



STATUTORY INSTRUMENTS.

S.I. No. 640 of 2020



MERCHANT SHIPPING (PASSENGER SHIPS) RULES 2020

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MERCHANT SHIPPING (PASSENGER SHIPS) RULES 2020

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S.I. No. 640 of 2020

MERCHANT SHIPPING (PASSENGER SHIPS) RULES 2020

I, EAMON RYAN, Minister for Transport, in exercise of the powers conferred on me by sections 10 (inserted by section 7 of the Merchant Shipping Act 2010 (No. 14 of 2010)) and 15 (inserted by section 8 of the Merchant Shipping Act 2010) (as adapted by the Communications, Climate Action and Environment (Alteration of Name of Department and Title of Minister) Order 2020 (S.I. No. 373 of 2020)) of the Merchant Shipping (Safety Convention) Act 1952 (No. 29 of 1952), sections 82 and 84 of the Merchant Shipping Act 2010 (as adapted by the Transport, Tourism and Sport (Alteration of Name of Department and Title of Minister) Order 2020 (S.I. No. 351 of 2020)), and after consultation with the Minister for the Environment, Climate and Communications in relation to Part 5 of the following rules, hereby make the following rules:

PART 1

PRELIMINARY AND GENERAL

Citation

1. These Rules may be cited as the Merchant Shipping (Passenger Ships) Rules 2020.

Interpretation

2. (1) In these Rules—

“accommodation spaces” means those spaces used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, games and hobbies rooms, barber shops, pantries containing no cooking appliances, and similar spaces;

“Act of 1992” means Merchant Shipping Act 1992 (No. 2 of 1992);

“auxiliary steering gear” means 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;

*Notice of the making of this Statutory Instrument was published in
“Iris Oifigiúil” of 29th December, 2020.*

“breadth of the ship” means the extreme width from outside of frame to outside of frame at or below the deepest subdivision load line;

“bulkhead deck” means the uppermost deck up to which the transverse watertight bulkheads are carried;

“cargo spaces” means all spaces used for cargo, including cargo oil tanks, and trunks to such spaces;

“complete deck” means a watertight deck or equivalent structure consisting of a non-watertight deck completely covered by a weathertight structure of adequate strength to maintain the weathertight integrity and fitted with weathertight closing appliances;

“control stations” means those spaces in which the ship’s radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralised;

“dead ship condition” means the condition under which the main propulsion plant, boilers and auxiliaries are not in operation due to the absence of power;

“deadweight” means the difference in tonnes between the displacement of a ship in water of a specific gravity of 1.025 at the load waterline corresponding to the assigned summer freeboard and the lightweight of the ship;

“deepest subdivision load line” means the waterline that corresponds to the greatest draught permitted by the subdivision requirements that are applicable;

“domestic voyage” means a voyage in sea areas from a place in the State to the same or another place within the State;

“draught” means the vertical distance from the moulded base line amidships to the subdivision load line in question;

“emergency condition” means a condition under which any services needed for normal operational and habitable conditions are not in working order due to failure of the main source of electrical power;

“emergency source of electrical power” means 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” means a switchboard which in the event of failure of the main electrical power supply system is directly supplied by the emergency source of electrical power or the transitional source of emergency power and is intended to distribute electrical energy to the emergency services;

“flashpoint” means the temperature in degrees Celsius (closed cup test) at which a product will give off enough flammable vapour to be ignited, as determined by an approved flashpoint apparatus;

“floodable length” at a given point means the maximum portion of the length of the ship, having its centre at the point in question, which can be flooded, under the assumption for permeability given in Rule 18(1), without the ship being submerged beyond the margin line;

“IMO” means International Maritime Organization;

“length”, unless expressly provided otherwise, means 96 per cent of the total length on a waterline at 85 per cent of the least moulded depth measured from the top of the keel, or the length from the fore-side of the stem 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 length is measured shall be parallel to the designed waterline;

“length of the ship” for the purpose of Rules 11 to 36, means the length measured between perpendiculars taken at the extremities of the deepest subdivision load line;

“line of coast” means land being the mainland of the State or any island which is normally inhabited and which has piers or berthing facilities which are in regular use;

“lightweight” means the displacement of a ship in tonnes without cargo, fuel, lubricating oil, ballast water, fresh water and feedwater in tanks, consumable stores, and passengers and crew and their effects;

“Load Line Rules” means the Merchant Shipping (Load Line) Rules 2001 (S.I. No. 424 of 2001);

“machinery space” for the purpose of Rules 11 to 36, means any space 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, and boilers serving the needs of propulsion;

“machinery spaces” for the purpose of Rules 37 to 121, means all machinery spaces of category A and all other spaces containing propelling machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilising, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces;

“machinery spaces of category A” means those spaces and trunks to such spaces which contain—

- (a) internal combustion machinery used for main propulsion,
- (b) 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
- (c) any oil-fired boiler or oil fuel unit;

“main generating station” means the space in which the main source of electrical power is situated;

“main steering gear” means the machinery, rudder actuators, steering gear power units, if any, and ancillary equipment and the means of applying torque to the rudder stock, such as the tiller or quadrant, necessary for effecting movement of the rudder for the purpose of steering the ship under normal service conditions;

“main source of electrical power” means a source intended to supply electrical power to the main switchboard for distribution to all services necessary for maintaining the ship in normal operational and habitable condition;

“main switchboard” means a switchboard which is directly supplied by the main source of electrical power and is intended to distribute electrical energy to the ship’s services;

“margin line” means a line drawn at least 76 mm below the upper surface of the bulkhead deck at side;

“maximum ahead service speed” means the greatest speed which the ship is designed to maintain in service at sea at the deepest seagoing draught;

“maximum speed astern” means the speed which it is estimated the ship can attain at the designed maximum astern power at the deepest seagoing draught;

“Minister” means Minister for Transport;

“moulded depth” –

- (a) means the vertical distance measured 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 a 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;
- (b) in ships having rounded gunwales, shall be measured to the point of intersection of the moulded lines of the deck and side shell plating, the lines extending as though the gunwale were of angular design;
- (c) where the freeboard deck is stepped and the raised part of the deck extends over the point at which the moulded depth is to be determined, shall be measured to a line of reference

extending from the lower part of the deck along a line parallel with the raised part;

“new passenger ship” means –

- (a) a passenger ship the keel of which was laid or which was at a similar stage of construction on or after 1 July 1998, or
- (b) a ship that is converted on or after 1 July 1998 to a passenger ship to operate in sea areas A, B, C or D. In the case of such a passenger ship, the date of construction shall be the date on which the conversion commences;

“normal operational and habitable condition” means a condition under which the ship as a whole, the machinery, services, means and aids ensuring propulsion, ability to steer, safe navigation, fire and flooding safety, internal and external communications and signals, means of escape, and emergency boat winches, as well as the designed comfortable conditions of habitability are in working order and functioning normally;

“oil fuel unit” means 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 greater than 0.18 N/mm^2 ;

“passenger” means any person carried on a ship other than –

- (a) the owner or a person to whom the ship is on hire or a person employed or engaged in any capacity on board the ship on the business of the ship, or
- (b) a person on board the ship either in pursuance of the obligation laid upon the master of the ship to carry shipwrecked, distressed or other persons or by reason of any circumstances that could not have been prevented or forestalled by the master or the owner of the ship;

“passenger ship” means a ship that carries more than 12 passengers;

“passenger spaces” means those spaces that are provided for the accommodation and use of passengers, excluding baggage, store, provision and mail rooms;

“permeability” in relation to a space means the percentage of that space which can be occupied by water. The volume of a space which extends above the margin line shall be measured only to the height of that line;

“positive stability” means the ability of a craft to return to its original position after the removal of a heeling moment;

“power actuating system” means the hydraulic equipment provided for supplying power to turn the rudderstock, comprising a steering gear power unit or units, together with the associated pipes and fittings, and a rudder actuator. The power actuating systems may share common mechanical components, that is, tiller, quadrant and rudder stock, or components serving the same purpose;

“public spaces” means those portions of the accommodation that are used for halls, dining rooms, lounges and similar permanently enclosed spaces;

“Radio Rules of 1992” means the Merchant Shipping (Radio) Rules 1992 (S.I. No. 224 of 1992);

“Radio Rules of 2018” means the Merchant Shipping (Radio) Rules 2018 (S.I. No. 452 of 2018);

“recognised organisation” means an organisation recognised in accordance with Regulation (EC) No. 391/2009 of the European Parliament and of the Council of 23 April 2009¹;

“Regulations of 2011” means the European Communities (Ship Inspection and Survey Organisations) Regulations 2011 (S.I. No. 275 of 2011);

“Regulations of 2017” means the European Union (Marine Equipment) Regulations 2017 (S.I. No. 177 of 2017);

¹ OJ No. L 131, 28.5.2009, p. 11.

“repairs, alterations or modifications of a major character” includes any change that substantially –

- (a) alters the dimensions of a ship, such as the lengthening of the ship by adding new midbody,
- (b) alters the passenger-carrying capacity of a ship, such as the conversion of a vehicle deck to passenger accommodation, or
- (c) increases a ship’s service life, such as the renewal of passenger accommodation on one entire deck;

“ro-ro cargo spaces” means spaces not normally subdivided in any way and 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 or goods (packaged or in bulk, in or on rail or road cars, vehicles (including road and rail tankers), trailers, containers, pallets, dismountable tanks or in or on similar stowage units or other receptacles) can be loaded and unloaded normally in a horizontal direction;

“ro-ro passenger ship” means a passenger ship with ro-ro cargo spaces or special category spaces;

“Rules of 2018” means the Merchant Shipping (Life-Saving Appliances) Rules 2018 (S.I. No. 438 of 2018);

“Safety Convention” means the International Convention for the Safety of Life at Sea signed in London on behalf of the Government on 1 November 1974 together with the Protocol to the International Convention for the Safety of Life at Sea signed in London on behalf of the Government on 17 February 1978 and the Protocol to the International Convention for the Safety of Life at Sea signed in London on behalf of the Government on 11 November 1988 and any amendments made to it up to and including those adopted by the 90th session of the Maritime Safety Committee of the International Maritime Organization held between 16 and 25 May 2012 and which have entered into force in respect of the State pursuant to Article VIII prior to the passing of the Merchant Shipping (Registration of Ships) Act 2014 (No. 43 of 2014) on 25 December 2014;

“service spaces” means those spaces used for galleys, pantries containing cooking appliances, lockers, mail and specie rooms, storerooms, workshops other than those forming part of the machinery spaces, and similar spaces and trunks to such spaces;

“ship with a full deck” means a ship that is provided with a complete deck, exposed to weather and sea, which has permanent means of closing all openings in the weatherpart thereof and below which all openings in the sides of the ship are fitted with permanent means of at least weathertight closing;

“similar stage of construction” means the stage at which –

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

“special category spaces” means those enclosed vehicle spaces above or 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 metres;

“steering gear control system” means the equipment by which orders are transmitted from the navigating bridge to the steering gear power units. Steering gear control systems comprise transmitters, receivers, hydraulic control pumps and their associated motors, motor controllers, piping and cables;

“steering gear power unit” means –

- (a) in the case of electric steering gear, an electric motor and its associated electrical equipment,
- (b) in the case of electrohydraulic steering gear, an electric motor and its associated electrical equipment and connected pump,
or

- (c) in the case of other hydraulic steering gear, a driving engine and connected pump;

“subdivision load line” means the waterline used in determining the subdivision of the ship;

“surveyor of ships” means a person appointed under section 724 of the Merchant Shipping Act 1894 to be a surveyor of ships for the purposes of that Act;

“watertight”, in relation to structure, means capable of preventing the passage of water through the structure in any direction under the head of water likely to occur in the intact or damage condition;

“weather deck” means a deck that is completely exposed to the weather from above and from at least two sides;

“weathertight” means that water will not penetrate into the ship in any sea conditions.

(2) For the purposes of these Rules, sea areas are divided into the following categories:

- (a) ‘Area A’ meaning a sea area outside of areas B, C and D;
- (b) ‘Area B’ meaning a sea area whose geographical coordinates are at no point more than 20 miles from the line of coast, corresponding to the medium tide height, but which is outside of areas C and D;
- (c) ‘Area C’ meaning a sea area whose geographical coordinates are at any point no more than 5 miles from the line of coast, corresponding to the medium tide height, but outside of sea area D if any. Additionally, the probability of the significant wave height exceeding 2.5 metres shall be smaller than 10 per cent for a period of one year for all-year-round operation, or for a specific period for seasonal operation, such as summer period operation;
- (d) ‘Area D’ meaning a sea area whose geographical coordinates are at any point no more than 3 miles from the line of coast, corresponding

to the medium tide height. Additionally, the probability of the significant wave height exceeding 1.5 metres shall be smaller than 10 per cent for a period of one year for all-year-round operation, or for a specific period for seasonal operation, such as summer period operation.

- (3) A list of the sea areas for the purposes of paragraph (2) is set out in Schedule 1.

Application

3. (1) These Rules apply to new passenger ships (other than high-speed passenger craft to which the European Union (Passenger Ships) Regulations 2019 (S.I. No. 676 of 2019) apply) of less than 24 metres in length, constructed of steel or aluminium, as described in paragraph (2), regardless of their flag, when engaged on a domestic voyage.

(2) Passenger ships are divided into the following classes according to the sea area in which they may operate:

- (a) “Class A” meaning a passenger ship engaged on a domestic voyage in Areas A, B, C and D;
- (b) “Class B” meaning a passenger ship engaged on a domestic voyage in Areas B, C and D;
- (c) “Class C” meaning a passenger ship engaged on a domestic voyage in Areas C and D;
- (d) “Class D” meaning a passenger ship engaged on a domestic voyage in Area D.

(3) The instruments specified in Schedule 2 shall not apply to passenger ships to which these Rules apply.

Safety requirements – passenger ships

4. (1) In a new passenger ship:

- (a) the construction and maintenance of the hull, main and auxiliary machinery, electrical and automatic plants shall comply with the standards specified for classification by the rules of a recognised organisation authorised under Regulation 4 of the Regulations of 2011;
- (b) the provisions of Chapter IV, including the 1988 Global Maritime Distress and Safety System (GMDSS) amendments, Chapters V and

VI of the Safety Convention shall apply to a Class A, B and C passenger ship;

- (c) the provisions for shipborne navigational equipment of Regulations 17, 18, 19, 20 and 21 of Chapter V of the Safety Convention, shall apply;
- (d) all shipboard marine equipment, as listed in implementing acts of the European Union adopted in accordance with Article 35 of Directive 2014/90/EU of the European Parliament and of the Council of 23 July 2014², placed or to be placed on board the ship shall comply with the Regulations of 2017.

(2) A new passenger ship shall comply with the following:

- (a) in relation to new passenger ships:
 - (i) a new Class A passenger ship shall comply with the requirements of the Safety Convention, and with the specific relevant requirements for Class A passenger ships as specified in these Rules;
 - (ii) a new Class B, C or D passenger ship shall comply with the specific relevant requirements that apply to each Class, as appropriate, as specified in these Rules.
- (b) in relation to load line requirements:
 - (i) the Load Line Rules or an equivalent level of safety to the satisfaction of the Minister having regard to the length and class of a ship and any restrictions to be placed on its operations;
 - (ii) notwithstanding clause (i), the minimum bow height requirement provided for in paragraph 16(5) of Schedule 4 to the Load Line Rules shall not apply to a new passenger ship of Class D;
 - (iii) a new passenger ship of Class A, B, C or D shall be a ship with a full deck.

(3) Where these Rules require that the hull or machinery of a ship shall be constructed in a particular manner, or that particular equipment shall be provided, or particular provision shall be made, the Minister may approve the hull or machinery of the ship to be constructed in any other manner or any other equipment to be provided or other provision made, if the Minister is satisfied by trial thereof or

² OJ No. L 257, 28.8.2014, p. 146.

otherwise that such other construction or equipment or other provision is at least as effective as that required by these Rules.

Stability requirements for ro-ro passenger ships

5. A ro-ro passenger ship of Class A, B or C, the keel of which is laid or at a similar stage of construction on or after 1 October 2004, shall comply with the stability requirements in the Merchant Shipping (Ro-Ro Passenger Ship Survivability) Rules 1998 to 2006.

Safety requirements for persons with reduced mobility

6. (1) Every owner, operator and master of a Class A, B, C or D passenger ship to which these Rules apply used for public transport, the keel of which is laid or is at a similar stage of construction on or after 1 October 2004, shall in respect of each such ship ensure that appropriate measures are taken, based where practicable on the guidelines in Schedule 3, to enable persons with reduced mobility to have safe access to such passenger ships.

(2) Where a modification of a passenger ship referred to in paragraph (1) is proposed, the owner, operator and master of such vessels shall apply the guidelines in Schedule 3 as far as is reasonable and practicable in economic terms.

Surveys — passenger ships

7. (1) A new passenger ship shall be surveyed in accordance with section 6 of the Act of 1992.

(2) A survey to which this Rule applies shall be carried out by a surveyor of ships or a recognised organisation authorised under Regulation 4 of the Regulations of 2011.

Certificates — passenger ships

8. (1) Sections 9, 10 and 11 of the Act of 1992 shall apply to a survey to which Rule 7 relates as they apply to a survey to which Part II of that Act relates and references in those sections to a survey shall include references to a survey carried out under Rule 7.

(2) Section 8 of the Act of 1992 shall apply to a survey carried out on a passenger ship referred to in Rule 7 as it applies to a survey carried out under Part II of that Act.

PART 2
CONSTRUCTION RULES

Structure of ships

Prohibition on the new installation of materials containing asbestos

9. (1) This Rule applies to materials used for the structure, machinery, electrical installations and equipment in a passenger ship.

(2) The new installation of materials that contain asbestos is prohibited in a passenger ship.

Construction drawings maintained on board and ashore

10. (1) In the case of a Class B, C or D passenger ship constructed on or after 1 January 2012, a set of as-built construction drawings and other plans showing any subsequent structural alterations to the ship, having regard to IMO MSC/Circ.1135 of 15 December 2004, shall be kept on board the ship.

(2) An additional set of the drawings referred to in paragraph (1) shall be kept ashore by the Company.

(3) In this Rule, “Company” means the owner of the ship or any other organisation or person such as the manager, or the bareboat charterer, who has assumed the responsibility for operation of the ship from the owner of the ship and who on assuming such responsibility has agreed to take over all the duties and responsibilities imposed by the International Safety Management Code.

Intact stability, subdivision and damage stability

Intact stability

11. (1) A new passenger ship of Class A, B, C or D shall, in all loading conditions, satisfy the following stability criteria after due correction for the effect of free surface of liquids in tanks in accordance with the assumptions of paragraph 3.3 of IMO Resolution A.749(18):

- (a) the area under the curve of righting lever (GZ curve) shall not be less than:
 - (i) 0.055 metre-radians up to an angle of heel of 30°;
 - (ii) 0.09 metre-radians up to an angle of heel of either 40° or the angle of flooding, that being the angle of heel at which the lower edges of any openings in the hull, superstructures or

deckhouses, being openings that cannot be closed weathertight, are immersed, if that angle is less than 40°;

(iii) 0.03 metre-radians between the angles of heel of 30° and 40° or between 30° and the angle of flooding if this angle is less than 40°;

(b) the righting lever GZ shall be at least 0.20 metre at an angle of heel equal to or greater than 30°;

(c) the maximum righting lever GZ shall occur at an angle of heel not less than 25°. Where this is not practicable, alternative criteria based on an equivalent level of safety may be applied, subject to the approval of the Minister;

(d) the initial transverse metacentric height shall not be less than 0.15 metre.

(2) The loading conditions to be considered in order to verify compliance with the stability criteria set out in paragraph (1) shall at a minimum include those listed in paragraph 3.5.1.1 of IMO Resolution A.749(18).

(3) (a) A new passenger ship of Class A, B, C or D shall comply with the additional Severe Wind and Rolling Criterion given in paragraph 3.2 of Chapter 3 of IMO Resolution A.749(18).

(b) In the case of a new passenger ship of Class C or D, the value of P to be used in the calculation of wind heeling levers may be reduced subject to the approval of the Minister.

(4) In this Rule a reference to IMO Resolution A.749(18) is a reference to that Resolution in its updated form.

Watertight subdivision

12. (1) A new passenger ship of Class B, C or D shall be subdivided by bulkheads, which shall be watertight up to the bulkhead deck, into watertight compartments the maximum length of which shall be calculated according to the specific requirements that apply to the ship as set out in Rules 13 and 14.

(2) Every other portion of the internal structure of a passenger ship referred to in paragraph (1), which affects the efficiency of the subdivision of the ship, shall be watertight.

(3) As an alternative to the requirements in paragraph (1), the following requirements may apply in the case of the specified new passenger ships:

(a) in a new Class B, C or D ship the keel of which was laid or was at a similar stage of construction on or before 31 December 2009, the

Regulations on subdivision and stability of passenger ships as an equivalent to Part B of Chapter II of the International Convention for the Safety of Life at Sea 1960, as given in IMO Resolution A.265(VIII), may be used, if applied in their entirety;

- (b) in a Class B, C or D ship the keel of which was laid or was at a similar stage of construction on or after 1 January 2009 and before 31 December 2019, the appropriate provisions of the Safety Convention Chapter II-1, Part B, as laid down in Annex 2 of IMO Resolution MSC.216(82);
- (c) in a Class B, C or D ship the keel of which was laid or was at a similar stage of construction on or after 1 January 2020, the requirements in the appropriate provisions of the Safety Convention Chapter II-1, parts B to B-4.

Floodable length

13. (1) In a new passenger ship of Class B, C or D, where a portion of an assumed margin line is appreciably below the deck to which bulkheads are carried, a limited relaxation in the watertightness of those portions of the bulkheads which are above the margin line and immediately under the higher deck may be permitted by the Minister.

(2) The assumptions referred to in this Rule relate to the permeability of the spaces below the margin line.

(3) In determining the floodable length, the assumed average permeability of the spaces below the margin line shall be as indicated in Table 1 to Rule 18(1).

Permissible length of compartments and factor of subdivision

14. (a) In a new passenger ship of Class B, C or D, the maximum permissible length of a compartment having its centre at any point in the ship's length is obtained from the floodable length by multiplying the latter by an appropriate factor called factor of subdivision.

- (b) In a new passenger ship of Class B, C or D, the factor of subdivision shall be:
 - (i) 1.0, when the ship is certified to carry less than 400 persons;
 - (ii) 0.5, when the ship is certified to carry 400 persons or more.

Special requirements concerning ship subdivision

15. (1) In a new passenger ship of Class B, C or D:

- (a) where in a portion or portions of a ship the watertight bulkheads are carried to a higher deck than in the remainder of the ship and it is

desired to take advantage of this higher extension of the bulkheads in calculating the floodable length, separate margin lines may be used for each such portion of the ship provided that:

- (i) the sides of the ship are extended throughout the ship's length to the deck corresponding to the upper margin line and all openings in the shell plating below this deck throughout the length of the ship are treated as being below a margin line, for the purpose of Rule 25, and
 - (ii) the two compartments adjacent to the "step" in the bulkhead deck are each within the permissible length corresponding to their respective margin lines, and, in addition, their combined length does not exceed twice the permissible length based on the lower margin line;
- (b) a compartment may exceed the permissible length determined in accordance with Rule 14 provided the combined length of each pair of adjacent compartments to which the compartment in question is common does not exceed either the floodable length or twice the permissible length, whichever is less;
 - (c) a main transverse bulkhead may be recessed provided that all parts of the recess lie inboard of vertical surfaces on both sides of the ship, situated at a distance from the shell plating equal to one fifth of the breadth of the ship, and measured at right angles to the centreline at the level of the deepest subdivision load line. Any part of a recess which lies outside these limits shall be dealt with as a step in accordance with paragraph (2);
 - (d) where a main transverse bulkhead is recessed or stepped, an equivalent plane bulkhead shall be used in determining the subdivision;
 - (e) where a main transverse watertight compartment contains local subdivision and the Minister is satisfied that, after any assumed side damage extending over a length of 3 metres plus 3 per cent of the length of the ship or 11 metres, or 10 per cent of the length of the ship whichever is the less, the whole volume of the main compartment will not be flooded, a proportionate allowance may be made in the permissible length otherwise required for such compartment. In such a case the volume of the effective buoyancy assumed on the undamaged side shall not be greater than that assumed on the damaged side;
 - (f) allowance under subparagraph (e) shall only be made if such allowance is not likely to prevent compliance with Rules 16, 17 and 18.

(2) In a new passenger ship of Class B, C or D, a main transverse bulkhead may be stepped provided that it meets one of the following conditions:

- (a) the combined length of the two compartments, separated by the bulkhead in question, does not exceed either 90 per cent of the floodable length or twice the permissible length, except that, in ships having a subdivision factor equal to 1, the combined length of the two compartments in question shall not exceed the permissible length;
- (b) additional subdivision is provided in way of the step to maintain the same level of safety as that secured by a plane bulkhead;
- (c) the compartment over which the step extends does not exceed the permissible length corresponding to a margin line taken 76 mm below the step.

(3) In a new passenger ship of Class B, C or D, where the distance between two adjacent main transverse bulkheads, or their equivalent plain bulkheads, or the distance between the transverse planes passing through the nearest stepped portions of the bulkheads, is less than 3 metres plus 3 per cent of the length of the ship, or 11 metres, or 10 per cent of the length of the ship, whichever is less, only one of these bulkheads shall be regarded as forming part of the subdivision of the ship.

(4) In a new passenger ship of Class B, C or D, where the required subdivision factor is 0.5, the combined length of any two adjacent compartments shall not exceed the floodable length.

Stability in damaged conditions – general

16. In a new passenger ship of Class B, C or D:

- (a) sufficient intact stability shall be provided in all service conditions so as to enable the ship to withstand the final stage of flooding of any one main compartment which is required to be within the floodable length;
- (b) where two adjacent main compartments are separated by a bulkhead which is stepped under the conditions of Rule 15(2)(a), the intact stability shall be adequate to withstand the flooding of those two adjacent compartments;
- (c) where the required factor of subdivision is 0.50, the intact stability shall be adequate to withstand the flooding of any two adjacent compartments;

- (d) the requirements of paragraph (a) shall be determined by calculations which are in accordance with Rules 18(1), (2) and (4) and which take into consideration the proportions and design characteristics of the ship and the arrangement and configuration of the damaged compartments. In making these calculations the ship shall be assumed to be in the worst anticipated service condition as regards stability;
- (e) where it is proposed to fit decks, inner skins or longitudinal bulkheads of sufficient tightness to seriously restrict the flow of water, proper consideration shall be given to such restrictions in the calculations.

