to above, can be supplied with water by another fire pump or an emergency fire pump. The emergency fire pump, its seawater inlet, and suction and delivery pipes and isolating valves shall be located outside the machinery space. If this arrangement cannot be made, the sea-chest may be fitted in the machinery space if the valve is remotely controlled from a position in the same compartment as the emergency fire pump and the suction pipe is as short as practicable. Short lengths of suction or discharge piping may penetrate the machinery space, provided they are enclosed in a substantial steel casing or are insulated to "A-60" class standards. The pipes shall have substantial wall thickness, but in no case less than 11 mm, and shall be welded except for the flanged connection to the sea inlet valve.

.2 A valve shall be fitted to serve each fire hydrant so that any fire hose may be removed while the fire pumps are in operation.

.3 Relief valves shall be provided in conjunction with fire pumps if the pumps are capable of developing a pressure exceeding the design pressure of the water service pipes, hydrants and hoses. These valves shall be so placed and adjusted as to prevent excessive pressure in any part of the fire main system.

.5 Number and position of hydrants

.1 The number and position of hydrants shall be such that at least two jets of water not emanating from the same hydrant, one of which shall be from a single length of hose, may reach any part of the ship normally accessible to the passengers or crew while the ship is being navigated and any part of any cargo space when empty, any ro-ro space or any vehicle space, in which latter case the two jets shall reach any part of the space, each from a single length of hose. Furthermore, such hydrants shall be positioned near the accesses to the protected spaces.

.2 In addition to the requirements in paragraph 2.1.5.1, passenger ships shall comply with the following:

.1 in the accommodation, service and machinery spaces, the number and position of hydrants shall

be such that the requirements of paragraph 2.1.5.1 may be complied with when all watertight doors and all doors in main vertical zone bulkheads are closed; and

.2 where access is provided to a machinery space of category A at a low level from an adjacent shaft tunnel, two hydrants shall be provided external to, but near the entrance to, that machinery space. Where such access is provided from other spaces, in one of those spaces two hydrants shal be provided near the entrance to the machinery space of category A. Such provision need not be made where the tunnel or adjacent spaces are not part of the escape route.

.6 Pressure at hydrants

With the two pumps simultaneously delivering water through the nozzles specified in paragraph 2.3.3, with the quantity of water as specified in paragraph 2.1.3, through any adjacent hydrants, the following minimum pressures shall be maintained at all hydrants for passenger ships:

4,000 gross tonnage and upwards	0.40 N/mm^2
less than 4,000 gross tonnage	0.30 N/mm^2

The maximum pressure at any hydrant shall not exceed that at which the effective control of a fire hose can be demonstrated.

.7 International shore connection

.1 Ships of 500 gross tonnage and upwards shall be provided with at least one international shore connection complying with the Fire Safety Systems Code.

.2 Facilities shall be available enabling such a connection to be used on either side of the ship.

.2 Fire pumps

.1 Pumps accepted as fire pumps

Sanitary, ballast, bilge or general service pumps may be accepted as fire pumps, provided that they are not normally used for pumping oil and that if they are subject to occasional duty for the transfer or pumping of oil fuel, suitable change-over arrangements are fitted.

.2 Number of fire pumps

Ships shall be provided with independently driven fire pumps in passenger ships of:

4,000 gross tonnage and upwards at least three

less than 4,000 gross tonnage at least two

.3 Arrangement of fire pumps and fire mains

.1 Fire pumps

The arrangement of sea connections, fire pumps and their sources of power shall be as to ensure that:

.1 Ships of 1,000 gross tonnage and upwards, in the event of a fire in any one compartment, all the fire pumps will not be put out of action; and

.2 Ships of less than 1,000 gross tonnage, if a fire in any one compartment could put all the pumps out of action, there shall be an alternative means consisting of an emergency fire pump complying with the provisions of the Fire Safety Systems Code with its source of power and sea connection located outside the space where the main fire pumps or their sources of power are located.

.2 Requirements for the space containing the emergency fire pump

.1 Location of the space

The space containing the fire pump shall not be contiguous to the boundaries of machinery spaces of category A or those spaces containing main fire pumps. Where this is not practicable, the common bulkhead between the two spaces shall be insulated to a standard of structural fire protection equivalent to that required for a control station.

.2 Access to the emergency fire pump

No direct access shall be permitted between the machinery space and the space containing the emergency fire pump and its source of power. When this is impracticable, the Administration may accept an arrangement where the access is by means of an airlock with the door of the machinery space being of "A-60" class standard and the other door being at least steel, both reasonably gastight, self-closing and without any hold-back arrangements. Alternatively, the access may be through a watertight door capable of being operated from a space remote from the machinery space and the space containing the emergency fire pump and unlikely to be cut off in the event of fire in those spaces. In such cases, a second means of access to the space containing the emergency fire pump and its source of power shall be provided.

.3 Ventilation of the emergency fire pump space

Ventilation arrangements to the space containing the independent source of power for the emergency fire pump shall be such as to preclude, as far as practicable, the possibility of smoke from a machinery space fire entering or being drawn into that space.

.4 Capacity of fire pumps

.1 Total capacity of required fire pumps

The required fire pumps shall be capable of delivering for fire-fighting purposes a quantity of water, at the pressure specified in paragraph 2.1.6, pumps in passenger ships: the quantity of water is not less than two thirds of the quantity required to be dealt with by the bilge pumps when employed for bilge pumping; and

.2 Capacity of each fire pump

Each of the required fire pumps shall have a capacity not less than 80% of the total required capacity divided by the minimum number of required fire pumps, but in any case not less than 25 m3/h, and each such pump shall in any event be capable of delivering at least the two required jets of water. These fire pumps shall be capable of supplying the fire main system under the required conditions. Where more pumps than the minimum of required pumps are installed, such additional pumps shall have a capacity of at least 25 m3/h and shall be capable of delivering at least the two jets of water required in paragraph 2.1.5.1.

.3 Fire hoses and nozzles

.1 General specifications

.1 Fire hoses shall be of non-perishable material approved by the Administration and shall be sufficient in length to project a jet of water to any of the spaces in which they may be required to be used. Each hose shall be provided with a nozzle and the necessary couplings. Hoses specified in this chapter as "fire hoses" shall, together with any necessary fittings and tools, be kept ready for use in conspicuous positions near the water service hydrants or connections. Additionally, in interior locations in passenger ships carrying more than 36 passengers, fire hoses shall be connected to the hydrants at all times. Fire hoses shall have a length of at least 10 m, but not more than:

.1 15 m in machinery spaces;

.2 20 m in other spaces and open decks; and

.3 25 m for open decks on ships with a maximum breadth in excess of 30 m.

.2 Unless one hose and nozzle is provided for each hydrant in the ship, there shall be complete interchangeability of hose couplings and nozzles.

.2 Number and diameter of fire hoses

.1 Ships shall be provided with fire hoses, the number and diameter of which shall be to the satisfaction of the Administration.

.2 Ships, there shall be at least one fire hose for each of the hydrants required by paragraph 2.1.5 and these hoses shall be used only for the purposes of extinguishing fires or testing the fire extinguishing apparatus at fire drills and surveys.

.3 Size and types of nozzles

.1 For the purposes of this chapter, standard nozzle sizes shall be 12 mm, 16 mm and 19 mm or as near thereto as possible. Larger diameter nozzles may be permitted at the discretion of the Administration.

.2 For accommodation and service spaces, a nozzle size greater than 12 mm need not be used.

.3 For machinery spaces and exterior locations, the nozzle size shall be such as to obtain the maximum discharge possible from two jets at the pressure mentioned in paragraph 2.1.6 from the smallest pump, provided that a nozzle size greater than 19 mm need not be used.

.4 Nozzles shall be of an approved dual-purpose type (i.e. spray/jet type) incorporating a shutoff.

3 Portable fire extinguishers

.1 Type and design

Portable fire extinguishers shall comply with the requirements of the Fire Safety Systems Code.

.2 Arrangement of fire extinguishers

.1 Accommodation spaces, service spaces and control stations shall be provided with portable fire extinguishers of appropriate types and in sufficient number to the satisfaction of the Administration. Ships of 1,000 gross tonnage and upwards shall carry at least five (5) portable fire extinguishers.

.2 One of the portable fire extinguishers intended for use in any space shall be stowed near the entrance to that space.

.3 Carbon dioxide fire extinguishers shall not be placed in accommodation spaces. In control stations and other spaces containing electrical or electronic equipment or appliances

necessary for the safety of the ship, fire extinguishers shall be provided whose extinguishing media are neither electrically conductive nor harmful to the equipment and appliances.

.4 Fire extinguishers shall be situated ready for use at easily visible places, which can be reached quickly and easily at any time in the event of a fire, and in such a way that their serviceability is not impaired by the weather, vibration or other external factors. Portable fire extinguishers shall be provided with devices which indicate whether they have been used.

4 Fixed fire-extinguishing systems

.1 Types of fixed fire-extinguishing systems

.1 A fixed fire-extinguishing system required by paragraph 5 below may be any of the following systems:

.1 a fixed gas fire-extinguishing system complying with the provisions of the Fire Safety Systems Code;

.2 a fixed high-expansion foam fire-extinguishing system complying with the provisions of the Fire Safety Systems Code; and

.3 a fixed pressure water-spraying fire-extinguishing system complying with the provisions of the Fire Safety Systems Code.

.2 Where a fixed fire-extinguishing system not required by this chapter is installed, it shall meet the requirements of the relevant regulations of this chapter and the Fire Safety Systems Code.

.3 Fire-extinguishing systems using Halon 1211, 1301, and 2402 and per fluorocarbons shall be prohibited.

.4 In general, the Administration shall not permit the use of steam as a fire-extinguishing medium in fixed fire-extinguishing systems. Where the use of steam is permitted by the Administration, it shall be used only in restricted areas as an addition to the required fire-extinguishing system and shall comply with the requirements of the Fire Safety System Code.

.2 Closing appliances for fixed gas fire-extinguishing systems

Where a fixed gas fire-extinguishing system is used, openings which may admit air to, or allow gas to escape from, a protected space shall be capable of being closed from outside the protected space.

.3 Storage rooms of fire-extinguishing medium

When the fire-extinguishing medium is stored outside a protected space, it shall be stored in a room which is located behind the forward collision bulkhead, and is used for no other purposes. Any entrance to such a storage room shall preferably be from the open deck and shall be independent of the protected space. If the storage space is located below deck, it shall be located no more than one deck below the open

deck and shall be directly accessible by a stairway or ladder from the open deck. Spaces which are located below deck or spaces where access from the open deck is not provided shall be fitted with a mechanical ventilation system designed to take exhaust air from the bottom of the space and shall be sized to provide at least 6 air changes per hour. Access doors shall open outwards, and bulkheads and decks, including doors and other means of closing any opening therein, which form the boundaries between such rooms and adjacent enclosed spaces shall be gastight. For the purpose of the application of tables 9.1 to 9.8, such storage rooms shall be treated as fire control stations.

.4 Water pumps for other fire-extinguishing systems

Pumps, other than those serving the fire main, required for the provision of water for fire-extinguishing systems required by this chapter, their sources of power and their controls shall be installed outside the space or spaces protected by such systems and shall be so arranged that a fire in the space or spaces protected will not put any such system out of action.

5 Fire-extinguishing arrangements in machinery spaces

.1 Machinery spaces containing oil-fired boilers or oil fuel units

.1 Fixed fire-extinguishing systems

Machinery spaces of category A containing oil-fired boilers or oil fuel units shall be provided with any one of the fixed fire-extinguishing systems in paragraph 4.1. In each case, if the engine-room and boiler room are not entirely separate, or if fuel oil can drain from the boiler room into the engine-room, the combined engine and boiler rooms shall be considered as one compartment.

.2 Additional fire-extinguishing arrangements

.1 There shall be in each boiler room or at an entrance outside of the boiler room at least one portable foam applicator unit complying with the provisions of the Fire Safety Systems Code.

.2 There shall be at least two portable foam extinguishers or equivalent in each firing space in each boiler room and in each space in which a part of the oil fuel installation is situated. There shall be not less than one approved foam-type extinguisher of at least 135/ capacity or equivalent in each boiler room. These extinguishers shall be provided with hoses on reels suitable for reaching any part of the boiler room. In the case of domestic boilers of less than 175 kW an approved foam-type extinguisher of at least 135 / capacity is not required.

.3 In each firing space there shall be a receptacle containing at least 0.1 m3 sand, sawdust impregnated with soda, or other approved dry material, along with a

suitable shovel for spreading the material. An approved portable extinguisher may be substituted as an alternative.

.2 Machinery spaces containing internal combustion machinery

.1 Fixed fire-extinguishing systems

Machinery spaces of category A containing internal combustion machinery shall be provided with one of the fixed fire-extinguishing systems in paragraph 4.1.

.2 Additional fire-extinguishing arrangements

.1 There shall be at least one portable foam applicator unit complying with the provisions of the Fire Safety Systems Code.

.2 There shall be in each such space approved foam-type fire extinguishers, each of at least 45 *L* capacity or equivalent, sufficient in number to enable foam or its equivalent to be directed onto any part of the fuel and lubricating oil pressure systems, gearing and other fire hazards. In addition, there shall be provided a sufficient number of portable foam extinguishers or equivalent which shall be so located that no point in the space is more than 10 m walking distance from an extinguisher and that there are at least two such extinguishers in each such space.

.3 Machinery spaces containing steam turbines or enclosed steam engines

.1 Fixed fire-extinguishing systems

In spaces containing steam turbines or enclosed steam engines used for main propulsion or other purposes having in the aggregate a total output of not less than 375 kW, one of the fire-extinguishing systems specified in paragraph 4.1 shall be provided if such spaces are periodically unattended.

.2 Additional fire-extinguishing arrangements

.1 There shall be approved foam fire extinguishers, each of at least 45 *L* capacity or equivalent, sufficient in number to enable foam or its equivalent to be directed on to any part of the pressure lubrication system, on to any part of the casings enclosing pressure-lubricated parts of the turbines, engines or associated gearing, and any other fire hazards. However, such extinguishers shall not be required if protection, at least equivalent to that required by this subparagraph, is provided in such spaces by a fixed fire-extinguishing system fitted in compliance with paragraph 4.1.

.2 There shall be a sufficient number of portable foam extinguishers or equivalent which shall be so located that

no point in the space is more than 10 m walking distance from an extinguisher and that there are at least two such extinguishers in each such space, except that such extinguishers shall not be required in addition to any provided in compliance with paragraph 5.1.2.2.

.4 Other machinery spaces

Where, in the opinion of the Administration, a fire hazard exists in any machinery space for which no specific provisions for fire-extinguishing appliances are prescribed in paragraphs 5.1, 5.2 and 5.3, there shall be provided in, or adjacent to, that space such a number of approved portable fire extinguishers or other means of fire extinction as the Administration may deem sufficient.

.5 Additional requirements for passenger ships

Ships carrying more than 36 passengers, each machinery space of category A shall be provided with at least two suitable water fog applicators.

.6 Fixed local application fire-extinguishing systems

.1 Paragraph 5.6 shall apply to passenger ships of 500 gross tonnage and above.

.2 Machinery spaces of category A above 500 m^3 in volume shall, in addition to the fixed fire extinguishing system required in paragraph 5.1.1, be protected by an approved type of fixed water-based or equivalent local application fire-extinguishing system, based on the guidelines developed by the Organization.t In the case of periodically unattended machinery spaces, the fire-extinguishing system shall have both automatic and manual release capabilities. In the case of continuously manned machinery spaces, the fire-extinguishing system is only required to have a manual release capability.

.3 Fixed local application fire-extinguishing systems are to protect areas such as the following without the necessity of engine shutdown, personnel evacuation, or sealing of the spaces:

.1 the fire hazard portions of internal combustion machinery used for the ship's main propulsion and power generation;

.2 boiler fronts;

.3 the fire hazard portions of incinerators; and

.4 purifiers for heated fuel oil.

.4 Activation of any local application system shall give a visual and distinct audible alarm in the protected space and at continuously manned stations. The alarm shall indicate the specific system activated. The system alarm requirements described within this paragraph are in addition to, and not a substitute for, the

detection and fire alarm system required elsewhere in this chapter.

6 Fire-extinguishing arrangements in control stations, accommodation and service spaces

.1 Sprinkler and water-spraying systems

.1 Ships carrying more than 36 passengers shall be equipped with an automatic sprinkler, fire detection and fire alarm system of an approved type complying with the requirements of the Fire Safety Systems Code in all control stations, accommodation and service spaces, including corridors and stairways. Alternatively, control stations, where water may cause damage to essential equipment, may be fitted with an approved fixed fire-extinguishing system of another type. Spaces having little or no fire risk such as voids, public toilets, carbon dioxide rooms and similar spaces need not be fitted with an automatic sprinkler system.

.2 Ships carrying not more than 36 passengers, when a fixed smoke detection and fire alarm system complying with the provisions of the Fire Safety Systems Code is provided only in corridors, stairways and escape routes within accommodation spaces, an automatic sprinkler system shall be installed in accordance with regulation 7.5.3.2.

.3 A fixed pressure water-spraying fire-extinguishing system complying with the provisions of the Fire Safety Systems Code shall be installed on cabin balconies of ships to which regulation 5.3.4 applies, where furniture and furnishings on such balconies are not as defined in regulations I/3 (Rooms Containing Furniture and Furnishings of Restricted Fire Risk).

.2 Spaces containing flammable liquid

.1 Paint lockers shall be protected by:

.1 a carbon dioxide system, designed to give a minimum volume of free gas equal to 40% of the gross volume of the protected space;

.2 a dry powder system, designed for at least 0.5 kg powder/m^3;

.3 a water spraying or sprinkler system, designed for 5 //m^2 min. Water spraying systems may be connected to the fire main of the ship; or

.4 a system providing equivalent protection, as determined by the Administration.

In all cases, the system shall be operable from outside the protected space.

.2 Flammable liquid lockers shall be protected by an appropriate fire-extinguishing arrangement approved by the Administration.

.3 For lockers of a deck area of less than 4 m^2, which do not give access to accommodation spaces, a portable carbon dioxide fire extinguisher sized to provide a minimum volume of free gas equal to 40% of the gross volume of the space may be accepted in lieu of a fixed system. A discharge port shall be arranged in the locker to allow the discharge of the extinguisher without having to enter into the protected space. The required portable fire extinguisher shall be stowed adjacent to the port. Alternatively, a port or hose connection may be provided to facilitate the use of fire main water.