Stability in damaged conditions for a new passenger ship

17. (1) This Rule applies to a new Class B, C or D passenger ship.

(2) The stability required in the final condition after damage, and after equalisation where provided, shall be determined as follows:

- (a) the positive residual righting lever curve shall have a minimum range of 15° beyond the angle of equilibrium. This range may be reduced to a minimum of 10° , in the case where the area under the righting lever curve is that specified in subparagraph (b) multiplied by the ratio $15/\text{range}$, where range is expressed in degrees;
- (b) the area under the righting lever curve shall be at least 0.015 m-rad, measured from the angle of equilibrium to the lesser of:
 - (i) the angle at which progressive flooding occurs;
 - (ii) 22° (measured from upright) in the case of one-compartment flooding, or 27° (measured from the upright) in the case of the simultaneous flooding of two adjacent compartments;
- (c) a residual righting lever is to be obtained within the range of positive stability, taking into account the greatest of the following heeling moments:
 - (i) the crowding of all passengers towards one side;
 - (ii) the launching of all fully loaded davit-launched survival craft on one side;
 - (iii) due to wind pressure;

as calculated by the formula:

$$\text{GZ(metres)} = \frac{\text{Heeling moment}}{\text{displacement}} + 0.04$$

However, in no case shall the righting lever be less than 0.10 metres;

(d) for the purpose of calculating the heeling moments in subparagraph (c), the following assumptions shall be made:

(i) moment due to crowding of passengers:

(I) 4 persons per square metre;

(II) a mass of 75 kg for each passenger;

(III) passengers shall be distributed on available deck areas towards one side of the ship on the decks where muster stations are located and in such a way that they produce the most adverse heeling moment;

(ii) moment due to launching of all fully loaded davit-launched survival craft on one side:

(I) all lifeboats and rescue boats fitted on the side to which the ship has heeled after having sustained damage shall be assumed to be swung out fully loaded and ready for lowering;

(II) for lifeboats that are arranged to be launched fully loaded from the stowed position, the maximum heeling moment during launching shall be taken;

(III) a fully loaded davit-launched life-raft attached to each davit on the side to which the ship has heeled after having sustained damage shall be assumed to be swung out ready for lowering;

(IV) persons not in the life-saving appliances which are swung out shall not provide either additional heeling or righting moment;

- (V) life-saving appliances on the side of the ship opposite to the side to which the ship has heeled shall be assumed to be in a stowed position;
- (iii) moments due to wind pressure:
 - (I) in a Class B passenger ship, a wind pressure of 120 N/m² shall be applied;
 - (II) in a Class C or Class D passenger ship, a wind pressure of 80 N/m² shall be applied;
 - (III) the area applicable shall be the projected lateral area of the ship above the waterline corresponding to the intact condition;
 - (IV) the moment arm shall be the vertical distance from a point at one half of the mean draught corresponding to the intact condition to the centre of gravity of the lateral area.

(3) When major progressive flooding occurs, that is when it causes a rapid reduction in the righting lever of 0.04 metres or more, the righting lever curve shall be considered as terminated at the angle at which the progressive flooding occurs and the range and the area referred to in paragraphs (2)(a) and (b) shall be measured to that angle.

(4) In cases where the progressive flooding is of a limited nature that does not continue unabated and causes an acceptably slow reduction in righting lever of less than 0.04 metres, the remainder of the curve shall be partially truncated by assuming that the progressively flooded space is so flooded from the beginning.

(5) In intermediate stages of flooding, the maximum righting lever shall be at least 0.05 metres and the range of positive righting levers shall be at least 7. In all cases, only one breach in the hull and only one free surface is required to be assumed.

Calculation of damage stability

18. (1) For the purpose of making damage stability calculations in a new Class B, C or D passenger ship, the volume and surface permeabilities shall be as follows in Table 1 to this Rule:

Table 1

Spaces	Permeability (per cent)
Appropriated to cargo or stores	60
Occupied by accommodation	95
Occupied by machinery	85
Intended for liquids	0 or 95 (*)

(*) Whichever results in more severe requirements.

Higher surface permeabilities shall be assumed in respect of spaces which, in the vicinity of the damaged waterplane, contain no substantial quantity of accommodation or machinery, and spaces that are not generally occupied by any substantial quantity of cargo or stores.

(2) In a new Class B, C or D passenger ship, the assumed extent of damage shall be as follows:

- (a) longitudinal extent: 3 metres plus 3 per cent of the length of the ship, or 11 metres, or 10 per cent of the length of the ship, whichever is less;
- (b) transverse extent (measured inboard from the ship's side, at right angles to the centreline at the level of the deepest subdivision load line): a distance of one fifth of the breadth of the ship;
- (c) vertical extent: from the base line upwards without limit;
- (d) if any damage of lesser extent than that indicated in subparagraph (a), (b) or (c) would result in a more severe condition regarding heel or loss of metacentric height, such damage shall be assumed in the calculations.

(3) Unsymmetrical flooding shall be kept to a minimum consistent with efficient arrangements. Where it is necessary to correct large angles of heel, the means adopted shall, where practicable, be self-acting, but in any case where controls to cross-flooding fittings are provided they shall be operable from above the bulkhead deck. For new Class B, C or D passenger ships, the maximum angle of heel after flooding, but before equalisation, shall not exceed 15°. Where cross-flooding fittings are required in Class B, C or D passenger ships, the time for equalisation shall not exceed 15 minutes. Suitable information concerning the use of cross-flooding fittings shall be supplied to the master of the ship by the owner of the ship

or any other organisation or person, such as the manager or the bareboat charterer, who has assumed responsibility for the safe operation of the ship from the owner.

(4) The final conditions of the ship after damage and, in the case of unsymmetrical flooding, after equalisation measures have been taken, shall be as follows:

- (a) in the case of symmetrical flooding, there shall be a positive residual metacentric height of at least 50 mm as calculated by the constant displacement method;
- (b) (i) in the case of unsymmetrical flooding, the angle of heel for one-compartment flooding shall not exceed 7° in a new Class B passenger ship and 12° in a new Class C or a new Class D passenger ship;
- (ii) for the simultaneous flooding of two adjacent compartments, a maximum heel of 12° may be permitted for new Class B passenger ships, provided that the factor of subdivision is nowhere greater than 0.50 in that part of the ship that is flooded;
- (c) in no case shall the margin line be submerged in the final stage of flooding. If it is considered that the margin line may become submerged during an intermediate stage of flooding, the Minister may require such investigations and arrangements as are considered necessary for the safety of the ship.

(5) The master of the ship shall be supplied by the owner of the ship or any other organisation or person, such as the manager or the bareboat charterer, who has assumed responsibility for the safe operation of the ship from the owner, with the data necessary to maintain sufficient intact stability under service conditions to enable the ship to withstand the critical damage. In the case of ships requiring cross-flooding, the master of the ship shall be informed of the conditions of stability on which the calculations of heel are based and be warned that excessive heeling might result should the ship sustain damage when in a less favourable condition.

(6) The data referred to in paragraph (5) to enable the master to maintain sufficient intact stability shall include information which indicates the maximum permissible height of the ship's centre of gravity above keel (KG), or alternatively the minimum permissible metacentric height (GM), for a range of draughts or displacements sufficient to include all service conditions. The information shall show the influence of various trims taking into account the operational limits.

- (7) (a) Each ship shall have scales of draughts marked clearly at the bow and stern.
- (b) In a 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, the ship shall also be fitted with

a reliable draught indicating system by which the bow and stern draughts can be determined.

- (8) (a) On completion of loading of the ship and prior to its departure, the master shall determine the ship's trim and stability and also ascertain and record that the ship is in compliance with stability criteria contained in the relevant Rules that apply to the ship.
- (b) The determination of the ship's stability shall always be made by calculation.
- (9) (a) Subject to subparagraph (b), the Minister may consider a relaxation of the requirements of these Rules in relation to damage stability where it is shown to the satisfaction of the Minister that the intact metacentric height in any service condition necessary to meet these requirements is excessive for the service intended.
- (b) A relaxation of the requirements for damage stability shall be permitted only in exceptional cases and where the Minister is satisfied that the proportions, arrangements and other characteristics of the ship are the most favourable to stability after damage that can practically and reasonably be adopted in the particular circumstances.

Peak and machinery space bulkheads

19. (1) This Rule applies to new Class B, C and D passenger ships.

(2) A forepeak or collision bulkhead shall be fitted which shall be watertight up to the bulkhead deck. This bulkhead shall be located at a distance from the forward perpendicular of not less than 5 per cent of the length of the ship and not more than 3 metres plus 5 per cent of the length of the ship.

(3) Where any part of the ship below the waterline extends forward of the forward perpendicular, such as a bulbous bow, the distances stipulated in paragraph (2) shall be measured from a point either:

- (a) at the mid-length of such extension, or
- (b) at a distance 1.5 per cent of the length of the ship forward of the forward perpendicular, or
- (c) at a distance 3 metres forward of the forward perpendicular,

whichever gives the smallest measurement,

(4) Where a long forward superstructure is fitted, the forepeak or collision bulkhead shall be extended weathertight to the next full deck above the bulkhead deck. The extension shall be so arranged as to preclude the possibility of the bow door causing damage to it in a situation where there is damage to, or detachment of, a bow door.

(5) The extension required in paragraph (4) is not required to be fitted directly above the bulkhead below provided all parts of the extension are not located forward of the forward limit specified in paragraph (2) or (3).

(6) Ramps that do not meet the requirements of this Rule shall be disregarded as an extension to the collision bulkhead.

(7) An afterpeak bulkhead, and bulkheads dividing the machinery space from the cargo and passenger spaces forward and aft, shall also be fitted and made watertight up to the bulkhead deck. The afterpeak bulkhead may be stepped below the bulkhead deck provided the degree of safety of the ship as regards subdivision is not thereby diminished.

(8) In all cases stern tubes shall be enclosed in watertight spaces.

Double bottoms

20. (1) This Rule applies to a new Class B, C or D passenger ship.

(2) A double bottom shall be fitted extending from the forepeak bulkhead to the afterpeak bulkhead as far as this is practicable and compatible with the design and proper working of the ship.

(3) Where a double bottom is fitted in a ship, its depth shall comply with the standards of a recognised organisation and the inner bottom shall be continued out to the ship's sides in such a manner as to protect the bottom to the turn of the bilge. Such protection shall be deemed satisfactory if the line of intersection of the outer edge of the margin plate with the bilge plating is not lower at any part than a horizontal plane passing through the point of intersection with the frame line amidships of a transverse diagonal line inclined at 25° to the base line and cutting it at a point one half of the ship's moulded breadth from the middle line.

(4) Small wells constructed in the double bottom of a ship in connection with drainage arrangements of holds, shall not extend downwards more than necessary. The depth of the well shall in no case be more than the depth less 460 mm of the double bottom at the centerline. A well extending to the outer bottom is permitted at the after end of the shaft tunnel. Other wells, for purposes such as lubricating oil under main engines, may be permitted by the Minister if he or she is satisfied that the arrangements give protection equivalent to that afforded by a double bottom complying with this Rule.

(5) A double bottom is not required to be fitted in way of watertight compartments of moderate size used exclusively for the carriage of liquids, provided the safety of the ship, in the event of bottom or side damage, is not, in the opinion of the Minister, thereby impaired.

(6) Notwithstanding paragraph (2), the Minister may permit a double bottom to be dispensed with in any part of the ship which is subdivided by application of a factor of subdivision not exceeding 0.5, if he or she is satisfied that the fitting of a double bottom in that part of the ship would not be compatible with the design and proper working of the ship.

Assigning, marking and recording of subdivision load lines

21. (1) This Rule applies to a new Class B, C or D passenger ship.
- (2) (a) In order that the required degree of subdivision shall be maintained, a load line corresponding to the approved subdivision draught shall be assigned and marked on a ship's side amidships.
- (b) A ship having spaces that are specially adapted for the accommodation of passengers and the carriage of cargo may, if the owners desire, have one or more additional load lines assigned and marked to correspond with the subdivision draughts that the Minister may approve for alternative service conditions.
- (3) (a) The subdivision load lines assigned and marked on a ship shall be recorded in the Passenger Ship's Certificate that applies to the ship, and shall be identified by the notation C.1 if there is only one subdivision load line.
- (b) If there is more than one subdivision load line, the subdivision load lines shall be identified with the letter C and with consecutive numbers beginning from the deepest subdivision load line, which shall be marked C.1
- (4) The freeboard corresponding to each of the load lines shall be measured at the same position and from the same deck line as the freeboards determined in accordance with the Load Line Rules.
- (5) The freeboard corresponding to each approved subdivision load line and the conditions of service for which it is approved shall be clearly indicated on the Passenger Ship's Certificate.
- (6) In no case shall any subdivision load line mark be placed above the deepest load line in salt water as determined by the strength of the ship or the Load Line Rules.
- (7) Where a load line mark has been assigned to a ship, whatever may be the position of the subdivision load line marks, the ship shall in no case be loaded so as to submerge the load line mark appropriate to the season and locality as determined in accordance with the Load Line Rules.
- (8) A ship shall in no case be so loaded that the subdivision load line mark appropriate to the particular voyage and condition of service is submerged.

Construction and initial testing of watertight bulkheads

22. (1) This Rule applies to new Class B, C or D passenger ships.
- (2) Each watertight subdivision bulkhead, whether transverse or longitudinal, shall be constructed in such a manner that it shall be capable of supporting the pressure due to the maximum head of water which it might have to sustain in the

event of damage to the ship but at least the pressure due to a head of water up to the margin line. The construction of these bulkheads shall be in accordance with the standards of a recognised organisation.

- (3) (a) Steps and recesses in bulkheads shall be watertight and as strong as the bulkhead at the place where each occurs.
- (b) Where frames or beams pass through a watertight deck or bulkhead, such deck or bulkhead shall be made structurally watertight without the use of wood or cement.

(4) The testing of main compartments by filling them with water shall not be compulsory. When testing by filling with water is not carried out, a hose test shall be carried out where practicable. This test shall be carried out in the most advanced stage of the fitting out of the ship. Where a hose test is not practicable because of possible damage to machinery, electrical equipment insulation or out fitting items, it may be replaced by a careful visual examination of welded connections, supported where deemed necessary by means such as a dye penetrant test or ultrasonic leak test or an equivalent test. In any case, a thorough inspection of the watertight bulkheads shall be carried out.

(5) The forepeak, double bottoms including duct keels and inner skins shall be tested with water to a head corresponding to the requirements of paragraph (2)

(6) Tanks that are intended to hold liquids, and which form part of the subdivision of the ship, shall be tested for tightness with water to a head up to the deepest subdivision load line or to a head corresponding to two-thirds of the depth from the top of keel to the margin line in way of the tanks, whichever is the greater, provided that in no case shall the test head be less than 900 millimetres above the top of the tank. If testing by water is impracticable, air leak testing while the tanks are subjected to an air pressure of not more than 0.14 bar may be accepted.

(7) The tests referred to in paragraphs (5) and (6) are for the purpose of ensuring that the subdivision structural arrangements are watertight and shall not be regarded as a test of the fitness of any compartment for the storage of oil fuel or for other special purposes for which a test of a superior character may be required depending on the height to which the liquid has access in the tank or its connections.

Openings in watertight bulkheads

23. (1) This Rule applies to new Class B, C or D passenger ships.

(2) The number of openings in watertight bulkheads shall be reduced to the minimum compatible with the design and proper working of the ship and satisfactory means shall be provided for closing these openings to the satisfaction of the Minister.

- (3) (a) Where pipes, scuppers, electrical cables and other similar fittings are carried through watertight subdivision bulkheads, arrangements shall be made to ensure the watertight integrity of the bulkheads.

- (b) Valves not forming part of a piping system shall not be permitted in watertight subdivision bulkheads.
 - (c) Lead or other heat sensitive materials shall not be used in systems which penetrate watertight subdivision bulkheads, where deterioration of such systems in the event of fire would impair the watertight integrity of the bulkheads.
- (4)
 - (a) Doors, manholes or access openings are not permitted in the collision bulkhead below the margin line or in watertight transverse bulkheads dividing a cargo space from an adjoining cargo space, except as provided for in paragraph (8)(a) and Rule 24.
 - (b) Except as provided in subparagraph (c), the collision bulkhead may be pierced below the margin line by no more than one pipe for dealing with fluid in the fore peak tank, provided that the pipe is fitted with a screw-down valve capable of being operated from above the bulkhead deck, the valve chest being secured inside the fore peak to the collision bulkhead. The fitting of this valve on the after side of the collision bulkhead may be accepted provided that the valve is readily accessible under all service conditions and the space in which it is located is not a cargo space.
 - (c) Where the fore peak is divided to hold two different kinds of liquids, the collision bulkhead may be pierced below the margin line by two pipes each of which is fitted as required by subparagraph (a), when the Minister is satisfied that there is no practical alternative to the fitting of such a second pipe and that, having regard to the additional subdivision provided in the forepeak, the safety of the ship is maintained.

(5) Within spaces containing the main and auxiliary propulsion machinery, including boilers serving the needs of propulsion, not more than one door apart from the doors to shaft tunnels may be fitted in each main transverse bulkhead. Where two or more shafts are fitted, the tunnels shall be connected by an intercommunicating passage. There shall be only one door between the machinery space and the tunnel spaces where two shafts are fitted and only two doors where there are more than two shafts. All these doors shall be of the sliding type and shall be so located as to have their sills as high as practicable. The hand gear for operating these doors from above the bulkhead deck shall be situated outside the spaces containing the machinery.

- (6)
 - (a) Watertight doors shall be sliding doors or hinged doors or doors of an equivalent type to the satisfaction of the Minister. Plate doors secured only by bolts and doors required to be closed by dropping or by the action of a dropping weight shall not be permitted;
 - (b) Sliding doors may be either hand operated only, or power operated as well as hand operated;

- (c) The means of operation whether by power or by hand of any sliding watertight door whether power operated or not shall be capable of closing the door with the ship listed to 15° either way. Consideration shall also be given to the forces which may act on either side of the doors as may be experienced when water is flowing through the opening applying a static head equivalent to a water height of at least one metre above the sill on the centreline of the door.
 - (d) Watertight doors which do not comply with subparagraphs (a), (b) and (c) shall be closed before the voyage commences and shall be kept closed during navigation; the time of opening such doors in port and of closing them before the ship leaves port shall be entered in the ship's logbook.
 - (e) Hand operated sliding doors may have a horizontal or vertical motion. It shall be possible to operate the mechanism at the door itself from either side, and from an accessible position above the bulkhead deck, with an all round crank motion, or some other movement to the satisfaction of the Minister that provides the same guarantee of safety and of an approved type. When operating a hand gear, the time necessary for the complete closure of the door with the vessel upright shall not exceed 90 seconds.
- (7)
- (a) All watertight doors shall be kept closed during navigation except that they may be opened during navigation as specified in subparagraphs (b) and (c). Any door that is opened in accordance with this paragraph shall be ready to be immediately closed.
 - (b) A watertight door may be opened during navigation to permit the passage of passengers or crew, or when work in the immediate vicinity of the door necessitates it being opened. The door shall be immediately closed when transit through the door is complete or when the task which necessitated it being open is completed.
 - (c) Certain watertight doors may be permitted to remain open during navigation only if considered absolutely necessary and essential to the safe and effective operation of the ship's machinery or to permit passengers normally unrestricted access throughout the passenger area. Such determinations shall be made by the Minister after careful consideration of the impact on ship operations and survivability. A watertight door that is permitted to remain open in this manner shall be clearly indicated in the ship's stability information and shall always be ready to be immediately closed.
- (8)
- (a) Where the Minister is satisfied that such doors are essential, watertight doors of a construction that is acceptable to the Minister may be fitted in watertight bulkheads dividing cargo between deck spaces. Such doors may be hinged, rolling or sliding doors but shall not be remotely controlled. They shall be fitted at the highest level and as far from the shell plating as practicable, but in no case shall

the outboard vertical edges be situated at a distance from the shell plating which is less than one fifth of the breadth of the ship, such distance being measured at right angles to the centreline at the level of the deepest subdivision load line.

- (b) The doors referred to in subparagraph (a) shall be closed before the voyage commences and shall be kept closed during navigation; the time of opening such doors in port and of closing them before the ship leaves port shall be entered in the logbook. Should any of the doors be accessible during the voyage, they shall be fitted with a device which prevents unauthorised opening. When it is proposed to fit such doors on a ship, the number and the arrangements shall be to the satisfaction of the Minister.

(9) Portable plates on bulkheads shall not be permitted except in a machinery space. Such plates shall always be in place before the ship leaves port, and shall not be removed during navigation except in case of urgent necessity at the discretion of the master of the ship.

Ships carrying goods vehicles and accompanying personnel

24. (1) This Rule applies to new Class B, C or D passenger ships designed or adapted for the carriage of goods vehicles and accompanying personnel.

(2) Where in a ship to which this Rule applies, the total number of passengers the ship is intended to carry, including persons accompanying vehicles, does not exceed

$$N = 12 + A/25,$$

where A is the total deck area (square metres) of spaces available for the stowage of goods vehicles and where the clear height at the stowage position and at the entrance to such spaces is not less than 4 metres, the provisions of Rule 23(8) in respect of watertight doors apply except that the doors may be fitted at any level in watertight bulkheads dividing cargo spaces. In addition, indicators are required on the navigating bridge to show automatically when each door is closed and all door fastenings are secured.

(3) For the purposes of this Rule, N shall be taken as the maximum number of passengers for which the ship may be certified in accordance with these Rules.

Openings in the shell plating below the margin line

25. (1) This Rule applies to new Class B, C or D passenger ships.

(2) The number of openings in the shell plating below the margin line shall be reduced to the minimum which, in the opinion of the Minister, is compatible with the design and proper working of the ship.

(3) The arrangement and efficiency of the means for closing any opening in the shell plating shall be consistent with its intended purpose and the position in which it is fitted.

- (4) (a) No side scuttle shall be fitted in such a position that its sill is below a line drawn parallel to the bulkhead deck at its side and having its lowest point at a distance equal to 2.5 per cent of the breadth of the ship measured vertically above the deepest subdivision load line, or 500 mm, whichever is the greater.
- (b) All side scuttles, the sills of which are below the margin line, shall be of such construction as will effectively prevent any person opening them without the consent of the master of the ship.
- (c) Where in a between-deck, the sills of any of the sidescuttles referred to in subparagraph (b) are below a line drawn parallel to the bulkhead deck at its side and having its lowest point 1.4 metres plus 2.5 per cent of the breadth of the ship above the water when the ship departs from any port, all the sidescuttles in that between-deck shall be closed watertight and locked before the ship leaves port, and they shall not be opened before the ship arrives at the next port. In the application of this subparagraph the appropriate allowance for fresh water may be made when applicable.
- (d) Sidescuttles and their deadlights that will not be accessible during navigation shall be closed and secured before the ship leaves port.

(5) The number of scuppers, sanitary discharges and other similar openings in the shell plating below the margin line shall be reduced to the minimum either by making each discharge serve as many as possible of the sanitary and other pipes, or in any other manner that satisfies the Minister.

- (6) (a) All inlets and discharges in the shell plating shall be fitted with efficient and accessible arrangements for preventing the accidental admission of water into the ship.
- (b) Except as provided in paragraph (7), each separate discharge led through the shell plating from spaces below the margin line shall be provided with either –
- (i) one automatic non-return valve fitted with a positive means of closing it from above the bulkhead deck, or
- (ii) two automatic non-return valves having no positive means of closing, provided that the inboard valve is situated above the deepest subdivision load line and is always accessible for examination under service conditions.
- (c) Where a valve with positive means of closing is fitted, the operating position above the bulkhead deck shall always be readily accessible and means shall be provided for indicating whether the valve is open or closed.

- (d) Paragraph 12 of Part I of Schedule 2 to the Load Line Rules shall apply to discharges led through the shell plating from spaces above the margin line.

(7) Machinery space main and auxiliary sea inlets and discharges in connection with the operation of machinery shall be fitted with readily accessible valves between the pipes and the shell plating or between the pipes and fabricated boxes attached to the shell plating. The valves may be controlled locally and shall be provided with indicators showing whether they are open or closed.

(8) In a new Class B, C or D passenger ship:

- (a) the handwheels or handles of the sea cocks shall be easily accessible for operation. All valves that are used as sea cocks shall close by clockwise movement of their handwheels;
- (b) discharge taps or valves on the side of the ship for blow-off water from boilers shall be located in easily accessible locations and shall not be located beneath deck plating. Taps or valves shall be so designed that it is easy to see whether they are open or closed. Taps shall be provided with safety screens, so designed that the key cannot be lifted off when the tap is open;
- (c) all valves and taps in pipe systems such as bilge and ballast systems, fuel oil and lubricating oil systems, fire extinguishing and sluicing systems, cooling water and sanitary systems shall be clearly marked as to their functions;
- (d) other outlet pipes shall, if they emerge below the deepest subdivision load line, be provided with equivalent means of shut-off on the side of the ship. If the outlet pipes emerge above the deepest subdivision load line, they shall be provided with an ordinary storm valve. In both cases the valves may be omitted if pipes are used of the same thickness as the plating indirect outlets from toilets and wash-basins, and floor outlets from washrooms provided with deadlights or otherwise protected against water shock. The wall thickness of such pipes is not required to be greater than 14 mm;
- (e) if a valve with a direct closing mechanism is fitted, the place from which it may be operated shall always be easily accessible, and there shall be a means of indicating whether the valve is open or closed;
- (f) when valves with direct closing mechanisms are placed in a machinery space, they may be operable from where they are located, provided that this place is easily accessible under all conditions.

(9) All shell fittings and valves required by this Rule shall be made of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material shall not be acceptable. All pipes to which this Rule refers shall be of steel or other equivalent material to the satisfaction of the Minister.

(10) Gangway and cargo ports fitted below the margin line shall be of sufficient strength to the satisfaction of the Minister. They shall be effectively closed and secured watertight before the ship leaves port, and shall be kept closed during navigation.

(11) Gangway and cargo ports shall in no case be so fitted as to have their lowest point below the deepest subdivision load line.

Watertight integrity of passenger ships above the margin line

26. (1) This Rule applies to new Class B, C or D passenger ships.

(2) All reasonable and practicable measures shall be taken to limit the entry and spread of water above the bulkhead deck. Such measures may include partial bulkheads or webs. Where partial watertight bulkheads or webs are fitted on the bulkhead deck, above or in the immediate vicinity of main subdivision bulkheads, they shall have watertight shell and bulkhead deck connections so as to restrict the flow of water along the deck when the ship is in a heeled damaged condition. Where the partial watertight bulkhead does not line up with the bulkhead below, the bulkhead deck between shall be made effectively watertight.

(3) The bulkhead deck or a deck above it shall be weathertight. All openings in the exposed weather deck shall have coamings of ample height and strength and shall be provided with efficient means for expeditiously closing so as to make them weathertight. Freeing ports, open rails and scuppers shall be fitted as necessary for rapidly clearing the weather deck of water under all weather conditions.

(4) Sidescuttles, gangway ports, cargo ports and the other means for closing openings in the shell plating above the margin line shall be of a standard acceptable to the Minister, and of efficient design and construction and of sufficient strength having regard to the spaces in which they are fitted and their positions relative to the deepest subdivision load line.

(5) Efficient inside deadlights, so arranged that they can be easily and effectively closed and secured watertight, shall be provided for all sidescuttles to spaces below the first deck above the bulkhead deck.

Closure of cargo loading doors

27. (1) This Rule applies to new Class B, C or D passenger ships.

(2) The following doors, located above the margin line, shall be closed and locked before the ship proceeds on any voyage, and shall remain closed and locked until the ship is at its next berth:

- (a) cargo loading doors in the shell or the boundaries of enclosed superstructures;
- (b) bow visors;

- (c) cargo loading doors in the collision bulkhead;
- (d) weathertight ramps forming an alternative closure to those mentioned in subparagraphs (a) to (c) inclusive. Provided that where a door cannot be opened or closed while the ship is at the berth, such a door may be opened or left open while the ship approaches or draws away from the berth, but only so far as may be necessary to enable the door to be immediately operated. In any case, the inner bow door shall be kept closed.

(3) Notwithstanding the requirements of paragraph (2), the Minister may authorise that particular doors can be opened at the discretion of the master of the ship, if necessary for the operation of the ship or the embarking and disembarking of passengers, when the ship is at safe anchorage and provided that the safety of the ship is not impaired.

(4) The master of a ship shall ensure that an effective system of supervision and reporting of the closing and opening of the doors referred to in paragraph (2) is implemented.

(5) The master of a ship shall ensure, before the ship proceeds on any voyage, that an entry in the logbook, as required in Rule 35, is made of the time of the last closing of the doors specified in paragraph (2) and the time of any opening of particular doors in accordance with paragraph (3).

Watertight integrity from the ro-ro deck (bulkhead deck) to spaces below

28. (1) This Rule applies to new Class B, C or D ro-ro passenger ships.

(2) Subject to the provisions of paragraphs (3) and (4), all accesses that lead to spaces below the bulkhead deck shall have a lowest point which is not less than 2.5 metres above the bulkhead deck.

(3) Where ramps are installed to give access to spaces below the bulkhead deck, their openings shall be capable of being closed weathertight to the satisfaction of the Minister so as to prevent ingress of water below, alarmed and indicated to the navigation bridge.

(4) The fitting of particular accesses to spaces below the bulkhead deck may be permitted by the Minister provided the accesses are necessary for the essential working of the ship, such as in relation to the movement of machinery and stores, and subject to such accesses being made watertight, alarmed and indicated to the navigation bridge.

(5) The accesses referred to in paragraphs (3) and (4) shall be closed before the ship leaves the berth on any voyage and shall remain closed until the ship is at its next berth.

(6) (a) The master of a ro-ro passenger ship shall ensure to the satisfaction of the Minister that an effective system of supervision and reporting

of the closing and opening of the accesses referred to in paragraphs (3) and (4) is implemented; and

- (b) the master of a ro-ro passenger ship shall ensure, before the ship leaves the berth on any voyage, that an entry in the logbook, as required by Rule 35, is made of the time of the last closing of the accesses referred to in paragraphs (3) and (4).

(7) As an alternative to paragraphs (2) to (6), the Minister may allow a new Class C ro-ro passenger ship and a new Class D ro-ro passenger ship to comply with the following requirements provided that coaming and sill heights are at least 600 mm on open ro-ro cargo decks and at least 380 mm on enclosed ro-ro cargo decks:

- (a) all accesses from the ro-ro deck that lead to spaces below the bulkhead deck shall be made weathertight to the satisfaction of the Minister and means shall be provided on the navigation bridge, to indicate whether the access is open or closed;
- (b) the accesses to which subparagraph (a) refers shall be closed before the ship leaves the berth on any voyage and shall remain closed until the ship is at its next berth;
- (c) notwithstanding subparagraph (b), the Minister may permit specified accesses to be opened during the voyage for a period of sufficient duration to permit through passage and, if required, for the essential working of the ship.

Access to ro-ro decks

29. The master or the designated officer of a ro-ro passenger ship shall ensure that, without the expressed consent of the master or the designated officer of the ship, as the case may be, a passenger shall not be allowed access to an enclosed ro-ro deck when the ship is underway.

Closure of bulkheads on the ro-ro deck

30. (1) In a new Class B, C or D ro-ro passenger ship all transverse and longitudinal bulkheads that are taken into account as being effective for the purpose of confining the seawater accumulated on the ro-ro deck shall be in place and secured before the ship leaves the berth and shall remain in place and secured until the ship is at its next berth.

(2) Notwithstanding the requirements of paragraph (1), the Minister may permit some accesses within such bulkheads to be opened during the voyage but only for a period of sufficient duration to permit through passage and, if required, for the essential working of the ship.

Stability information

31. (1) This Rule applies to new Class B, C or D passenger ships.

(2) Every passenger ship shall be inclined upon its completion and the elements of its stability shall be determined. The master of the ship shall be supplied by the owner with such information as shall be approved by the Minister as specified in Schedule 4 as is necessary to enable the master by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service.

(3) Where any alterations are made to a ship so as to affect materially the stability information supplied to the master in accordance with this Rule, amended stability information shall be provided. The ship shall be re-inclined if the Minister so requires.

(4) At periodical intervals not exceeding 5 years, a lightweight survey of a ship shall be carried out to verify any changes in the light ship displacement and longitudinal centre of gravity. The ship shall be re-inclined whenever, in comparison with the approved stability information, a deviation from the lightship displacement exceeding 2 per cent or a deviation of the longitudinal centre of gravity exceeding 1 per cent of the length of the ship is found or anticipated.

(5) The Minister may allow the inclining test of an individual ship to be dispensed with provided basic stability data are available from the inclining test of a sister ship and it is shown to the satisfaction of the Minister that reliable stability information for the exempted ship can be obtained from such basic data having regard to IMO MSC/Circ.1158.

(6) In circumstances where an accurate inclining of a ship is not practical, the lightweight displacement and centre of gravity shall be determined by a lightweight survey and accurate calculation having regard to Regulation 2.7 of the IMO International Code of Safety for High-Speed Craft 2000 in its updated version.

Damage control plans

32. (1) In a new Class B, C or D passenger ship, there shall be permanently exhibited, for the guidance of the officer in charge of the ship, plans showing clearly for each deck and hold the boundaries of the watertight compartments, the openings therein, the means of closing such openings and the position of any controls thereof, and the arrangements for the correction of any list due to flooding.

(2) Booklets containing the information referred to in paragraph (1) shall be made available by the owner of the ship to the officers of the ship.

Integrity of the hull and superstructure, damage prevention and control

33. (1) This Rule applies to new Class B, C or D passenger ships.

(2) (a) Indicators shall be provided on the navigating bridge of the ship for all shell doors, loading doors and other closing appliances which, if left open or not properly secured, could in the opinion of the Minister

lead to flooding of a special category space or a ro-ro cargo space. The indicator system shall be designed on the fail-safe principle and shall show by visual alarms if a door is not fully closed or if any of the securing arrangements are not in place and fully locked, and by audible alarms if such door or closing appliances become open or the securing arrangements become unsecured.

- (b) The indicator panel on the navigating bridge shall be equipped with a mode selection function “harbour/sea voyage” so arranged that an audible alarm is given on the navigation bridge if the ship leaves harbour with the bow doors, inner doors, stern ramp or any other shell doors not closed or any closing device not in a correct position. The power supply for the indicator system shall be independent of the power supply for operating and securing the doors.

(3) A television surveillance and a water leakage detection system shall be arranged on a ship to provide an indication to the navigation bridge and to the engine control station of any leakage through inner and outer bow doors, stern doors or any other shell doors which could lead to flooding of special category spaces or ro-ro cargo spaces.

(4) Special category spaces and ro-ro cargo spaces shall be continuously patrolled or monitored by effective means, such as television surveillance, so that any movement of vehicles in adverse weather conditions and unauthorised access by passengers thereto can be detected whilst the ship is underway.

(5) Documented operating procedures for closing and securing all shell doors, loading doors and other closing appliances which, if left open or not properly secured, could lead to flooding of a special category space or ro-ro cargo space, shall be kept on board the ship and posted at an appropriate place on the ship.

Marking, periodical operation and inspection of watertight doors, etc.

34. (1) This Rule applies to new Class B, C or D passenger ships.

(2) Drills for the operation of the watertight doors, sidescuttles, valves and closing mechanisms of scuppers shall take place weekly.

(3) All watertight doors in main transverse bulkheads that are in use at sea shall be operated daily.

(4) The watertight doors and all connected mechanisms and indicators, all valves, the closing of which is necessary to make a compartment watertight, and all valves the operation of which is necessary for damage control cross-connections shall be periodically inspected at sea at least once a week.

(5) The valves, doors and mechanisms to which this Rule refers shall be suitably marked to ensure that they may be properly used to provide maximum safety.

Entries in log

35. (1) This Rule applies to new Class B, C or D passenger ships.

(2) Hinged doors, portable plates, sidescuttles, gangway and cargo ports and other openings, which are required by these Rules to be kept closed during navigation, shall be closed before the ship leaves the port. The time of closing and the time of opening such doors and other openings (if permissible under these Rules) shall be recorded in the ship's logbook.

(3) A record of all drills and inspections required by Rule 34 shall be entered in the ship's logbook with an explicit record of any defects which may be disclosed.

Railings

36. (1) This Rule applies to new Class A, B, C or D passenger ships constructed on or after 1 January 2003.

(2) On external decks to which passengers are permitted access, and where there is no bulwark of adequate height provided, railings shall be provided of a height of minimum 1,100 mm above the deck and of such design and construction to the satisfaction of the Minister as to prevent any passenger from climbing on these railings and from accidentally falling from that deck.

(3) Stairs and landings on external decks to which paragraph (2) refers shall be provided with railings of equivalent construction.

Machinery

General requirements for machinery installations

37. (1) In a new Class B, C or D passenger ship:
- (a) the machinery, boilers and other pressure vessels, associated piping systems and fittings shall be so installed and protected as to reduce to a minimum any danger to persons on board the ship, due regard being paid to moving parts, hot surfaces and other hazards;
 - (b) means shall be provided to the satisfaction of the Minister whereby normal operation of propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative;
 - (c) means shall be provided to the satisfaction of the Minister to ensure that the machinery can be brought into operation from the dead ship condition without external aid.

(2) In a new Class B or C passenger ship, 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 Minister may permit a reduction in these angles having regard to the particular type, size and service conditions of a ship.

(3) In a new Class A, B or C passenger ship, means shall be provided for the propulsion machinery and the propeller to be stopped in cases of emergencies from relevant positions outside of the engine room or engine control room, such as open deck or the wheel house.

(4) In a Class B, C or D passenger ship constructed on or after 1 January 2003, the location and arrangement of vent pipes for fuel oil service, settling and lubricating 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 to the satisfaction of the Minister shall be provided on each ship, with a capacity of at least 8 hours for Class B ships and at least 4 hours for Class C and D ships, at maximum continuous rating of the propulsion plant and normal operating load at sea of the generator plant.

Internal combustion engines

38. In a new Class B, C or D passenger ship, internal combustion engines of a cylinder diameter of 200 mm, or a crankcase volume of 0.6 m³ and greater 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 any discharge from them is so directed as to minimise the possibility of injury to personnel.

Bilge pumping arrangement

39. (1) In a new Class B, C or D passenger ship:
- (a) 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 or liquid cargo 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;
 - (b) 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;
 - (c) all bilge pipes used in or under 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;
 - (d) (i) 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;
 - (ii) 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;
 - (e) all distribution boxes and manually operated valves in connection with the bilge pumping arrangements shall be in positions which are accessible under ordinary circumstances.
- (2) (a) In a new Class B, C or D passenger ship, provision shall be made for the drainage of enclosed cargo spaces situated on the bulkhead deck.
- (b) Where the freeboard to the bulkhead deck 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 Rule 25.

- (c) Where the freeboard is such that the edge of the bulkhead deck is immersed when the ship heels 5° or less, the drainage of the enclosed cargo spaces on the bulkhead deck shall be led to a suitable space, or spaces, of adequate capacity, having high water level alarm and provided with suitable arrangements for discharge overboard. In addition it shall be ensured that:
 - (i) the number, size and disposition of the scuppers are such as to prevent unreasonable accumulation of free water;
 - (ii) the pumping arrangements required by this Rule take account of the requirements for any fixed pressure water spraying fire-extinguishing system;
 - (iii) 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
 - (iv) 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.
- (3) In a new Class A, B, C or D passenger ship:
- (a) the drainage from ro-ro decks and car decks shall be of sufficient capacity that the scuppers, wash ports and similar fittings on the starboard and the port side shall be able to cope with a quantity of water originating from drencher and fire pumps, taking into account the ship's conditions of heel and trim;
 - (b) when provided with sprinkler installations and hydrants, passenger and crew lounges shall have an adequate number of scuppers, sufficient to cope with the quantity of water originating from fire extinguishing by the room's sprinkler heads and from two fire hoses with jets. The scuppers shall be located in the most effective positions, such as in each corner.
- (4) In a new Class B, C or D passenger ship:
- (a) the bilge pumping system required by paragraph (1)(a) shall be capable of operation under all practicable conditions after a casualty whether the ship is upright or listed. For this purpose wing suctions shall generally be fitted except in narrow compartments at the end of the ship where one suction may be sufficient. In compartments of unusual form, additional suctions may be required to the satisfaction

of the Minister. Arrangements shall be made whereby water in the compartment may find its way to the suction pipes;

- (b) where practicable, the power bilge pumps shall be placed in separate watertight compartments and so arranged or situated that these compartments will not be flooded by the same damage. If the main propulsion machinery, auxiliary machinery and boilers are in two or more watertight compartments, the pumps available for bilge service shall be distributed as far as is possible throughout these compartments;
- (c) with the exception of additional pumps which may be provided for peak compartments only, each required bilge pump shall be so arranged as to draw water from any space required to be drained in accordance with paragraph (1)(a);
- (d)
 - (i) each power bilge pump shall be capable of pumping water through the required main bilge pipe at a speed of not less than 2 metres per second;
 - (ii) independent power bilge pumps situated in machinery spaces shall have direct suctions from these spaces, except that not more than two such suctions shall be required in any one space;
 - (iii) where two or more such suctions are provided, there shall be at least one on each side of the ship;
 - (iv) direct suctions shall be suitably arranged to the satisfaction of the Minister and those in a machinery space shall be of a diameter not less than that required for the bilge main;
- (e) in addition to the direct bilge suction or suctions required by subparagraph (d)(iv), a direct emergency bilge suction fitted with a non-return valve shall be led from the largest available independent power driven pump to the drainage level of the machinery space; the suction shall be of the same diameter as the main inlet to the pumps used;
- (f) the spindles of the sea inlet and direct suction valves shall extend well above the engine-room platform to the satisfaction of the Minister;
- (g) all bilge suction piping up to the connection to the pumps shall be independent of other piping;
- (h) the diameter “d” of the main and branch bilge suction pipes shall be calculated according to the following formulae. The actual internal

diameter may be rounded off to the nearest standard size acceptable to the Minister:

main bilge suction pipe:

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

branch bilge suction pipes between collecting boxes and suction:

$$d = 25 + 2.15 \sqrt{(L_1 (B + D))}$$

where

d is the internal diameter of the bilge main (millimetres),

L and B are the length and the breadth of the ship (metres),

L_1 is the length of the compartment, and

D is the moulded depth of the ship to bulkhead deck (metres) provided that, in a ship having an enclosed cargo space on the bulkhead deck which is internally drained in accordance with the requirements of paragraph (2)(c) and which extends for the full length of the ship, D shall be measured to the next deck above the bulkhead deck. Where the enclosed cargo spaces cover a lesser length, D shall be taken as the moulded depth to the bulkhead deck plus lh/L where l and h are the aggregate length and height respectively of the enclosed cargo spaces;

- (i) (i) provision shall be made to the satisfaction of the Minister to prevent the compartment served by any bilge suction pipe being flooded in the event of the pipe being severed or otherwise damaged by collision or grounding in any other compartment;
- (ii) for the purpose of clause (i), where the pipe is at any part situated nearer the side of the ship than one fifth of the breadth of the ship (measured at right angles to the centreline at the level of the deepest subdivision load line), or is in a duct keel, a non-return valve shall be fitted to the pipe in the compartment containing the open end;
- (j) distribution boxes, cocks and valves in connection with the bilge pumping system shall be so arranged that –
 - (i) in the event of flooding, one of the bilge pumps may be operative on any compartment;

- (ii) damage to a pump or its pipe connecting to the bilge main outboard of a line drawn at one fifth of the breadth of the ship shall not put the bilge system out of action;
 - (iii) where there is only one system of pipes common to all the pumps, the necessary valves for controlling the bilge suction shall be capable of being operated from above the bulkheads deck;
 - (iv) where in addition to the main bilge pumping system an emergency bilge pumping system is provided, it shall be independent of the main system and so arranged that a pump is capable of operating on any compartment under flooding condition as specified in subparagraph (a); in this case only, the valves necessary for the operation of the emergency system shall be capable of being operated from above the bulkhead deck;
- (k) all cocks and valves referred to in subparagraph (j), which can be operated from above the bulkhead deck, shall have their controls at their place of operation clearly marked and shall be provided with means to indicate whether they are open or closed.

Number and type of bilge pumps

40. (1) In a new Class B, C or D passenger ship, the number and type of bilge pumps on board shall be as set out below:

- (a) a passenger ship certificated to carry not more than 250 passengers:
one main engine pump and one independent power pump, located and powered outside the engine room;
- (b) a passenger ship certificated to carry in excess of 250 passengers:
one main engine pump and two independent power pumps, one of which shall be located and powered outside the engine room.

(2) The main engine pump may be replaced by one independent power pump.

(3) The drainage of very small compartments may be dealt with by movable hand pumps.

Means of going astern

41. In a new Class B, C or D passenger ship:

- (a) sufficient power for going astern shall be provided to secure proper control of the ship in all normal circumstances;

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

Steering Gear

42. (1) In a new Class B, C or D passenger ship:
- (a) the ship shall be provided with an efficient main and auxiliary steering system which shall be so arranged that the failure of one system will not render the other system inoperative;
 - (b) the main steering gear and rudder stock where fitted shall be:
 - (i) of adequate strength, and capable to steer the ship at maximum service speed ahead, and so designed that they will not be damaged at maximum speed astern;
 - (ii) (I) 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 seconds;
 - (II) where it is impractical to demonstrate compliance with the requirements of subclause (I) during sea trials with the ship at its deepest seagoing draught and running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch, ships, regardless of their date of construction, may demonstrate compliance with this requirement by one of the following methods:
 - (A) during sea trials the ship is at even keel and the rudder fully submerged whilst running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch,

- (B) where full rudder immersion during sea trials cannot be achieved, an appropriate ahead speed shall be calculated using the submerged rudder blade area in the proposed sea trial loading condition. The calculated ahead speed shall result in a force and torque applied to the main steering gear which is at least as great as if it was being tested with the ship at its deepest seagoing draught and running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch, or
 - (C) the rudder force and torque at the sea trial loading condition have been reliably predicted and extrapolated to the full load condition. The speed of the ship shall correspond to the number of maximum continuous revolutions of the main engine and maximum design pitch of the propeller;
- (iii) operated by power where necessary to meet the requirements of subparagraph (b)(ii) and in any case when a rudder stock over 120 mm in diameter in way of the tiller, excluding strengthening for navigation in ice, is required in order to comply with subparagraph (b)(i);
- (c) if fitted, the auxiliary steering gear shall be:
 - (i) of adequate strength and capable of steering the ship at navigable speed and of being brought speedily into action in an emergency;
 - (ii)
 - (I) capable of putting the rudder over from 15° on one side to 15° on the other side in not more than 60 seconds with the ship at its deepest seagoing draught and running ahead at one half of the maximum ahead service speed or 7 knots, whichever is the greater;
 - (II) where it is impractical to demonstrate compliance with clause (I) during sea trials with the ship at its deepest seagoing draught and running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater, a passenger ship regardless of the date of construction, may demonstrate compliance with this requirement by one of the following methods:

- (A) during sea trials the ship is at even keel and the rudder fully submerged whilst running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater;
 - (B) where full rudder immersion during sea trials cannot be achieved, an appropriate ahead speed shall be calculated using the submerged rudder blade area in the proposed sea trial loading condition. The calculated ahead speed shall result in a force and torque applied to the auxiliary steering gear which is at least as great as if it was being tested with the ship at its deepest seagoing draught and running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater;
 - (C) the rudder force and torque at the sea trial loading condition have been reliably predicted and extrapolated to the full load condition;
- (iii) operated by power where necessary to meet the requirements of clause (ii) and in any case where a rudder stock is more than 230 mm in diameter in way of the tiller, excluding strengthening for navigation in ice.

(2) In a new Class B, C or D passenger ship, steering power units shall be arranged to restart automatically when power is restored after a power failure and shall be capable of being brought into operation from a position on the navigating bridge. In the event of a power failure to any of the steering power units, an audible and visual alarm shall be given on the navigating bridge.

(3) In a new Class B, C or D passenger ship, where the main steering gear comprises two or more identical power units, an auxiliary steering gear is not required to be fitted, provided that:

- (a) the main steering gear is capable of operating the rudder as required by paragraph (1)(b)(ii) while any one of the power units is out of operation;

- (b) 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 the steering capability can be maintained or speedily regained.

(4) In a new Class B, C or D passenger ship:

- (a) steering gear control shall be provided:
 - (i) for the main steering gear, both on the navigating bridge and in the steering compartment;
 - (ii) when the main steering gear is arranged in accordance with paragraph (2), by two independent control systems, both operable from the navigating 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 is not required to be fitted;
 - (iii) for the auxiliary steering gear, in the steering gear compartment and, if power operated, it shall also be operable from the navigating bridge and shall be independent of the control system for the main steering gear;
- (b) any main and auxiliary steering gear control system operable from the navigating bridge shall comply with the following:
 - (i) 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;
 - (ii) means shall be provided in the steering gear compartment for disconnecting any control system operable from the navigating bridge from the steering gear it serves;
 - (iii) the system shall be capable of being brought into operation from a position on the navigating bridge;
 - (iv) in the event of a failure in the electrical power supply to the control system, an audible and visual alarm shall be given in the navigating bridge; and
 - (v) short circuit protection only shall be provided for steering gear control supply circuits.

- (c) the electrical power circuits and the steering gear control systems with their associated components, cables and pipes required by this Rule and by Rule 43 shall be separated as far as is practicable throughout their length;
- (d) a means of communication shall be provided between the navigating bridge and the steering gear compartment or alternative steering position;
- (e) the angular position of the rudder(s) shall:
 - (i) if the main steering gear is power operated, be indicated on the navigating bridge. The rudder angle indication shall be independent of the steering gear control system;
 - (ii) be recognisable in the steering gear compartment;
- (f) hydraulic power-operated steering gear shall be provided with the following:
 - (i) arrangements to maintain the cleanliness of the hydraulic fluid taking into consideration the type and design of the hydraulic system;
 - (ii) a low-level alarm for each hydraulic fluid reservoir to give the earliest practical indication of hydraulic fluid leakage. Audible and visual alarms shall be given on the navigating bridge and in the machinery space where they can be readily observed; and
 - (iii) 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 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;
- (g) the steering gear compartments shall be –
 - (i) readily accessible and, as far as practicable, separated from machinery spaces, and
 - (ii) 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.

Additional requirements for electric and electro-hydraulic steering gear

43. (1) In a new Class B, C or D passenger ship, means for indicating that the motors of electric and electro-hydraulic steering gears are running shall be installed on the navigating bridge and at a suitable main machinery control position to the satisfaction of the Minister.

(2) In a new Class B, C or D passenger ship:

- (a) each electric or electro-hydraulic steering system comprising of one or more power units shall be served by at least two exclusive circuits fed directly from the main switchboard; one of the circuits may be supplied through the emergency switchboard;
- (b) an auxiliary electric or electro-hydraulic steering system associated with a main electric or electro-hydraulic steering system may be connected to one of the circuits supplying the main steering system;
- (c) the circuits supplying an electric or electro-hydraulic steering system shall have adequate rating for supplying all motors which can be simultaneously connected to them and may be required to operate simultaneously.

(3) (a) In a new Class B, C or D passenger ship, short circuit protection and an overload alarm shall be provided for steering gear electric and electro-hydraulic 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.

- (b) In a new Class B, C or D passenger ship, the alarms required in paragraph (a) 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 and as may be required by Rule 63.

(4) When an auxiliary steering gear required by Rule 42(1)(c)(iii) to be operated by power is not electrically powered or is powered by an electric motor primarily intended for other services, the main steering system 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 system, the requirements of paragraph (3) may be waived by the Minister, if satisfied with the protection arrangement together with the requirements of Rule 42(2) applicable to auxiliary steering systems.