.3 Deep-fat cooking equipment

Deep-fat cooking equipment shall be fitted with the following:

.1 an automatic or manual fire-extinguishing system tested to an international standard acceptable to the Organization;

.2 a primary and backup thermostat with an alarm to alert the operator in the event of failure of either thermostat;

.3 arrangements for automatically shutting off the electrical power upon activation of the fire extinguishing system;

.4 an alarm for indicating operation of the fire-extinguishing system in the galley where the equipment is installed; and

.5 controls for manual operation of the fire-extinguishing system which are clearly labelled for ready use by the crew.

7 Fire-extinguishing arrangements in cargo spaces

.1 Except as provided for in paragraph 7.2, the cargo spaces of passenger ships of 1,000 gross tonnage and upwards shall be protected by a fixed carbon dioxide or inert gas fire-extinguishing system complying with the provisions of the Fire Safety Systems Code or by a fixed high-expansion foam fire-extinguishing system which gives equivalent protection.

.2 Where it is shown to the satisfaction of the Administration that a passenger ship is engaged on voyages of such short duration that it would be unreasonable to apply the requirements of paragraph 7.1 and also in ships of less than 1,000 gross tonnage, the arrangements in cargo spaces shall be to the satisfaction of the Administration, provided that the ship is fitted with steel hatch covers and effective means of closing all ventilators and other openings leading to the cargo spaces.

8 Fire-fighter's outfits

.1 Types of fire-fighter's outfits

Fire-fighter's outfits shall comply with the Fire Safety Systems Code.

.2 Number of fire-fighter's outfits

.1 Ships shall carry at least two fire-fighter's outfits.

.2 In addition, in passenger ships there shall be provided:

.1 for every 80 m, or part thereof, of the aggregate of the lengths of all passenger spaces and service spaces on the deck which carries such spaces or, if there is more than one such deck, on the deck which has the largest aggregate of such lengths, two fire-fighter's outfits and, in addition, two sets of personal equipment, each set comprising the items stipulated in the Fire Safety Systems Code. Ships carrying more than 36 passengers, two additional fire-fighter's outfits shall be provided for each main vertical zone. However, for stairway enclosures which constitute individual main vertical zones and for the main vertical zones in the fore or aft end of a ship which do not contain spaces of categories (6), (7), (8) or (12) defined in regulation 9.2.2.3, no additional fire-fighter's outfits are required; and

.2 on ships carrying more than 36 passengers, for each pair of breathing apparatus, one water fog applicator which shall be stored adjacent to such apparatus.

.3 The Administration may require additional sets of personal equipment and breathing apparatus, having due regard to the size and type of the ship.

.4 Two spare charges shall be provided for each required breathing apparatus. Passenger ships carrying not more than 36 passengers that are equipped with suitably located means for fully recharging the air cylinders free from contamination need carry only one spare charge for each required apparatus. Ships carrying more than 36 passengers, at least two spare charges for each breathing apparatus shall be provided.

.5 Passenger ships carrying more than 36 passengers constructed on or after 1 July 2010 shall be fitted with a suitably located means for fully recharging breathing air cylinders, free from contamination. The means for recharging shall be either:

1. breathing air compressors supplied from the main and emergency switchboard, or independently driven, with a minimum capacity of 60 L/min per required breathing apparatus, not to exceed 420 L/min; or

2. self-contained high-pressure storage systems of suitable pressure to recharge the breathing apparatus used on board, with a capacity of at least 1,200 L per required breathing apparatus, not to exceed 50,000 L of free air.

.3 Storage of fire-fighter's outfits

.1 The fire-fighter's outfits or sets of personal equipment shall be kept ready for use in an easily accessible location that is permanently and clearly marked and, where more than one fire-fighter's outfit or more than one set of personal equipment is carried, they shall be stored in widely separated positions.

.2 Ships at least two fire-fighter's outfits and, in addition, one set of personal equipment shall be available at any one position. At least two fire-fighter's outfits shall be stored in each main vertical zone.

Regulation 8

Structural integrity

1 Purpose

The purpose of this regulation is to maintain structural integrity of the ship, preventing partial or whole collapse of the ship structures due to strength deterioration by heat. For this purpose, materials used in the ships' structure shall ensure that the structural integrity is not degraded due to fire.

2 Material of hull, superstructures, structural bulkheads, decks and deckhouses

The hull, superstructures, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material. For the purpose of applying the definition of steel or other equivalent material as given in regulation I/3, the "applicable fire exposure" shall be according to the integrity and insulation standards given in tables 9.1 to 9.4. For example, where divisions such as decks or sides and ends of deckhouses are permitted to have "B-0" fire integrity, the "applicable fire exposure" shall be half an hour.

3 Structure of aluminum alloy

Unless otherwise specified in paragraph 2, in cases where any part of the structure is of aluminum alloy, the following shall apply:

.1 the insulation of aluminum alloy components of "A" or "B" class divisions, except structure which, in the opinion of the Administration, is non-load-bearing, shall be such that the temperature of the structural core does not rise more than 200°C above the ambient temperature at any time during the applicable fire exposure to the standard fire test; and

.2 special attention shall be given to the insulation of aluminum alloy components of columns, stanchions and other structural members required to support lifeboat and liferaft stowage, launching and embarkation areas, and "A" and "B" class divisions to ensure:

.1 that for such members supporting lifeboat and liferaft areas and "A" class divisions, the temperature rise limitation specified in paragraph 3.1 shall apply at the end of one hour; and

.2 that for such members required to support "B" class divisions, the temperature rise limitation specified in paragraph 3.1 shall apply at the end of half an hour.

4 Machinery spaces of category A

.1 Crowns and casings

Crowns and casings of machinery spaces of category A shall be of steel construction and shall be insulated as required by tables 9.5 and 9.7, as appropriate.

.2 Floor plating

The floor plating of normal passageways in machinery spaces of category A shall be made of steel.

5 Materials of overboard fittings

Materials readily rendered ineffective by heat shall not be used for overboard scuppers, sanitary discharges, and other outlets which are close to the waterline and where the failure of the material in the event of fire would give rise to danger of flooding.

Part C Escape

Regulation 9

Notification of crew and passengers

1 Purpose

The purpose of this regulation is to notify crew and passengers of a fire for safe evacuation. For this purpose, a general emergency alarm system and a public address system shall be provided.

2 General emergency alarm system

A general emergency alarm system required by regulation IX/10 shall be used for notifying crew and passengers of a fire.

3 Public address systems

A public address system or other effective means of communication complying with the requirements of regulation IX/7 shall be available throughout the accommodation and service spaces and control stations and open decks.

Regulation 10

Means of escape

1 Purpose

The purpose of this regulation is to provide means of escape so that persons on board can safely and swiftly escape to the lifeboat and liferaft embarkation deck. For this purpose, the following functional requirements shall be met:

.1 safe escape routes shall be provided;

.2 escape routes shall be maintained in a safe condition, clear of obstacles; and

.3 additional aids for escape shall be provided as necessary to ensure accessibility, clear marking, and adequate design for emergency situations.

2 General requirements

.1 Unless expressly provided otherwise in this regulation, at least two widely separated and ready means of escape shall be provided from all spaces or groups of spaces.

.2 Lifts shall not be considered as forming one of the means of escape as required by this regulation.

3 Means of escape from control stations, accommodation spaces and service spaces

.1 General requirements

.1 Stairways and ladders shall be so arranged as to provide ready means of escape to the lifeboat and liferaft embarkation deck from passenger and crew accommodation spaces and from spaces in which the crew is normally employed, other than machinery spaces.

.2 Unless expressly provided otherwise in this regulation, a corridor, lobby, or part of a corridor from which there is only one route of escape shall be prohibited. Dead-end corridors used in service areas which are necessary for the practical utility of the ship, such as fuel oil stations and athwart ship supply corridors, shall be permitted, provided such dead-end corridors are separated from crew accommodation areas and are inaccessible from passenger accommodation areas. Also, a part of a corridor that has a depth not exceeding its width is considered a recess or local extension and is permitted.

.3 All stairways in accommodation and service spaces and control stations shall be of steel frame construction except where the Administration sanctions the use of other equivalent material.

.4 If a radiotelegraph station has no direct access to the open deck, two means of escape from, or access to, the station shall be provided, one of which may be a porthole or window of sufficient size or other means to the satisfaction of the Administration.

.5 Doors in escape routes shall, in general, open in way of the direction of escape, except that:

.1 individual cabin doors may open into the cabins in order to avoid injury to persons in the corridor when the doo r is opened; and

.2 doors in vertical emergency escape trunks may open out of the trunk in order to permit the trunk to be used both for escape and for access.

.2 Means of escape

.1 Escape from spaces below the bulkhead deck

.1 Below the bulkhead deck, two means of escape, at least one of which shall be independent of watertight doors, shall be provided from each watertight compartment or similarly restricted space or group of spaces. Exceptionally, the Administration may dispense with one of the means of escape for crew spaces that are entered

only occasionally, if the required escape route is independent of watertight doors.

.2 Where the Administration has granted dispensation under the provisions of paragraph 3.2.1.1, this sole means of escape shall provide safe escape. However, stairways shall not be less than 800 mm in clear width with handrails on both sides.

.2 Escape from spaces above the bulkhead deck

Above the bulkhead deck there shall be at least two means of escape from each main vertical zone or similarly restricted space or group of spaces, at least one of which shall give access to a stairway forming a vertical escape.

.3 Direct access to stairway enclosures

Stairway enclosures in accommodation and service spaces shall have direct access from the corridors and be of a sufficient area to prevent congestion, having in view the number of persons likely to use the m in an emergency. Within the perimeter of such stairway enclosures, only public toilets, lockers of non-combustible material providing storage for non-hazardous safety equipment and open information counters are permitted. Only public spaces, corridors, lifts, public toilets, special category spaces and open ro-ro spaces to which any passengers carried can have access, other escape stairways required by paragraph 3.2.4.1 and external areas are permitted to have direct access to these stairway enclosures. Small corridors or "lobbies" used to separate an enclosed stairway from galleys or main laundries may have direct access to the stairway provided they have a minimum deck area of 4.5 m, a width of no less than 900 mm and contain a fire hose station.

.4 Details of means of escape

.1 At least one of the means of escape required by paragraphs 3.2.1.1 and 3.2.2 shall consist of a readily accessible enclosed stairway, which shall provide continuous fire shelter from the level of its origin to the appropriate lifeboat and liferaft embarkation decks, or to the uppermost weather deck if the embarkation deck does not extend to the main vertical zone being considered. In the latter case, direct access to the embarkation deck by way of external open stairways and passageways shall be provided and shall have emergency lighting in accordance with regulation VII/3.2 and slip-free surfaces underfoot. Boundaries facing external open stairways and passageways forming part of an escape route and boundaries in such a position

that their failure during a fire would impede escape to the embarkation deck shall have fire integrity, including insulation values, in accordance with tables 9.1 to 9.4, as appropriate.

.2 Protection of access from the stairway enclosures to the lifeboat and liferaft embarkation areas shall be provided either directly or through protected internal routes which have fire integrity and insulation values for stairway enclosures as determined by tables 9.1 to 9.4, as appropriate.

.3 Stairways serving only a space and a balcony in that space shall not be considered as forming one of the required means of escape.

.4 Each level within an atrium shall have two means of escape, one of which shall give direct access to an enclosed vertical means of escape meeting the requirements of paragraph 3.2.4.1.

.5 The widths, number and continuity of escapes shall be in accordance with the requirements in the Fire Safety Systems Code.

.5 Marking of escape routes

.1 In addition to the emergency lighting required by regulations VII/3.2 , the means of escape, including stairways and exits, shall be marked by lighting or photo luminescent strip indicators placed not more than 300 mm above the deck at all points of the escape route, including angles and intersections. The marking must enable passengers to identify the routes of escape and readily identify the escape exits. If electric illumination is used, it shall be supplied by the emergency source of power and it shall be so arranged that the failure of any single light or cut in a lighting strip will not result in the marking being ineffective. Additionally, escape route signs and fire equipment location markings shall be of photo luminescent material or marked by lighting. The Administration shall ensure that such lighting or photo luminescent equipment has been evaluated, tested and applied in accordance with the Fire Safety Systems Code

.2 Ships carrying more than 36 passengers, the requirements of the paragraph 3.2.5.1 shall also apply to the crew accommodation areas.

.6 Normally locked doors that form part of an escape route

.1 Cabin and stateroom doors shall not require keys to

unlock the m from inside the room. Neither shall there be any doors along any designated escape route which require keys to unlock them when moving in the direction of escape.

.2 Escape doors from public spaces that are normally latched shall be fitted with a means of quick release. Such means shall consist of a door-latching mechanism incorporating a device that releases the latch upon the application of a force in the direction of escape flow. Quick release mechanisms shall be designed and installed to the satisfaction of the Administration and, in particular:

.1 consist of bars or panels, the actuating portion of which extends across at least one half of the width of the door leaf, at least 760 mm and not more than 1,120 mm above the deck;

.2 cause the latch to release when a force not exceeding 67 N is applied; and

.3 not be equipped with any locking device, set screw or other arrangement that prevents the release of the latch when pressure is applied to the releasing device.

4 Means of escape from machinery spaces

.1 Means of escape on passenger ships

Means of escape from each machinery space in passenger ships shall comply with the following provisions.

.1 Escape from spaces below the bulkhead deck

Where the space is below the bulkhead deck, the two means of escape shall consist of either:

.1 two sets of steel ladders, as widely separated as possible, leading to doors in the upper part of the space, similarly separated and from which access is provided to the appropriate lifeboat and liferaft embarkation decks. One of these ladders shall be located within a protected enclosure that satisfies regulation 6.2.2.6, category (2), or regulation 6.2.2. , category (4), as appropriate, from the lower part of the space it serves to a safe position outside the space. Self-closing fire doors of the same fire integrity standards shall be fitted in the enclosure. The ladder shall be fixed in such a way that heat is not transferred into the enclosure through non-insulated fixing points. The protected enclosure shall have minimum internal dimensions of at least 800 mm x 800

mm, and shall have emergency lighting provisions; or

.2 one steel ladder leading to a door in the upper part of the space from which access is provided to the embarkation deck and additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the embarkation deck.

.2 Escape from spaces above the bulkhead deck

Where the space is above the bulkhead deck, the two means of escape shall be as widely separated as possible and the doors leading from such means of escape shall be in a position from which access is provided to the appropriate lifeboat and liferaft embarkation decks. Where such means of escape require the use of ladders, these shall be of steel.

.3 Dispensation from two means of escape

In a ship of less than 1,000 gross tonnage, the Administration may dispense with one of the means of escape, due regard being paid to the width and disposition of the upper part of the space. In a ship of 1,000 gross tonnage and above, the Administration may dispense with one means of escape from any such space, including a normally unattended auxiliary machinery space, so long as either a door or a steel ladder provides a safe escape route to the embarkation deck, due regard being paid to the nature and location of the space and whether persons are normally employed in that space. In the steering gear space, a second means of escape shall be provided when the emergency steering position is located in that space unless there is direct access to the open deck.

.4 Escape from machinery control rooms

Two means of escape shall be provided from a machinery control room located within a machinery space, at least one of which will provide continuous fire shelter to a safe position outside the machinery space.

.2 Emergency escape breathing devices

.1 On all ships, within the machinery spaces, emergency escape breathing devices shall be situated ready for use at easily visible places, which can be reached quickly and easily at any time in the event of fire. The location of emergency escape breathing devices shall take into account the layout of the machinery space and the number of persons normally working in the spaces.

.2 The number and location of these devices shall be indicated in the fire control plan.

.3 Emergency escape breathing devices shall comply with the Fire Safety Systems Code.

5 Means of escape on passenger ships from special category an d open ro-ro spaces to which any passengers carried can have access

.1 In special category and open ro-ro spaces to which any passengers carried can have access, the number and locations of the means of escape both below and above the bulkhead deck shall be to the satisfaction of the Administration and, in general, the safety of access to the embarkation deck shall be at least equivalent to that provided for under paragraphs 3.2.1.1, 3.2.2, 3.2.4.1 and 3.2.4.2. Such spaces shall be provided with designated walkways to the means of escape with a breadth of at least 600 mm. The parking arrangements for the vehicles shall maintain the walkways clear at all times.

.2 One of the escape routes from the machinery spaces where the crew is normally employed shall avoid direct access to any special category space.

6 Means of escape from ro-ro spaces

At least two means of escape shall be provided in ro-ro spaces where the crew are normally employed. The escape routes shall provide a safe escape to the lifeboat and liferaft embarkation decks and shall be located at the fore and aft ends of the space.

7 Additional requirements for ro-ro passenger ships

.1 General

.1 Escape routes shall be provided from every normally occupied space on the ship to an assembly station. These escape routes shall be arranged so as to provide the most direct route possible to the assembly station, and shall be marked with symbols based on the guidelines developed by the Organization.

.2 The escape route from cabins to stairway enclosures shall be as direct as possible, with a minimum number of changes in direction. It shall not be necessary to cross from one side of the ship to the other to reach an escape route. It shall not be necessary to climb more than two decks up or down in order to reach an assembly station or open deck from any passenger space.

.3 External routes shall be provided from open decks, as referred to in paragraph 7.1.2, to the survival craft embarkation stations.

.4 Where enclosed spaces adjoin an open deck, openings from the enclosed space to the open deck shall, where practicable, be capable of being used as an emergency exit.

.5 Escape routes shall not be obstructed by furniture and other obstructions. With the exception of tables and chairs which may be cleared to provide open space, cabinets and other heavy

furnishings in public spaces and along escape routes shall be secured in place to prevent shifting if the ship rolls or lists. Floor coverings shall also be secured in place. When the ship is under way, escape routes shall be kept clear of obstructions such as cleaning carts, bedding, luggage and boxes of goods.

.2 Instruction for safe escape

.1 Deck s shall be sequentially numbered, starting with "1" at the tank top or lowest deck. The numbers shall be prominently displayed at stair landings and lift lobbies. Decks may also be named, but the deck number shall always be displayed with the name.

.2 Simple "mimic" plans showing the "you are here" position and escape routes marked by arrows shall be prominently displayed on the inside of each cabin doo r and in public spaces. The plan shall show the directions of escape and shall be properly oriented in relation to its position on the ship.

.3 Strength of handrails and corridors

.1 Handrails or other handholds shall be provided in corridors along the entire escape route so that a firm handhold is available at every step of the way, where possible, to the assembly stations and embarkation stations. Such handrails shall be provided on both sides of longitudinal corridors more than 1.8 m in width and transverse corridors more than 1 m in width. Particular attention shall be paid to the need to be able to cross lobbies, atriums and other large open spaces along escape routes. Handrails and other handholds shall be of such strength as to withstand a distributed horizontal load of 750 N/m applied in the direction of the center of the corridor or space, and a distributed vertical load of 750 N/m applied in the downward direction. The two loads need not be applied simultaneously.