Ventilating systems in machinery spaces

44. In a new Class B, C or D passenger ship, machinery spaces of category A shall be adequately ventilated to the satisfaction of the Minister 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 having regard in particular to the prevention of an accumulation of oil vapour under all normal conditions.

Communication between the navigating bridge and machinery space

45. In a new Class B, C or D passenger ship:

- (a) at least two independent means of communication shall be provided for communication orders from the navigating 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;
- (b) one of the independent means of communication referred to in paragraph (a) shall be an engine-room telegraph which provides visual indication of the orders and responses both in the machinery space and on the navigating bridge;
- (c) appropriate means of communication shall be provided to the satisfaction of the Minister between the navigating bridge and any other position on the ship from which the speed or direction of thrust of the propellers may be controlled.

Engineers' alarm

46. In a new Class B, C or D passenger ship, an engineers' alarm shall be provided to be operated from the engine control room or at a manoeuvring platform as appropriate, and shall be clearly audible in the engineers' accommodation, and/or navigating bridge as appropriate.

Location of emergency installations

47. In a new Class B, C or D passenger ship, emergency sources of electrical power, fire pumps, bilge pumps except those specifically serving the spaces forward of the collision bulkhead, and fixed fire-extinguishing system required by Part 3 of these Rules and other emergency installations which are essential for the safety of the ship, except anchor windlasses, shall not be installed forward of the collision bulkhead.

Machinery controls

48. (1) In a new Class B, C or D passenger ship:

- (a) main and auxiliary machinery essential for the propulsion and the safety of the ship shall be provided with effective means for its operation and control to the satisfaction of the Minister;
- (b) where remote control of propulsion machinery from the navigating bridge is provided and the machinery spaces are intended to be manned, the following requirements shall apply:
 - (i) the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the navigating bridge under all sailing conditions, including manoeuvring;
 - (ii) 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;
 - (iii) the main propulsion machinery shall be provided with an emergency stopping device on the navigating bridge which shall be independent of the navigating bridge control system;
 - (iv) propulsion machinery orders from the navigating bridge shall be indicated in the main machinery control room or at the manoeuvring platform as appropriate;
 - (v) remote control of the propulsion machinery shall be possible only from one location at a time and interconnected control positions shall be permitted at such locations. At each location an indicator shall be provided showing which location is in control of the propulsion machinery. The transfer of control between the navigating bridge and machinery spaces shall be possible only in the main machinery space or the main machinery control room. The control system shall include means to prevent the propelling thrust from altering significantly when transferring control from one location to another;
 - (vi) means shall be provided to control the propulsion machinery locally, even in the event of failure in any part of the remote control system;
 - (vii) the design of the remote control system shall be such that in case of its failure an alarm will be given and the pre-set speed

and direction of thrust of the propellers shall be maintained until local control is in operation;

(viii) indicators shall be fitted on the navigating bridge to indicate:

- (I) propeller speed and direction of rotation, in the case of fixed pitch propellers;
- (II) propeller speed and pitch position, in the case of controllable pitch propellers;

(ix) an alarm shall be provided on the navigating 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;

(c) (i) where the main propulsion and associated machinery, including sources of main electrical power supply, are provided with various degrees of automatic and 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 shall be as safe and effective as if it were under direct supervision;

(ii) for the purpose of clause (i), Rules 59 to 62 shall apply as appropriate. Particular consideration shall be given to protecting such spaces against fire and flooding;

(d) 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.

(2) In the case of a Class B, C or D passenger ship constructed on or after 1 January 2003:

(a) 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;

- (b) where remote control of propulsion machinery from the navigating bridge is provided, the following shall apply:
- (i) the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the navigating bridge under all sailing conditions, including manoeuvring;
 - (ii) 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. Where multiple propellers are designed to operate simultaneously, they may be controlled by one control device;
 - (iii) the main propulsion machinery shall be provided with an emergency stopping device on the navigating bridge which shall be independent of the navigating bridge control system;
 - (iv) propulsion machinery orders from the navigation bridge shall be indicated in the main machinery control room and at the manoeuvring platform;
 - (v) remote control of the propulsion machinery shall be possible only from one location at a time and interconnected control positions shall be permitted at such locations. At each location, an indicator shall be provided showing which location is in control of the propulsion machinery. The transfer of control between the navigating bridge and machinery spaces shall be possible only in the main machinery space or the main machinery control room. The control system shall include means to prevent the propelling thrust from altering significantly when transferring control from one location to another;
 - (vi) means shall be provided to control the propulsion machinery locally, even in the case of failure in any part of the remote control system. It shall be possible to control the auxiliary machinery, essential for the propulsion and safety of the ship, at or near the machinery concerned;
 - (vii) the design of the remote control system shall be such that in case of its failure an alarm will be given. The pre-set speed and direction of thrust of the propellers shall be maintained until local control is in operation;

- (viii) indicators shall be fitted in the navigation bridge, the main machinery control room and at the manoeuvring platform to indicate –
 - (I) propeller speed and direction of rotation, in the case of fixed pitch propellers, and
 - (II) propeller speed and pitch position, in the case of controllable pitch propellers;
- (ix) an alarm shall be provided on the navigating 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;
- (c) (i) where the main propulsion and associated machinery, including sources of main electrical power supply, are provided with various degrees of automatic and 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 shall be as safe and effective as if it were under direct supervision;
- (ii) for the purpose of clause (i), Rules 59 to 62 shall apply as appropriate. Particular consideration shall be given to protecting such spaces against fire and flooding;
- (d) 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.

Steam pipe systems

49. In a new Class B, C or D passenger ship:

- (a) 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;
- (b) means shall be provided for draining every steam pipe in which dangerous water hammer action might otherwise occur;

- (c) where 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.

Air pressure systems

50. In a new Class B, C or D passenger ship:

- (a) 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;
- (b) 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;
- (c) 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 and auxiliary engines shall be entirely separate from the compressor discharge pipe system;
- (d) provision shall be made to reduce to a minimum the entry of oil into the air pressure systems and to drain these systems.

Protection against noise

51. (1) In a new Class B, C or D passenger ship, measures shall be taken to reduce machinery noise in machinery spaces to acceptable levels. 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.

(2) Measures shall be taken in the construction of a new Class B, C or D passenger ship of 1,600 gross tonnage and greater to reduce on-board noise and to protect personnel from the noise in accordance with the IMO Code on noise levels on board ships adopted by the IMO Maritime Safety Committee by resolution MSC.337(91), in its updated version.

Lifts

52. (1) This Rule applies to a new Class A, B, C or D passenger ship.

(2) Passenger and goods lifts shall, in respect of dimensioning, layout, number of passengers or quantity of goods, comply with the provisions laid down by the Minister in each individual case or for each type of plant.

(3) Installation drawings and maintenance instructions, including provisions governing periodical inspections of lifts referred in paragraph (2) shall be approved by the Minister. The plant shall be inspected and approved before it is taken into use.

(4) Following approval in accordance with paragraph (3), a certificate of approval shall be issued by the Minister, which shall be kept on board the ship.

(5) The Minister may permit the periodical inspections to be carried out by an expert authorised by the Minister or by a recognised organisation.

Electrical Installations

General requirements for electrical installations

53. (1) In a new Class B, C or D passenger ship, electrical installations shall be such that –

- (a) 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,
- (b) electrical services essential for safety will be ensured under various emergency conditions, and
- (c) the safety of passengers, crew and the ship from electrical hazards will be ensured.

(2) The electrical equipment and installations shall comply with the requirements of the International Standard IEC 60092 of the International Electrotechnical Commission relating to electrical installations in ships in its updated edition, or an alternative standard that provides an equivalent level of safety to the satisfaction of the Minister.

Main source of electrical power and lighting

54. (1) In a new passenger ship of Class C or D in which electrical power is the only power for maintaining the auxiliary services essential for the safety of the ship, and a new passenger ship of Class B in which electrical power is the only power for maintaining the auxiliary services essential for the safety and the propulsion of the ship, two or more main generating sets shall be provided of such power that the auxiliary services can be operated when any one set is out of service.

(2) In a new Class C or D passenger ship, one of the main generating sets may be main propulsion engine driven, provided it is of such power that the services referred to in paragraph (1) can be operated when any one other set is out of service.

(3) In a new Class B, C or D passenger ship:

- (a) 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;

- (b) 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 lighting system, required by Rule 55, inoperative;
- (c) 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 Rule inoperative.

(4) 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 the space where the generating set and the switchboard are installed.

(5) In a new Class B, C or D passenger ship constructed on or after 1 January 2012:

- (a) 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;
- (b) such lighting provided in accordance with subparagraph (a), 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 illuminated for a minimum of 30 minutes.

Emergency source of electrical power

55. (1) In a new Class B, C or D passenger ship:

- (a) there shall be provided a self-contained emergency source of electrical power with an emergency switchboard located above the bulkhead deck, in a readily accessible space which shall not be contiguous to the boundaries of machinery spaces of category A or of those spaces containing the main source of electrical power or main switchboard;
- (b) subparagraph (a) shall not apply where a ship is designed with two fully redundant machinery spaces, separated by at least one watertight and fire-safe compartment and two bulkheads or an alternative construction giving the same level of safety, and provided

that there is at least one generator with an associated switchboard in each machinery space.

- (2) (a) The emergency source of electrical power provided in accordance with this Rule may consist of either –
- (i) an accumulator battery capable of complying with the requirements of paragraph (5), without being recharged or suffering an excessive voltage drop, or
 - (ii) a generator, capable of complying with the requirements of paragraph (5), driven by internal combustion type of machinery with an independent supply of fuel having a flashpoint of not less than 43°C, with automatic starting arrangements and provided with a transitional source of emergency electrical power in accordance with paragraph (6).
- (b) In a new Class C or D passenger ship, the transitional source of emergency electrical power referred to in paragraph (a)(ii) is not required if there is a suitably located independent battery arrangement to the satisfaction of the Minister provided for that particular consumer for the period of time required by paragraph (6).

(3) The emergency source of electric power shall be so arranged that it will operate efficiently when the ship is listed to 22.5° and when the trim of the ship is 10° from an even keel. An emergency generator set shall be capable of being readily started in any cold condition likely to be encountered and, in the case of a new passenger ship, be capable of being started automatically.

(4) The emergency switchboard shall be situated as near as practicable to the emergency source of power.

(5) The emergency source of power provided in accordance with paragraph (1) shall:

- (a) be capable of operating in general for a period of:
 - (i) 12 hours, in the case of a new Class B passenger ship;
 - (ii) 6 hours, in the case of a new Class C passenger ship;
 - (iii) 3 hours, in the case of a new Class D passenger ship;
- (b) in particular, be capable of operating simultaneously the consumers identified within the following services as required in each case for the class of ship and for the relevant times indicated in subparagraph (a):
 - (i) one independent bilge power pump and one of the fire pumps;
 - (ii) emergency lighting:

- (I) at every muster or embarkation station and over the sides as provided in Rule 127(4)(a), (b) and (c);
 - (II) in all alleyways, stairways and exits giving access to the muster or embarkation stations;
 - (III) in the machinery spaces, and in the place where the emergency generator is situated;
 - (IV) in the control stations where radio and main navigating equipment are situated;
 - (V) as required in Rule 101(1)(f);
 - (VI) at all stowage positions for firefighter's outfits;
 - (VII) at one independent bilge power pump and one of the fire pumps, referred to in subparagraph (i) and at the starting position of their motors;
- (iii) the ship's navigation bridge;
 - (iv) all communication equipment, the general alarm system, the fire detection system, and all signals that may be required in an emergency, if they are electrically operated from the ships's main generating sets;
 - (v) the ship's sprinkler pump, if any, and if it is electrically operated; and
 - (vi) the ship's daylight signalling lamp, if it is operated by the ship's main source of electric power;
- (c) be capable of operating for a period of 30 minutes the power-operated watertight doors together with the associated control, indication and alarm circuits.

(6) The transitional source of emergency electrical power required by paragraph (2) shall consist of an accumulator battery suitably located for use in an emergency and shall operate the lighting required by paragraph (5)(b)(ii)(I) without recharging or suffering an excessive voltage drop for a period not less than 30 minutes.

(7) In a Class B, C or D passenger ship constructed on or after 1 January 2003, 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 minutes after blackout.

Supplementary emergency lighting for ro-ro ships

56. In the case of a new Class B, C or D passenger ship, in addition to the emergency lighting required in Rule 55(5)(b)(ii), on every ship with ro-ro cargo spaces or special category spaces:

- (a) all passenger public spaces and alleyways shall be provided with supplementary electric lighting to the satisfaction of the Minister that:
 - (i) can operate for at least 3 hours 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;
 - (ii) shall ensure that any failure of the lamp will be immediately apparent. Any accumulator battery provided shall be replaced at intervals having regards to the specific service life in the ambient conditions that they are subject to in service;
- (b) 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 (a), is provided.

Precautions against shock, fire and other hazards of electrical origin

57. (1) In the case of a new Class B, C or D passenger ship, 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:

- (a) 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,
- (b) supplied at a voltage not exceeding 250 V by safety isolating transformers supplying only one consuming device, or
- (c) constructed in accordance with the principle of double insulation.

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

(3) The sides and the rear and, where necessary, the front of switchboards shall be suitably guarded. Exposed live parts having voltages to earth exceeding the

voltage specified in paragraph (1)(a) 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.

(4) In distribution systems with no connection to earth, a device capable of monitoring the insulation level to earth and giving an audible or visual indication of abnormally low insulation values shall be provided.

(5) (a) All metal sheaths and armour of cables shall be electrically continuous and shall be earthed.

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

(c) In the case of a new Class B, C or D passenger ship:

(i) 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;

(ii) in ro-ro passenger ships, cabling for emergency alarms and public address systems installed on or after 1 July 1998 shall be approved by the Minister having regard to the recommendations developed by the IMO;

(iii) cables connecting fire pumps to the emergency switchboard shall be of a fire-resistant type where they pass through high fire risk areas. Where practicable all such cables shall be run in such a manner as to preclude their being rendered unserviceable by heating of the bulkheads that may be caused by a fire in an adjacent space;

(iv) 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 specifications.

(6) In the case of a new Class B, C or D passenger ship, each separate circuit shall be protected against short circuit and against overload, except as permitted in Rules 42 and 43.

(7) In the case of a new Class B, C or D passenger ship:

- (a) lighting fittings shall be so arranged to the satisfaction of the Minister as to prevent temperature rises which could damage the cables and wiring, and to prevent surrounding material from becoming excessively hot;
- (b)
 - (i) accumulator batteries shall be suitably housed, and compartments used primarily for their accommodation shall be properly constructed and efficiently ventilated to the satisfaction of the Minister;
 - (ii) electrical or other equipment, which may constitute a source of ignition of flammable vapours, shall not be permitted in the compartments referred to in clause (i);
- (c) distribution systems shall be so arranged that fire in any main vertical zone, as is defined in Rule 67(1), 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 wide as is practicable.

(8) In a new Class B, C or D passenger ship constructed on or after 1 January 2012, electrical equipment shall not be installed in any space where flammable mixtures are liable to collect, such as in compartments assigned principally to accumulator batteries, in paint lockers, acetylene stores or similar spaces, unless the Minister is satisfied that such equipment is:

- (a) essential for operational purposes;
- (b) of a type that will not ignite the mixture concerned;
- (c) appropriate to the space concerned; and
- (d) appropriately certified for safe usage in the dusts, vapours or gases likely to be encountered.

Additional requirements for passenger ships constructed with periodically unattended machinery spaces

Special consideration

58. In the case of a new Class B, C or D passenger ship, the Minister may permit machinery spaces to be periodically unattended and, in such cases, may impose additional requirements to those stipulated in these Rules when considered necessary to achieve equivalent safety to that of normally attended machinery spaces.

General requirements for periodically unattended machinery spaces

59. In the case of a new Class B, C or D passenger ship:

- (a) the arrangements for periodically unattended machinery spaces shall be such as to ensure that the safety of the ship in all sailing conditions, including manoeuvring, is equivalent to that of a ship having the machinery spaces manned;
- (b) measures shall be taken to ensure that the equipment is functioning in a reliable manner and that arrangements are made to the satisfaction of the Minister for regular inspections and routine tests to ensure continuous reliable operation;
- (c) every ship shall be provided with documentary evidence of its fitness to operate with periodically unattended machinery spaces.

Fire precautions

60. (1) In a new Class B, C or D passenger ship, means shall be provided to detect and raise the alarm at an early stage in case of a fire –

- (a) in boiler air supply casings and exhausts (uptakes), and
- (b) in scavenging air belts of propulsion machinery, unless it is considered by the Minister to be unnecessary in a particular case.

(2) Internal combustion engines of 2,250 kW and greater or having cylinders of greater than 300 mm bore shall be provided with crankcase oil mist detectors or engine bearing temperature monitors or equivalent devices to the satisfaction of the Minister.

Protection against flooding

61. (1) This Rule applies to a new Class B, C or D passenger ship.

(2) Bilge wells in periodically unattended machinery spaces shall be located and monitored in such a way that the accumulation of liquids is detected at normal angles of trim and heel, and shall be large enough to accommodate easily the normal drainage during the unattended period.

- (3) Where the bilge pumps are capable of being started automatically:
- (a) means shall be provided to indicate when the influx of liquid is greater than the pump capacity or when the pump is operating more frequently than would normally be expected. In these cases, smaller bilge wells to cover a reasonable period of time may be permitted by the Minister;
 - (b) where automatically controlled bilge pumps are provided, special attention shall be given to oil pollution prevention requirements;
 - (c) the location of the controls of any valve serving a sea inlet, a discharge below the waterline or a bilge injection system shall be so sited as to allow adequate time for operation in case of influx of water to the space, having regard to the time likely to be required in order to reach and operate such controls. If the level to which the space could become flooded with the ship in the fully loaded condition so requires, arrangements shall be made to operate the controls from a position above such level.

Control of propulsion machinery from the navigating bridge

62. (1) (a) In a new Class B, C or D passenger ship, the speed, direction of thrust and, if applicable, the pitch of the propeller, shall be fully controllable from the navigating bridge under all sailing conditions, including manoeuvring.

- (b) The remote control referred to in subparagraph (a) shall be performed by a separate control device for each independent propeller, with automatic performance of all associated services including, where necessary, means of preventing overload of the propulsion machinery.
- (c) The main propulsion machinery shall be provided with an emergency stopping device on the navigating bridge, which shall be independent of the navigating bridge control system.

(2) Propulsion machinery orders from the navigating bridge shall be indicated in the main machinery control room or at the propulsion machinery control position as appropriate.

- (3) (a) Remote control of the propulsion machinery shall be possible only from one location at a time; at such locations interconnected control positions shall be permitted.
- (b) At each location there shall be an indicator showing which location is in control of the propulsion machinery.
 - (c) The transfer of control between the navigating bridge and machinery spaces shall be possible only in the main machinery space or in the main machinery control room. The system shall include means to the satisfaction of the Minister to prevent the propelling thrust from

altering significantly when transferring control from one location to another.

(4) All machinery essential for the safe operation of the ship shall be controlled from a local position, even in the case of failure in any part of the automatic or remote control systems.

(5) The design of the remote automatic control system shall be such that in case of its failure an alarm will be given. Unless it is considered impracticable by the Minister, the preset speed and direction of thrust of the propeller shall be maintained until local control is in operation.

(6) Indicators shall be fitted on the navigating bridge for –

- (a) propeller speed and direction of rotation, in the case of fixed pitch propellers, or
- (b) propeller speed and pitch position, in the case of controllable pitch propellers.

(7) The number of consecutive automatic attempts which fail to produce a start shall be limited to safeguard sufficient starting air pressure. An alarm shall be provided to indicate low starting air pressure set at a level which still permits starting operations of the propulsion machinery.

(8) In a new Class B passenger ship, a reliable means of vocal communication, to the satisfaction of the Minister, shall be provided between, as appropriate –

- (a) the main machinery control room, or
- (b) the propulsion machinery control position,
and
 - (i) the navigating bridge, and
 - (ii) the engineer officers' accommodation.

Alarm system

63. (1) In a new Class B, C or D passenger ship, an alarm system shall be provided to indicate any fault requiring attention and shall:

- (a) be capable of sounding an audible alarm in the main machinery control room or at the propulsion machinery control position, and to indicate visually each separate alarm function at a suitable position;
- (b) have a connection to the engineers' public rooms and to each of the engineers' cabins through a selector switch, to ensure connection to a least one of those cabins. Alternative arrangements may be permitted by the Minister if they are considered to be equivalent;
- (c) activate an audible and visual alarm on the navigating bridge for any situation which requires action by or the attention of the officer on watch;

- (d) as far as is practicable be designed on the fail-to-safety principle;
- (e) activate the engineers' alarm provided in accordance with Rule 46, if an alarm function has not received attention locally within a limited time not exceeding 2 minutes.

(2) The alarm system shall be continuously powered and shall have an automatic changeover to a stand-by power supply in case of loss of normal power supply.

(3) Failure of the normal power supply of the alarm system shall be indicated by an alarm.

(4) The alarm system shall be capable of indicating at the same time the existence of more than one fault, and the acceptance of any alarm at one location shall not inhibit the sounding of another alarm.

(5) Acceptance at the position referred to in paragraph (1) of any alarm condition shall be indicated at the positions where it was shown. Alarms shall be maintained until they are accepted and the visual indications of individual alarms shall remain until the fault has been corrected, when the alarm system shall automatically reset to the normal operating condition.

Safety systems

64. In a new Class B, C or D passenger ship:

- (a) a safety system shall be provided to ensure that serious malfunction in machinery or boiler operations, which presents an immediate danger, shall initiate the automatic shutdown of that part of the plant and that an alarm shall be given;
- (b) shutdown of the propulsion system shall not be automatically activated except in cases which could lead to serious damage, complete breakdown, or explosion;
- (c) where arrangements for overriding the shutdown of the main propelling machinery are fitted, these shall be such as to preclude inadvertent operation. Visual means shall be provided to indicate when the override has been activated;
- (d) automatic machinery safety shut down and slow down controls shall be separated from the alarm installation.

Special requirements for machinery, boiler and electrical installations

65. (1) In a new Class B, C or D passenger ship, the main source of electrical power shall comply with the following:

- (a) (i) where the electrical power can normally be supplied by one generator, suitable load-shedding arrangements shall be provided to the satisfaction of the Minister to ensure the

integrity of supplies to services required for propulsion and steering, as well as the safety of the ship, and

- (ii) in the case of loss of the generator in operation, adequate provision shall be made for automatic starting and connecting to the main switchboard of a stand-by generator of sufficient capacity to permit propulsion and steering and to ensure the safety of the ship, with automatic restarting of the essential auxiliaries including, where necessary, sequential operations;
- (b) if the electrical power is normally supplied by more than one generator simultaneously in parallel operation, provision shall be made, for instance by load shedding, to ensure that, in case of loss of one of these generating sets, the remaining ones are kept in operation without overload to permit propulsion and steering, and to ensure the safety of the ship.

(2) Where stand-by machines are required for other auxiliary machinery essential to propulsion, automatic changeover devices shall be provided.

Automatic control and alarm system

66. (1) In a new Class B, C or D passenger ship, the control system shall be such that the services needed for the operation of the main propulsion machinery and its auxiliaries are ensured through the necessary automatic arrangements.

(2) An alarm shall be given on the automatic changeover.

(3) An alarm system complying with Rule 63 shall be provided for all important pressures, temperatures and fluid levels and other essential parameters.

(4) A centralised control position shall be arranged with the necessary alarm panels and instrumentation to indicate any alarm.

(5) Means shall be provided to keep the starting air pressure at the required level where internal combustion engines essential for the main propulsion are started by compressed air.