.2 The lowest 0.5 m of bulkheads and other partitions forming vertical divisions along escape routes shall be able to sustain a load of 750 N/m to allow the m to be used as walking surfaces from the side of the escape route with the ship at large angles of heel.

.4 Evacuation analysis

Escape routes shall be evaluated by an evacuation analysis early in the design process. The analysis shall be used to identify and eliminate, as far as practicable, congestion which may develop during an abandonment, due to normal movement of passengers and crew along escape routes, including the possibility that crew may need to move along these routes in a direction opposite to the movement of passengers. In addition, the analysis shall be used to demonstrate that

escape arrangements are sufficiently flexible to provide for the possibility that certain escape routes, assembly stations, embarkation stations or survival craft may not be available as a result of a casualty.

PART D - OPERATIONAL REQUIREMENTS

Regulation 11
Operational readiness and maintenance

1 Purpose

The purpose of this regulation is to maintain and monitor the effectiveness of the fire safety measures the ship is provided with. For this purpose, the following functional requirements shall be met:

.1 fire protection systems and fire-fighting systems and appliances shall be maintained ready for use; and

.2 fire protection systems and fire-fighting systems and appliances shall be properly tested and inspected.

2 General requirements

At all times while the ship is in service, the requirements of paragraph 1.1 shall be complied with. A ship is not in service when:

.1 it is in for repairs or lay-up (either at anchor or in port) or in dry-dock;

.2 it is declared not in service by the owner or the owner's representative; and

.3 in the case of passenger ships, there are no passengers on board.

.1 Operational readiness

.1 The following fire protection systems shall be kept in good order so as to ensure their required performance if a fire occurs:

.1 structural fire protection including fire resisting divisions, and protection of openings and penetrations in these divisions;

.2 fire detection and fire alarm systems; and

.3 means of escape systems and appliances.

.2 Fire-fighting systems and appliances shall be kept in good working order and readily available for immediate use. Portable extinguishers which have been discharged shall be immediately recharged or replaced with an equivalent unit.

.2 Maintenance, testing and inspections

.1 Maintenance, testing and inspections shall be carried out based on the guidelines developed by the Organization and in a manner having due regard to ensuring the reliability of fire-fighting systems and appliances.

.2 The maintenance plan shall be kept on board the ship and shall be available for inspection whenever required by the Administration.

.3 The maintenance plan shall include at least the following fire protection systems and fire- fighting systems and appliances,

where installed:

.1 fire mains, fire pumps and hydrants including hoses, nozzles and international shore connections;

.2 fixed fire detection and fire alarm systems;

.3 fixed fire-extinguishing systems and other fire extinguishing appliances;

.4 automatic sprinkler, fire detection and fire alarm systems;

.5 ventilation systems including fire and smoke dampers, fans and their controls;

.6 emergency shut down of fuel supply;

.7 fire doors including their controls;

.8 general emergency alarm systems;

.9 emergency escape breathing devices;

.10 portable fire extinguishers including spare charges; and

.11 fire-fighter's outfits.

.4 The maintenance programme may be computer-based.

3 Additional requirements for passenger ships

In addition to the fire protection systems and appliances listed in paragraph 2.2.3, ships carrying more than 36 passengers shall develop a maintenance plan for low-location lighting and public address systems.

Regulation 12

Instructions, onboard training and drills

1 Purpose

The purpose of this regulation is to mitigate the consequences of fire by means of proper instructions for training and drills of persons onboard in correct procedures under emergency conditions. For this purpose, the crew shall have the necessary knowledge and skills to handle fire emergency cases, including passenger care.

2 General requirements

.1 Instructions, duties and organization

.1 Crew members shall receive instruction on fire safety onboard the ship.

.2 Crew members shall receive instructions on their assigned duties.

.3 Parties responsible for fire-extinguishing shall be organized. These parties shall have the capability to complete their duties at all times while the ship is in service.

.2 Onboard training and drills

.1 Crew members shall be trained to be familiar with the arrangements of the ship as well as the location and operation of any fire-fighting systems and appliances that they may be called upon to use.

.2 Training in the use of the emergency escape breathing devices shall be considered as part of on board training.

.3 Performance of crew members assigned fire-fighting duties shall be periodically evaluated by conducting onboard training

and drills to identify areas in need of improvement, to ensure competency in fire-fighting skills is maintained, and to ensure the operational readiness of the fire-fighting organization.

.4 Onboard training in the use of the ship's fire-extinguishing systems and appliances shall be planned and conducted in accordance with provisions of regulation IX.

.5 Fire drills shall be conducted and recorded in accordance with the provisions of regulations IX.

.6 An onboard means of recharging breathing apparatus cylinders used during drills shall be provided or a suitable number of spare cylinders shall be carried onboard to replace those used.

.3 Training manuals

.1 A training manual shall be provided in each crew mess room and recreation room or in each crew cabin.

.2 The training manual shall be written in the working language of the ship.

.3 The training manual, which may comprise several volumes, shall contain the instructions and information required in paragraph .4 in easily understood terms and illustrated wherever possible. Any part of such information may be provided in the form of audio-visual aides in lieu of the manual.

.4 The training manual shall explain the following in detail:

.1 general fire safety practice and precautions related to the dangers of smoking, electrical hazards, flammable liquids and similar common shipboard hazards;

.2 general instructions on fire-fighting activities and fire-fighting procedures including procedures for notification of a fire and use of manually operated call points;

.3 meanings of the ship's alarms;

.4 operation and use of fire-fighting systems and appliances;

.5 operation and use of fire doors;

.6 operation and use of fire and smoke dampers; and

.7 escape systems and appliances.

.4 Fire control plans

.1 General arrangement plans shall be permanently exhibited for the guidance of the ship's officers, showing clearly for each deck the control stations, the various fire sections enclosed by "A' class divisions, the sections enclosed by “B" class divisions together with particulars of the fire detection and fire alarm systems, the sprinkler installation, the fire-extinguishing appliances, means of access to different compartments, decks, etc., and the ventilating system, including particulars of the fan control positions, the position of dampers and identification numbers of the ventilating fans serving each section. Alternatively, at the discretion of the Administration, the aforementioned details may be set out in a booklet, a copy of which shall be supplied to each officer, and one copy shall at all times be available on board in an accessible position. Plans and

booklets shall be kept up to date; any alterations thereto shall be recorded as soon as practicable. Description in such plans and booklets shall be in the language or languages required by the Administration.

.2 A duplicate set of fire control plans or a booklet containing such plans shall be permanently stored in a prominently marked weathertight enclosure outside the deckhouse for the assistance of shore-side fire-fighting personnel.

3 Additional requirements for passenger ships

.1 Fire drills

In addition to the requirement of paragraph 2.2.3, fire drills shall be conducted in accordance with the provisions of regulation III/30, having due regard to notification of passengers and movement of passengers to assembly stations and embarkation decks.

.2 Fire control plans

In ships carrying more than 36 passenger, plans and booklet required by this regulation shall provide information regarding fire protection, fire detection and fire extinction based on the guidelines developed by the Organization.

Regulation 13

Carriage of dangerous goods

1 Purpose

The purpose of this regulation is to provide additional safety measures in order to address the fire safety objectives of this chapter for ships carrying dangerous goods. For this purpose, the following functional requirements shall be met:

.1 fire protection systems shall be provided to protect the ship from the added fire hazards associated with carriage of dangerous goods;

.2 dangerous goods shall be adequately separated from ignition sources; and

.3 appropriate personnel protective equipment shall be provided for the hazards associated with the carriage of dangerous goods.

2 General requirements

.1 The carriage of dangerous goods shall comply with the requirements of this regulation, as appropriate, except when carrying dangerous goods in limited quantities unless such requirements have already been met by compliance with the requirements elsewhere in this chapter.

.2 The following ship types and cargo spaces shall govern the application of tables 19.1 and 19.2 :

.1 ships and cargo spaces not specifically designed for the carriage of freight containers, but intended for the carriage of dangerous goods in packaged form, including goods in freight containers and portable tanks;

.2 purpose-built containerships and cargo spaces intended for the

carriage of dangerous goods in freight containers and portable tanks;

.3 ro-ro ships and ro-ro spaces intended for the carriage of dangerous goods;

3 Special requirements

Unless otherwise specified, the following requirements shall govern the application of tables 19.1, 19. 2 and 19. 3 stowage of dangerous goods where the numbers of the following paragraphs are indicated in the first column of the tables.

.1 Water supplies

.1 Arrangements shall be made to ensure immediate availability of a supply of water from the fire main at the required pressure either by permanent pressurization or by suitably placed remote arrangements for the fire pumps.

.2 The quantity of water delivered shall be capable of supplying four nozzles of a size and at pressures as specified in regulation 7.2, capable of being trained on any part of the cargo space when empty. This amount of water may be applied by equivalent means to the satisfaction of the Administration.

.3 Means shall be provided for effectively cooling the designated cargo space by at least 5*L*/min per square meter of the horizontal area of cargo spaces, either by a fixed arrangement of spraying nozzles or by flooding the cargo space with water. Hoses may be used for this purpose in small cargo spaces and in small areas of larger cargo spaces at the discretion of the Administration. However, the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. The drainage system shall be sized to remove no less than 125 % of the combine d capacity of both the water spraying system pumps and the required number of fire hose nozzles. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of not more than 40 m in each watertight compartment. If this is not possible, the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information.

.4 Provision to flood a designated cargo space with suitable specified media may be substituted for the requirements in paragraph 3.1.3.

.5 The total required capacity of the water supply shall satisfy paragraphs 3.1.2 and 3.1.3, if applicable, simultaneously calculated for the largest designated cargo space. The capacity

requirements of paragraph 3.1.2 shall be met by the total capacity of the main fire pump(s), not including the capacity of the emergency fire pump, if fitted. If a drencher system is used to satisfy paragraph 3.1.3, the drencher pump shall also be taken into account in this total capacity calculation.

.2 Sources of ignition

Electrical equipment and wiring shall not be fitted in enclosed cargo spaces or vehicle spaces unless it is essential for operational purposes in the opinion of the Administration. However, if electrical equipment is fitted in such spaces, it shall be of a certified safe type for use in the dangerous environments to which it may be exposed unless it is possible to completely isolate the electrical system (e.g. by removal of links in the system, other than fuses). Cable penetrations of the decks and bulkheads shall be sealed against the passage of gas or vapour. Through runs of cables and cables within the cargo spaces shall be protected against damage from impact. Any other equipment which may constitute a source of ignition of flammable vapour shall not be permitted.

.3 Detection system

Ro-ro spaces shall be fitted with a fixed fire detection and fire alarm system complying with the requirements of the Fire Safety Systems Code. All other types of cargo spaces shall be fitted with either a fixed fire detection and fire alarm system or a sample extraction smoke detection system complying with the requirements of the Fire Safety Systems Code. If a sample extraction smoke detection system is fitted, particular attention shall be given to paragraph 2.1.3 in chapter 10 of the Fire Safety Systems Code in order to prevent the leakage of toxic fumes into occupied areas.

.4 Ventilation

.1 Adequate power ventilation shall be provided in enclosed cargo spaces. The arrangement shall be such as to provide for at least six air changes per hour in the cargo space, based on an empty cargo space, and for removal of vapours from the upper or lower parts of the cargo space, as appropriate.

.2 The fans shall be such as to avoid the possibility of ignition of flammable gas/air mixtures. Suitable wire mesh guards shall be fitted over inlet and outlet ventilation openings.

.3 Natural ventilation shall be provided in enclosed cargo spaces intended for the carriage of solid dangerous goods in bulk, where there is no provision for mechanical ventilation.

.5 Bilge pumping

.1 Where it is intended to carry flammable or toxic liquids in enclosed cargo spaces, the bilge pumping system shall be designed to protect against inadvertent pumping of such liquids through machinery space piping or pumps. Where large quantities of such liquids are carried, consideration shall be

given to the provision of additional means of draining those cargo spaces.

.2 If the bilge drainage system is additional to the system served by pumps in the machinery space, the capacity of the system shall be not less than 10 m^3/h per cargo space served. If the additional system is common, the capacity need not exceed 25m^3/h. The additional bilge system need not be arranged with redundancy.

.3 Whenever flammable or toxic liquids are carried, the bilge line into the machinery space shall be isolated either by fitting a blank flange or by a closed lockable valve.

.4 Enclosed spaces outside machinery spaces containing bilge pumps serving cargo spaces intended for carriage of flammable or toxic liquids shall be fitted with separate mechanical ventilation giving at least six air changes per hour. If the space has access from another enclosed space, the door shall be self-closing.

.5 If bilge drainage of cargo spaces is arranged by gravity drainage, the drainage shall be either led directly overboard or to a closed drain tank located outside the machinery spaces. The tank shall be provided with a vent pipe to a safe location on the open deck. Drainage from a cargo space into bilge wells in a lower space is only permitted if that space satisfies the same requirements as the cargo space above.

.6 Personnel protection

.1 Four sets of full protective clothing, resistant to chemical attack, shall be provided in addition to the fire-fighter's outfits required by regulation 7.8. The protective clothing shall cover all skin, so that no part of the bod y is unprotected.

.2 At least two self-contained breathing apparatuses additional to those required by regulation 7.8 shall be provided. Two spare charges suitable for use with the breathing apparatus shall be provided for each required apparatus. Passenger ships carrying not more than 36 passengers that are equipped with suitably located means for fully recharging the air cylinders free from contamination need carry only one spare charge for each required apparatus.

.7 Portable fire extinguishers

Portable fire extinguishers with a total capacity of at least 12 kg of dry powder or equivalent shall be provided for the cargo spaces. These extinguishers shall be in addition to any portable fire extinguishers required elsewhere in this chapter.

.8 Insulation of machinery space boundaries

Bulkheads forming boundaries between cargo spaces and machinery spaces of category A shall be insulated to "A-60" class standard, unless the dangerous goods are stowed at least 3 m horizontally away

from such bulkheads. Other boundaries between such spaces shall be insulated to "A-60" class standard.

.9 Water-spray system

Each open ro-ro space having a deck above it and each space deemed to be a closed ro-ro space not capable of being sealed shall be fitted with an approved fixed pressure water-spraying system for manual operation which shall protect all parts of any deck and vehicle platform in the space, except that the Administration may permit the use of any other fixed fire-extinguishing system that has been shown by full-scale test to be no less effective. However, the drainage and pumping arrangements shall be such as to prevent the build-up office surfaces. The drainage system shall be sized to remove no less than 125 % of the combine d capacity of both the water-spraying system pumps and the required number of fire hose nozzles. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of not more than 40 m in each watertight compartment. If this is not possible, the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information.

.10 Separation of ro-ro spaces

.1 In ships having ro-ro spaces, a separation shall be provided between a closed ro-ro space and an adjacent open ro-ro space. The separation shall be such as to minimize the passage of dangerous vapours and liquids between such spaces. Alternatively, such separation need not be provided if the ro-ro space is considered to be a closed cargo space over its entire length and fully complies with the relevant special requirements of this regulation.

.2 In ships having ro-ro spaces, a separation shall be provided between a closed ro-ro space and the adjacent weather deck. The separation shall be such as to minimize the passage of dangerous vapours and liquids between such spaces. Alternatively, a separation need not be provided if the arrangements of the closed ro-ro spaces are in accordance with those required for the dangerous goods carried on adjacent weather decks.

Regulation 19.2.2 / Regulation 19	Weather decks (.1 to .5 inclusive)	.1 Not specifically designed	.2 Container cargo spaces	.3 Closed ro-ro cargo spaces[5]	.3 Open ro-ro cargo spaces	.4 Solid dangerous goods in bulk	.5 Shipborne barges
.3.1.1	X	X	X	X	X	For application of requirements of regulation 19 to different classes of dangerous goods - see Table 19.2	X
.3.1.2	X	X	X	X	X		-
.3.1.3	-	X	X	X	X		X
.3.1.4	-	X	X	X	X		X
.3.2	-	X	X	X	X		X[4]
.3.3	-	X	X	X	-		X[4]
.3.4.1	-	X	X[1]	X	-		X[4]
.3.4.2	-	X	X[1]	X	-		X[4]
.3.5	-	X	X	X	-		-
.3.6.1	X	X	X	X	X		-
.3.6.2	X	X	X	X	X		-
.3.7	X	X	-	-	X		-
.3.8	X	X	X[2]	X	X		-
.3.9	-	-	-	X[3]	X		-
.3.10.1	-	-	-	X	-		-
.3.10.2	-	-	-	X	-		-

Table 19.1 - Application of the Requirements to Different Modes of Carriage of Dangerous Goods in Ships and Cargo Spaces

Where X appears in table 19.1 , it means this requirement is applicable to all classes of dangerous goods a given in the appropriate line of table 19.3, except a s indicated by the notes.

Notes:

1 For classes 4 and 5.1 not applicable to closed freight containers.

For classes 2, 3, 6.1 and 8 when carried in closed freight containers, the ventilation rate may be reduced to not less than two ail changes. For the purpose of this requirement a portable tank is a closed freight container.

2 Applicable to decks only.

3 Applies only to closed ro-ro spaces, not capable of being scaled.

4 Special category spaces shall be treated as closed ro-ro spaces when dangerous goods are carried.

Table 19. 2 - Application of The Requirements to Different Classes of Dangerous Goods For Ships and Cargo Spaces Carrying Solid Dangerous Goods in Bulk

Class / Regulation 19	4.1	4.2	4.3[6]	5.1	6.1	8	9
.3.1.1	X	X	-	X	-	-	X
.3.1.2	X	X	-	X	-	-	X
.3.2	X	X[7]	X	X[8]	-	-	X[8]
.3.4.1	-	X[7]	X	-	-	-	-
.3.4.2	X[9]	X[7]	X	X[7,9]	-	-	X[7,9]
.3.4.3	X	X	X	X	X	X	X
.3.6	X	X	X	X	X	X	X
.3.8	X	X	X	X[7]	-	-	X[10]

Notes:

1 The hazards of substances in this class which may be carried in bulk are such that special consideration shall be given by the Administration to the construction and equipment of the ship involved in addition to meeting the requirements enumerated in this table.

2 Only applicable to Seedcake containing solvent extractions, to Ammonium nitrate and to Ammonium nitrate fertilizers.

3 Only applicable to Ammonium nitrate and to Ammonium nitrate fertilizers.

However, a degree of protection in accordance with standards contained in the International Electro technical Commission publication 60079, Electrical apparatus for explosive gas atmospheres, is sufficient.

4 Only suitable wire mesh guards are required.

Regulation 14

Protection of vehicle, special category and ro-ro spaces

1 Purpose

The purpose of this regulation is to provide additional safety measures in order to address the fire safety objectives of this chapter for ships fitted with vehicle, special category and ro-ro spaces. For this purpose, the following functional requirements shall be met:

.1 fire protection systems shall be provided to adequately protect the ship from the fire hazards associated with vehicle, special category and ro-ro spaces;

.2 ignition sources shall be separated from vehicle, special category and ro-ro spaces; and

.3 vehicle, special category and ro-ro spaces shall be adequately ventilated.

2 General requirements

.1 Application

In addition to complying with the requirements of regulations in parts B, C, D and E, as appropriate, vehicle, special category and ro-ro spaces shall comply with the requirements of this regulation.

.2 Basic principles for passenger ships

.1 The basic principle underlying the provisions of this regulation is that the main vertical zoning required by regulation 6. 2 may not be practicable in vehicle spaces of passenger ships and, therefore, equivalent protection must be obtained in such spaces on the basis of a horizontal zone concept and by the provision of an efficient fixed fire-extinguishing system. Based on this concept, a horizontal zone for the purpose of this regulation may include special category spaces on more than one deck provided that the total overall clear height for vehicles does not exceed 10 m.

.2 The basic principle underlying the provisions of paragraph 2.2. 1 is also applicable to ro-ro spaces.

.3 The requirements of ventilation systems, openings in "A" class divisions and penetrations in "A" class divisions for maintaining the integrity of vertical zones in this chapter shall be applied equally to decks and bulkheads forming the boundaries separating horizontal zones from each other and from the remainder of the ship.

3 Precaution against ignition of flammable vapours in closed vehicle spaces, closed ro-ro spaces and special category spaces

.1 Ventilation systems

.1 Capacity of ventilation systems

There shall be provided an effective power ventilation system sufficient to give at least the following air changes:

.1 Passenger ships:

Special category spaces	10 air changes per hour
Closed ro-ro and vehicle spaces other than special category spaces for ships carrying more than 36 passengers	10 air changes per hour
Closed ro-ro and vehicle spaces other than special category spaces for ships carrying not more than 36 passengers	6 air changes per hour

.2 Performance of ventilation systems

.1 Ships, the power ventilation system required in paragraph 3.1.1 shall be separate from other ventilation systems and shall be in operation at all times when vehicles are in such spaces. Ventilation ducts serving such cargo spaces capable of being effectively sealed shall be separated for each such space. The system shall be capable of being controlled from a position outside such spaces.

.2 The ventilation system shall be such as to prevent air stratification and the formation of air pockets.

.3 Indication of ventilation systems

Mean s shall be provided on the navigation bridge to indicate any loss of the required ventilating capacity.

.4 Closing appliances and ducts

.1 Arrangements shall be provided to permit a rapid shutdown and effective closure of the ventilation system from outside of the space in case of fire, taking into account the weather and sea conditions.

.2 Ventilation ducts, including dampers, within a common horizontal zone shall be made of steel. Ships ventilation ducts that pass through other horizontal zones or machinery spaces shall be "A-60" class steel ducts constructed in accordance with regulations 6.7.2.1. 1 and 6.7.2.1.2.

.5 Permanent openings

Permanent openings in the side plating, the ends or deckhead of the space shall be so situated that a fire in the cargo space does not endanger stowage areas and embarkation stations for survival craft and accommodation spaces, service spaces and control stations in superstructures and deckhouses above the cargo spaces.

.2 Electrical equipment and wiring

.1 Except as provided in paragraph 3.2.2, electrical equipment and wiring shall be of a type suitable for use in an explosive petrol and air mixture.

.2 In case of other than special category spaces below the bulkhead deck, notwithstanding the provisions in paragraph 3.2.1 , above a height of 450 mm from the deck and from each platform for vehicles, if fitted, except platforms with openings of sufficient size permitting penetration of petrol gases downwards, electrical equipment of a type so enclosed and protected as to prevent the escape of sparks shall be permitted as an alternative, on condition that the ventilation system is so designed and operated as to provide continuous ventilation of the cargo spaces at the rate of at least ten air changes per hour whenever vehicles are on board.

.3 Electrical equipment and wiring in exhaust ventilation ducts

Electrical equipment and wiring, if installed in an exhaust ventilation duct, shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

.4 Other ignition sources

Other equipment which may constitute a source of ignition of flammable vapours shall not be permitted.

.5 Scuppers and discharges

Scuppers shall not be led to machinery or other spaces where sources of ignition may be present.

4 Detection and alarm

.1 Fixed fire detection and fire alarm systems

Except as provided in paragraph 4.3.1, there shall be provided a fixed fire detection and fire alarm system complying with the requirements of the Fire Safety Systems Code. The fixed fire detection system shall be capable of rapidly detecting the onset of fire. The type of detectors and their spacing and location shall be to the satisfaction of the Administration, taking into account the effects of ventilation and other relevant factors. After being installed, the system shall be tested under normal ventilation conditions and shall give an overall response time to the satisfaction of the Administration.

.2 Sample extraction smoke detection systems

Except open ro-ro spaces, open vehicle spaces and special category

spaces, a sample extraction smoke detection system complying with the requirements of the Fire Safety Systems Cod e may be used as an alternative for the fixed fire detection and fire alarm system required in paragraph 4.1.

.3 Special category spaces

.1 An efficient fire patrol system shall be maintained in special category spaces. If an efficient fire patrol system is maintained by a continuous fire watch at all times during the voyage, a fixed fire detection and fire alarm system is not required.

.2 Manually operated call points shall be spaced so that no part of the space is more than 20 m from a manually operated call point, and one shall be placed close to each exit from such spaces.

5 Structural fire protection

Notwithstanding the provisions of regulation 6.2.2, in passenger ships carrying more than 36 passengers, the boundary bulkheads and decks of special category spaces and ro-ro spaces shall be insulated to "A-60" class standard. However, where a category (5), (9) or (10) space, as defined in regulation 6.2.2.3, is on one side of the division, the standard may be reduced to "A-0". Where fuel oil tanks are below a special category space or a ro-ro space, the integrity of the deck between such spaces may be reduced to "A-0" standard.

6 Fire extinction

.1 Fixed fire-extinguishing systems

.1 Vehicle spaces and ro-ro spaces which are not special category spaces and are capable of being sealed from a location outside of the cargo spaces shall be fitted with a fixed gas fire-extinguishing system which shall comply with the provisions of the Fire Safety Systems Code , except that:

.1 if a carbon dioxide fire-extinguishing system is fitted, the quantity of gas available shall be at least sufficient to give a minimum volume of free gas equal to 45 % of the gross volume of the largest such cargo space which is capable of being sealed, and the arrangements shall be such as to ensure that at least two thirds of the gas required for the relevant space shall be introduced within 10 min;

.2 any other fixed fire-extinguishing system may be fitted provided the Administration is satisfied that an equivalent protection is achieved; and

.3 as an alternative, a fire-extinguishing system meeting the requirements of paragraph 6.1.2 may be fitted.

.2 Ro-ro and vehicle spaces not capable of being scaled and special category spaces shall be fitted with an approved fixed pressure water-spraying system for manual operation which shall protect all parts of any deck and vehicle platform in such spaces. Such water-spray systems shall have:

.1 a pressure gauge on the valve manifold;
.2 clear marking on each manifold valve indicating the spaces served;
.3 instructions for maintenance and operation located in the valve room ; and
.4 a sufficient number of drainage valves.

.3 The Administration may permit the use of any other fixed fire-extinguishing system that has been shown, by a full-scale test in conditions simulating a flowing petrol fire in a vehicle space or a ro-ro space, to be not less effective in controlling fires likely to occur in such a space.

.4 When fixed pressure water-spraying fire-extinguishing systems are provided, in view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or decks during the operation of the water-spraying system, the following arrangements shall be provided:

.1 in passenger ships:

.1 in the spaces above the bulkhead deck, scuppers shall be fitted so as to ensure that such water is rapidly discharged directly overboard;

.1 in ro-ro passenger ships, discharge valves for scuppers, fitted with positive means of closing operable from a position above the bulkhead deck in accordance with the requirements of the International Convention on Load Lines in force, shall be kept open while the ships are at sea;

.2 any operation of valves referred to in paragraph 6.1.4.1.2.1 shall be recorded in the log-book;

.2 in the spaces below the bulkhead deck, the Administration may require pumping and drainage facilities to be provided additional to the requirements of regulation II-1/35-1. In such case, the drainage system shall be sized to remove no less than 125 % of the combine d capacity of bot h the water-spraying system pumps and the required number of fire hose nozzles. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of no t more than 40 m

in each watertight compartment ;

.2 Portable fire extinguishers

.1 Portable fire extinguishers shall be provided at each deck level in each hold or compartment where vehicles are carried, spaced not more than 20m apart on both sides of the space. At least one portable fire extinguisher shall be located at each access to such a cargo space.

.2 In addition to the provision of paragraph 6.2.1, the following fire-extinguishing appliances shall be provided in vehicle, ro-ro and special category spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion:

.1 at least three water-fog applicators; and

.2 one portable foam applicator unit complying with the provisions of the Fire Safety Systems Code, provided that at least two such units are available in the ship for use in such spaces.

CHAPTER IX

Life-Saving Appliance

Regulation 1
General Requirements

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

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

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

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

Regulation 2
Rationalized Safety Requirements

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

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

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

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

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

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

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

.2 They shall not impede the launching or handling of other lifesaving appliances;

.3 They shall not impede the marshalling of persons at the embarkation stations or their embarkation; and

.4 They shall be capable of being put in the water safely and rapidly even under unfavorable condition of list and trim.

7 Lifejackets shall be provided in every passenger accommodation:

.1 Passenger accommodation with lying/bunker arrangements - lifejackets shall be stowed immediately overhead or under the bed, in each accommodation. Lifejackets in first class accommodations may be stowed in properly marked cabinets.

.2 Passenger accommodation with seating arrangements - lifejackets shall be stowed immediately overhead or under the seat.

.3 Every common area shall be provided with additional lifejackets the number of which should be equivalent to at least twenty five percent (25%) of the total passenger capacity such area can accommodate, stored in a properly marked cabinet easily seen by and accessible to the passengers at all times.

.4 No lifejacket locker/cabinet shall be permanently locked during voyage.

.5 The number of lifejackets in every locker/cabinet shall be clearly indicated.

.6 Lifejacket for children and infants shall be distributed during embarkation and collected upon arrival.

.7 Proper safety information and signage (regarding stowage location, donning procedures, etc.) Shall be provided in all conspicuous places and should be clear and easily understood. Actual demonstration of the donning of lifejacket or showing of safety film/video on passenger ships shall be conducted prior departure.

.8 Number of type-approved lifejackets on board ships:

.1 Every ship shall carry type-approved lifejackets equivalent to the total number of authorized persons on board.

.2 Additional 10% and 5% of the actual number of persons allowed on-board shall be provided for children and infants, respectively or such greater number as maybe required to provide a lifejacket for each child.

.3 Additional lifejackets shall be required at each of the common areas.

.4 Additional lifejackets shall also be provided for every officer/crew at each watch/work stations.

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

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

Regulation 3
Training and Abandon Ship Drills

1 Every crew member shall be trained in launching and maneuvering life-saving appliances

2 The method and instructions for use of life-saving appliances and arrangements shall be exhibited at muster stations and common crew areas.

3 Muster stations and embarkation stations for lifeboats shall be provided with lighting supplied by the emergency source of power.

4 Every crew member shall participate in at least one abandon ship drill and one fire drill every month. Each drill shall be the occasion of a training session on the use of the corresponding equipment.

5 The conduct of the above drills and corresponding training shall be recorded in an official logbook.

Regulation 4
Stowage, Launching and Recovery of Survival Craft

1 Survival craft shall be stowed such that:

.1 neither the survival craft nor its launching gear will interfere with the operation of any other survival crafts at any other launching station,

.2 they are as near the water surface as is safe and practicable

.3 they are kept in a state of continuous readiness and that two members of the crew can carry out preparations for embarkation and launching in less than five minutes.

2 The arrangements for the recovery of survival craft shall be to the satisfaction of the Administration.

3 Survival craft which are not stowed under davits or equivalent systems shall be stowed such that they are secured to the ship by hydrostatic release units.

Regulation 5
Marking of Survival craft

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

1 the name of the ship and its homeport.

2 the maximum number of persons for which it is approved to carry.

Regulation 6
Operational Readiness, Maintenance and Inspections

1 Operational readiness

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

2 Maintenance

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

3 Maintenance of falls

Falls used in launching shall be inspected periodically with special regard for areas passing through sheaves and renewed when necessary due to deterioration of the falls or at intervals of not more than 5 years, whichever is the earlier.

4 Spares and repair equipment

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

5 Weekly inspection

The following tests and inspections shall be carried out weekly:

.1 All survival crafts, rescue boats and launching appliances shall be visually inspected to ensure that they are ready for use; and

.2 the general emergency alarm system shall be tested.

6 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.

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

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

Regulation 7
Public Address Systems

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

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

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

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

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

Regulation 8
Record of Passengers

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

Regulation 9
Passenger Safety

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

.1 a general explanation of emergency procedures;

.2 the location of emergency exits and survival crafts embarkation areas;

.3 the stowage location of lifejackets;

.4 the proper method of putting on and adjusting lifejackets of the type carried on the vessel including a demonstration of the proper donning of a lifejacket;

.5 the location of the instruction placards for lifejackets and other lifesaving devices; and

.6 that all passengers will be required to wear lifejackets when possible hazardous conditions exist, as directed by the master.

2 As an alternative to an announcement that complies with 1, the master or

other designated person may:

.1 prior to getting underway, deliver to each passenger or, on a ship that does not carry vehicles and that has seats for each passenger, place near each seat, a card or pamphlet that has the information listed in .1.1 to .1.6; and

.2 make an abbreviated announcement consisting of:

.1 a statement that passengers should follow the instructions of the crew in an emergency;

.2 the location of lifejackets; and

.3 that further information concerning emergency procedures including the donning of lifejackets, location of other emergency equipment, and emergency evacuation procedures are located on the card or pamphlet that was given to each passenger or is located near each seat.

3 Ferries operating on short runs of less than 15 minutes may substitute bulkhead placards or signs for the announcement required in 2.1 and 2.2 where the Administration determines that the announcements are not practical due to the ship's unique operation.

Regulation 10
Communications

1 Each ship covered by this regulation shall carry:

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

.2 at least one radar transponder. Such radar transponder shall be so stowed that it can be rapidly placed in any survival crafts;

.3 an emergency means comprising either fixed or portable equipment or both for two-way communications between emergency control stations, muster and embarkation stations and strategic positions on board;

.4 a general emergency alarm system for summoning the crew to muster stations capable of sounding a signal consisting of seven or more short blasts followed by a long blast on the ship's whistle or siren which shall be powered from the ship's main or the emergency power. The system shall be operated from the ship's bridge and be audible throughout all the accommodation and normal crew spaces.

Regulation 11
Minimum Requirements of Life-Saving Appliances and Equipment

1 Ships Engaged In Coastal Waters

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

.1 Lifeboat or combination of liferaft and lifeboat, or

.2 Liferaft (Inflatable/Rigid Type)

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

.2 Rescue Boats**:**

.1 One (1) rescue boat or equivalent approved-type rescue boat of ships of 500 GT and above.

.3 Lifebuoys**:**

.1 Four (4) Lifebuoys for ships less than 20 meters in length;

.2 Six (6) lifebuoys for ships 20 meters but less than 40 in length;

.3 Eight (8) lifebuoys for ships 40 meters but less than 60 meters in length;

.4 Ten (10) lifebuoys for ships 60 meters but less than 120 meters in length; and

.5 50% of the required lifebuoys, and in no case less than two (2), shall be fitted with self-igniting lights with at least one (1) of which shall be fitted with self-activated smoke signal as well as a buoyant line of at least 25 meters in length.

.4 Lifejackets**:**

.1 Every ship shall carry at least one (1) approved-type lifejacket for each and every person authorized on board with an additional 10% and 5% of the total number of persons allowed on-board, suitable for children and infants respectively.

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

.5 Distress Flares:

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

2 Ships Engaged In Protected Waters

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

.1 Lifeboat or combination of liferaft, or

.2 Liferaft (Inflatable/Rigid Type)

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

.2 Lifebuoys:

.1 Two (2) Lifebuoys for ships less than 20 meters in length;

.2 Four (4) lifebuoys for ships 20 meters but less than 40 meters in length;

.3 Six (6) lifebuoys for ships 40 meters but less than 60 meters in length;

.4 Eight (8) lifebuoys for ships 60 meters but less than 120 meters in length;

.5 Ten (10) lifebuoys for ships 120 meters and over in length; and

.6 50% of the required lifebuoys, shall be fitted with self-igniting lights with at least one (1) of which shall be fitted with self-activated smoke signal as well as a buoyant line of at least 25 meters in length.

.3 Lifejackets:

.1 Every ship shall carry at least one (1) approved-type lifejacket for each and every person authorized on board with an additional 10% and 5% of the total number of persons allowed on-board, suitable for children and infants respectively.

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

.4 Distress Flares:

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

Regulation 12
Manning and Survival Procedures

1 All persons manning such ships shall be trained in launching and operating the survival crafts.

2 Illustrations and instructions relating to the use of life-saving appliances in appropriate languages shall be posted at muster stations and other crew spaces.

3 Posters or signs shall be provided on or in a vicinity of survival crafts and their launching controls.

4 Muster stations shall be provided close to the embarkation stations. Both shall be adequately illuminated by lighting supplied from the emergency source of electric power.

5 Each member of the crew shall participate in at least one abandon ship drill and one fire drill every month. On board training in the use of life-saving appliances, including survival crafts equipment shall be provided at such drills.

6 Records shall be maintained relating to abandon ship drills, fire drills and on board training, in such-log-books as may be prescribed by the Administration.

Regulation 13
Muster List and Emergency Instructions

1 Clear instructions to be followed in the event of an emergency shall be provided of each person on board.

2 Muster lists shall specify the tails of the general emergency alarm, public address system and action to be taken by the crew and passenger when this alarm is sounded. It shall be exhibited in conspicuous places throughout the ship, including the control compartment, engine room and crew accommodation spaces.