PART 3
FIRE PROTECTION RULES

PART A

GENERAL

Interpretation (Part 3)

67. (1) In this Part –

“A’ class division” means a division formed by bulkheads and decks which is:

- (a) constructed of steel or other equivalent material;
- (b) suitably stiffened;
- (c) so constructed as to be capable of preventing the passage of smoke and flame to the end of the 60 minute standard fire test;
- (d) insulated with approved non-combustible materials 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 180°C above the original temperature, within the time listed below:

Class “A-60”	60 minutes
Class “A-30”	30 minutes
Class “A-15”	15 minutes
Class “A-0”	0 minutes; and

- (e) the Minister has required a test of a prototype bulkhead or deck to ensure that it meets the above requirements for integrity and temperature rise in accordance with the IMO Resolution A.754(18) or, in the case of a Class B, C or D passenger ship constructed on or after 1 January 2003, the Fire Test Procedures Code;

“automatic fire damper” means a fire damper that closes independently in response to exposure to fire products;

“automatic smoke damper” means a smoke damper that closes independently in response to exposure to smoke or hot gases;

“B’ class division” means a division formed by bulkheads, decks, ceilings or linings which:

- (a) is so constructed as to be capable of preventing the passage of flame to the end of the first 30 minutes of the standard fire test;
- (b) has 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 minutes
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Class “B-0”	0 minutes;
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- (c) is constructed of approved non-combustible materials and all materials used in the construction and erection of a “B” class division shall be non-combustible, with the exception that combustible veneers may be permitted provided they meet other requirements of this Part; and
- (d) the Minister has required a test of a prototype division to ensure that it meets the above requirements for integrity and temperature rise in accordance with IMO Resolution A.754(18) or, in the case of a Class B, C or D passenger ship constructed on or after 1 January 2003, the Fire Test Procedures Code;

“C’ class division” means a division constructed of approved non-combustible materials which is not required to meet requirements relative to the passage of smoke and flame or limitations relative to the temperature rise. Combustible veneers shall be permitted provided they meet the requirements of this Part;

“central control station” means a control station in which the following control and indicator functions are centralised:

- (a) fixed fire detection and alarm systems;
- (b) automatic sprinklers, fire detection and alarm systems;
- (c) fire door indicator panels;

- (d) fire door closures;
- (e) watertight door indicator panels;
- (f) watertight door closures;
- (g) ventilation fans;
- (h) general and fire alarms;
- (i) communication systems including telephones; and
- (j) microphones to public address systems;

“closed ro-ro cargo spaces” means ro-ro cargo spaces that are neither open ro-ro cargo spaces nor weather decks;

“combustible material” means any material other than non-combustible material;

“continuous ‘B’ class ceiling or lining” means a ‘B’ class ceiling or lining that terminates only at an ‘A’ or ‘B’ class division;

“continuously manned central control station” means a central control station that is continuously manned by a responsible member of the crew;

“enclosed vehicle spaces” means vehicle spaces that are neither open vehicle spaces nor weather decks;

“fire damper” means, for the purpose of implementing Rules 108 to 114, a device installed in a ventilation duct which under normal conditions remains open allowing flow in the duct and is closed during a fire, preventing the flow in the duct to restrict the passage of fire;

“Fire Safety Systems Code” means the International Code for Fire Safety Systems adopted by the Maritime Safety Committee of the IMO by Resolution MSC.98(73), in its updated version;

“Fire Test Procedures Code” means –

- (a) the International Code for Application of Fire Test Procedures, as adopted by the Maritime Safety Committee of the IMO by Resolution MSC.61(67), as may be amended by the IMO,

provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the Safety Convention concerning the amendment procedures applicable to the Annex other than Chapter I, or

- (b) in the case of a ship constructed on or after 1 July 2012, the International Code for Application of Fire Test Procedures, 2010 (2010 FTP Code) as adopted by the Maritime Safety Committee of the IMO by resolution MSC.307(88), as may be amended by the IMO, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the Safety Convention concerning the amendment procedures applicable to the Annex other than Chapter I;

“low flame spread” means that the surface thus described will adequately restrict the spread of flame, this being determined:

- (a) by a fire test according to IMO Resolution A.653(16), for bulkhead, ceiling and deck finish materials, or
- (b) in the case of a Class B, C or D passenger ship constructed on or after 1 January 2003, in accordance with the Fire Test Procedures Code;

“main vertical zones” means those sections of a ship into which the hull, superstructure, and deckhouses are divided by “A” class divisions, the mean length and width of which on any deck does not in general exceed 40 metres;

“manual fire damper” means a fire damper that is intended to be opened or closed by the crew by hand at the damper itself;

“manual smoke damper” means a smoke damper intended to be opened or closed by the crew by hand at the damper itself;

“non-combustible material” means –

- (a) in a new Class B, C or D passenger ship, a material that neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750 °C, this being determined by a fire test in accordance with the IMO Resolution A.799(19) “Revised recommendation on test

methods for qualifying marine construction materials as non-combustible”, or

- (b) in a Class B, C or D passenger ship constructed on or after 1 January 2003, a material that neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750 °C, this being determined in accordance with the Fire Test Procedures Code;

“open ro-ro cargo spaces” means ro-ro cargo spaces that are either open at both ends, or open at one end, and are provided with adequate natural ventilation effective over the entire length through permanent openings in the side plating or deckhead or from above and, in a passenger ship constructed on or after 1 January 2003, having a total area of at least 10 per cent of the total area of the space sides;

“open vehicle spaces” means those vehicle spaces that are either open at both ends or have an opening at one end, and are provided with adequate natural ventilation effective over their entire length through permanent openings distributed in the side plating or deckhead or from above and, in a passenger ship constructed on or after 1 January 2003, having a total area of at least 10 per cent of the total area of the space sides;

“remotely operated fire damper” means a fire damper that is closed by the crew through a control located at a distance away from the controlled damper;

“rooms containing furniture and furnishings of restricted fire risk” for the purpose of Rule 99 means those rooms containing furniture and furnishings of restricted fire risk (whether cabins, public spaces, offices and other types of accommodation) in which:

- (a) all case furniture such as desks, wardrobes, dressing tables, bureaux, dressers, is 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;
- (b) all free-standing furniture such as chairs, sofas, tables, is constructed with frames of non-combustible materials;
- (c) all draperies, curtains and other suspended textile materials have qualities of resistance to the propagation of flame not inferior to those of wool of mass 0.8 kg/m², in accordance with IMO Resolution A.471(XII), in its updated version or, in the

case of a Class B, C or D passenger ship constructed on or after 1 January 2003, the Fire Test Procedures Code;

- (d) all floor coverings have qualities of resistance to the propagation of flame not inferior to those of an equivalent woollen material used for the same purpose or, in the case of a Class B, C or D passenger ship constructed on or after 1 January 2003, have low flame spread characteristics;
- (e) all exposed surfaces of bulkheads, linings and ceilings have low flame-spread characteristics;
- (f) all upholstered furniture has qualities of resistance to the ignition and propagation of flame in accordance with the Fire Test Procedures of Upholstered Furniture of IMO Resolution A.652(16) or, in the case of a Class B, C or D passenger ship constructed on or after 1 January 2003, the Fire Test Procedures Code;
- (g) in a Class B, C or D passenger ship constructed on or after 1 January 2003, all bedding components have qualities of resistance to the ignition and propagation of flame, this being determined in accordance with the Fire Test Procedures Code;

“smoke damper” means, for the purpose of implementing Rules 108 to 114, a device installed in a ventilation duct which under normal conditions remains open allowing flow in the duct and is closed during a fire, preventing the flow in the duct to restrict the passage of smoke and hot gases. A smoke damper is not expected to contribute to the integrity of a fire rated division penetrated by a ventilation duct;

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

Initial internal furnace temperature	20°C
at the end of the first 5 minutes	576°C
at the end of 10 minutes	679°C
at the end of 15 minutes	738°C

at the end of 30 minutes	841°C
at the end of 60 minutes	945°C.

In a Class B, C or D passenger ship constructed on or after 1 January 2003, the test methods shall be in accordance with the Fire Test Procedures Code;

“steel or other equivalent material” means steel or 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 (an example is aluminium alloy with appropriate insulation);

“vehicle spaces” means cargo spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion.

Objectives of Fire Protection Rules

68. (1) The following objectives shall underpin the application of the Rules in this Part:

- (a) the prevention of the occurrence of fire and explosion on a ship;
- (b) the reduction of the risk to life caused by fire;
- (c) the reduction of the risk of damage caused by fire to the ship, its cargo and the environment;
- (d) the containment, control and suppression of fire and explosion in the compartment of origin on a ship;
- (e) the provision of adequate and readily accessible means of escape for passengers and crew on a ship.

(2) In order to achieve the objectives set out in paragraph (1), the following general principles shall apply having regard to the class of passenger ship and the potential fire hazard involved:

- (a) the separation of accommodation spaces from the remainder of a ship by thermal and structural boundaries;
- (b) restricted use of combustible materials;
- (c) detection of a fire in the zone of origin;
- (d) containment and extinction of a fire in the space of origin;
- (e) protection of means of escape or access for fire-fighting;

- (f) ready availability of fire-extinguishing appliances;
- (g) minimisation of possible ignition of flammable cargo vapour.

Obligation on ships undergoing repairs, alterations, modifications, etc.

69. (1) A passenger ship that undergoes repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements that applied to the ship before undergoing the repairs, alterations, modifications and outfitting.

(2) Repairs, alterations and modifications which substantially alter the dimensions of a passenger ship or the passenger accommodation spaces, or substantially increase the service life of a ship and outfitting related thereto shall where practicable meet the relevant requirements for a new passenger ship to the satisfaction of the Minister.

Fire pumps, fire mains, hydrants, hoses and nozzles

70. (1) A new Class B, C or D passenger ship shall be provided with fire pumps, fire mains, hydrants, hoses and nozzles complying as applicable with the requirements of this Part.

(2) In a new Class B, C or D passenger ship constructed before 1 January 2003, where more than one independent fire pump is required, 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 this machinery space. 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 a fire pump not located in this machinery space through pipes which do not enter this space. Exceptionally, the Minister may permit short lengths of the emergency fire pump suction and discharge piping to penetrate the machinery space if it is impracticable to route it externally, provided that the integrity of the fire main is maintained by the enclosure of the piping in a substantial steel casing.

(3) In a new Class B, C or D passenger ship constructed on or after 1 January 2003, 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 pump or an emergency fire pump. The emergency 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 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 standards. The pipes shall have substantial wall thickness, but in no case shall be less than 11 mm and shall be welded except for the flanged connection to the sea inlet valve.

Application of Rules 72 to 78

71. Unless indicated otherwise, Rules 72 to 78 shall apply to a new Class B passenger ship.

Capacity of fire pumps

72. (1) The required fire pumps shall be capable of delivering for fire-fighting purposes a quantity of water at the pressure specified in Rule 74(2) that is not less than two thirds of the quantity required to be dealt with by the bilge pumps when employed for bilge pumping.

(2) In every ship that is required by these Rules to be provided with more than one power fire pump, each of the required fire pumps shall have a capacity not less than 80 per cent 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.

(3) In a ship constructed on or after 1 January 2003, where more pumps than the minimum 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 accordance with Rule 75.

Arrangements of fire pumps, fire mains and ready availability of water supply

73. (1) A passenger ship shall be provided with power driven fire pumps as follows:

- (a) in the case of a ship certified to carry more than 500 passengers, at least three fire pumps, one of which may be a main engine driven pump;
- (b) in the case of a ship certified to carry up to 500 passengers or less, at least two fire pumps, one of which may be a main engine driven pump.

(2) 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 changeover arrangements are fitted.

(3) The arrangement of sea connections, fire pumps and their sources of power shall be such as to ensure that –

- (a) in a ship certified to carry more than 250 passengers, in the event of a fire in any one compartment, all the fire pumps shall not be put out of action, and
- (b) in new Class B passenger ship certified to carry up to 250 passengers or less, if a fire in any one compartment could put all the pumps out of action, there shall be an alternative means of providing water for fire-fighting purposes consisting of an independently driven, power-operated emergency fire pump with its source of power and sea connection located outside the machinery space. Such an independently driven, power-operated emergency fire pump shall comply with the provisions of the Fire Safety Systems Code that apply to ships constructed on or after 1 January 2003.

(4) In a new class B passenger ship certified to carry more than 250 passengers, the arrangements for the ready availability of water supply shall be such that at least one 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 a required fire pump.

(5) In a passenger ship with a periodically unattended machinery space or when only one person is required on watch, there shall be immediate water delivery from the fire main system at a suitable pressure, either by remote starting of one of the main fire pumps with remote starting from the navigating bridge and fire control station, if any, or permanent pressurisation of the fire main system by one of the main fire pumps.

(6) The delivery valve of each fire pump shall be fitted with a non-return valve.

Diameter of and pressure in the fire mains

74. (1) 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.

(2) With two pumps simultaneously delivering water through the nozzles specified in Rule 78 and sufficient hydrants to provide for the quantity of water specified in paragraph (1), the following minimum pressures shall be maintained at all hydrants:

New Class B passenger ship certified to carry	
more than 500 passengers	0.4 N/mm ²
Up to 500 passengers	0.3 N/mm ²

(3) The maximum pressure at any hydrant shall not exceed that at which the effective control of a fire hose can be demonstrated.

Number and position of hydrants

75. (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 cargo space or any special category space, in which latter case the two jets shall reach any part of such space, each from a single length of hose. Furthermore, such hydrants shall be positioned near the accesses to the protected spaces.

(2) In the accommodation, service and machinery spaces, the number and position of the hydrants shall be such that the requirements of paragraph (1) may be complied with when all watertight doors and all doors in main vertical zone bulkheads are closed.

(3) Where access is provided to a machinery space 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 shall be provided near the entrance of the machinery space. Such provision is not required where the tunnel or adjacent spaces are not part of the escape route.

Pipes and hydrants

76. (1) 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.

(2) 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.

(3) A valve shall be fitted to serve each fire hose so that any fire hose may be removed while the fire pumps are at work.

(4) In a passenger ship constructed on or after 1 January 2003, isolating valves shall be installed for all open deck fire main branches used for purposes other than fire-fighting.

Fire hoses

77. (1) Fire hoses shall be of non-perishable material approved by the Minister, 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.

(2) There shall be complete interchangeability of hose couplings and nozzles. Hoses specified in this Part 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. In addition, in interior locations in ships carrying more than 36 passengers, fire hoses shall be connected to the hydrants at all times.

(3) At least one fire hose shall be provided for each of the hydrants required by Rule 75.

(4) The length of a fire hose shall be restricted to not more than:

- (a) 15 metres, on deck and in superstructures, and
- (b) 10 metres, in machinery spaces.

Nozzles

78. (1) For the purposes of this Part, standard nozzle sizes shall be 12 mm, 16 mm and 19 mm or as near thereto as possible. In cases where other systems are used, such as fog systems, different diameter nozzles may be permitted by the Minister.

(2) All nozzles shall be of an approved dual-purpose type, that is a spray/jet type, and shall have a shutoff facility.

(3) For accommodation and service spaces, a nozzle size greater than 12 mm is not required to be used.

(4) 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 Rule 74 from the smallest pump, provided that a nozzle size greater than 19 mm is not required to be used.

Fire pumps, fire mains, hydrants, hoses, nozzles and ready availability of water supply in a new Class C or D passenger ship

79. (1) This Rule applies to a new Class C or D passenger ship.
- (2) (a) One independent fire pump shall be provided, which shall be capable of delivering for fire-fighting purposes at least one jet of water from any fire hydrant in accordance with this Rule.
- (b) The quantity of water delivered in accordance with subparagraph (a) shall not be less than two thirds of the quantity required to be dealt with by the bilge pumps when employed for bilge pumping.
- (c) The fire pump shall be capable, when discharging the maximum amount referred to in subparagraph (b) through fire hydrants with nozzles of 12mm or 16mm or 19 mm, of maintaining at any hydrant minimum pressures as required in class B ships.
- (3) (a) Every passenger ship carrying in excess of 250 passengers shall be provided with a fire pump in addition to that provided in accordance with paragraph (2), which shall be permanently connected to the fire main. The pump shall be operated by power. The pump and its source of power shall not be situated in the same compartment as the pump provided in accordance with paragraph (2) and shall be provided with a permanent sea connection situated outside the machinery space. The pump shall be capable of delivering at least one jet of water from any fire hydrants provided in the ship and maintain a pressure of at least 0.3 N/mm².
- (b) Every passenger ship of 21.34 metres length or over, certified to carry up to 250 passengers or less and constructed after 1 January 2020 shall be provided with an additional fire pump which shall be permanently connected to the fire main but which shall not be required to be operated by power. Such pump and its source of power, if any, shall not be situated in the same compartment as the pump required by paragraph (2)(a) and shall be provided with a permanent sea connection situated outside the machinery space. Where such a pump is operated by power, it shall be capable of delivering at least one jet of water from any fire hydrant provided in the ship and maintaining a pressure of at least 0.3 N/mm². Where such a pump is manually operated, it shall be capable of producing a jet of water having a throw of not less than 6 metres from nozzles provided in compliance with paragraph (2)(c).
- (c) In every passenger ship of less than 21.34 metres in length, certified to carry up to 250 passengers and constructed after 1 January 2020, where the pump referred to in paragraph (2)(a) and its source of power are not situated in a position outside the machinery space, there shall be provided in a position outside the machinery space either a power or hand operated pump with a permanent sea

connection and a hose with a 10 millimetres diameter nozzle capable of producing a jet of water having a throw of not less than 6 metres, which can be directed on to any part of the ship.

(4) Sanitary, ballast, bilge or general service pumps may be accepted as fire pumps.

(5) Every passenger ship shall be provided with a fire main having a diameter sufficient for the effective distribution of the maximum discharge specified in this Rule. The number and position of the hydrants shall be such that at least one jet of water may reach any part of the ship using one single maximum length of hose that is not more than:

- (a) 15 metres, on deck and in superstructures, and
- (b) 10 metres, in machinery spaces.

(6) Every passenger ship shall be fitted with at least one fire hose for every hydrant fitted.

(7) In a passenger ship with a periodically unattended machinery space or when only one person is required on watch, there shall be immediate water delivery from the fire main system at a suitable pressure, either by remote starting of one of the main fire pumps with remote starting from the navigating bridge and fire control station, if any, or permanent pressurisation of the fire main system by one of the main fire pumps.

(8) The delivery valve of each fire pump shall be fitted with a non-return valve.

Fixed gas fire-extinguishing systems

80. (1) A new Class B, C or D passenger ship constructed before 1 January 2003 shall be provided with a fixed gas fire-extinguishing system that meets the following requirements:

- (a) the necessary pipes for conveying fire-extinguishing medium into protected spaces shall be provided with control valves so marked as to indicate clearly the spaces to which the pipes are led. Suitable provision to the satisfaction of the Minister shall be made to prevent inadvertent admission of the medium to any space;
- (b) the piping for the distribution of fire-extinguishing medium shall be arranged and discharge nozzles so positioned that a uniform distribution of medium is obtained;
- (c) means shall be provided to close from outside the protected spaces all openings that may admit air to or allow gas to escape from the protected space;
- (d) means shall be provided to automatically give audible warning of the release of fire-extinguishing medium into any space in which

personnel normally work or to which they have access. The alarm shall operate for a suitable period before the medium is released;

- (e) the means of control of any fixed gas fire-extinguishing system shall be readily accessible and simple to operate and shall be grouped together in as few locations as possible at positions that are not likely to be cut off by a fire in a protected space. At each location there shall be clear instructions relating to the operation of the system having regard to the safety of personnel;
- (f) automatic release of fire-extinguishing medium shall not be permitted, except as permitted in respect of local automatically operated units fitted, in addition to and independent of any required fixed fire-extinguishing system, in machinery spaces over equipment having a high fire risk or in enclosed areas of high fire risk within machinery spaces;
- (g) where the quantity of extinguishing medium is required to protect more than one space, the quantity of medium available is not required to be more than the largest quantity required for any one space so protected;
- (h) except as otherwise permitted by the Minister, pressure containers required for the storage of fire-extinguishing medium, shall be located outside protected spaces in accordance with subparagraph (k);
- (i) means shall be provided for the crew or shore personnel to safely check the quantity of medium in the containers;
- (j) containers for the storage of fire extinguishing medium and associated pressure components shall be constructed of suitable material and shall be of efficient design and sufficient strength having regard to their locations and maximum ambient temperatures expected in service;
- (k)
 - (i) when the fire-extinguishing medium is stored outside a protected space, it shall be stored in a room which shall be situated in a safe and readily accessible position and shall be effectively ventilated. Any entrance to such a storage room shall preferably be from the open deck and in any case shall be independent of the protected space;
 - (ii) 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

adjoining enclosed spaces shall be gastight. For the purpose of application of the Tables for fire integrity of bulkheads and decks to Rule 99 or Rule 100, as applicable, such storage rooms shall be treated as control stations;

- (l) the use of a fire-extinguishing medium, which either by itself or under expected conditions of use gives off toxic gases in such quantities as to endanger persons or gives off gases which are harmful to the environment, in fire-extinguishing systems on board new ships and in such new installations on board existing ships, shall not be permitted.

(2) A Class B, C or D passenger ship constructed on or after 1 January 2003 shall be provided with a fixed gas fire-extinguishing system that meets the following requirements:

- (a) the fixed gas fire-extinguishing system shall comply with the Fire Safety Systems Code;
- (b) means shall be provided to close from outside the protected space all openings which may admit air to or allow gas escape from the protected space;
- (c) when the fire-extinguishing medium is stored outside a protected space the following requirements shall be met:
 - (i) it shall be stored in a room which is located behind the forward collision bulkhead and is used for no other purposes;
 - (ii) any entrance to such a storage room shall preferably be from the open deck and shall be independent of the protected space;
 - (iii) if the storage place 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;
 - (iv) spaces that 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;
 - (v) access doors shall open outwards and bulkheads and decks including doors and other means of closing any opening therein, which form boundaries between such rooms and adjacent enclosed spaces, shall be gastight. For the purpose of the application of the Tables to Rules 99 and 100, such storage

rooms shall be treated as fire control stations.

(3) A new Class A, B, C or D passenger ship shall be provided with a fixed gas fire-extinguishing system that meets the following requirements:

- (a) where the volume of free air contained in air receivers in any space is such that, if released in such space in the event of fire, such release of air within that space would seriously affect the efficiency of the fixed fire-extinguishing system, an additional quantity of fire-extinguishing medium shall be provided;
- (b) suppliers of fixed fire-extinguishing installations shall provide a description of the installation, including a checklist for maintenance, in the English language;
- (c) the quantity of the fire-extinguishing medium shall be checked at least once a year by either a person with required expertise to the satisfaction of the Minister, the supplier of the installation or a recognised organisation;
- (d) the periodic checking that is carried out by the ship's chief engineer or organised by the ship's management shall be entered in the ship's logbook stating the scope and the time of such checking;
- (e) non-prescribed fire extinguishing equipment that is installed in such areas as store rooms shall, in its construction and dimensioning, comply with the relevant provisions of this Rule for the type of installation in question;
- (f) all doors to spaces protected by carbon dioxide installation shall be marked "This space is protected by a CO₂ installation and shall be evacuated when the alarm equipment comes into operation".

Fixed fire-extinguishing systems – carbon dioxide systems

81. (1) Where carbon dioxide is used as a fire-extinguishing medium in a new Class B, C or D passenger ship constructed before 1 January 2003, the following provisions shall apply:

- (a) (i) for cargo spaces, the quantity of carbon dioxide available shall, unless otherwise provided, be sufficient to give a minimum volume of free gas equal to 30 per cent of the gross volume of the largest cargo space so protected in the ship. If there is a connection through ventilation ducts between two or more cargo spaces, these shall be considered one space. In passenger ships used for the carriage of vehicles, the necessary quantity

of carbon dioxide shall be calculated as 45 per cent of the gross cubic content of the largest cargo space;

- (ii) for machinery spaces, the quantity of carbon dioxide carried shall be sufficient to give a minimum volume of free gas equal to the larger of the following volumes, either:
 - (I) 40 per cent of the gross volume of the largest machinery space so protected, the volume to exclude that part of the casing above the level at which the horizontal area of the casing is 40 per cent or less of the horizontal area of the space concerned taken midway between the tank top and the lowest part of the casing; or
 - (II) 35 per cent of the gross volume of the largest machinery space protected, including the casing, provided that if two or more machinery spaces are not entirely separated they shall be considered as forming one space;
- (b) for the purpose of this paragraph the volume of free carbon dioxide shall be calculated at $0.56 \text{ m}^3/\text{kg}$;
- (c) the fixed piping system shall be such that 85 per cent of the gas can be discharged into the space within 2 minutes;
- (d) the release mechanism of carbon dioxide shall meet the following requirements:
 - (i) two separate controls shall be provided for releasing carbon dioxide into a protected space and to ensure the activities of the alarm. One control shall be used to discharge the gas from its storage containers. A second control shall be used for opening the valve of the piping which conveys the gas into the protected space;
 - (ii) the two controls provided in accordance with clause (i) shall be located inside a release box that is clearly identified for the particular space. If the box containing the controls is to be locked, a key to the box shall be in a break-glass type enclosure conspicuously located adjacent to the box;
- (e) the spaces in which the carbon dioxide batteries are located shall be properly arranged to the satisfaction of the Minister as regards their access, ventilation and communication equipment. Necessary safety measures to the satisfaction of the Minister shall be taken regarding the construction, installation, marking, filling and testing of carbon

dioxide cylinders, pipes and fittings, and for the control and alarm equipment for such installation.

(2) Where carbon dioxide is used as a fire-extinguishing medium in a Class B, C or D passenger ship constructed on or after 1 January 2003, the following provisions shall apply:

- (a) the carbon dioxide system shall comply with the Fire Safety Systems Code;
- (b) the spaces in which the carbon dioxide batteries are located shall be properly arranged to the satisfaction of the Minister as regards their access, ventilation and communication equipment. Necessary safety measures to the satisfaction of the Minister shall be taken regarding the construction, installation, marking, filling and testing of carbon dioxide, cylinders piping and fittings and for control and alarm equipment for such installation.

Fixed low-expansion foam fire-extinguishing systems fitted in machinery spaces in addition to the requirements of Rule 86

82. (1) Where a fixed low-expansion foam fire-extinguishing system is fitted in any machinery space in a new Class B, C or D passenger ship constructed before 1 January 2003, in addition to the requirements of Rule 86, the system shall comply with the following:

- (a) the system shall be capable of discharging through fixed discharge outlets in not more than five minutes a quantity of foam sufficient to cover to a depth of 150 mm the largest single area over which oil fuel is liable to spread;
- (b) the system shall be capable of generating foam suitable for extinguishing oil fires;
- (c) means shall be provided for effective distribution of the foam through a permanent system of piping and control valves or cocks to suitable discharge outlets and for the foam to be effectively directed by fixed sprayers on other main fire hazards in the protected space;
- (d) the expansion ratio of the foam shall not exceed 12 to 1;
- (e) the means of control of any such systems shall be readily accessible and simple to operate and shall be grouped together in as few locations as possible at positions not likely to be cut off by a fire in the protected space.

(2) In a Class B, C or D passenger ship constructed on or after 1 January 2003, fixed low-expansion foam fire-extinguishing systems in machinery spaces shall comply with the Fire Safety Systems Code.

Fixed high-expansion foam fire-extinguishing systems in machinery spaces

83. (1) Where a fixed high-expansion foam fire-extinguishing system is provided in any machinery space in a new Class B, C or D passenger ship constructed before 1 January 2003, the system shall meet the following requirements:

- (a) the fixed high-expansion foam system in machinery spaces shall be capable of rapidly discharging through fixed discharge outlets a quantity of foam sufficient to fill the greatest space to be protected at a rate of at least one metre in depth per minute. The quantity of foam-forming liquid available shall be sufficient to produce a volume of foam equal to five times the volume of the largest space to be protected. The expansion ratio of the foam shall not exceed 1,000 to 1;
- (b) supply ducts for delivering foam, air intakes to the foam generator and the number of foam-producing units shall be such as will provide effective foam production and distribution;
- (c) the arrangement of the foam generator delivery ducting shall be such that a fire in the protected space shall not affect the foam generating equipment;
- (d) the foam generator, its sources of power supply, foam forming liquid and means of controlling the system shall be readily accessible and simple to operate and shall be grouped in as few locations as possible at positions not likely to be cut off by a fire in the protected space.

(2) In a Class B, C or D passenger ship constructed on or after 1 January 2003, fixed high-expansion foam fire-extinguishing systems in machinery spaces shall comply with the Fire Safety Systems Code.