3 Illustrations and instructions in appropriate languages shall be posted in public spaces and be conspicuously displayed at assembly stations at other passenger spaces and near each seat to inform passengers of:

.1 their assembly station;

.2 the essential actions they must take in an emergency; and

.3 the method of donning lifejackets.

4 Posters or signs shall be provided on or in a vicinity of survival crafts and their launching controls.

5 Muster stations shall be provided close to the embarkation stations. Both shall be adequately illuminated by lighting supplied from the emergency source of electric power.

6 Each member of the crew shall participate in at least one abandon ship drill and one fire drill every month. On board training in the use of life-saving appliances, including survival crafts equipment shall be provided at such drills.

7 Records shall be maintained relating to abandon ship drills, fire drills and on board training in such deck/engine logbook as may be prescribed by the Administration.

CHAPTER X

Radio Communications

Regulation 1
General Requirements

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

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

Regulation 2
Functional Requirements

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

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

.1 transmitting ship-to-shore distress alerts by at least two separate and independent means, each using a different radio communication service;

.2 receiving shore-to-ship distress alerts;

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

.4 transmitting and receiving search and rescue coordinating communications;

.5 transmitting and receiving on-scene communications;

.6 transmitting and where applicable receiving signals for locating;

.7 transmitting and receiving maritime safety information;

.8 transmitting and receiving general radio communications to and from shore-based radio systems or networks; and

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

Regulation 3
Ship Requirements

1 Every radio installation shall:

.1 be so located that no harmful interference of mechanical, electrical or other origin affects its proper use or that of other equipment;

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

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

.4 be provided with reliable, efficient and permanently installed electric lighting;

.5 be clearly marked with the call sign, the ship station identity and other codes as applicable.

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

Regulation 4
Watches

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

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

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

.1 VHF Channel 16;

.2 radiotelephone distress frequency 2,182 KHz.

Regulation 5
Maintenance Requirements

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

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

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

.1 duplication of equipment

.2 shore-based maintenance, or

.3 at-sea electronic maintenance capability.

Regulation 6
Radio Equipment – General

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

.1 Ships operating in the protected areas:

.1 VHF radio Installation;

.2 Ships operating in coastwise voyage;

.1 VHF, MF/HF SSB Radio Installation (20 – 100 watts power output);

.2 GPS (150 GT and above);

.3 AIS (300 GT and above).

Regulation 7

Sources of Energy

There shall be available at all times, while the ship is at sea, a supply of electrical energy sufficient to operate the radio installations and to charge any batteries used as part of *a* reserve source or sources of energy for the radio installations for a period of 18 hours as specified in these Rules and Regulations.

Regulation 8

Radio Logs

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

.1 details required by the Radio Regulations;

.2 the time listening watch begins when the ship leaves port, and the time at which it ends when the ship reaches port;

.3 the time at which listening watch was discontinued for any reason together with the reason thereof, and the time at which listening watch was resumed thereafter; and

.4 details of the maintenance of the batteries (if provided), including a record of the charging required.

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

Regulation 9

Minimum Radio Requirements

Type of Vessel	Trading	Gross Tonnage	Radio's
Passenger	Coastwise	500 GT and above	VHF, SSB, GPS, NAVTEX, EPIRB, AIS and 2 SART

CHAPTER XI

Safety of Navigation

Regulation 1
Navigational warnings

Competent authority shall take all steps necessary to ensure that, when intelligence of any dangers is received from whatever reliable source, it shall be promptly brought to the knowledge of those concerned and communicated to other interested Governments.

Regulation 2
Meteorological services and warnings

1 Competent authoritys undertake to encourage the collection of meteorological data by ships at sea and to arrange for their examination, dissemination and exchange in the manner most suitable for the purpose of aiding navigation. Administrations shall encourage the use of meteorological instruments of a high degree of accuracy and shall facilitate the checking of such instruments upon request. Arrangements may be made by appropriate national meteorological services for this checking to be undertaken, free of charge to the ship.

2 In particular, Competent authoritys undertake to carry out, in co-operation, the following meteorological arrangements:

.1 To warn ships of gales, storms and tropical cyclones by the issue of information in text and, as far as practicable, graphic form, using the appropriate shore-based facilities for terrestrial and space radio communications services.

.2 To issue, at least twice daily, by terrestrial and space radio communication services, as appropriate, weather information suitable for shipping containing data, analyses, warnings and forecasts of weather, waves and ice. Such information shall be transmitted in text and, as far as practicable, graphic form, including meteorological analysis and prognosis charts transmitted by facsimile or in digital form for reconstitution on board the ship's data processing system.

.3 To prepare and issue such publications as may be necessary for the efficient conduct of meteorological work at sea and to arrange, if practicable, for the publication and making available of daily weather charts for the information of departing ships.

.4 To arrange for a selection of ships to be equipped with tested marine meteorological instruments (such as a barometer, a barograph, a psychrometer and suitable apparatus for measuring sea temperature) for use in this service, and to take, record and transmit meteorological observations at the main standard times for surface synoptic observations (i.e. at least four times daily, whenever circumstances permit) and to encourage other ships to take, record and transmit observations in a modified form, particularly when in areas where shipping is sparse.

.5 To encourage companies to involve as many of their ships as practicable in the making and recording of weather observations; these observations to be transmitted using the ship's terrestrial or space radio communications facilities for the benefit of the various national meteorological services.

.6 The transmission of these weather observations is free of charge to the ships concerned.

.7 When in the vicinity of a tropical cyclone , or of a suspected tropical cyclone , ships should be encouraged to take and transmit their observations at more frequent intervals whenever practicable, bearing in mind navigational preoccupations of ships' officers during storm conditions.

.8 To arrange for the reception and transmission of weather messages from and to ships, using the appropriate shore-based facilities for terrestrial and space radio communications services.

.9 To encourage masters to inform ships in the vicinity and also shore stations whenever they experience a wind speed of 50 knots or more (force 10 on the Beaufort scale).

.10 To endeavor to obtain a uniform procedure in regard to the international meteorological services already specified, and as far as practicable, to conform to the technical regulations and recommendations made by the World Meteorological Organization, to which Competent authoritys may refer, for study and advice, any meteorological question which may arise in carrying out the present Convention.

3 The information provided for in this regulation shall be furnished in a form for transmission and be transmitted in the order of priority prescribed by the Radio Regulations. During transmission "to all stations" of meteorological information, forecasts and warnings, all ship stations must conform to the provisions of the Radio Regulations.

4 Forecasts, warnings, synoptic and other meteorological data intended for ships shall be issued and disseminated by the national meteorological service in the best position to serve various coastal and high seas areas, in accordance with mutual arrangements made by Competent authoritys , in particular as defined by the World Meteorological Organization's system for the preparation and dissemination of meteorological forecasts and warnings for the high seas under the global maritime distress and safety system (GMDSS).

Regulation 3
Hydrographic services

1 Competent authoritys undertake to arrange for the collection and compilation of hydrographic data and the publication, dissemination and keeping up to date of all nautical information necessary for safe navigation.

2 In particular, Competent authoritys undertake to co-operate in carrying out, as far as possible, the following nautical and hydrographic services, in the manner most

suitable for the purpose of aiding navigation:

.1 to ensure that hydrographic surveying is carried out, as far as possible, adequate to the requirements of safe navigation;

.2 to prepare and issue nautical charts, sailing directions, lists of lights, tide tables and other nautical publications, where applicable, satisfying the needs of safe navigation;

.3 to promulgate notices to mariners in order that nautical charts and publications are kept, as far as possible, up to date; and

.4 to provide data management arrangements to support these services.

3 Competent authoritys undertake to ensure the greatest possible uniformity in charts and nautical publications and to take into account, whenever possible, relevant international resolutions and recommendations.

4 Competent authoritys undertake to co-ordinate their activities to the greatest possible degree in order to ensure that hydrographic and nautical information is made available on a world-wide scale as timely, reliably, and unambiguously as possible.

Regulation 4

Ship reporting systems

1 Ship reporting systems contribute to safety of life at sea, safety and efficiency of navigation and/or protection of the marine environment. A ship reporting system, when adopted and implemented in accordance with the guidelines and criteria developed by the Organization pursuant to this regulation, shall be used by all ships or certain categories of ships or ships carrying certain cargoes in accordance with the provisions of each system so adopted.

2 The Organization is recognized as the only international bod y for developing guidelines, criteria and regulations on an international level for ship reporting systems. Competent authoritys shall refer proposals for the adoption of ship reporting systems to the Organization. The Organization will collate and disseminate to Competent authoritys all relevant information with regard to any adopted ship reporting system.

3 The initiation of action for establishing a ship reporting system is the responsibility of the Government or Governments concerned. In developing such systems, provision of the guidelines and criteria developed by the Organization shall be taken into account.

4 Ship reporting systems not submitted to the Organization for adoption do not necessarily need to comply with this regulation. However, Governments implementing such systems are encouraged to follow, wherever possible, the guidelines and criteria developed by the Organization. Competent authoritys may submit such systems to the Organization for recognition.

5 Where two or more Governments have a common interest in a particular area, they should formulate proposals for a co-ordinate d ship reporting system on the basis of agreement between them. Before proceeding with a proposal for adoption of a ship reporting system, the Organization shall disseminate details of the proposal to those Government s which have a common interest in the area covered

by the proposed system. Where a coordinated ship reporting system is adopted and established, it shall have uniform procedures and operations.

6 After adoption of a ship reporting system in accordance with this regulation, the Government or Governments concerned shall take all measures necessary for the promulgation of any information needed for the efficient and effective use of the system. Any adopted ship reporting system shall have the capability of interaction and the ability to assist ships with information when necessary. Such systems shall be operated in accordance with the guidelines and criteria developed by the Organization pursuant to this regulation.

7 The master of a ship shall comply with the requirements of adopted ship reporting systems and report to the appropriate authority all information required in accordance with the provisions of each such system.

8 All adopted ship reporting systems and actions taken to enforce compliance with those systems shall be consistent with international law, including the relevant provisions of the United Nations Convention on the Law of the Sea.

9 Nothing in this regulation or its associated guidelines and criteria shall prejudice the rights and duties of Governments under international law or the legal regimes of straits used for international navigation and archipelagic sea lanes.

10 The participation of ships in accordance with the provisions of adopted ship reporting systems shall be free of charge to the ships concerned.

11 The Organization shall ensure that adopted ship reporting systems are reviewed under the guidelines and criteria developed by the Organization.

Regulation 5
Vessel traffic services

1 Vessel traffic services (VTS) contribute to safety of life at sea, safety and efficiency of navigation and protection of the marine environment, adjacent shore areas, work sites and offshore installations from possible adverse effects of maritime traffic.

2 Competent authoritys undertake to arrange for the establishment of VTS where, in their opinion, the volume of traffic or the degree of risk justifies such services.

3 Competent authoritys planning and implementing VTS shall, wherever possible, follow the guidelines developed by the Organization. The use of VTS may only be made mandatory in sea areas within the territorial seas of a coastal State.

4 Competent authoritys shall endeavor to secure the participation in, and compliance with, the provisions of vessel traffic services by ships entitled to fly their flag.

5 Nothing in this regulation or the guidelines adopted by the Organization shall prejudice the rights and duties of Governments under international law or the legal regimes of straits used for international navigation and archipelagic sea lanes.

Regulation 6
Establishment and operation of aids to navigation

1 Each Competent authority undertakes to provide, as it deems practical and necessary, either individually or in co-operation with other Competent authoritys, such aids to navigation as the volume of traffic justifies and the degree of risk requires.

2 In order to obtain the greatest possible uniformity in aids to navigation, Competent authoritys undertake to take into account the international recommendations and guidelines when establishing such aids.

3 Competent authoritys undertake to arrange for information relating to aids to navigation to be made available to all concerned. Changes in the transmissions of position-fixing systems which could adversely affect the performance of receivers fitted in ships shall be avoided as far as possible and only be effected after timely and adequate notice has been promulgated.

Regulation 7
Ships' manning

1 Competent authoritys undertake, each for its national ships, to maintain, or, if it is necessary, to adopt, measures for the purpose of ensuring that, from the point of view of safety of life at sea, all ships shall be sufficiently and efficiently manned.

2 Every ship to which this regulation applies shall be provided with an appropriate minimum safe manning document or equivalent issued by the Administration as evidence of the minimum safe manning considered necessary to comply with the provisions of paragraph 1.

3 On all ships, to ensure effective crew performance in safety matters, a working language shall be established and recorded in the ship's log-book. The company, as defined in regulation I/3, or the master, as appropriate, shall determine the appropriate working language. Each seafarer shall be required to understand and, where appropriate, give orders and instructions and to report back in that language. If the working language is not an official language of the State whose flag the ship is entitled to fly, all plans and lists required to be posted shall include a translation into the working language.

4 On ships to which this regulation applies, English shall be used on the bridge as the working language for bridge-to-bridge and bridge-to-shore safety communications as well as for communications on board between the pilot and bridge watchkeeping personnel, unless those directly involved in the communication speak a common language other than English.

Regulation 8
Principles relating to bridge design, design and arrangement of navigational systems and equipment and bridge procedures

All decisions which are made for the purpose of applying the requirements of regulations 12, 16, 18, 19, 21 and 22 and which affect bridge design, the design and

arrangement of navigational systems and equipment on the bridge and bridge procedures shall be taken with the aim of:

1 facilitating the tasks to be performed by the bridge team and the pilot in making full appraisal of the situation and in navigating the ship safely under all operational conditions;

2 promoting effective and safe bridge resource management;

3 enabling the bridge team and the pilot to have convenient and continuous access to essential information which is presented in a clear and unambiguous manner, using standardized symbols and coding systems for controls and displays;

4 indicating the operational status of automated functions and integrated components , systems and/or sub-systems;

5 allowing for expeditious, continuous and effective information processing and decision-making by the bridge team and the pilot;

6 preventing or minimizing excessive or unnecessary work and any conditions or distractions on the bridge which may cause fatigue or interfere with the vigilance of the bridge team and the pilot; and

7 minimizing the risk of human error and detecting such error, if it occurs, through monitoring and alarm systems, in time for the bridge team and the pilot to take appropriate action.

Regulation 9
Maintenance of equipment

1 The Administration shall be satisfied that adequate arrangements are in place to ensure that the performance of the equipment required by this chapter is maintained.

2 Except as provided in regulations II/2, while all reasonable steps shall be taken to maintain the equipment required by this chapter in efficient working order, malfunctions of that equipment shall not be considered as making the ship unseaworthy or as a reason for delaying the ship in ports where repair facilities are not readily available, provided suitable arrangements are made by the master to take the inoperative equipment or unavailable information into account in planning and executing a safe voyage to a port where repairs can take place.

Regulation 10
Electromagnetic compatibility

1 Administrations shall ensure that all electrical and electronic equipment on the bridge or in the vicinity of the bridge, on ships constructed on or after 1 July 2002, is tested for electromagnetic compatibility, taking into account the recommendation s developed by the Organization.

2 Electrical and electronic equipment shall be so installed that electromagnetic interference docs not affect the proper function of navigational systems and equipment.

3 Portable electrical and electronic equipment shall not be operated on the bridge if it may affect the proper function of navigational systems and equipment.

Regulation 11
Approval, surveys and performance standards of navigational systems and equipment and voyage data recorder

1 Systems and equipment required to meet the requirements of regulations 12 and 14 shall be of a type approved by the Administration.

2 Systems and equipment, including associated back-up arrangements, where applicable, installed on or after 1 July 2002 to perform the functional requirements of regulations 12 and 14 shall conform to appropriate performance standards not inferior to those adopted by the Organization.

3 When systems and equipment are replaced or added to on ships constructed before 1 July 2002, such systems and equipment shall, in so far as is reasonable and practicable, comply with the requirements of paragraph 2.

4 Systems and equipment installed prior to the adoption of performance standards by the Organization may subsequently be exempted from full compliance with such standards at the discretion of the Administration, having due regard to the recommended criteria adopted by the Organization. However, for an electronic chart display and information system (ECDIS) to be accepted as satisfying the chart carriage requirement of regulation 12.2.1.4, that system shall conform to the relevant performance standards not inferior to those adopted by the Organization in effect on the date of installation, or, for systems installed before 1 January 1999, not inferior to the performance standards adopted by the Organization on 23 November 1995.

5 The Administration shall require that the manufacturers have a quality control system audited by a competent authority to ensure continuous compliance with the type approval conditions. Alternatively, the Administration may use final product verification procedures where the compliance with the type approval certificate is verified by a competent authority before the product is installed on board ships.

6 Before giving approval to systems or equipment embodying new features not covered by this chapter, the Administration shall ensure that such features support functions at least as effective as those required by this chapter.

7 When equipment, for which performance standards have been developed by the Organization, is carried on ships in addition to those items of equipment required by regulations 12 and 14, such equipment shall be subject to approval and shall, as far as practicable, comply with performance standards not inferior to those adopted by the Organization.

8 The voyage data recorder system, including all sensors, shall be subjected to an annual performance test. The test shall be conducted by an approved testing or servicing facility to verify the accuracy, duration and recoverability of the recorded data. In addition, tests and inspections shall be conducted to determine the serviceability of all protective enclosures and devices fitted to aid location. A copy of the certificate of compliance issued by the testing facility, stating the date of compliance and the applicable performance standards, shall be retained on board the ship.

Regulation 12

Carriage requirements for ship borne navigational systems and equipment

1 Application and requirements

.1 Ships constructed on or after 1 July 2002 shall be fitted with navigational systems and equipment which will fulfil the requirements prescribed in paragraphs 2.1 to 2.9.

.2 Ships constructed before 1 July 2002 shall:

.1 subject to the provisions of paragraphs 1.2.2 and 1.2.3, unless they comply fully with this regulation, continue to be fitted with equipment which fulfils the requirements prescribed in regulations XI/4, XI/5 and XI/14 in force prior to 1 July 2002 ;

.2 be fitted with the equipment or systems required in paragraph 2.1.6 not later than the first survey after 1 July 2002 , at which time the radio direction-finding apparatus referred to in XI/5 in force prior to 1 July 2002 shall no longer be required; and

.3 be fitted with the system required in paragraph 2.4 not later than the dates specified in paragraphs 2 and 2.4.3.

2 Ship borne navigational equipment and systems

.1 All ships, irrespective of size, shall have:

.1 a properly adjusted standard magnetic compass, or other means, independent of any power supply, to determine the ship's heading and display the reading at the main steering position;

.2 a pelorus or compass bearing device, or other means, independent of any power supply, to take bearings over an arc of the horizon of 360°;

.3 means of correcting heading and bearings to true at all times;

.4 nautical charts and nautical publications to plan and display the ship's route for the intended voyage and to plot and monitor positions throughout the voyage; an electronic chart display and information system (ECDIS) may be accepted as meeting the chart carriage requirements of this subparagraph;

.5 back-u p arrangements to meet the functional requirements of subparagraph .4 , if this function is partly or fully fulfilled by electronic means;

.6 a receiver for a global navigation satellite system or a terrestrial radio navigation system, or other means, suitable for use at all times throughout the intended voyage to establish and update the ship's position by automatic means;

.7 when the ship's bridge is totally enclosed and unless the Administration determines otherwise, a sound reception system, or other means, to enable the officer in charge of the navigational watch to hear sound signals and determine their direction;

.8 a telephone, or other means, to communicate heading information to the emergency steering position, if provided.

.2 Passenger ships irrespective of size shall, in addition to the requirements of paragraph 2.1, be fitted with:

.1 a spare magnetic compass, interchangeable with the magnetic compass as referred to in paragraph 2.1.1, or other means to perform the function referred to in paragraph 2.1.1 by means of replacement or duplicate equipment;

.2 a daylight signaling lamp, or other means, to communicate by light during day and night using an energy source of electrical power not solely dependent upon the ship's power supply.

.3 Passenger ships irrespective of size shall, in addition to meeting the requirements of paragraph 2.2, be fitted with:

.1 an echo-sounding device, or other electronic means, to measure and display the available depth of water;

.2 a 9 GHz radar, or other means, to determine and display the range and bearing of radar transponders and of other surface craft, obstructions, buoys, shorelines and navigational marks to assist in navigation and in collision avoidance;

.3 an electronic plotting aid, or other means, to plot electronically the range and bearing of targets to determine collision risk;

.4 speed and distance measuring device, or other means, to indicate speed and distance through the water;

.5 a properly adjusted transmitting heading device, or other means, to transmit heading information for input to the equipment referred to in paragraphs 2.3.2 , 2.3. 3 and 2.4.

.4 Passenger ships irrespective of size shall be fitted with an automatic identification system (AIS) , as follows:

.1 ships constructed on or after 1 July 2002;

.2 ships engaged on international voyages constructed before 1 July 2002:

.1 in the case of passenger ships, not later than 1 July 2003;

.3 ships not engaged on international voyages constructed before 1 July 2002 , not later than 1 July 2008;

.4 the Administration may exempt ships from the application of the requirements of this paragraph when such ships will be taken permanently out of service within two years after the implementation date specified in subparagraphs .2 and .3;

.5 AIS shall:

.1 provide automatically to appropriately equipped shore stations, other ships and aircraft information, including the ship's identity, type, position, course, speed,

navigational status and other safety-related information;

.2 receive automatically such information from similarly fitted ships;

.3 monitor and track ships; and

.4 exchange data with shore-based facilities;

.6 the requirements of paragraph 2.4.5 shall not be applied to cases where international agreements, rules or standards provide for the protection of navigational information; and

.7 AIS shall be operated taking into account the guidelines adopted by the Organizations Ships fitted with AIS shall maintain AIS in operation at all times except where international agreements, rules or standards provide for the protection of navigational information.

.5 All ships shall, in addition to meeting the requirements of paragraph 2.3, with the exception of paragraphs 2.3.3 and 2.3.5, and the requirements of paragraph 2.4, have:

.1 a gyro-compass, or other means, to determine and display their heading by ship borne non-magnetic means, being clearly readable by the helmsman at the main steering position. These means shall also transmit heading information for input to the equipment referred in paragraphs 2.3.2, 2.4 and 2.5.5;

.2 a gyro-compass heading repeater, or other means, to supply heading information visually at the emergency steering position if provided;

.3 a gyro-compass bearing repeater, or other means, to take bearings, over an arc of the horizon of 360°, using the gyro-compass or other means referred to in subparagraph .1. However, ships of less than 1,600 gross tonnage shall be fitted with such means as far as possible;

.4 rudder, propeller, thrust, pitch and operational mode indicators, or other means, to determine and display rudder angle, propeller revolutions, the force and direction of thrust and, if applicable, the force and direction of lateral thrust and the pitch and operational mode, all to be readable from the conning position; and

.5 an automatic tracking aid, or other means, to plot automatically the range and bearing of other targets to determine collision risk.

.6 On all ships of 500 gross tonnage and upwards, failure of one piece of equipment should not reduce the ship's ability to meet the requirements of paragraphs 2.1.1, 2.1. 2 and 2.1.4.

.7 All ships of 3,000 gross tonnage and upwards shall, in addition to meeting the requirements of paragraph 2.5 , have:

.1 a 3 GHz radar or, where considered appropriate by the

Administration, a second 9 GHz radar, or other means, to determine and display the range and bearing of other surface craft, obstructions, buoys, shorelines and navigational marks to assist in navigation and in collision avoidance, which are functionally independent of those referred to in paragraph 2.3.2; and

.2 a second automatic tracking aid, or other means, to plot automatically the range and bearing of other targets to determine collision risk which are functionally independent of those referred to in paragraph 2.5.5.

.8 All ships of 10,000 gross tonnage and upwards shall, in addition to meeting the requirements of paragraph 2.7 with the exception of paragraph 2.7.2, have:

.1 an automatic radar plotting aid, or other means, to plot automatically the range and bearing of at least 20 other targets, connected to a device to indicate speed and distance through the water, to determine collision risks and simulate a trial manoeuvre; and

.2 a heading or track control system, or other means, to automatically control and keep to a heading and/or straight track.

.9 All ships of 50,000 gross tonnage and upwards shall, in addition to meeting the requirements of paragraph 2.8 , have:

.1 a rate-of-turn indicator, or other means, to determine and display the rate of turn; and

.2 a speed and distance measuring device, or other means, to indicate speed and distance over the ground in the forward and athwart ships direction.

3 When "other means" are permitted under this regulation, such means must be approved by the Administration in accordance with regulation 11.

4 The navigational equipment and systems referred to in this regulation shall be so installed, tested and maintained as to minimize malfunction.

5 Navigational equipment and systems offering alternative modes of operation shall indicate the actual mode of use.

6 Integrated bridge systems shall be so arranged that failure of one sub-system is brought to the immediate attention of the officer in charge of the navigational watch by audible and visual alarms and does not cause failure to any other sub-system. In case of failure in one part of an integrated navigational system, it shall be possible to operate each other individual item of equipment or part of the system separately.

Regulation 13
Voyage data recorders

1 To assist in casualty investigations ships, shall be fitted with a voyage data recorder (VDR) as follows:

.1 passenger ships constructed on or after 01 January 2021; and

.2 existing passenger ships not later than 01 January 2022.

2 Administrations may exempt ships, other than ro-ro passenger ships, constructed before 01 January 2021 from being fitted with a VDR where it can be demonstrated that interfacing a VDR with the existing equipment on the ship is unreasonable and impracticable.

Regulation 14
Navigation bridge visibility

1 Ships of not less than 55m in length, constructed on or after 1 July 1998, shall meet the following requirements:

.1 The view of the sea surface from the conning position shall not be obscured by more than two ship lengths, or 500 m, whichever is less, forward of the bow to 10° on either side under all conditions;

.2 No blind sector, or other obstructions outside of the wheelhouse forward of the beam which obstructs the view of the sea surface as seen from the conning position, shall exceed 10°. The total arc of blind sectors shall not exceed 20°. The clear sectors between blind sectors shall be at least 5°. However, in the view described in .1, each individual blind sector shall not exceed 5°;

.3 The horizontal field of vision from the conning position shall extend over an arc of not less than 225°, that is from right ahead to not less than 22.5° abaft the beam on either side of the ship;

.4 From each bridge wing, the horizontal field of vision shall extend over an arc of at least 225°, that is from at least 45° on the opposite bow through right ahead and then from right ahead to right astern through 180° on the same side of the ship;

.5 From the main steering position, the horizontal field of vision shall extend over an arc from right ahead to at least 60° on each side of the ship;

.6 The ship's side shall be visible from the bridge wing;

.7 The height of the lower edge of the navigation bridge front windows above the bridge deck shall be kept as low as possible. In no case shall the lower edge present an obstruction to the forward view as described in this regulation;

.8 The upper edge of the navigation bridge front windows shall allow a forward view of the horizon, for a person with a height of eye of 1,800 mm above the bridge deck at the conning position, when the ship is pitching in heavy seas. The Administration, if satisfied that a 1,800 mm

height of eye is unreasonable and impractical, may allow reduction of the height of eye but not to less than 1,600 mm ;

.9 Window s shall meet the following requirements:

.1 To help avoid reflections, the bridge front windows shall be inclined from the vertical plane top out, at an angle of not less than 10° and not more than 25° ;

.2 Framing between navigation bridge windows shall be kept to a minimum and not be installed immediately forward of any work station;

.3 Polarized and tinted windows shall not be fitted;

.4 A clear view through at least two of the navigation bridge front windows and, depending on the bridge configuration, an additional number of clear-view windows shall be provided at all times, regardless of weather conditions.

2 Ships constructed before 1 July 1998 shall, where practicable, meet the requirements of paragraphs 1.1 and 1.2. However, structural alterations or additional equipment need not be required.

3 On ships of unconventional design which, in the opinion of the Administration, cannot comply with this regulation, arrangements shall be provided to achieve a level of visibility that is as near as practical to that prescribed in this regulation.

Regulation 15

Pilot transfer arrangements

1 Application

.1 Ships engaged on voyages in the course of which pilots are likely to be employed shall be provided with pilot transfer arrangements.

.2 Equipment and arrangements for pilot transfer which are installed on or after 01 January 2021 shall comply with the requirements of this regulation, and due regard shall be paid to the standards adopted by the Organization[1].

.3 Equipment and arrangements which are replaced after 01 January 2021 shall, in so far as is reasonable and practicable, comply with the requirements of this regulation.

2 General

.1 All arrangements used for pilot transfer shall efficiently fulfil their purpose of enabling pilots to embark and disembark safely. The appliances shall be kept clean, properly maintained and stowed and shall be regularly inspected to ensure that they are safe to use. They shall be used solely for the embarkation and disembarkation of personnel.

[1] Resolution A.1045(27) as amended

.2 The rigging of the pilot transfer arrangements and the embarkation of a pilot shall be supervised by a responsible officer having means of communication with the navigation bridge who shall also arrange for the escort of the pilot by a safe route to and from the navigation bridge. Personnel engaged in rigging and operating any mechanical equipment shall be instructed in the safe procedures to be adopted and the equipment shall be tested prior to use.

.3 AII pilot ladders used for pilot transfer shall be clearly identified with tags or other permanent marking so as to enable identification of each appliance for the purposes of survey, inspection and record keeping a record shall be kept on the ship as to the clate the identified ladder is placed into service and any repairs effected.

.4 Reference in this regulation to an accommodation ladder includes a sloping ladder used as part of the pilot transfer arrangements.

3 Transfer arrangements

.1 Arrangements shall be provided to enable the pilot to embark and disembark safely on either side of the ship.

.2 In all ships, where the distance from sea level to the point of access to, or egress from, the ship exceeds 9 m, and when it is intended to embark and disembark pilots by means of the accommodation ladder,- or other equally safe and convenient means in conjunction with a pilot ladder, the ship shall carry such equipment on each side, unless the equipment is capable of being transferred for use on either side.

.3 Safe and convenient access to, and egress from, the ship shall be provided by either:

.1 a pilot ladder requiring a climb of not less than 1.5m and not more than 9m above the surface of the water, so positioned and secured that:

.1 it is clear of any possible discharges from the ship;

.2 it is within the parallel body length of the ship and, as far as is practicable, within the mid-ship half length of the ship;

.3 each step rests firmly against the ship's side; where constructional features, such as rubbing bands, would prevent the implementation of this provision, special arrangements shall, to the satisfaction of the Administration, be made to ensure that persons are able to embark and disembark safely;

.4 the single length of pilot ladder is capable of reaching the water from the point of access to, or egress from, the ship and due allowance is made for all conditions of loading and trim of the ship, and for an adverse list of 15°; the securing strong point, shackles and securing ropes shall be at least as strong as the side ropes;

.2 an accommodation ladder in conjunction with the pilot ladder, or

other equally safe and convenient means, whenever the distance from the surface of the water to the point of access to the ship is more than 9m. The accommodation ladder shall be sited leading aft. When in use, the lower end of the accommodation ladder shall rest firmly against the ship's side within the parallel body length of the ship and, as far as is practicable, within the mid-ship half-length and clear of all discharges; or

4 Access to the ship's deck

Means shall be provided to ensure safe, convenient and unobstructed passage for any person embarking on, or disembarking from, the ship between the head of the pilot ladder, or of any accommodation ladder or other appliance, and the ship's deck. Where such passage is by means of:

.1 a gateway in the rails or bulwark, adequate handholds shall be provided;

.2 a bulwark ladder, two handhold stanchions rigidly secured to the ship's structure at or near their bases and at higher points shall be fitted. The bulwark ladder shall be securely attached to the ship to prevent overturning.

5 Shipside doors

Shipside doors used for pilot transfer shall not open outwards.

6 Mechanical pilot hoists

Mechanical pilot hoists shall not be used.

7 Associated equipment

.1 The following associated equipment shall be kept at hand ready for immediate use when persons are being transferred:

.1 two man-ropes of not less than 28mm in diameter, properly secured to the ship, if required by the pilot;

.2 a lifebuoy equipped with a self-igniting light;

.3 a heaving line.

.2 When required by paragraph 4, stanchions and bulwark ladders shall be provided.

8 Lighting

Adequate lighting shall be provided to illuminate the transfer arrangements over side, the position on deck where a person embarks or disembarks.

Regulation 16

Use of heading and/or track control systems

1 In areas of high traffic density, in conditions of restricted visibility and in all other hazardous navigational situations where heading and/or track control systems are in use, it shall be possible to establish manual control of the ship's steering

immediately.

2 In circumstances as above, the officer in charge of the navigational watch shall have available without delay the services of a qualified helmsperson who shall be ready at all times to take over steering control.

3 The change-over from automatic to manual steering and vice versa shall be made by, or under the supervision of, a responsible officer.

4 The manual steering shall be tested after prolonged use of heading and/or track control systems and before entering areas where navigation demands special caution.

Regulation 17
Operation of steering gear

In areas where navigation demands special caution, ships shall have more than one steering gear power unit in operation when such units are capable of simultaneous operation.

Regulation 18
Steering gear testing and drills

1 Within two (2) to three (3) hours before departure, the ship's steering gear shall be checked and tested by the ship's crew. The test procedure shall include, where applicable, the operation of the following:

.1 the main steering gear;

.2 the auxiliary steering gear;

.3 the remote steering gear control systems;

.4 the steering positions located on the navigation bridge;

.5 the emergency power supply;

.6 the rudder angle indicators in relation to the actual position of the rudder;

.7 the remote steering gear control system power failure alarms;

.8 the steering gear power unit failure alarms; and

.9 automatic isolating arrangements and other automatic equipment.

2 The checks and tests shall include:

.1 the full movement of the rudder according to the required capabilities of the steering gear;

.2 a visual inspection of the steering gear and its connecting linkage; and

3 the operation of the means of communication between the navigation bridge and steering gear compartment.

.1 Simple operating instructions with a block diagram showing the change-over procedures for remote steering gear control systems and steering gear power units shall be permanently displayed on the

navigation bridge and in the steering compartment.

.2 All ships' officers concerned with the operation and/or maintenance of steering gear shall be familiar with the operation of the steering systems fitted on the ship and with the procedures for changing from one system to another.

4 In addition to the routine checks and tests prescribed in paragraphs 1 and 2, emergency steering drills shall take place at least once every three months in order to practice emergency steering procedures. These drills shall include direct control within the steering gear compartment, the communications procedure with the navigation bridge and, where applicable, the operation of alternative power supplies.

5 The Administration may waive the requirements to carry out the checks and tests prescribed in paragraphs 1 and 2 for ships which regularly engage on voyages of short duration. Such ships shall carry out these checks and tests at least once every week.

6 The date upon which the checks and tests prescribed in paragraphs 1 and 2 are carried out and the date and details of emergency steering drills carried out under paragraph 4 shall be recorded.

Regulation 19
Nautical charts and nautical publications

Nautical charts and nautical publications, such as sailing directions, lists of lights, notices to mariners, tide tables and all other nautical publications necessary for the intended voyage, shall be adequate and up to date.

Regulation 20
Records of navigational activities

All ships shall keep on board a record of navigational activities and incidents which are of importance to safety of navigation and which must contain sufficient detail to restore a complete record of the voyage. When such information is not maintained in the ship's log-book, it shall be maintained and ~~in another form~~ approved by the Administration.

Regulation 21
Life-saving signals to be used by ships, or persons in distress

An illustrated table describing the life-saving signals shall be readily available to the officer of the watch of every ship to which this chapter applies. The signals shall be used by ships or persons in distress when communicating with life-saving stations, maritime rescue units and aircraft engaged in search and rescue operations.

Regulation 22
Operational limitations

A list of all limitations on the operation of a passenger ship, including exemptions from any of these regulations, restrictions in operating areas, weather restrictions, sea state restrictions, restrictions in permissible loads, trim, speed and any other limitations, whether imposed by the Administration or established during the design or the building stages, shall be compiled before the passenger ship is put in service. The list, together with any necessary explanations, shall be documented and henceforth attached to the applicable safety certificate, and shall be kept on board readily available to the master. The list shall be kept updated.

Regulation 23
Danger messages

1 The master of every ship which meets with a dangerous derelict, or any other direct danger to navigation, or a tropical storm, or winds of force 10 or above on the Beaufort scale for which no storm warning has been received, is bound to communicate the information by all means at his disposal to ships in the vicinity, and also to the competent authorities. The form in which the information is sent is not obligatory. It may be transmitted either in plain language (preferably English or Filipino) or by means of the International Code of Signals.

2 Each Competent authority will take all steps necessary to ensure that when intelligence of any of the dangers specified in paragraph 1 is received, it will be promptly brought to the knowledge of those concerned and communicated to other interested Governments

3 The transmission of messages regarding the dangers specified is free of cost to the ships concerned.

4 All radio messages issued under paragraph 1 shall be preceded by the safety signal, using the procedure as prescribed by the Radio Regulations as defined in this rules and regulations.

Regulation 24
Information required in danger messages

The following information is required in danger messages:

1 Derelicts and other direct dangers to navigation:

.1 The kind of derelict or danger observed.

.2 The position of the derelict or danger when last observed.

.3 The time and date (Universal Co-ordinated Time) when the danger was last observed.