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

84. (1) Where a fixed pressure water-spraying fire-extinguishing system is provided in machinery spaces in a new Class B, C or D passenger ship constructed before 1 January 2003, the system shall meet the following requirements:

- (a) the system shall be provided with spraying nozzles that meet the requirements of the Regulations of 2017;
- (b) the number and arrangement of the nozzles shall be such as to ensure an effective average distribution of water of at least 5 litres/m² per minute in the spaces to be protected. Increased application rates may be considered by the Minister if necessary for particular hazardous

areas. Nozzles shall be fitted above bilges, tank tops and other areas over which oil fuel is liable to spread and above other specific fire hazards in the machinery spaces;

- (c) the system may be divided into sections, the distribution valves of which shall be operated from easily accessible positions outside the spaces to be protected and shall not be readily cut off by a fire in the protected space;
 - (d) the system shall be kept charged at the necessary pressure and the pump supplying the water for the system shall be put automatically into action by a pressure drop in the system;
 - (e) the pump shall be capable of simultaneously supplying at the necessary pressure all sections of the system in any one compartment to be protected. The pump and its controls shall be installed outside the space or spaces to be protected. It shall not be possible for a fire in the space or spaces protected by the water-spraying system to put the system out of action;
 - (f) precautions shall be taken to prevent the nozzles from becoming clogged by impurities in the water or corrosion of piping, nozzles, valves and pump.
- (2) (a) In a new Class B, C or D passenger ship constructed before 1 January 2003, and subject to subparagraph (b), the pump that is provided in any fixed pressure water-spraying fire-extinguishing system in machinery spaces may be –
- (i) dependent upon power being supplied from the emergency generator, or
 - (ii) driven by an independent internal combustion machinery.
- (b) Where the pump referred to subparagraph (a) is dependent upon power being supplied from the emergency generator fitted in compliance with the provisions of Rules 53 to 57, that generator shall be so arranged as to start automatically in case of main power failure so that power for the pump required by paragraph (1)(e) is immediately available.
- (c) Where the pump is driven by independent internal combustion machinery it shall be so situated that a fire in the protected space shall not affect the air supply to the machinery.

(3) In a Class B, C or D passenger ship constructed on or after 1 January 2003, fixed pressure water-spraying fire-extinguishing systems in machinery spaces shall comply with the Fire Safety Systems Code.

Portable fire extinguishers

85. (1) A new Class B, C or D passenger ship constructed before 1 January 2003 shall be provided with portable fire extinguishers that comply with the following requirements:

- (a) all portable fire extinguishers shall be of approved types and designs in accordance with the Regulations of 2017;
- (b) the capacity of required portable fluid extinguishers shall be not more than 13.5 litres and not less than 9 litres. Other extinguishers shall be at least as portable as the 13.5 litre fluid extinguisher and shall have a fire-extinguishing capability at least equivalent to that of a 9 litre fluid extinguisher;
- (c) spare charges shall be carried for 50 per cent of the total of each type of extinguisher on board the ship. Another extinguisher of the same type may be a spare charge for an extinguisher that cannot be readily recharged on board the ship;
- (d) in general, portable carbon dioxide fire extinguishers shall not be located in accommodation spaces. Where such extinguishers are provided in radio rooms, at switchboards and other similar positions, the volume of any space containing one or more extinguishers shall be such as to limit the concentration of vapour that can occur due to discharge to not more than 5 per cent of the net volume of the space for the purpose of these Rules. The volume of carbon dioxide shall be calculated at 0.56 m³/kg.

(2) In a Class B, C and D passenger ship constructed on or after 1 January 2003:

- (a) portable fire extinguishers shall comply with the provisions of the Fire Safety Systems Code;
- (b) 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;
- (c) 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;

- (d) spare charges shall be provided for 100 per cent of the first 10 extinguishers and 50 per cent of the remaining fire extinguishers capable of being recharged on board the ship;
 - (e) for the fire extinguishers that cannot be recharged on board the ship, additional portable fire extinguishers of the same quantity, type, capacity and number as determined in paragraph (3)(d) shall be provided in lieu of spare charges.
- (3) In a new Class B, C or D passenger ship:
- (a) fire extinguishers containing an extinguishing medium which either by itself or under expected conditions of use gives off toxic gases in such quantities as to endanger persons or gives off gases which are harmful to the environment shall not be permitted;
 - (b) the fire extinguishers shall be suitable for extinguishing fires that are possible in the vicinity of the fire extinguisher location;
 - (c) one of the portable fire extinguishers intended for use in any space shall be located near the entrance of that space;
 - (d) the minimum number of fire extinguishers to be provided shall be as follows:
 - (i) in accommodation and service spaces, the fire extinguishers shall be so located that no point in the space is more than 10 metres walking distance from an extinguisher;
 - (ii) an extinguisher suitable for use in high voltage areas shall be located in the proximity of any electric panel or subpanel having a power of 20 kW or greater;
 - (iii) in galleys, the extinguishers shall be so located that no point in the space is more than 10 metres walking distance from an extinguisher;
 - (iv) an extinguisher shall be located in the proximity of paint lockers store rooms containing readily flammable products;
 - (v) at least one extinguisher shall be located on the navigating bridge and in each control station;
 - (e) portable fire extinguishers provided for use in accommodation or service spaces shall so far as practicable have a uniform method of operation;
 - (f) portable fire extinguishers shall be periodically inspected, function-tested and pressure-tested to the satisfaction of the Minister.

Fire-extinguishing arrangements in machinery spaces

86. (1) In a new Class B, C or D passenger ship, machinery spaces of category A shall be provided with a fixed fire-extinguishing system that is either:

- (a) a gas system complying with the relevant provisions of Rules 80 and 81, or an equivalent water-based system, complying with the provisions of IMO MSC/Circ.1165 in its updated version, taking into consideration the date of construction of the ship; or
- (b) a high-expansion foam system complying with the relevant provisions of Rule 83, taking into consideration the date of construction of the ship; or
- (c) a pressure water-spraying system complying with the relevant provisions of Rule 84, taking into consideration the date of construction of the ship.

(2) (a) In addition to the requirements of paragraph (1) –

- (i) in any space containing internal combustion engines, or oil fuel settling tanks or oil-fuel units, one foam fire-extinguisher of at least 45 litres capacity, or equivalents sufficient in number to enable foam or its equivalent to be directed on to any part of the fuel and lubricating oil pressure systems, gearing and other fire hazards, shall be provided, and
 - (ii) one portable fire extinguisher suitable for extinguishing oil fires for each 746 kW or part thereof of such machinery, provided that not less than two nor more than 6 such extinguishers shall be required in any such space.
- (b) The use of a fixed low-expansion foam fire extinguishing system in lieu of some of the 6 portable fire extinguishers required by this Rule may be permitted, provided that not less than two portable extinguishers shall always be required.

(3) In a new Class B, C or D passenger ship, when heated oil is used as heating medium, the Minister may additionally require that boiler rooms are equipped with permanently installed or portable equipment for local systems for jet spraying of water under pressure or the spreading of foam above and below the floor for fire-extinguishing purposes.

Special arrangements in machinery spaces

87. (1) In a new Class B, C or D passenger ship:

- (a) 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;
 - (b) skylights shall be of steel and shall not contain glass panels. Suitable arrangements shall be made to permit the release of smoke in the event of fire, from the space to be protected;
 - (c) 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 facility, provided with a remotely operated release device.
- (2) In a new Class B, C or D passenger ship:
- (a) windows shall not be fitted in machinery space boundaries. This requirement does not preclude the use of glass in control rooms within the machinery spaces;
 - (b) means of control shall be provided for:
 - (i) opening and closure of skylights, closure of openings in funnels which normally allow exhaust ventilation, and closure of ventilator dampers;
 - (ii) permitting the release of smoke;
 - (iii) closing power-operated doors or actuating release mechanism on doors other than power-operated watertight doors;
 - (iv) stopping ventilating fans;
 - (v) stopping forced and induced draught fans, oil fuel transfer pumps, oil fuel unit pumps and other similar fuel pumps. In the case of passenger ships constructed on or after 1 January 2003, other similar fuel pumps means lubricating oil service pumps, thermal oil circulating pumps and oil separators;
 - (c) (i) the controls required in subparagraph (b)(v) and Rule 91(3)(e) shall be located outside the space concerned, where they will not be cut off in the event of fire in the space they serve. Such controls and the controls for any required fire-extinguishing system shall be situated at one control position or grouped in

as few positions as possible. Such positions shall have a safe access from the open deck;

(ii) clause (i) shall not apply to oily water separators;

(d) when access to any machinery space of category A is provided at a low level from an adjacent shaft tunnel, there shall be provided in the shaft tunnel, near the watertight door, a light steel fire-screen door operable from each side.

Fixed fire detection and fire alarm systems - general

88. (1) Paragraphs (2) to (16) apply to fixed fire detection and fire alarm systems in a new Class B, C or D passenger ship constructed before 1 January 2003.

(2) Any required fixed fire detection and fire alarm system with manually operated call points shall be capable of immediate operation at all times.

(3) Power supplies and electric circuits necessary for the operation of the system shall be monitored for loss of power or fault conditions as appropriate. Occurrence of a fault condition shall initiate a visual and audible fault signal at the control panel which shall be distinct from a fire signal.

(4) There shall be not less than two sources of power supply for the electrical equipment used in the operation of the fire detection and fire alarm system, one of which shall be an emergency source. The power supply shall be provided by separate feeders reserved solely for that purpose. Such feeders shall run to an automatic changeover switch situated in or adjacent to the control panel for the fire detection system.

(5) Detectors and manually operated call points shall be grouped into sections. The activation of any detector or manually operated call point shall initiate a visual and audible fire signal at the control panel and indicating units. Where the signals have not received attention within 2 minutes, an audible alarm shall be automatically sounded throughout the crew accommodation and service spaces, control stations and machinery spaces. This alarm sounder system is not required to be an integral part of the detection system.

(6) The control panel for the fixed fire detection and fire alarm system shall be located either on the navigating bridge of the ship or in the main fire control station.

(7) Indicating units shall, as a minimum, denote the section in which a detector or manually operated call point has operated. At least one unit shall be so located that it is easily accessible to responsible members of the crew at all times, when at sea or in port, except when the ship is out of service. One indicating unit shall be located on the navigating bridge if the control panel is located in the main fire control station.

(8) Clear information shall be displayed on or adjacent to each indicating unit about the spaces covered and the location of the sections.

(9) Where the fire detection system does not include means of remotely identifying each detector individually, no section covering more than one deck within accommodation, service and control stations shall normally be permitted except a section that covers an enclosed stairway. In order to avoid delay in identifying the source of fire, the number of enclosed spaces included in each section shall be limited as determined by the Minister. In no case shall more than 50 enclosed spaces be permitted in any section. If the detection system is fitted with remotely and individually identifiable fire detectors, the sections may cover several decks and may serve any number of enclosed spaces.

(10) Where there is no fire detection system capable of remotely and individually identifying each detector, a section of detectors shall not serve spaces on both sides of the ship, nor on more than one deck, and neither shall it be situated in more than one main vertical zone except that the Minister, if satisfied that the protection of the ship against fire will not thereby be reduced, may permit such a section of detectors to serve both sides of the ship and more than one deck. In passenger ships fitted with individually identifiable fire detectors, a section may serve spaces on both sides of the ship and on several decks but may not be situated in more than one main vertical zone.

(11) A section of fire detectors that covers a control station, a service space or an accommodation space shall not include a machinery space.

(12) Detectors shall be operated by heat, smoke or other products of combustion, flame or any combination of these factors. Detectors operated by other factors indicative of incipient fires may be considered by the Minister provided that they are not less sensitive than such detectors. Flame detectors shall only be used in addition to smoke or heat detectors.

(13) Suitable instructions and component spares for testing and maintenance shall be provided.

(14) (a) The function of the detection system shall be periodically tested to the satisfaction of the Minister 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.

(b) All detectors shall be of such a type that they can be tested for correct operation and restored to normal surveillance without the renewal of any component.

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

(16) Fire detection systems with a zone address identification capability shall be so arranged that –

(a) a loop cannot be damaged at more than one point by a fire,

- (b) means are provided to ensure that any fault (such as power break, short circuit, earth) occurring in the loop shall not render the whole loop ineffective,
- (c) all arrangements are made to enable the initial configuration of the system to be restored in the event of failure (electrical, electronic, informatic), and
- (d) the first initiated fire alarm shall not prevent any other detector from initiating further fire alarms.

(17) In a new Class B, C or D passenger ship constructed on or after 1 January 2003,

- (a) a fixed fire detection and fire alarm system shall be of an approved type complying with the Fire Safety Systems Code, and
- (b) 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 20 metres from a manually operated call point.

(18) In a new Class A, B, C or D passenger ship, the Minister shall ensure that safety provisions on the installations regarding their independence from other installations or systems, the corrosion resistance of their components, the electrical power supply to their control system, and the availability of instructions for their operation and maintenance, shall be complied with.

Fixed fire detection and fire alarm systems – installation requirements

89. (1) This Rule applies installation requirements for fixed fire detection and fire alarm systems in a new Class B, C or D passenger ship constructed before 1 January 2003.

(2) Manually operated call points 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 20 metres from a manually operated call point.

(3) Smoke detectors shall be installed in all stairways, corridors and escape routes within accommodation spaces.

(4) Where a fixed fire detection and fire alarm is required for the protection of spaces other than those specified in paragraph (3), at least one detector complying with Rule 88(12) shall be installed in each such space.

(5) Detectors shall be located for optimum performance. Positions near beams and ventilation ducts or other positions where patterns of airflow could adversely affect performance and positions where impact or physical damage is likely, shall be avoided. In general, detectors that are located on the overhead shall be a minimum distance of 0.5 metres away from bulkheads.

(6) (a) The maximum spacing of detectors shall be in accordance with Table 1 below:

Table 1

Type of detector	Maximum floor area per detector (m ²)	Maximum distance apart between centres (m)	Maximum distance away from bulkheads (m)
Heat	37	9	4.5
Smoke	74	11	5.5

(b) The Minister may require or permit other spaces based upon test data that demonstrate the characteristics of the detectors.

(7) Electrical wiring that forms part of the system shall be so arranged as to avoid galleys, machinery spaces, and other enclosed spaces of high fire risk except where it is necessary to provide for fire detection or fire alarm in such spaces or to connect to the appropriate power supply.

Fixed fire detection and fire alarm systems – design requirements

90. (1) A fixed fire detection and fire alarm system in a new Class B, C or D passenger ship constructed before 1 January 2003 shall comply with the design requirements of this Rule.

(2) The system and equipment shall be suitably designed to withstand supply voltage variation and transients, ambient temperature changes, vibration, humidity, shock, impact and corrosion normally encountered in ships.

(3) (a) Smoke detectors installed in stairways, corridors and escape routes within accommodation spaces in accordance with Rule 89(3) shall be certified to operate before the smoke density exceeds 12.5 per cent

obscuration per metre, but not until the smoke density exceeds 2 per cent obscuration per metre.

- (b) Smoke detectors installed in other spaces shall operate within sensitivity limits to the satisfaction of the Minister having regard to the avoidance of detector insensitivity or oversensitivity.

(4) Heat detectors shall be certified to operate before the temperature exceeds 78°C but not until the temperature exceeds 54°C, when the temperature is raised to those limits at a rate less than 1 °C per minute. At higher rates of temperature rise, the heat detector shall operate within temperature limits to the satisfaction of the Minister having regard to the avoidance of detector insensitivity or oversensitivity.

(5) The permissible temperature of operation of heat detectors may be increased to 30°C above the maximum deckhead temperature in drying rooms and similar spaces of a normal high ambient temperature.

Arrangements for oil fuel, lubricating oil and other flammable oils

91. (1) In a new Class B, C or D passenger ship, the following limitations shall apply to the use of oil as fuel:

- (a) except as otherwise permitted by this Rule, no oil fuel with a flashpoint of less than 60°C shall be used;
- (b) in emergency generators, oil fuel with a flashpoint of not less than 43°C may be used;
- (c) subject to such additional precautions as may be considered necessary and on condition that the ambient temperature of the space in which such oil fuel is stored or used shall not be allowed to rise to within 10°C below the flashpoint of the oil fuel, the Minister may permit the general use of oil fuel having a flashpoint of less than 60°C but not less than 43°C.

(2) (a) In a Class B, C or D passenger ship constructed on or after 1 January 2003, oil fuel having a flashpoint of less than 60°C but not less than 43°C may be permitted subject to the following requirements:

- (i) fuel oil tanks except those arranged in double bottom compartments shall be located outside of machinery spaces of category A;
- (ii) provisions for the measurement of oil temperature are provided on the suction pipe of the fuel pump;
- (iii) stop valves and/or cocks are provided on the inlet side and outlet side of the oil fuel strainers;

(iv) pipe joints of welded construction or of circular cone type or spherical type union joint are applied as much as possible.

(b) The flashpoint of oils shall be determined by an approved closed cup method.

(3) In a new Class B, C or D passenger ship in which oil fuel is used, the arrangements for the storage, distribution and utilisation of the oil fuel shall be such as to ensure the safety of the ship and the persons on board and shall at least comply with the following provisions:

(a) (i) 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;

(ii) for the purposes of this subparagraph "heated oil" means oil the temperature of which after heating is higher than 60°C or higher than the current flashpoint of the oil, if this is lower than 60°C .

(b) the ventilation of machinery spaces shall be sufficient under all normal conditions to prevent accumulation of oil vapour;

(c) as far as practicable, oil fuel tanks shall be part of the ship's structure and shall be located outside machinery spaces. Where oil fuel tanks, other than double bottom tanks, are necessarily located adjacent to or within machinery spaces, 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, they shall not contain oil fuel having a flashpoint of less than 60°C . The use of freestanding oil fuel tanks shall be avoided and shall be prohibited in machinery spaces;

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

- (e) (i) every oil fuel pipe which, if damaged, would allow oil to escape from a storage, settling or daily service tank, having a capacity of 500 litres or greater, 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. Where such additional valve is fitted in the machinery space, it shall be operated from a position outside this space;
- (ii) in passenger ships constructed on or after 1 January 2003, 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 located in machinery spaces;
- (iii) in passenger ships constructed on or after 1 January 2012 having a gross tonnage of less than 500, fuel tanks above the double bottom shall be fitted with a cock or valve;
- (iv) in passenger ships constructed before 1 January 2012 having a gross tonnage of less than 500, the cock or the valve mentioned in clause (i) shall also be fitted in fuel tanks having a capacity of less than 500 litres and situated above the double bottom, not later than the first periodical survey on or after 1 January 2012;
- (f) safe and efficient means of ascertaining the amount of oil fuel contained in any oil fuel tank shall be provided.

(4) In a new Class B, C or D passenger ship, sounding pipes 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, sounding pipes shall not terminate in machinery spaces. Where the Minister considers that these latter requirements are impracticable, termination of sounding pipes in machinery spaces may be permitted on condition that all the following requirements are met:

- (a) an oil-level gauge is provided meeting the requirements of paragraph (5)(a);
- (b) 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;

- (c) the termination 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. Provision shall be made to ensure that any spillage of oil fuel through the control cock involves no ignition hazard.
- (5) In a new Class B, C or D passenger ship:
- (a) other means of ascertaining the amount of oil fuel contained in any oil fuel tank may be permitted if such means, like the means provided in paragraph (4)(a), do not require penetration below the top of the tank, and providing their failure or overfilling of the tanks shall not permit release of fuel;
 - (b) means prescribed in subparagraph (a) shall be maintained in the proper condition to ensure their continued accurate functioning in service;
 - (c) 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. Any relief valves and air or overflow pipes 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 or into special category spaces, closed ro-ro cargo spaces, machinery spaces or similar spaces situated in ships constructed on or after 1 January 2003;
 - (d)
 - (i) oil fuel pipes and their valves and fittings shall be of steel or other approved material, except that restricted use of flexible pipes may be permitted. Such flexible pipes and end attachments shall be of approved fire-resisting materials of adequate strength;
 - (ii) in the case of valves fitted to oil fuel tanks and which are under static pressure, steel or spheroidal-graphite cast iron may be accepted. 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.
- (6) In a new Class B, C or D passenger ship:
- (a) all 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 for an alarm to be given where there is a fuel line failure;

- (b) all surfaces with temperatures greater than 220°C, which may be impinged as a result of a fuel system failure, shall be properly insulated;
- (c) oil fuel lines shall be screened or otherwise suitably protected to avoid as far as practicable oil spray or oil leakages onto hot surfaces, into machinery air intakes, or other sources of ignition. The number of joints in such piping systems shall be kept to a minimum.

(7) In a new Class B, C or D passenger ship constructed on or after 1 January 2003:

- (a) 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. 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;
- (b) 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 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 pressurised oil fuel leaks while in service and after maintenance;
- (c) 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;
- (d) where the Minister 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 Minister having regard to the fire risk.

- (8) (a) In a new Class B, C or D passenger ship, the arrangements for the storage, distribution and utilisation of oil used in pressure lubrication systems shall be such as to ensure the safety of the ship and persons

on board, and such arrangements in machinery spaces shall at least comply with paragraphs (3)(a), (d), (e), (f), (4), (5), (6)(b) and (c) except that:

- (i) this does not preclude the use of sight-flow glasses in lubricating systems provided that they are shown by test to have a suitable degree of fire resistance. If sight-flow glasses are used, the pipe shall be provided with valves in both ends. The valve at the lower end of the pipe shall be of a self-closing type;
 - (ii) sounding pipes may be authorised in machinery spaces. The requirements of subparagraphs (4)(a) and (4)(c) are not required to be applied on condition that the sounding pipes are fitted with appropriate means of closure;
- (b) In the case of a new Class B, C or D passenger ship constructed on or after 1 January 2003, the provisions of paragraph (3)(e) shall also apply to lubricating oil tanks except those having a capacity less than 500 litres, storage tanks on which valves are closed during the normal operation of the ship or where it is determined that the unintended operation of a quick closing valve on the lubricating oil tank would endanger the safe operation of the main propulsion and essential auxiliary machinery.
- (9) (a) The arrangements for the storage, distribution and utilisation 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.
- (b) In locations where means of ignition are present, such arrangements shall at least comply with paragraphs (3)(d) and (f), (6)(b) and (c) and with paragraphs (5)(c) and (d) in respect of strength and construction.

(10) In periodically unattended machinery spaces, in addition to the requirements of paragraphs (1) to (9), the oil fuel and lubricating oil systems shall comply with the following requirements:

- (a) where daily service oil fuel tanks are filled automatically, or by remote control, means shall be provided to prevent overflow spillages. Other equipment that treats flammable liquids automatically, such as 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;

- (b) 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.

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

Miscellaneous items

92. (1) In a new Class B, C or D passenger ship:

- (a) where "A" class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts or for girders, beams or other structural members, arrangements shall be made to the satisfaction of the Minister to ensure that the fire resistance is not impaired in so far as is reasonable and practicable;
- (b) in the case of passenger ships that are constructed on or after 1 January 2003, where "A" class divisions are penetrated, such penetrations shall be tested in accordance with the Fire Test Procedures Code, to ensure that the fire resistance of the divisions is not impaired;
- (c) in the case of ventilation ducts, Rules 106(4) and 107 apply;
- (d) where a pipe penetration is constructed 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 no openings, testing is not required. Such penetrations shall be suitably insulated by extension of the insulation at the same level of the division;
- (e) where "B" class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts or for the fitting of ventilation terminals, lighting fixtures and similar devices, arrangements shall be made to the satisfaction of the Minister to ensure that the fire resistance is not impaired in so far as is reasonable and practicable. In passenger ships that are constructed on or after 1 January 2003, for such penetrations arrangements shall be made to ensure that the fire resistance of the divisions is not impaired;
- (f) (i) pipes other than steel or copper that penetrate "B" class divisions shall be protected by either:
 - (I) a fire tested penetration device, suitable for the fire resistance of the division pierced and the type of the pipe used; or

- (II) 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 greater and not less than 600 mm for pipe diameters of less than 150 mm (preferably equally divided to each side of the division);
- (ii) 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;
- (g) (i) pipes penetrating “A” or “B” class divisions shall be constructed of approved materials to the satisfaction of the Minister having regard to the temperature such divisions are required to withstand;
- (ii) in a ship constructed on or after 1 January 2003, no-insulated metallic pipes penetrating “A” or “B” class divisions shall be of materials having a melting temperature that exceeds 950°C for “A-0” and 850°C for “B-0” class divisions;
- (h) in accommodation spaces, service spaces or control stations, pipes intended to convey oil or other flammable liquids shall be of a suitable material and construction to the satisfaction of the Minister having regard to the fire risk;
- (i) materials readily rendered ineffective by heat shall not be used for over board scuppers, sanitary discharges, and other outlets that are close to the waterline and where the failure of the material in the event of fire would give rise to danger of flooding;
- (j) 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;
- (k) all waste receptacles shall be constructed of non-combustible materials with no openings in the sides or bottom;
- (l) (i) in spaces where penetration of oil products is possible, the surface of insulation shall be impervious to oil or oil vapours;
- (ii) in a new Class A, B, C or D passenger ship, in spaces in which there is a risk of oils splashing or oil vapour, such as in machinery spaces of category A, the surface of the insulating material shall be impermeable by oil and oil vapour. Where there is covering by non-perforated steel plate or other non-

combustible materials, other than aluminium, which is the ultimate physical surface, this covering may be joined by seaming or riveting;

- (m) (i) paint lockers and flammable liquid lockers shall be protected by a fire-extinguishing arrangement approved by the Minister, enabling the crew to extinguish a fire without entering the space;
 - (ii) in a ship constructed on or after 1 January 2003, paint lockers shall be protected by one of the following systems:
 - (I) a carbon dioxide system, designed to give a minimum volume of free gas equal to 40 per cent of the gross volume of the protected space;
 - (II) a dry powder system, designed for at least 0.5 kg powder/m³;
 - (III) a waterspraying or sprinkler system, designed for 5 litres/m² minute. Water spraying systems may be connected to the fire main of the ship; or
 - (IV) a system providing equivalent protection to the satisfaction of the Minister.
 - (iii) in any case, the system provided shall be operable from outside the protected space;
- (n) flammable liquid lockers shall be protected by an appropriate fire extinguishing arrangement approved by the Minister;
 - (o) (i) in the case of lockers of a deck area of less than 4 m², which do not give access to accommodation spaces, a carbon dioxide portable extinguisher sized to provide a minimum volume of free gas equal to 40 per cent of the gross volume of the space may be accepted by the Minister in lieu of a fixed system;
 - (ii) a discharge port shall be arranged in the locker referred to in clause (i) 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;

- (p) (i) in a new Class A, B, C or D passenger ship, deep-fat fryers, boiling and roasting apparatus shall not be installed or used in spaces outside the main galley;
 - (ii) in a ship constructed on or after 1 January 2003, deep-fat cooking equipment shall be fitted with the following:
 - (I) an automatic or manual extinguishing system tested to an international standard in accordance with Publication ISO 15371:2000 on fire-extinguishing systems for protection of galley deep-fat cooking equipment;
 - (II) a primary and backup thermostat with an alarm to alert the operator in the event of failure of either thermostat;
 - (III) arrangements for automatically shutting off the electrical power upon activation of the extinguishing system;
 - (IV) an alarm for indicating operation of the extinguishing system in the galley where the equipment is installed;
 - (V) controls for manual operation of the extinguishing system, which are clearly labelled for ready use of the crew;
 - (iii) in a ship constructed before 1 January 2003, new installations for deep-fat cooking equipment shall comply with the requirements of this subparagraph;
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- (q) (i) in a new Class A, B, C or D passenger ship, in the implementation of fire proofing measures, steps shall be undertaken to the satisfaction of the Minister to prevent heat transfer through heat bridges, such as between decks and bulkheads;
 - (ii) in a ship constructed on or after 1 January 2003, 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 aluminium 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;
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- (r) in a new Class A, B, C or D passenger ship, all portable containers for gases that are compressed, liquefied or broken down under pressure, which may feed a possible fire, shall immediately after use be put in a suitable place above the bulkhead deck, from which there is direct access to open deck.

Fire control plans

93. (1) In a new Class B, C or D passenger ship, general arrangement fire control plans shall be permanently exhibited for the guidance of the ship's officers.

(2) The general arrangement fire control plans shall show clearly for each deck of the ship 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 fire-extinguishing appliances, means of access to different compartments, decks and other areas, 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.

(3) As an alternative to paragraph (2) and at the discretion of the Minister, 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 the ship in an accessible position. Plans and booklets shall be kept up to date, any alterations being recorded thereon as soon as practicable. Description in such plans and booklets shall be in the English language.

(4) In a new class B, C or D passenger ship constructed on or after 1 January 2003, the information to be provided in accordance with this Rule with the required fire control plans and booklets, and the graphical symbols to be used for the fire control plans, shall be in accordance with the IMO Resolutions A.756(18) and A.952(23) in their updated version.

Operational readiness and maintenance

94. (1) This Rule applies to a new Class B, C or D passenger ship.

(2) (a) At all times while a ship is in service, the fire protection systems and fire-fighting systems and appliances shall be maintained ready for use.

(b) For the purposes of this Rule, a ship is not in service when:

- (i) it is in a port for repairs or is or laid up (either at anchor or at a berth in a port) or in dry-dock;
- (ii) it is declared not in service by the owner or the owner's representative; and
- (iii) there are no passengers on board the ship.

(3) The following fire protection systems shall be kept in good order so as to ensure their operational readiness and required performance in the event of a fire occurring:

- (a) structural fire protection including fire resisting divisions and protection of openings and penetrations in these divisions;
- (b) fire detection and fire alarm systems; and
- (c) means of escape systems and appliances.

(4) Fire-fighting systems and appliances shall be kept in good working order and readily available for immediate use. Portable extinguishers that have been discharged shall be immediately recharged or replaced with an equivalent unit.

(5) Maintenance, testing and inspections shall be carried out based on the Revised Guidelines for the maintenance and inspection of fire protection systems and appliances in IMO MSC.1/Circ.1432 in its updated version and in a manner that has due regard to ensuring the reliability of fire-fighting systems and appliances.

(6) A maintenance plan shall be kept on board a passenger ship and shall be available for inspection whenever required by a surveyor of ships.

(7) The maintenance plan referred to in paragraph (6) shall include at least the following fire protection systems and fire-fighting systems and appliances, where installed:

- (a) fire mains, fire pumps and hydrants including hoses and nozzles;
- (b) fixed fire detection and fire alarm systems;
- (c) fixed fire-extinguishing systems and other fire-extinguishing appliances;
- (d) automatic sprinkler, fire detection and fire alarm systems;
- (e) ventilation systems, including fire and smoke dampers, fans and their controls;
- (f) emergency shutdown of fuel supply;
- (g) fire doors, including their controls;
- (h) general emergency alarm systems;
- (i) emergency escape breathing devices;
- (j) portable fire extinguishers, including spare charges; and
- (k) fire-fighter's outfits.

(8) The maintenance programme may be computer-based.

(9) In a new Class B, C or D passenger ship constructed on or after 1 January 2003 and carrying more than 36 passengers, a maintenance plan for low-location lighting and public address systems shall be developed in addition to the maintenance plan referred to in paragraph (6).

Instructions, on-board training and drills

95. (1) This Rule applies to a new Class B, C or D passenger ship.

(2) Crew members shall receive instructions on fire safety on-board the ship and on their assigned duties.

(3) Working parties responsible for fire extinguishing shall be organised and shall have the capability to complete their duties at all times while the ship is in service.

(4) 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.

(5) Training in the use of the emergency escape breathing devices shall be considered as a part of on-board training where such devices are installed on a ship.

(6) Performance of crew members assigned fire-fighting duties shall be periodically evaluated by conducting on-board 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 organisation.

(7) On-board training in the use of the ship's fire-extinguishing systems and appliances shall be planned and conducted in accordance with Rule 20(5)(a) of the Rules of 2018.

(8) Fire drills shall be conducted and recorded in accordance with Rule 20(4) and (6), and Rule 31 of the Rules of 2018.

(9) (a) A training manual shall be provided in each crew mess room and recreation room or in each crew cabin, or on the navigating bridge where such rooms and cabins are not present on board the ship.

(b) The training manual provided in accordance with subparagraph (a) –

(i) shall be written in the English language,

(ii) may comprise several volumes, and

(iii) shall contain the instructions and the information required in subparagraph (c) 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.

(c) The training manual provided in accordance with subparagraph (a) shall explain the following in detail:

(i) general fire safety practice and precautions related to the dangers of smoking, electrical hazards, flammable liquids and similar common shipboard hazards;

- (ii) general instructions on fire-fighting activities and fire-fighting procedures, including procedures for notification of a fire and use of manually operated call points;
 - (iii) the meanings of ship's alarms;
 - (iv) the operation and use of fire-fighting systems and appliances;
 - (v) the operation and use of fire doors;
 - (vi) the operation and use of fire and smoke dampers;
 - (vii) escape systems and appliances.
- (10) Fire control plans shall comply with the requirements of Rule 93.
- (11) (a) For the purpose of providing information and instruction for proper ship and cargo handling operations in relation to fire safety, operational booklets shall be provided on board a ship.
- (b) The required fire operational booklet provided in accordance with subparagraph (a) –
- (i) shall contain the necessary information and instructions for the safe operation of the ship and cargo handling operations in relation to fire safety,
 - (ii) shall include information concerning the crew's responsibilities for the general fire safety of the ship while embarking and disembarking passengers, loading and discharging cargo, bunkering and while underway,
 - (iii) in the case of a ship carrying dangerous goods, shall provide reference to the pertinent fire-fighting and emergency cargo handling instructions contained in the International Maritime Dangerous Goods Code,
 - (iv) shall be written in the English language, and
 - (v) may be combined with the training manuals required in paragraph (9).

PART B

FIRE SAFETY MEASURES

Structure

96. (1) This Rule applies to a new Class B, C or D passenger ship.

- (2) (a) The hull, superstructures, structural bulkheads, decks and deckhouses of a ship shall be constructed of steel or other equivalent material.
- (b) For the purpose of applying the definition of steel or other equivalent material in Rule 67(1), the “applicable fire exposure” shall be according to the integrity and insulation standards given in the Tables to Rules 99 and 100.
- (3) In cases where any part of the structure of a ship is constructed of aluminium alloy, the following shall apply:
- (a) the insulation of aluminium alloy components of “A” or “B” class divisions, except structure which 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;
- (b) special attention shall be given to the insulation of aluminium alloy components of columns, stanchions and other structural members required to support lifeboat and life-raft stowage, launching and embarkation areas, and “A” and “B” class divisions to ensure:
- (i) that for such members supporting lifeboat and life-raft areas and “A” class divisions, the temperature rise limitation specified in subparagraph (a) shall apply at the end of 60 minutes; and
- (ii) that for such members required to support “B” class divisions, the temperature rise limitation specified in subparagraph (a) shall apply at the end of 30 minutes;
- (c) crowns and casings of category A machinery spaces shall be of steel construction and adequately insulated and the openings therein, if any, shall be suitably arranged and protected to prevent the spread of fire.

Main vertical zones and horizontal zones

97. (1) In a new Class B, C or D passenger ship carrying more than 36 passengers, the hull, superstructure and deckhouses shall be contained in a single main vertical zone, except in cases where the Minister considers that it is proper to apply sub-division into two or more main vertical zones taking into account the design and intended service of the ship. Where sub-division into two or more vertical zones is required, the hull, superstructure and deckhouses shall be subdivided by “A-60” class divisions. Steps and recesses shall be kept to a minimum but where they are necessary, they shall be “A-60” class divisions. Where an open deck space, a sanitary or similar space or a tank including a fuel oil tank, void space or auxiliary machinery space having little or no fire risk, 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 a new Class B, C or D passenger ship carrying not more than 36 passengers, the hull, superstructure and deckhouses in way of accommodation and service spaces shall be contained in a single main vertical zone, except in cases where the Minister considers that it is proper to apply sub-division into two or more main vertical zones taking into account the design and intended service of the ship. Where sub-division into two or more vertical zones is required, the hull, superstructure and deckhouses shall be subdivided into main vertical zones by “A” class divisions. These divisions shall have insulation values in accordance with the Tables to Rule 100.

(3) In a new Class B, C or D passenger ship, where sub-division is required, 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.

(4) In a new Class B, C or D passenger ship carrying more than 36 passengers:

- (a) the bulkheads referred to in paragraph (3) shall extend from deck to deck and to the shell or other boundaries;
- (b) on ships designed for special purposes, such as automobile or railroad car ferries where the provision of main vertical zone bulkheads would defeat the purpose for which the ship is intended, equivalent protection shall be obtained by dividing space in horizontal zones;
- (c) on a ship with special category spaces, any such space as referenced in subparagraph (b) shall comply with the applicable provisions of Rule 119 and in so far as such compliance would be inconsistent with compliance with other requirements of this Part, the requirements of Rule 119 shall prevail.

Bulkheads within a main vertical zone

98. (1) In a new Class B, C or D passenger ship carrying more than 36 passengers, all bulkheads that are not required to be “A” class divisions shall be at least “B” class or “C” class divisions as prescribed in Tables 1 and 2 to Rule 99. All such divisions may be faced with combustible materials in accordance with Rule 116.

(2) In a new Class B, C or D passenger ship carrying not more than 36 passengers, all bulkheads within accommodation and service spaces that are not required to be “A” class divisions shall be at least “B” class or “C” class divisions as prescribed in Tables 1 and 3 to Rule 100. All such divisions may be faced with combustible materials in accordance with Rule 116.

(3) In a new Class B, C or D passenger ship carrying not more than 36 passengers, all corridor bulkheads, where not required to be “A” class divisions,

shall be “B” class divisions which shall extend from deck to deck except 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 Minister.

(4) All bulkheads required to be “B” class division, except corridor bulkheads prescribed in paragraph (3), shall extend from deck to deck and to the shell or other boundaries unless the continuous “B” class ceilings or linings fitted on both sides of the bulkheads are at least of the same fire resistance as the bulkhead, in which case the bulkhead may terminate at the continuous ceiling or lining.

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

99. (1) In a new Class B, C or D passenger ship, in addition to complying with the specific provisions for fire integrity of bulkheads and decks elsewhere in this Part, the minimum fire integrity of all bulkheads and decks shall be as prescribed in Tables 1 and 2 to this Rule.

(2) The following requirements shall govern the application of Tables 1 and 2 to this Rule:

- (a) Table 1 shall apply to bulkheads not bounding either main vertical zones or bounding horizontal zones. Table 2 shall apply to decks not forming steps in main vertical zones nor bounding horizontal zones;
- (b) in order to determine 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). Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this Rule, it shall be treated as a space within the relevant category having the most stringent boundary requirements. 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, including:
 - spaces containing emergency sources of power and lighting;
 - wheelhouse and chartroom;
 - spaces containing the ship’s radio equipment;
 - fire-extinguishing rooms, fire control rooms and fire-recording stations;
 - control room for propulsion machinery when located outside the propulsion machinery space;

spaces containing centralised fire alarm equipment;
 spaces containing centralised emergency public address system stations and equipment.

- (2) Stairways, including:
 interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) for passengers and crew and enclosures thereto; in this connection a stairway that 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 including passenger and crew corridors.
- (4) Evacuation stations and external escape routes, including:
 survival craft stowage area;
 open deck spaces and enclosed promenades forming lifeboat and life-raft embarkation and lowering stations;
 muster 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 life-rafts and evacuation slide's embarkation areas.
- (5) Open deck spaces, including:
 open deck spaces and enclosed promenades clear of lifeboat and life-raft embarkation and lowering stations;
 air spaces (the space outside superstructures and deckhouses).
- (6) Accommodation spaces of minor fire risk, including:
 cabins containing furniture and furnishing 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 m².
- (7) Accommodation spaces of moderate fire risk, including:
 spaces as in category (6) but containing furniture and furnishing of other than restricted fire risk;
 public spaces containing furniture and furnishing of restricted fire risk and having a deck area of 50 m² or greater;

isolated lockers and small storerooms in accommodation spaces having areas less than 4 m² (in which flammable liquids are not stowed);

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 m² or less);

specie rooms;

operating rooms.

- (8) Accommodation spaces of greater fire risk, including:

public spaces containing furniture and furnishing of other than restricted fire risk and having a deck area of 50 m² or greater;

barber shops and sale shops.

- (9) sanitary and similar spaces, including:

communal sanitary facilities, shower, baths, water closets;

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, including:

water tanks forming part of the ship's structure;

voids and cofferdams;

auxiliary machinery spaces that 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; stabiliser 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; spaces for pumps and refrigeration machinery (not handling or using flammable liquids);

closed trunks serving the aforementioned spaces, and other closed trunks such as pipe and cable trunks.

- (11) Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk, including:

cargo oil tanks;

cargo holds, trunkways and hatchways;

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) that 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 small internal combustion engines of power output up to 110 kW driving generators, sprinkler, drencher or fire pumps, bilge pumps;

closed trunks serving the aforementioned spaces.

- (12) Machinery spaces and main galleys, including:

main propulsion machinery rooms (other than electric propulsion motor rooms) and boiler rooms;

auxiliary machinery spaces other than those in categories (10) and (11) that contain internal combustion machinery or other oil burning, heating or pumping units;

main galleys and annexes;

trunks and casings to the aforementioned spaces.

- (13) Store-rooms, workshops, pantries, including:

main pantries not annexed to galleys;

main laundry;

large drying rooms (having a deck area greater than 4 m²);

miscellaneous stores;

mail and baggage rooms;

garbage rooms;

workshops (not part of machinery spaces or galleys);

lockers and storerooms having areas greater than 4 m², other than those spaces that have provisions for the storage of flammable liquids.

(14) Other spaces in which flammable liquids are stowed, including:

paint lockers;

store-rooms containing flammable liquids (including dyes and medicines);

laboratories (in which flammable liquids are stowed);

- (c) where a single value is shown for the fire integrity of a boundary between two spaces, that value shall apply in all cases;
- (d) there are no special requirements for material or integrity of boundaries where only a dash appears in the Tables;
- (e) the Minister shall determine in respect of category (5) spaces whether the insulation values in Table 1 shall apply to ends of deckhouses and superstructures, and whether the insulation values in Table 2 shall apply to weather decks. In no case shall the requirements of category (5) of Table 1 or Table 2 necessitate enclosure of spaces which in the opinion of the Minister are not required to be enclosed.

(3) Continuous “B” class ceiling or linings, in association with the relevant decks or bulkheads, may be accepted by the Minister as contributing wholly or in part, to the required insulation and integrity of a division.

(4) In approving structural fire protection details, the Minister shall have regard to the risk of heat transmission at intersections and terminal points of required thermal barriers.

Table 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-0 ^c	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
Evacuation 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 greater 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-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-0 ^a	A-0	A-0	A-15
Machinery spaces and main galleys	(12)												A-0 ^a	A-0	A-60
Storerooms, workshops, pantries, etc.	(13)													A-0 ^a	A-0
Other spaces in which flammable liquids are stowed	(14)														A-30

Note: See Notes following Table 2 to this Rule

Table 2
Decks neither forming steps in main vertical zones nor bounding horizontal zones

Space below ↓ Space 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
Evacuation 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 greater 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

Storerooms, workshops, pantries, 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
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

Notes to be applied to Tables 1 and 2 to Rule 99

a – Where adjacent spaces are in the same numerical category and superscript “a” appears, a bulkhead or deck between such spaces is not required to be fitted if deemed unnecessary by the Minister. For example, in category (12) a bulkhead may not be required between a galley and its annexed pantries provided the pantry bulkhead and decks maintain the integrity of the galley boundaries. A bulkhead is required between a galley and a 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 the 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 may be of ‘B’ class integrity.

d – Where spaces of categories (6), (7), (8) and (9) are located completely within the outer perimeter of the muster station, the bulkheads of these spaces may be of ‘B-0’ class integrity. Control positions for audio, video and light installations may be considered as part of the muster station.

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

100. (1)(a) In a new Class B, C or D passenger ship carrying not more than 36 passengers, in addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this Part, the minimum fire integrity of bulkheads and decks shall be as prescribed in Table 1 to this Rule, and Table 3 to this Rule in the case of a passenger ship constructed before 1 January 2018, and as prescribed in Table 2 and Table 4 to this Rule in the case of a passenger ship constructed on or after 1 January 2018, as appropriate.
- (b) When approving structural precautions for fire protection in new ships, account shall be taken of the risk of heat transfer between heat bridges at intersection points and of where the thermal barring devices terminate.
- (2) The following requirements shall govern the application of Tables 1 and 3 and Tables 2 and 4 to this Rule as appropriate:
- (a) Tables 1, 2, 3 and 4 to this Rule shall apply respectively to the bulkheads and decks separating adjacent spaces;
- (b) in order to determine 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. 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, including:
- spaces containing emergency sources of power and lighting;
 - wheelhouse and chartroom;
 - spaces containing the ship's radio equipment;
 - fire-extinguishing rooms, fire control rooms and fire-recording stations;
 - control room for propulsion machinery when located outside the propulsion machinery space;
 - spaces containing centralised fire alarm equipment.
- (2) Corridors, including passenger and crew corridors and lobbies.
- (3) Accommodation spaces, excluding corridors.

- (4) Stairways, including:
interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto; in this connection, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.
- (5) Service spaces (low risk), including lockers and storerooms not having provisions for the storage of flammable liquids and having areas less than 4 m² and drying rooms and laundries.
- (6) Machinery spaces of category A
- (7) Other machinery spaces, including machinery spaces as defined in Rule 2, but excluding machinery spaces of category A.
- (8) Cargo spaces, including all spaces used for cargo (including cargo oil tanks) and trunkways and hatchways to such spaces, other than special category spaces.
- (9) Service spaces (high risk) including:
galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and storerooms having areas of 4 m² or greater, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces.
- (10) Open decks, including open deck spaces and enclosed promenades having no fire risk.
Air spaces, being the space outside superstructures and deckhouses.
- (11) Special category spaces.

(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 Rule 96(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 to have “A” class integrity elsewhere in this Part. Similarly, in such boundaries which are not required to have “A” class integrity, doors may be of materials to the satisfaction of the Minister.

Table 1
Fire integrity of bulkheads separating adjacent spaces

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 ^d	B-0 ^d	A-0 ^a	B-0 ^d	A-60	A-0	A-0	A-15	(*)	A-15
Accommodation spaces	(3)			C ^d	A-0 ^a	B-0 ^d	A-60	A-0	A-0	A-15	(*)	A-30
Stairways	(4)				A-0 ^a	A-0 ^a	A-60	A-0	A-0	A-15	(*)	A-15
Service spaces (low risk) undefined	(5)					C ^d	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 risk)	(9)									A-0 ^b	(*)	A-30
Open decks	(10)											A-0
Special category spaces	(11)											A-0

Note: See Notes following Table 4 to this Rule

Table 2

Fire integrity of bulkheads separating adjacent spaces in a passenger ship of Class B, C or D constructed on or after 1 January 2018

Spaces		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations	(1)	A-0 ^d	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*	A-60
Corridors	(2)		C ^d	B-0 ^d	A-0 ^d	B-0 ^d	A-60	A-15	A-60	A-15	*	A-30
Accommodation Spaces	(3)			C ^d	A-0 ^d	B-0 ^d	A-60	A-0	A-0	A-15	*	A-30
Stairways	(4)				A-0 ^d	A-0 ^d	A-60	A-0	A-0	A-15	*	A-30
Service spaces (low risk)	(5)					C ^d	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 risk)	(9)									A-0 ^b	*	A-30
Open decks	(10)											A-0
Special category and Ro-Ro spaces	(11)											A-30

Note: See Notes following Table 4 to this Rule

Table 3
Fire integrity of decks separating adjacent spaces

Space below↓ Space 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-30
Corridors	(2)	A-0	(*)	(*)	A-0	(*)	A-60	A-0	A-0	A-0	(*)	A-0
Accommodation spaces	(3)	A-60	A-0	(*)	A-0	(*)	A-60	A-0	A-0	A-0	(*)	A-30
Stairways	(4)	A-0	A-0	A-0	(*)	A-0	A-60	A-0	A-0	A-0	(*)	A-0
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 e	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 risk)	(9)	A-60	A-30	A-30	A-30	A-0	A-60	A-0	A-0	A-0	(*)	A-30
Open decks	(10)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	—	A-0
Special category spaces	(11)	A-60	A-15	A-30	A-15	A-0	A-30	A-0	A-0	A-30	A-0	A-0

Note: See Notes following Table 4 to this Rule

Table 4**Fire integrity of decks separating adjacent spaces in a Class B, C or D passenger ship constructed on or after 1 January 2018**

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
Corridors	(2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30
Accommodation spaces	(3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30
Stairways	(4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*	A-30
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-60e	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 risk)	(9)	A-60	A-30	A-30	A-30	A-0	A-60	A-0	A-0	A-0	*	A-30
Open decks	(10)	*	*	*	*	*	*	*	*	*	—	A-0
Special category and Ro-Ro spaces	(11)	A-60	A-30	A-30	A-30	A-0	A-60	A-0	A-0	A-30	A-0	A-30

Notes to be applied to Tables 1, 2, 3 and 4 to Rule 100, as appropriate:

a – For clarification as to which applies, see Rules 98 and 104.

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, such as in category (9). A galley next to a galley shall not require a bulkhead but a galley next to a paint room shall require an “A-0” bulkhead.

c – Bulkheads separating the wheelhouse and chartroom from each other may be “B-0” rating.

d – For the application of Rule 97(2), “B-0” and “C”, where appearing in Table 1 and Table 2, shall be read as “A-0”.

e – Fire insulation is not required to be fitted where the machinery space in category (7) has little or no fire risk.

(*) 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. In ships constructed on or after 1 January 2003, where a deck, except in a category (10) space, is penetrated for the passage of electric cables, pipes and ventilation ducts, such penetration shall be made tight to prevent the passage of flame and smoke. Divisions between control stations (emergency generators) and open decks may have air intake openings without means for closure, unless a fixed gas fire-fighting system is fitted. For the application of Rule 97(2), an asterisk, where appearing in Table 3 and Table 4, except for categories (8) and (10), shall be read as “A-0”.