2 Tropical cyclones (storms):

.1 A statement that a tropical cyclone has been encountered. This

obligation should be interpreted in a broad spirit, and information transmitted whenever the master has goo d reason to believe that a tropical cyclone is developing or exists in the neighborhood.

.2 Time, date (Universal Co-ordinate d Time) and position of ship when the observation was taken.

.3 As much of the following information as is practicable should be included in the message:

— barometric pressure, preferably corrected (stating millibars, millimeters, or inches, and whether corrected or uncorrected);

— barometric tendency (the change in barometric pressure during the past three hours);

— true wind direction;

— wind force (Beaufort scale);

— state of the sea (smooth, moderate, rough, high);

— swell (slight, moderate, heavy) and the true direction from which it comes. Period or length of swell (short, average, long) would also be of value;

— true course and speed of ship.

Subsequent observations

3 When a master has reported a tropical cyclone or other dangerous storm, it is desirable, but not obligatory, that further observations be made and transmitted hourly, if practicable, but in any case at intervals of not more than 3 hours, so long as the ship remains under the influence of the storm.

4 Winds of force 10 or above on the Beaufort scale for which no storm warning has been received. This is intended to deal with storms other than the tropical cyclones referred to in paragraph 2; when such a storm is encountered, the message should contain similar information to that listed under the paragraph but excluding the details concerning sea and swell.

Regulation 25

Distress situations: obligations and procedures

1 The master of a ship at sea which is in a position to be able to provide assistance, on receiving information from any source that persons are in distress at sea, is bound to proceed with all speed to their assistance, if possible informing them or the search and rescue service that the ship is doing so. This obligation to provide assistance applies regardless of the nationality or status of such persons or the circumstances in which they are found. If the ship receiving the distress alert is unable or, in the special circumstances of the case, considers it unreasonable or unnecessary to proceed to their assistance, the master must enter in the log-book the reason for failing to proceed to the assistance of the persons in distress, taking into account the recommendation of the Organization to inform the appropriate search and rescue service accordingly.

Competent authority shall co-ordinate and co-operate to ensure that masters of

ships providing assistance by embarking persons in distress at sea are released from their obligations with minimum further deviation from the ships' intended voyage, provided that releasing the master of the ship from the obligations under the current regulation does not further endanger the safety of life at sea. The Competent authority responsible for the search and rescue region in which such assistance is rendered shall exercise primary responsibility for ensuring such co-ordination and co-operation occurs, so that survivors assisted are disembarked from the assisting ship and delivered to a place of safety, taking into account the particular circumstances of the case and guidelines developed by the Organization. In these cases the relevant Competent authority shall arrange for such disembarkation to be effected as soon as reasonably practicable.

2 The master of a ship in distress or the search and rescue service concerned, after consultation, so far as may be possible, with the masters of ships which answer the distress alert, has the right to requisition one or more of those ships as the master of the ship in distress or the search and rescue service considers best able to render assistance, and it shall be the duty of the master or masters of the ship or ships requisitioned to comply with the requisition by continuing to proceed with all speed to the assistance of persons in distress.

3 Masters of ships shall be released from the obligation imposed by paragraph 1 on learning that their ships have not been requisitioned and that one or more other ships have been requisitioned and are complying with the requisition. This decision shall, if possible, be communicated to the other requisitioned ships and to the search and rescue service.

4 The master of a ship shall be released from the obligation imposed by paragraph 1 and, if his ship has been requisitioned, from the obligation imposed by paragraph 2 on being informed by the persons in distress or by the search and rescue service or by the master of another ship which has reached such persons that assistance is no longer necessary.

5 The provisions of this regulation do not prejudice the Convention for the Unification of Certain Rules of Law relating to Assistance and Salvage at Sea, signed at Brussels on 23 September 1910, particularly the obligation to render assistance imposed by article 11 of that Convention.

6 Masters of ships who have embarked persons in distress at sea shall treat them with humanity, within the capabilities and limitations of the ship.

Regulation 26

Safe navigation and avoidance of dangerous situation

1 Prior to proceeding to sea, the master shall ensure that the intended voyage has been planned using the appropriate nautical charts and nautical publications for the area concerned, taking into account the guidelines and recommendations developed by the Organization[2].

2 The voyage plan shall identify a route which :

.1 takes into account any relevant ships routeing systems;

[2] Refer to Guidelines for voyagc planning (resolution A.893(21) as amended.

.2 ensures sufficient sea room for the safe passage of the ship throughout the voyage;

.3 anticipates all known navigational hazards and adverse weather conditions; and

.4 takes into account the marine environmental protection measures that apply, and avoids, as far as possible, actions and activities which could cause damage to the environment.

Regulation 27
Master's discretion

The owner, the charterer, the company operating the ship as defined in regulation XIV/1, or any other person shall not prevent or restrict the master of the ship from taking or executing any decision which, in the master's professional judgment, is necessary for safety of life at sea and protection of the marine environment.

Regulation 28
Misuse of distress signals

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

Table 1: Rationalized Requirements of Navigational Equipment On-Board

Navigational Equipment	500 GT and Above	3,000 GT and Above	10,000 GT and Above	50,000 GT and Above
Voyage Data Recorder (VDR)	O	O	O	O
Magnetic Compass	O	O	O	O
Spare Magnetic Compass	O	O	O	O
Pelorus Compass	O	O	O	O
Nautical Chart and Publications or Electronic Chart Display and Information System (ECDIS)	O	O	O	O
Global Navigation Satellite System or Terrestrial Radio Navigation System (GPS)	O	O	O	O
Telephone (Bridge-Emergency Steering Position)	O	O	O	O
Daylight Signaling Lamp	O	O	O	O
Echo-Sounding Device	O	O	O	O
9 GHz Radar	O	O	O	O
Radar Reflector	X	X	X	X
Electronic Plotting Aid	O	O	O	O
Speed and Distance Measuring Device/Indicator	O	O	O	O

Properly Adjusted Transmitting Heading Device	O	O	O	O
Automatic Identification System (AIS)	O	O	O	O
Gyro-Compass	O	O	O	O
Gyro-Compass Repeater	O	O	O	O
Rudder Angle, Propeller Revolutions, The Force And Direction Of Thrust Indicator	O	O	O	O
Automatic Tracking Aid	O	O	O	O
Second Automatic Tracking Aid	X	O	O	O
3 GHz Radar	X	O	O	O
Automatic Radar Plotting Aid	X	X	O	O
Heading or Track Control System	X	X	O	O
Rate-of-Turn Indicator	X	X	X	O

Chapter XII

Collision Regulations

All Philippine-registered ships shall at all times adhere to the rules and regulations of the International Regulations for Preventing Collision at Sea (COLREG), 1972 as amended.

All vessels shall observe and comply with the traffic separations scheme implemented by concerned agencies in their area of operation.

Chapter XIII

Carriage of Dangerous Goods

Regulation 1
General

1 Ships engaged in the carriage of dangerous goods in package form shall comply with MARPOL III and the International Maritime Dangerous Goods (IMDG Code).

2 Ships engaged in the carriage of dangerous goods in solid form in bulk shall comply with MARPOL III and the International Maritime Solid Bulk Cargoes (IMSBC Code).

3 The Company and the Master shall ensure that all dangerous and/or hazardous cargoes or goods on board the ship are carried in compliance with the existing MARINA rules and regulations and its future amendments and shall be jointly responsible for the safe carriage of such.

4 The Master shall ensure that all dangerous cargo/es carried on board are protected from any unauthorized access and that such spaces where these cargoes are carried are properly marked (i.e. black and yellow stripes, no smoking, others, as applicable).

5 Dangerous goods liable to spontaneous combustion shall not be carried on board unless added precautions are taken for the carriage of such items.

6 Only personnel with training in handling, carriage and stowage of dangerous goods shall be allowed to handle dangerous goods.

.1 All personnel shall be adequately trained in the use of protective equipment and have basic training in the procedures appropriate to their duties necessary under emergency conditions.

.2 Personnel involved in cargo operations shall be adequately trained in handling procedures.

.3 Officers shall be trained in emergency procedures to deal with conditions of leakage, spillage or fire involving the cargo and sufficient number of them shall be instructed and trained in essential first aid for cargoes carried, based on the guidelines developed by the Organization.

7 The Company shall ensure that designated crew properly trained in handling accidents involving dangerous goods is readily available.

The Company shall ensure that materials/equipment, to include medical first aid, to address accidents involving dangerous goods are readily available.

Chapter XIV

Safety Management System

Regulation 1
General

1 Every company operating any of the ships covered by these rules and regulations shall develop, adopt and implement a Safety Management System (SMS) compliant with the International Safety Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code), as amended.

2 The company in implementing the ISM Code shall take into consideration the guidelines set by the International Maritime Organization (IMO) and existing MARINA Regulations and its future amendments.

3 No company/ship shall operate without a valid DOC/SMC.

4 Where another company/entity other than the registered owner/disponent owner has assumed operational control' and responsibility over a ship covered under this Regulation, the registered/disponent owner shall communicate to the Administration the company/entity which shall assume responsibility for compliance with this Circular.

5 Ships of foreign registry temporarily used in the Philippine waters on Special Permits issued by the Administration are required to have a SMS compliant with the ISM Code.

6 All companies and ships commencing operations and which are covered herein, are given twelve (12) months from date of accreditation or registration under Philippine flag, to have the required DOC and SMC.

7 The companies and ships as provided in the preceding paragraph 6 shall submit for approval a safety management system and shall be issued interim DOC and interim SMC with validity as follows

.1 Interim DOC - not more than 12 months; and
.2 Interim SMC – valid for 6 months and can be extended another 6 months

Regulation 2
Application

This Chapter shall apply to new and existing ships.

Regulation 3
Implementation

The implementation of this Chapter shall conform to the existing MARINA Memorandum Circular and its future amendments.

Chapter XV

Trainings

Regulation 1
Application

All seafarers onboard Philippine registered ships shall be required to undertake relevant/appropriate training/seminars in relation to the types of ships they are employed.

Regulation 2
Training Manuals

1 All ships must have on-board Training Manuals and Training Aids as approved by the Administration.

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

3 The training manual, which may comprise several volumes, shall contain instructions and information, in easily understood terms illustrated wherever possible, on the life-saving appliances provided in the ship and on the best methods of survival. Any part of such information may be provided in the form of audio-visual aids in lieu of the manual. The following shall be explained in detail:

.1 donning of lifejackets;
.2 muster at the assigned stations;
.3 boarding, launching, and clearing the survival craft and rescue boats, including, where applicable, use of marine evacuation systems;
.4 method of launching from within the survival craft;
.5 release from launching appliances;
.6 methods and use of devices for protection in launching areas, where appropriate;
.7 illumination in launching areas;
.8 use of all survival equipment;
.9 use of all detection equipment;
.10 with the assistance of illustrations, the use of radio life-saving appliances;
.11 use of engine and accessories;
.12 recovery of survival craft and rescue boats including stowage and securing
.13 best use of the survival craft facilities in order to survive;
.14 methods of retrieval, breeches-buoy and shore life-saving apparatus and ship's line-throwing apparatus; whenever applicable
.15 all other functions contained in the muster list and emergency instructions; and
.16 instructions for emergency repair of the life-saving appliances.

4 The training manual shall be written in the working language of the ship.

Chapter XVI

PART 1

Health, Safety and 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.

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 deck heads 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. (see MSC.337(91) – Noise Level Code)[3]

4 Where practical, taking into account the size and type of the vessel, resolution A.468(XII) may be used as a point of reference

5 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.

6 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.

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

8 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.

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[3] Where practical, taking into account the size and type of the vessel, resolution A.468(XII) may be used as a point of reference

9 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.

10 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.

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

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

13 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^2.

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 he 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 he paced 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.

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.

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 (e.g., 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.

3 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.

4 Emergency exits shall be clearly marked as such.

5 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.

6 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^3, 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.

2 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 XVII

Prevention of Marine Pollution

Regulation 1
Coverage

1 The provisions of the International Convention for the Prevention of Pollution from Ships 1973 and its 1978 Protocol including its future amendments, and national legislations and issuances to implement thereto, shall apply to ships covered by these Rules and Regulations. Where the Administration considers the provisions relating to construction and equipment unreasonable or impracticable, it may exempt such ships from such provisions, provided that the construction and equipment of that ship provides equivalent protection against pollution of the marine environment, having regard to the service for which the ship is intended.

The following MARPOL Annexes shall be applied to ships as covered by the Convention;

.1 Annex I of MARPOL73/78 – Regulation for the Prevention of Pollution by Oil
.2 Annex II of MARPOL73/78 – Regulation for the Pollution by Noxious Liquid
.3 Annex III of MARPOL73/78 – Regulation for the Prevention of Pollution by Harmful substances carried by sea in Packaged Form
.4 Annex IV of MARPOL73/78 – Regulation for the Prevention of Pollution by Sewage
.5 Annex V of MARPOL73/78 – Regulation for the Prevention of Pollution by Garbage from Ships
.6 Annex VI of MARPOL73/78 – Regulation for the Prevention of Air Pollution from Ships

Hence, ships which are not covered by the Annexes must have an appropriate measure to prevent marine pollution and environmental protection.

PART A - CONSTRUCTION

Regulation 2
Standard discharge connection

To enable pipes of reception facilities to be connected with the ship's discharge pipeline for residues from machinery bilges and from sludge tanks, both lines shall be fitted with a standard discharge connection in accordance with the following table:

Standard dimensions of flanges for discharge connections

Description	Dimension
Outside diameter	215 mm
Inner diameter	According to pipe outside diameter
Bolt circle diameter	183 mm
Slots in flange	6 holes 22 mm in diameter equidistantly

	placed on a bolt circle of the above diameter, slotted to the flange periphery. The slot width to be 22 mm
Flange thickness	20 mm
Bolts and nuts: quantity, diameter	6, each of 20 mm in diameter and of suitable length
The flange is designed to accept pipes up to a maximum internal diameter of 125 mm and shall be of steel or other equivalent material having a flat face. This flange, together with a gasket of oil-proof material, shall be suitable for a service pressure of 600 kPa.	

Regulation 3
Oil filtering equipment

1 Except as specified in paragraph 3 of this regulation, any ship of 400 gross tonnage and above but less than 10,000 gross tonnage shall be fitted with oil filtering equipment complying with paragraph 6 of this regulation. Any such ship which may discharge into the sea ballast water retained in oil fuel tanks in accordance with regulation 16.2 shall comply with paragraph 2 of this regulation.

2 Except as specified in paragraph 3 of this regulation, any ship of 10,000 gross tonnage and above shall be fitted with oil filtering equipment complying with paragraph 7 of this regulation.

3 Ships, such as hotel ships, storage vessels, etc., which are stationary except for non-cargo carrying relocation voyages need not be provided with oil filtering equipment. Such ships shall be provided with a holding tank having a volume adequate, to the satisfaction of the Administration, for the total retention on board of the oily bilge water. All oily bilge water shall be retained on board for subsequent discharge to reception facilities.

4 The Administration shall ensure that ships of less than 400 gross tonnage are equipped, as far as practicable, to retain on board oil or oily mixtures or discharge them in accordance with the requirements of regulation 1.1.1.

5 The Administration may waive the requirements of paragraphs 1 and 2 of this regulation for:

.1 any ship engaged exclusively on voyages within special areas, or

.2 any ship certified under the International Code of Safety for High-Speed Craft (or otherwise within the scope of this Code with regard to size and design) engaged on a scheduled service with a turn-around time not exceeding 24 hours and covering also non-passenger/cargo-carrying relocation voyages for these ships,

.3 with regard to the provision of subparagraphs .1 and .2 above, the following conditions shall be complied with:

.1 the ship is fitted with a holding tank having a volume adequate, to the satisfaction of the Administration, for the total retention on board of the oily bilge water;

.2 all oily bilge water is retained on board for subsequent discharge to reception facilities;

.3 the Administration has determined that adequate reception facilities are available to receive such oily bilge water in a sufficient number of ports or terminals the ship calls at;

.4 the International Oil Pollution Prevention Certificate, when required, is endorsed to the effect that the ship is exclusively engaged on the voyages within special areas or has been accepted as a high-speed craft for the purpose of this regulation and the service is identified; and

.5 the quantity, time, and port of the discharge are recorded in the Oil Record Book Part I.

6 Oil filtering equipment referred to in paragraph 1 of this regulation shall be of a design approved by the Administration and shall be such as will ensure that any oily mixture discharged into the sea after passing through the system has an oil content not exceeding 15 parts per million. In considering the design of such equipment, the Administration shall have regard to the specification recommended by the Organization.

7 Oil filtering equipment referred to in paragraph 2 of this regulation shall comply with paragraph 6 of this regulation. In addition, it shall be provided with alarm arrangements to indicate when this level cannot be maintained. The system shall also be provided with arrangements to ensure that any discharge of oily mixtures is automatically stopped when the oil content of the effluent exceeds 15 parts per million. In considering the design of such equipment and approvals, the Administration shall have regard to the specification recommended by the Organization.

PART B - CONTROL OF OPERATIONAL DISCHARGE OF OIL

Regulation 4
Control of Discharge of Oil

Subject to the provisions of regulation 1.1.1 and paragraphs 2, 3, and 6 of this regulation, any discharge into the sea of oil or oily mixtures from ships shall be prohibited.

1 Discharges outside special areas

Any discharge into the sea of oil or oily mixtures from ships of 400 gross tonnage and above shall be prohibited except when all the following conditions are satisfied:

.1 the ship is proceeding en route;
.2 the oily mixture is processed through an oil filtering equipment meeting the requirements of regulation 1.1.1; and

.3 the oil content of the effluent without dilution does not exceed 15 parts per million.

2 Discharges in special areas

Any discharge into the sea of oil or oily mixtures shall be prohibited except when all of the following conditions are satisfied:

.1 the ship is proceeding en route;
.2 the oily mixture is processed through an oil filtering equipment meeting the requirements of regulation 1.1.1 ; and
.3 the oil content of the effluent without dilution does not exceed 15 parts per million.
.4 In respect of the protected area, any discharge into the sea of oil or oily mixtures from any ship shall be prohibited.

3 Nothing in this regulation shall prohibit a ship on a voyage only part of which is in a special area from discharging outside a special area in accordance with paragraph 2 of this regulation.

Regulation 5
Oil Record Book, Part I (Machinery space operations)

1 Every ship shall be provided with an Oil Record Book Part I (Machinery space operations). The Oil Record Book, whether as a part of the ship's official log-book.

2 The Oil Record Book Part I shall be completed on each occasion, on a tank-to-tank basis if appropriate, whenever any of the following machinery space operations takes place in the ship:

.1 ballasting or cleaning of oil fuel tanks;
.2 discharge of dirty ballast or cleaning water from oil fuel tanks;
.3 collection and disposal of oil residues (sludge and other oil residues);
.4 discharge overboard or disposal otherwise of bilge water which has accumulated in machinery spaces; and
.5 bunkering of fuel or bulk lubricating oil.

3 In the event of such discharge of oil or oily mixture as is referred to in regulation 1.1.1 or in the event of accidental or other exceptional discharge of oil not excepted by that regulation, a statement shall be made in the Oil Record Book Part I of the circumstances of, and the reasons for, the discharge.

4 Each operation described in paragraph 2 of this regulation shall be fully recorded without delay in the Oil Record Book Part I, so that all entries in the book appropriate to that operation are completed. Each completed operation shall be signed by the officer or officers in charge of the operations concerned and each completed page shall be signed by the master of ship. The entries in the Oil Record Book Part I, for ships holding an International Oil Pollution Prevention Certificate, shall be at least in English or any working languages.

5 Any failure of the oil filtering equipment shall be recorded in the Oil Record Book Part I.

6 The Oil Record Book Part I shall be kept in such a place as to be readily available for inspection at all reasonable times and, except in the case of unmanned

ships under tow, shall be kept on board the ship. It shall be preserved for a period of three years after the last entry has been made.

The competent authority may inspect the Oil Record Book Part I on board any ship to which this regulation 1.1.1 applies while the ship is in its port or offshore terminals and may make a copy of any entry in that book and may require the master of the ship to certify that the copy is a true copy of such entry. Any copy so made which has been certified by the master of the ship as a true copy of an entry in the ship's Oil Record Book Part I shall be made admissible in any judicial proceedings as evidence of the facts stated in the entry. The inspection of an Oil Record Book Part I and the taking of a certified copy by the competent authority under this paragraph shall be performed as expeditiously as possible without causing the ship to be unduly delayed.

Regulation 6
Shipboard oil pollution emergency plan

1 Every ship shall carry on board a shipboard oil pollution emergency plan approved by the competent authority.

2 Such a plan shall be prepared based on guidelines developed by the Organization and written in the working language of the master and officers. The plan shall consist at least of:

.1 the procedure to be followed by the master or other persons having charge of the ship to report an oil pollution incident, as required in article 8 and Protocol I of the present Convention, based on the guidelines developed by the Organization;
.2 the list of authorities or persons to be contacted in the event of an oil pollution incident;
.3 a detailed description of the action to be taken immediately by persons on board to reduce or control the discharge of oil following the incident; and
.4 the procedures and point of contact on the ship for coordinating shipboard action with national and local authorities in combating the pollution.

3 In the case of ships to which regulation 1.1.2 also applies, such a plan may be combined with the shipboard marine pollution emergency plan for noxious liquid substances required under regulation 1.1.2. In this case, the title of such a plan shall be ''Shipboard marine pollution emergency plan''.

Regulation 7
Sewage systems

Every ship which, in accordance with regulation 2, is required to comply with the provisions of this Chapter shall be equipped with one of the following sewage systems:

1 a sewage treatment plant which shall be of a type approved by the Administration, taking into account the standards and test methods developed by the Organization, or

2 a sewage comminuting and disinfecting system approved by the Administration. Such system shall be fitted with facilities to the satisfaction of the Administration, for the temporary storage of sewage when the ship is less than 3 nautical miles from the nearest land, or

3 a holding tank of the capacity to the satisfaction of the Administration for the retention of all sewage, having regard to the operation of the ship, the number of persons on board and other relevant factors. The holding tank shall be constructed to the satisfaction of the Administration and shall have a means to indicate visually the amount of its contents.

Regulation 8

Standard discharge connections

1 To enable pipes of reception facilities to be connected with the ship's discharge pipeline, both lines shall be fitted with a standard discharge connection in accordance with the following table:

Standard dimensions of flanges for discharge connections

Description	Dimension
Outside Diameter	210 mm
Inner diameter	According to pipe outside diameter
Bolt circle Diameter	170 mm
Slots in flange	4 holes, 18 mm in diameter, equidistantly placed on a bolt circle of the above diameter, slotted to the flange periphery. The slot width to be 18 mm
Flange thickness	16 mm
Bolts and nuts: quantity and diameter	4, each of 16 mm in diameter and of suitable length
The flange is designed to accept pipes up to a maximum internal diameter of 100 mm and shall be of steel or other equivalent material having a flat face. This flange, together with a suitable gasket, shall be suitable for a service pressure of 600 kPa.	

For ships having a moulded depth of 5 m and less, the inner diameter of the discharge connection may be 38 mm.

2 For ships in dedicated trades, i.e. passenger ferries, alternatively the ship's discharge pipeline may be fitted with a discharge connection which can be accepted by the Administration, such as quick-connection couplings.

Regulation 9

Discharge of sewage

1 Subject to the provisions of regulation 1.1.4 the discharge of sewage into the sea is prohibited, except when:

.1 the ship is discharging comminuted and disinfected sewage using a system approved by the Administration at a distance of more than 3 nautical miles from the nearest land, or sewage which is not comminuted or disinfected at a distance of more than 12 nautical miles from the nearest land, provided that, in any case, the sewage that has been stored in holding tanks shall not be discharged instantaneously but at a moderate rate when the ship is en route and proceeding at not less than 4 knots; the rate of discharge shall be approved by the Administration based upon standards developed by the Organization; or

.2 the ship has in operation an approved sewage treatment plant which has been certified by the competent authority to meet the operational requirements referred to in regulation 1.1.4, and

.1 the test results of the plant are laid down in the ship's (International) Sewage Pollution Prevention Certificate ; and

.2 additionally, the effluent shall not produce visible floating solids nor cause discoloration of the surrounding water.

2 When the sewage is mixed with wastes or waste water covered by other Annexes described in regulation 1 of this chapter, the requirements of those Annexes shall be complied with in addition to the requirements of this regulation.

Regulation 10

Disposal of garbage outside special areas

1 Subject to the provisions of regulations 1.1.5 of this chapter:

.1 the disposal into the sea of all plastics, including but not limited to synthetic ropes, synthetic fishing nets, plastic garbage bags and incinerator ashes from plastic products which may contain toxic or heavy metal residues, is prohibited;

.2 the disposal into the sea of the following garbage shall be made as far as practicable from the nearest land but in any case is prohibited if the distance from the nearest land is less than:

.1 25 nautical miles for dunnage, lining and packing materials which will float;

.2 12 nautical miles for food wastes and all other garbage including paper products, rags, glass, metal, bottles, crockery and similar refuse;

.3 disposal into the sea of garbage specified in this regulation may be permitted when it has passed through a comminuter or grinder and made as far as practicable from the nearest land but in any case is prohibited if the distance from the nearest land is less than 3 nautical miles. Such comminuted or ground garbage shall be capable of passing through a screen with openings no greater than 25 mm.

2 When the garbage is mixed with other discharges having different disposal or discharge requirements the more stringent requirements shall apply.

Regulation 11
Special requirements for disposal of garbage

1 Subject to the provisions of paragraph 2 of this regulation, the disposal of any materials regulated by this regulation is prohibited from fixed or floating platforms engaged in the exploration, exploitation and associated offshore processing of seabed mineral resources, and from all other ships when alongside or within 500 m of such platforms.

2 The disposal into the sea of food wastes may be permitted when they have been passed through a comminuter or grinder from such fixed or floating platforms located more than 12 nautical miles from land and all other ships when alongside or within 500 m of such platforms. Such comminuted or ground food wastes shall be capable of passing through a screen with openings no greater than 25 mm.

Regulation 12
Exceptions

Regulations 10 and 11 of this chapter shall not apply to:

1 the disposal of garbage from a ship necessary for the purpose of securing the safety of a ship and those on board or saving life at sea; or

2 the escape of garbage resulting from damage to a ship or its equipment provided all reasonable precautions have been taken before and after the occurrence of the damage, for the purpose of preventing or minimizing the escape; or

3 the accidental loss of synthetic fishing nets, provided that all reasonable precautions have been taken to prevent such loss.

Regulation 13
Placards, garbage management plans and garbage recordkeeping

1 Every ship of 12m or more in length overall shall display placards which notify the crew and passengers of the disposal requirements of this chapter, as applicable.

The placards shall be written in the working language of the ship's personnel and, for ships engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties to the Convention.

2 Every ship of 400 gross tonnage and above, and every ship which is certified to carry 15 persons or more, shall carry a garbage management plan which the crew shall follow. This plan shall provide written procedures for collecting, storing, processing and disposing of garbage, including the use of the equipment on board. It shall also designate the person in charge of carrying out the plan. Such a plan shall be in accordance with the guidelines developed by the Organization and written in the working language of the crew.

3 Every ship of 400 gross tonnage and above and every ship which is certified to carry 15 persons or more engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties to the Convention and every fixed and floating platform engaged in exploration and exploitation of the sea-bed shall be provided with a Garbage Record Book. The Garbage Record Book, whether as a part of the ship's official log-book or otherwise, shall be in the form specified in the appendix to this Chapter;

.1 each discharge operation, or completed incineration, shall be recorded in the Garbage Record Book and signed for on the date of the incineration or discharge by the officer in charge. Each completed page of the Garbage Record Book shall be signed by the master of the ship. The entries in the Garbage Record Book shall be at least in English or working languages;

.2 the entry for each incineration or discharge shall include date and time, position of the ship, description of the garbage and the estimated amount incinerated or discharged;

.3 the Garbage Record Book shall be kept on board the ship and in such a place as to be available for inspection in a reasonable time. This document shall be preserved for a period of two years after the last entry is made on the record;

.4 in the event of discharge, escape or accidental loss referred to in regulation 1.1.5 an entry shall be made in the Garbage Record Book of the circumstances of, and the reasons for, the loss.

4 The Administration may waive the requirements for Garbage Record Books for:

.1 any ship engaged on voyages of 1 hour or less in duration which is certified to carry 15 persons or more; or

.2 fixed or floating platforms while engaged in exploration and exploitation of the sea-bed.

5 The competent authority may inspect the Garbage Record Book on board any ship to which this regulation applies while the ship is in its ports or offshore terminals and may make a copy of any entry in that book, and may require the master of the ship to certify that the copy is a true copy of such an entry. Any copy so made, which has been certified by the master of the ship as a true copy of an entry in the ship's Garbage Record Book, shall be admissible in any judicial proceedings as evidence of the facts stated in the entry. The inspection of a Garbage Record Book and the taking of a certified copy by the competent authority under this paragraph shall be performed as expeditiously as possible without causing the ship to be unduly delayed.

6 In the case of ships built before 1 July 1997, this regulation shall apply as from 1 July 1998.

Regulation 14
Ozone-depleting substances

1 Any deliberate emissions of ozone depleting substances shall be prohibited. Deliberate emissions include emissions occurring in the course of maintaining, servicing, repairing or disposing of systems or equipment, except that deliberate emissions do not include minimal releases associated with the recapture or recycling of an ozone-depleting substance. Emissions arising from leaks of an ozone-depleting substance, whether or not the leaks are deliberate, may be regulated by Parties to the Protocol of 1997.

2 New installations which contain ozone-depleting substances shall be prohibited on all ships, except that new installations containing hydro chlorofluorocarbons (HCFCs) are permitted until 1 January 2020.

3 The substances referred to in this regulation, and equipment containing such substances, shall be delivered to appropriate reception facilities when removed from ships.

Regulation 15
Nitrogen oxides (NOx)

1

.1 This regulation shall apply to:

.1 each diesel engine with a power output of more than 130 kW which is installed on a ship constructed on or after 1 January 2000; and

.2 each diesel engine with a power output of more than 130 kW which undergoes a major conversion on or after 1 January 2000.

.2 This regulation does not apply to:

.1 emergency diesel engines, engines installed in lifeboats and any device or equipment intended to be used solely in case of emergency; and

.2 engines installed on ships solely engaged in voyages within waters subject to the sovereignty or jurisdiction of the State the flag of which the ship is entitled to fly, provided that such engines are subject to an alternative NOx control measure established by the Administration.

.3 Notwithstanding the provisions of sub-paragraph .1 of this paragraph, the Administration may allow exclusion from the application of this regulation to any diesel engine which is installed on a ship constructed, or on a ship which undergoes a major conversion, before the date of entry into force of the present Protocol, provided that the ship is solely

engaged in voyages to ports or offshore terminals within the State the flag of which the ship is entitled to fly.

2

.1 For the purpose of this regulation, major conversion means a modification of an engine where:

.1 the engine is replaced by a new engine built on or after 1 January 2000, or

.2 any substantial modification, as defined in the NOx Technical Code, is made to the engine, or

.3 the maximum continuous rating of the engine is increased by more than 10%.

.2 The NOx emission resulting from modifications referred to in the subparagraph .1 of this paragraph shall be documented in accordance with the NOx Technical Code for approval by the Administration.

3

.1 Subject to the provision of regulation 1.1.6 the operation of each diesel engine to which this regulation applies is prohibited, except when the emission of nitrogen oxides (calculated as the total weighted emission of NO_2) from the engine is within the following limits:

.1 17.0 g/kW·h when *n* is less than 130 rpm

.2 45.0 x *n*-0.2 g/kW·h when *n* is 130 or more but less than 2000 rpm

.3 9.8 g/kW·h when *n* is 2000 rpm or more where *n* = rated engine speed (crankshaft revolutions per minute). When using fuel composed of blends from hydrocarbons derived from petroleum refining, test procedure and measurement methods shall be in accordance with the NOx Technical Code, taking into consideration the test cycles and weighting factors.

.2 Notwithstanding the provisions of sub-paragraph .1 of this paragraph, the operation of a diesel engine is permitted when:

.1 an exhaust gas cleaning system, approved by the Administration in accordance with the NOx Technical Code, is applied to the engine to reduce on board NOx emissions at least to the limits specified in sub-paragraph .1, or

.2 any other equivalent method, approved by the Administration taking into account relevant guidelines to be developed by the Organization, is applied to reduce on board NOx emissions at least to the limit specified in sub-paragraph .1 of this paragraph.

Regulation 16

Sulphur oxides (SOx)

1 The sulphur content of any fuel oil used on board ships shall not exceed 4.5% m/m.

2 The world-wide average sulphur content of residual fuel oil supplied for use on board ships shall be monitored taking into account guidelines to be developed by the Organization.

3 For the purpose of this regulation, SO_x emission control areas shall include any other sea area, including port areas, designated by the Organization in accordance with criteria and procedures for designation of SO_x emission control areas with respect to the prevention of air pollution from ships.

4 While ships are within SO_x emission control areas, at least one of the following conditions shall be fulfilled:

.1 the sulphur content of fuel oil used on board ships in a SO_x emission control area does not exceed 1.5% m/m;

.2 an exhaust gas cleaning system, approved by the Administration taking into account guidelines to be developed by the Organization is applied to reduce the total emission of sulphur oxides from ships, including both auxiliary and main propulsion engines, to 6.0 g SO_x/kW·h or less calculated as the total weight of sulphur dioxide emission. Waste streams from the use of such equipment shall not be discharged into enclosed ports, harbours and estuaries unless it can be thoroughly documented by the ship that such waste streams have no adverse impact on the ecosystems of such enclosed ports, harbours and estuaries, based upon criteria communicated by the authorities of the port State to the Organization. The Organization shall circulate the criteria to all Parties to the Convention; or

.3 any other technological method that is verifiable and enforceable to limit SOx emissions to a level equivalent to that described in subparagraph .2 is applied. These methods shall be approved by the Administration/competent authority taking into account guidelines to be developed by the Organization.

5 The sulphur content of fuel oil referred to in paragraph 1 and paragraph 4.1 of this regulation shall be documented by the supplier as required by regulation 1.1.6.

6 Those ships using separate fuel oils to comply with paragraph 4.1 of this regulation shall allow sufficient time for the fuel oil service system to be fully flushed of all fuels exceeding 1.5% m/m sulphur content prior to entry into a SO_x emission control area. The volume of low-sulphur fuel oils (less than or equal to 1.5% sulphur content) in each tank as well as the date, time, and position of the ship when any fuel-changeover operation is completed, shall be recorded in such log-book as prescribed by the Administration.

7 During the first 12 months immediately following entry into force of the present Protocol, or of an amendment to the present Protocol designating a specific SO_x emission control area under paragraph 3.2 of this regulation, ships entering a SO_x emission control area referred to in paragraph 3.1 of this regulation or designated under paragraph 3.2 of this regulation are exempted from the requirements in paragraphs 4 and 6 of this regulation and from the requirements of paragraph 5 of this regulation in so far as they relate to paragraph 4.1 of this regulation.

Chapter XVIII

Ship Security Regulations

Regulation 1
Application

1 These Rules and Regulations shall apply to ships covered by the provisions of the International Ship and Port Facility Security Code (ISPS Code). Where the Administration considers this Regulation unreasonable or impracticable, it may exempt such ships from such provisions, provided that the ship has equivalent protection against threaten security in the maritime transport sector.

2 All Philippine-registered domestic ships regardless of size, that have ship-to-ship interface with international ships or with an ISPS port facility, must comply with the minimum requirement of the ISPS Code and the National Transport and Maritime Security (NTMS) as implemented by the designated Authority.

3 All Philippine-registered domestic ships that will engage in the overseas trade shall comply with the requirements of the ISPS Code.

Chapter XIX

Minimum Safe Manning

Regulation 1
General Provisions

1 All Philippine-registered ships shall be manned by a sufficient number of qualified, competent and certificated officers and ratings who can safely operate the ships at all times in accordance with International Convention on Standards of Training Certification and Watchkeeping for Seafarers (STCW) 1978, as amended and the International Maritime Organization Resolution A 1047(27) on the Principles of Safe Manning

2 Philippine-registered ships shall have onboard and displayed in conspicuous place a MARINA Certified True Copy of the Minimum Safe Manning Certificate indicating therein the BASIC safe manning complement and their corresponding licenses and qualification requirements. In addition, a Crew List, indicating the Officer's and/or Crew's positions and licenses/qualifications, must be attached to the Minimum Safe Manning Certificate.

3 Issuance of Minimum Safe Manning Certificate shall conform to the requirements of the existing MARINA Memorandum Circular and its future amendments.

4 Masters, officers and ratings performing watchkeeping shall meet the certification requirements of MARINA Memorandum Circular 2012 - 04 and, where applicable, by the certification requirements of the 1978 STCW Convention, as amended.