Means of escape

101. (1) In a new Class B, C or D passenger ship, stairways and ladders, corridors and doors shall be arranged to provide ready means of escape to the lifeboat and life-raft embarkation deck from all passenger and crew spaces and from spaces in which the crew is normally employed, other than machinery spaces. In particular, the following provisions shall be complied with:

- (a) (i) 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 one of the means of escape may be dispensed with, due regard being paid to the nature and location of spaces and to the number of persons who might normally be employed in a space. In such a case the sole means of escape shall provide safe escape;
- (ii) in a passenger ship constructed on or after 1 January 2003, the dispensation provided for in clause (i) may only be given for crew spaces that are entered only occasionally, in which case the required escape route shall be independent of watertight doors;
- (b) 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;
- (c) where a radiotelegraph station has no direct access to the open deck, two means of escape from or access to such station shall be provided, one of which may be a porthole or window of sufficient size or another means;
- (d) dead-end corridors used in service areas which are necessary for the practical utility of the ship, such as fuel oil stations and athwartship supply corridors, shall be permitted, provided such dead-end corridors are separated from crew accommodation areas and are inaccessible from passenger accommodation areas. A part of a corridor that has a depth not exceeding its width is considered a recess or local extension and shall be permitted;
- (e) (i) in a new Class B, C or D passenger ship constructed before 1 January 2003, satisfactory protection of access from the stairway enclosures to the lifeboat and life-raft embarkation areas shall be provided;
- (ii) in a Class B, C or D passenger ship constructed on or after 1 January 2003, protection of access from the stairway enclosures to the lifeboat and life-raft 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 the Tables in Rules 99 and 100, as appropriate;

- (f) (i) in a new Class B, C or D passenger ship, in addition to the emergency lighting required by Rule 55 and Rule 12(5) of the Rules of 2018, the means of escape including stairways and exits, shall be marked by lighting or photoluminescent 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 all the routes of escape and readily identify the escape exits. Where 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, all escape route signs and fire equipment location markings shall be of photoluminescent material or marked by lighting. The Minister shall ensure that such lighting or photoluminescent equipment have been evaluated, tested and applied in accordance with the guidelines as given in IMO Resolution A.752(18);
- (ii) in the case of a Class B, C and D passenger ship constructed on or after 1 January 2003, such lighting or photoluminescent equipment shall be evaluated, tested and applied in accordance with the Fire Safety Systems Code;
- (g) in the case of a Class B, C or D passenger ship constructed on or after 1 January 2003 and carrying more than 36 passengers, the requirements of subparagraph (f) shall also apply to the crew accommodations;
- (h) in a Class B, C or D passenger ship constructed on or after 1 January 2003:
 - (i) cabin and stateroom doors shall not require keys to unlock them from inside the room. Neither shall there be any doors along any designated escape route that require keys to unlock them when moving in the direction of escape;
 - (ii) 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 Minister and shall, in particular:

- (I) 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;
 - (II) cause the door latch to release when a force not exceeding 67 N is applied; and
 - (III) 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.
- (2) (a) (i) In special category spaces on a new Class B, C or D passenger ship, the number and disposition of the means of escape both below and above the bulkhead deck shall be to the satisfaction of the Minister and in general the safety of access to the embarkation deck shall be at least equivalent to that provided under paragraph (1)(a), (1)(b) and (1)(e)(i).
- (ii) In a new Class B, C or D passenger ship constructed on or after 1 January 2003, special category spaces shall be provided with designated walkways to the means of escape with a breadth of at least 600 mm, and where practicable and reasonable those designated longitudinal walkways shall raise at least 150 mm above the deck surface. The parking arrangements for vehicles shall maintain the walkways clear at all times.
- (b) In a new Class B, C or D passenger ship, one of the escape routes from the machinery spaces where the crew is normally employed shall avoid direct access to any special category space. Hoistable drive-up/down ramps to platform decks must not be capable of blocking the approved escape routes when in lowered position.
- (3) In a new Class B, C or D passenger ship, two means of escape shall be provided from each machinery space. In particular, the following provisions shall be complied with:
- (a) where the space is below the bulkhead deck, the two means of escape shall consist of either:
 - (i) 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 there is access to the appropriate lifeboat and life-raft embarkation decks. In a new passenger ship, one of these ladders shall provide continuous fire shelter from the lower part of the space to a safe position outside the space. In a new Class B, C or D passenger ship constructed on or after 1 January 2003, that ladder shall be located within a protected enclosure that satisfies Rule 99(2)(b), category (2) or Rule 100(2)(b), 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 × 800 mm, and shall have emergency lighting provisions; or

- (ii) one steel ladder leading to a door 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.
- (b) 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 life-raft embarkation decks. Where such means of escape require the use of ladders, these shall be of steel;
 - (c) in a Class A, B, C or D passenger ship, from spaces for monitoring the operation of machinery, and from work spaces, there shall be at least two means of escape, one of which shall be independent of the machinery space and give access to the embarkation deck;
 - (d) the underside of stairs in machinery spaces shall be shielded.
- (4) In a new Class B, C or D passenger ship:
- (a) the Minister may dispense with one of the means of escape in machinery spaces, due regard being paid to the width and disposition of the upper part of the space;
 - (b) 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.

(5) In a Class B, C or D passenger ship constructed on or after 1 January 2018, two means of escape shall be provided from the main workshop within a machinery space. At least one of those escape routes shall provide a continuous fire shelter to a safe position outside the machinery space.

(6) In no case in a new Class B, C or D passenger ship shall lifts be considered as forming one of the required means of escape.

Escape routes on ro-ro passenger ships

102. (1) In a new Class B, C or D ro-ro passenger ship, escape routes shall meet the following requirements:

- (a) handrails or other handholds shall be provided in all corridors along the entire escape route, so that a firm handhold is available every step of the way, where possible, to the muster stations and embarkation stations. Such handrails shall be provided on both sides of longitudinal corridors greater than 1.8 metres in width and transverse corridors greater than one metre in width. Particular attention shall be paid to the need for persons 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 centre of the corridor or space, and a distributed vertical load of 750 N/m applied in the downward direction. The two loads are not required to be applied simultaneously;
- (b) escape routes shall not be obstructed by furniture or 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 where the ship rolls or lists. Floor coverings shall also be secured in place. When the ship is underway, escape routes shall be kept clear of obstructions such as cleaning carts, bedding, luggage and boxes containing goods;
- (c) escape routes shall be provided from every normally occupied space on the ship to a muster station. These escape routes shall be arranged so as to provide the most direct route possible to the muster station, and shall be marked with symbols related to life-saving appliances and arrangements, adopted by the IMO by Resolution A.760(18) in its updated version;
- (d) 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;
- (e) decks shall be sequentially numbered, starting with "1" at the tank top or lowest deck. These 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;
- (f) 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 door 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;
- (g) cabin and stateroom doors shall not require keys to unlock them from inside the room. Neither shall there be any doors along any designed escape route which require keys to unlock them when moving in the direction of escape.

(2) In a new Class B, C or D ro-ro passenger ship, escape routes shall meet the following requirements:

- (a) the lowest 0.5 metres of bulkheads and other partitions forming vertical divisions along escape routes shall be able to sustain a load of 750 N/m² to allow them to be used as walking surfaces from the side of the escape route with the ship at large angles of heel;
- (b) 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 a muster station or open deck from any passenger space;
- (c) external routes shall be provided from open decks referred to in subparagraph (b) to the survival craft embarkation stations.

(3) In a new Class B, C or D ro-ro passenger ship constructed on or after 1 July 1999, escape routes shall be evaluated early in the design process by an evacuation analysis carried out with regard to the IMO Guidelines for evacuation analysis for new and existing passenger ships in MSC.1/Circ.1238. The analysis shall be used to identify and eliminate, as far as practicable, congestion which may develop during 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 the movement of the 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, muster stations, embarkation stations or survival craft may not be available as a result of a casualty.

Penetrations and openings in "A" and "B" class divisions

103. (1) In a new Class B, C or D passenger ship, all openings in "A" class divisions shall meet the following requirements:

- (a) all openings in "A" class divisions shall be provided with permanently attached means of closing which shall be as effective for resisting fires as the divisions in which they are fitted;
- (b) the construction of all 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, as far as practicable equivalent to that of the bulkheads in which the doors are situated. Such doors and doorframes shall be constructed of steel or other equivalent material. Watertight doors are not required to be insulated;
- (c) it shall be possible for each door to be opened and closed from each side of the bulkhead by one person only;
- (d) fire doors in main vertical zone bulkheads and stairways enclosures other than power-operated sliding watertight doors

and doors normally locked, shall satisfy the following requirements:

- (i) the doors shall be self-closing and be capable of closing with an angle of up to 3.5° opposing closure. The speed of closure shall, if necessary, be controlled so as to prevent undue danger to persons. In new ships the uniform rate of closure shall be no more than 0.2 m/s and no less than 0.1 m/s with the ship in the upright position;
- (ii) in a new Class B, C or D passenger ship, remote-controlled sliding or power-operated doors shall be equipped with an alarm that sounds at least 5 seconds but no more than 10 seconds before the door begins to move and continues sounding until the door is completely closed. A door designed to re-open upon contacting an object in its path shall re-open sufficiently to allow a clear passage of at least 0.75 metres, but no more than one metre;
- (iii) in a new Class B, C or D passenger ship, all doors, except fire doors which are normally kept closed, shall be capable of remote and automatic release from a continuously manned central control station, either simultaneously or in groups, and also individually from a position at both sides of the door. Indication shall be provided at the fire control panel in the continuously manned central control station whether each of the remote-controlled doors is closed. 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. Release switches shall have an on-off function to prevent automatic resetting of the system. Holdback hooks not subject to central control station release are prohibited;
- (iv) in a new Class B, C or D passenger ship, 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 10 times (fully opened and closed) using the local controls;
- (v) double-leaf doors equipped with a latch necessary to their fire integrity shall have a latch that is automatically activated by the operation of the doors when released by the system;
- (vi) doors giving direct access to special category spaces which are power-operated and automatically closed are not

required to be equipped with the alarms and remote-release mechanisms required by clauses (ii) and (iii).

(2) In the case of a Class B, C or D passenger ship constructed on or after 1 January 2003, fire doors in main vertical zone bulkheads, galley boundaries and stairway enclosures other than power-operated watertight doors and those that are normally locked, shall satisfy the following requirements:

- (a) the doors shall be self-closing and shall be capable of closing against an angle of inclination of up to 3.5° opposing closure;
- (b) the approximate time of closure for hinged fire doors shall be no more than 40 seconds and no less than 10 seconds from the beginning of their movement with the ship in the upright position. The approximate uniform rate of closure for sliding fire doors shall be of no more than 0.2 m/s and no less than 0.1 m/s with the ship in the upright position;
- (c) the doors shall be capable of remote release from the continuously manned central control station, either simultaneously or in groups and shall also be capable of release 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;
- (d) hold-back hooks not subject to central control station release are prohibited;
- (e) a door closed remotely from the central control station shall be capable of being reopened at both sides of the door by local control. After such local opening the door shall automatically close again;
- (f) indication shall be provided at the fire door indicator panel in the continuously manned central control station whether each of the remote-released doors are closed;
- (g) the release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system or main source of electric power;
- (h) local power accumulators for power-operated doors shall be provided in the immediate vicinity of the doors to enable the doors to be operated after disruption of the control system or main source of electric power at least 10 times (fully opened or closed) using the local controls;
- (i) disruption of the control system or main source of electric power at one door shall not impair the safe functioning of the other doors;
- (j) remote-released sliding or power-operated doors shall be equipped with an alarm that sounds for at least 5 seconds but no longer than 10 seconds after the door is released from the central control station and before the door begins to move and continue sounding until the door is completely closed;

- (k) a door designed to re-open upon contacting an object in its path shall re-open not more than one metre from the point of contact;
- (l) double-leaf doors equipped with latch necessary to their fire integrity shall have a latch that is automatically activated by the operation of the doors when released by the control system;
- (m) doors giving direct access to special category spaces which are power-operated and automatically closed are not required to be equipped with the alarms and remote-release mechanisms required in subparagraphs (c) and (j);
- (n) the components of the local control system shall be accessible for maintenance and adjusting;
- (o) power-operated doors shall be provided with a control system of an approved type which shall be able to operate in case of fire, this being determined in accordance with the Fire Test Procedure Code. The control system shall satisfy the following requirements:
 - (i) the system shall be able to operate the door at a temperature of at least 200°C for at least 60 minutes, served by the power supply;
 - (ii) the power supply for all other doors not subject to fire shall not be impaired;
 - (iii) 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 at temperatures of up to at least 945°C.

(3) In a new Class B, C or D passenger ship, 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 accordance with Rule 115. Similarly, the requirements for “A” class integrity shall not apply to exterior doors in superstructures and deckhouses.

(4) In a Class B, C or D passenger ship constructed on or after 1 January 2003, the requirements for “A” class integrity of the outer boundaries of a ship shall not apply to:

- (a) glass partitions, windows and sidescuttles, provided that there is no requirement for such boundaries to have a “A” class integrity in accordance with Rule 115;
- (b) exterior doors, except for those in superstructures and deckhouses facing life-saving appliances, embarkation and external muster station areas, external stairs and open decks used for escape routes. Stairway enclosure doors are not required to meet this requirement.

(5) In a new Class B, C or D passenger ship, except for watertight doors, weathertight doors, semi-watertight doors, doors leading to the open deck and doors that 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 of material, construction and fire resistance that is 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 to the door hinges, or in the case of sliding doors, nearest the opening.

- (6) (a) In the case of a new Class B, C or D passenger ship, doors and door frames in “B” class divisions and means of securing them shall provide a method of closure that shall have resistance to fire equivalent to that of the divisions, except that ventilation openings may be permitted in the lower portion of such doors. Where such an opening is in or under a door, the total net area of any such opening or openings shall not exceed 0.05 m². 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 m². All ventilation openings shall be fitted with a grill made of non-combustible material. Doors shall be non-combustible.
- (b) For reasons of noise reduction, the Minister may approve, as an equivalent, doors with built-in ventilation sound-locks with openings at the bottom on one side of the door and at the top on the other side, on condition that the following provisions have been complied with:
- (i) the upper opening shall always face towards the corridor and shall be provided with a grating of non-combustible material and an automatically operating fire damper, which is activated at a temperature of approximately 70°C;
 - (ii) the lower opening shall be provided with a grating made of a non-combustible material;
 - (iii) the doors shall be tested in accordance with IMO Resolution A.754(18).

(7) In the case of a new Class B, C or D passenger ship, cabin doors in “B” class divisions shall be of a self-closing type. Hold-backs shall not be permitted.

(8) In a new Class B, C or D passenger ship, the requirements for “B” class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles. The requirements for “B” class integrity shall not apply to exterior doors in superstructures and deckhouses. In the case of a passenger ship carrying not more than 36 passengers, the Minister may permit the use of combustible materials in doors separating cabins from the individual interior sanitary spaces such as showers.

Protection of stairways and lifts in accommodation and service spaces

104. (1) In a new Class B, C or D passenger ship, all stairways shall be of steel frame construction, except where the Minister sanctions the use of other

equivalent material, and shall be within enclosures formed of “A” class divisions, with positive means of closure of all openings except:

- (a) a stairway connecting only two decks is not required to be enclosed, provided the integrity of the deck is maintained by proper bulkheads or doors in one between-deck space. When a stairway is closed in one between-deck space, the stairway enclosure shall be protected in accordance with Table 2 to Rule 99 and Tables 3 and 4 to Rule 100 for decks;
 - (b) stairways may be fitted in the open in a public space, provided they lie wholly within such public space.
- (2) (a) In a new Class B, C or D passenger ship, stairway enclosures shall have direct access with the corridors and shall be of a sufficient area to prevent congestion, having regard to the number of persons likely to use them in an emergency.
- (b) In a new Class B, C or D passenger ship, within the perimeter of the stairway enclosures to which subparagraph (a) refers, only public toilets, lockers of non-combustible material providing storage for safety equipment, and open information counters shall be permitted.
- (c) Only public spaces, corridors, public toilets, special category spaces and external areas shall be permitted to have direct access to the stairway enclosures to which this paragraph refers.
- (3) In a new Class B, C or D passenger ship, lift trunks shall be so fitted as to prevent the passage of smoke and flame from one between-deck to another and shall be provided with means of closing so as to permit the control of draught and smoke.

Ventilation systems for passenger ships built before 1 January 2018 carrying more than 36 passengers

105. (1) This Rule applies to a new Class B, C or D passenger ship carrying more than 36 passengers and built before 1 January 2018.

(2) The ventilation system shall, in addition to paragraph 1 in Regulation II-2/32 of the Safety Convention as in force on 17 March 1998, comply with Rule 106(3) to (9), (11) and (12).

(3) The ventilation fans shall be so disposed that the ducts reaching the various spaces remain within the main vertical zone, or are disposed to provide an equivalent level of safety, to the satisfaction of the Minister.

(4) Where ventilation systems penetrate decks, precautions shall be taken, in addition to those relating to fire integrity of the deck required by Rule 92(1)(a) to (d), to reduce the likelihood of smoke and hot gases passing from one between-deck space to another through the system. In addition to insulation requirements contained in this Rule, vertical ducts shall, if necessary, be insulated as required by the appropriate Tables in Rule 99.

(5) Ventilation ducts shall be constructed of the following materials:

- (a) ducts not less than 0.075 m² in sectional area and all vertical ducts serving more than a single between-deck space shall be constructed of steel or other equivalent material;
- (b) ducts less than 0.075 m² in sectional area other than vertical ducts referred to in subparagraph (a) 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;
- (c) short lengths of duct, not in general exceeding 0.02 m² in sectional area nor two metres in length, shall not be required to be non-combustible provided that all of the following conditions are met:
 - (i) the duct shall be constructed of a material of low fire risk to the satisfaction of the Minister or, in a Class B, C or D passenger ship constructed on or after 1 January 2003, the duct shall be of a material which has low flame spread characteristics;
 - (ii) the duct is used only at the terminal end of the ventilation system;
 - (iii) 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.

(6) Stairway enclosures shall be ventilated and shall be served only by an independent fan and duct system which shall not serve any other spaces in the ventilation system.

(7) All power ventilation, except machinery space and cargo space ventilation and any alternative system that may be provided under Rule 106(9), 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. Controls provided for the power ventilation serving machinery spaces shall also be grouped so as to be operable from two positions, one of which shall be outside such spaces. Fans serving power ventilation systems to cargo spaces shall be capable of being stopped from a safe position outside such spaces.

(8) Where public spaces span 3 or more open decks and contain combustibles such as furniture and enclosed spaces such as shops, offices and restaurants, the space 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 minutes or less.

(9) Ventilation ducts shall be provided with suitably located hatches for inspection and cleaning, where reasonable and practicable.

(10) Exhaust ducts from galley ranges in which grease or fat is likely to accumulate shall meet the requirements of Rule 106(5)(e) and (f) and Rule 106(6) and shall be fitted with:

- (a) a grease trap readily removable for cleaning unless an alternative approved grease removal system is fitted;
- (b) 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;
- (c) a fixed means for extinguishing a fire within the duct;
- (d) remote control arrangements for shutting off the exhaust fans and supply fans, for operating the fire dampers mentioned in subparagraph (b) 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, means shall be provided to close all branches exhausting through the same main duct before an extinguishing medium is released into the system;
- (e) suitably located hatches for inspection and cleaning.

Ventilation systems for passenger ships built before 1 January 2018 carrying not more than 36 passengers

106. (1) This Rule applies to new passenger ships carrying not more than 36 passengers and built before 1 January 2018.

(2) In a new Class B, C or D passenger ship, ventilation ducts shall be of non-combustible material. Short ducts not generally-exceeding two metres in length and with a cross-section not exceeding 0.02 m², shall not be required to be non-combustible, subject to the following conditions:

- (a) the ducts shall be of a material which, in the opinion of the Minister, has a low fire risk or, in the case of a new Class B, C or D passenger ship constructed on or after 1 January 2003, the ducts shall be of a material which has low flame spread characteristics;
- (b) the ducts may only be used at the end of the ventilation device;
- (c) the ducts shall not be situated less than 600 mm, measured along the duct, from an opening in an "A" or "B" class division, including continuous "B" class ceilings.

(3) Where the ventilation ducts with a free-sectional area exceeding 0.02 m² pass through class "A" bulkheads or decks, the openings shall be lined with a steel sheet sleeve unless the ducts passing through the bulkheads or decks are of steel in the vicinity of passage through the deck or bulkhead and the ducts and sleeves shall comply in this part with the following:

- (a) 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;

- (b) ducts with a free cross-sectional area exceeding 0.075 m^2 shall be fitted with fire dampers in addition to the requirements of subparagraph (a). 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 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. In a new Class B, C or D passenger ships constructed on or after 1 January 2003, where fire dampers 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.

(4) In a new Class B, C and D passenger ship constructed on or after 1 January 2003, 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 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.

(5) Ducts provided for the ventilation of machinery spaces, galleys, car deck spaces, ro-ro cargo spaces or special category spaces shall not pass through accommodation spaces, service spaces or control stations unless they comply with the conditions specified in the following subparagraphs (a) to (d) or (e) and (f):

- (a) the ducts shall be 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 greater respectively and, in the case of such ducts, the widths or diameters of which are between 300 mm and 760 mm having a thickness to be obtained by interpolation;
- (b) the ducts are suitably supported and stiffened;
- (c) the ducts are fitted with automatic fire dampers close to the boundaries penetrated; and
- (d) the ducts are insulated to "A-60" standard from the machinery spaces, galleys, car deck spaces, ro-ro cargo spaces or special category spaces to a point at least 5 metres beyond each fire damper;

or

- (e) the ducts are constructed of steel in accordance with subparagraphs (a) and (b) and

(f) the ducts are insulated to “A-60” 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 (11).

(6) In new class B, C or D passenger ship constructed on or after 1 January 2003, 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 a passenger ship carrying not more than 36 passengers is not required to 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.

(7) Ducts provided for ventilation to accommodation spaces, service spaces or control stations shall not pass through machinery spaces, galleys, car deck spaces, ro-ro cargo spaces or special category spaces unless they comply with the conditions specified in subparagraphs (a), (b) and (c) or subparagraphs (d) and (e):

- (a) where they pass through a machinery space, galley, car deck space, ro-ro cargo space or special category space, the ducts shall be constructed of steel in accordance with paragraphs (5)(a) and (b);
- (b) automatic fire dampers shall be fitted close to the boundaries penetrated; and
- (c) the integrity of the machinery space, galley, car deck space, ro-ro cargo space or special category space boundaries shall be maintained at the penetrations;

or

- (d) where they pass through a machinery space, galley, car deck space, ro-ro cargo space or special category space, the ducts shall be constructed of steel in accordance with paragraphs (5)(a) and (b); and
- (e) the ducts shall be insulated to “A-60” standard throughout the machinery space, galley, car deck space, ro-ro cargo space or special category space;

except that penetrations of main zone divisions shall also comply with the requirements of paragraph (11).

(8) Ventilation ducts with a free-sectional area exceeding 0.02 m² passing through class “B” 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.

(9) Such measures as are practicable shall be taken in respect of control stations outside machinery spaces in order to ensure that ventilation, visibility and freedom from smoke are maintained, in order that in the event of fire the machinery and equipment contained therein may be supervised and continue to

function effectively. Alternative and separate means of air supply shall be provided; air inlets of the two sources of supply shall be so disposed that the risk of both inlets drawing in smoke simultaneously is minimised. Such requirements are not required to apply to control stations situated on, and opening on to, an open deck, or where local closing arrangements would be equally effective.

(10) 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:

- (a) a grease trap readily removable for cleaning;
- (b) a fire damper located in the lower end of the duct;
- (c) arrangements, operable from within the galley, for shutting off the exhaust fans;
- (d) fixed means for extinguishing a fire within the duct.

(11) Where it is necessary in a passenger ship 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 shall be marked in red light-reflecting colour. 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 Rule 92(1)(a) to (d). 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.

(12) In a new Class B, C or D passenger ship, the main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated.

(13) In a new Class B, C or D passenger ship, 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. 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.

Ventilation systems in passenger ships constructed on or after 1 January 2003 and before 1 January 2018

107. In a Class B, C or D passenger ship constructed on or after 1 January 2003 and before 1 January 2018 the following arrangements shall be tested in accordance with the IMO Fire Test Procedures Code:

- (a) fire dampers, including relevant means of operation;
- (b) duct penetrations through “A” class divisions. Where steel sleeves are directly joined to ventilation ducts by means of riveted or screwed flanges or by welding, the test shall not be required.

Ventilation systems in passenger ships constructed on or after 1 January 2018

108. (1) This Rule applies to ventilation systems in a Class B, C or D passenger ship constructed on or after 1 January 2018.

(2) (a) Ventilation ducts, including single and double wall ducts, shall be of steel or an equivalent material, except for flexible bellows of short length not exceeding 600 mm used for connecting fans to the ducting in air-conditioning rooms. Unless expressly provided otherwise in paragraph (7), any other material used in the construction of ducts, including insulation, shall also be non-combustible. However, short ducts, not exceeding 2 m in length and with a free cross-sectional area not exceeding 0.02 m², shall not be required to be of steel or equivalent material, subject to the following conditions:

- (i) the ducts shall be made of non-combustible material which may be faced internally and externally with membranes having low flame-spread characteristics and, in each case, a calorific value not exceeding 45 MJ/m² of their surface area for the thickness used. The calorific value shall be calculated in accordance with the recommendations published by the International Organization for Standardization, in particular publication ISO 1716:2002, "Reaction to the fire tests for building products — Determination of the heat of combustion";
- (ii) the ducts are only used at the end of the ventilation device;
- (iii) 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.

(b) In this paragraph, "free cross-sectional area" means, even in the case of a pre-insulated duct, the area calculated on the basis of the inner dimensions of the duct itself and not the insulation.

(3) The following arrangements shall be tested in accordance with the Fire Test Procedures Code:

- (a) fire dampers, including their relevant means of operation, although the testing shall not be required for dampers located at the lower end of the duct in exhaust ducts for galley ranges, which must be of steel and capable of stopping the draught in the duct;
- (b) duct penetrations through "A" class divisions, although the testing shall not be required where steel sleeves are directly joined to ventilation ducts by means of riveted or screwed connections or by welding.

(4) Fire dampers shall be easily accessible. Where they are placed behind ceilings or linings, those ceilings or linings shall be provided with an inspection hatch on which the identification number of the fire damper is marked. The fire damper identification number shall also be marked on any remote controls provided.

(5) Ventilation ducts shall be provided with hatches for inspection and cleaning. The hatches shall be located near the fire dampers.

(6) The main inlets and outlets of 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 the operating position of the closing device.

(7) Combustible gaskets in flanged ventilation duct connections shall not be permitted within 600 mm of openings in “A” or “B” class divisions and in ducts required to be of “A” class construction.

(8) Ventilation openings or air balance ducts between two enclosed spaces shall not be provided except as permitted by Rule 103(6)(a).

Ventilation systems – arrangement of ducts in passenger ships constructed on or after 1 January 2018

109. (1) This Rule applies to the arrangement of ducts in a Class B, C or D passenger ship constructed on or after 1 January 2018.

(2) The ventilation systems for machinery spaces of category A, vehicle spaces, ro-ro spaces, galleys, special category spaces and cargo spaces shall be separated from each other and from the ventilation systems serving other spaces except that the galley ventilation systems in passenger ships carrying not more than 36 passengers are not required to be completely separated from other ventilation systems, but may be served by separate ducts from a ventilation unit serving other spaces. In such a case, an automatic fire damper shall be fitted in the galley ventilation duct near the ventilation unit.

(3) 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 paragraph (5).

(4) Ducts provided for the ventilation of 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 paragraph (5).

(5) As permitted in paragraphs (3) and (4), ducts shall be either:

- (a) constructed of steel having a thickness of at least 3 mm for ducts with a free cross-sectional area of less than 0.075 m², at least 4 mm for ducts with a free cross-sectional area of between 0.075 m² and 0.45 m², and at least 5 mm for ducts with a free cross-sectional area greater than 0.45 m²;
- (b) suitably supported and stiffened;
- (c) fitted with automatic fire dampers close to the boundaries penetrated;
- (d) insulated to “A-60” class standard from the boundaries of the spaces they serve to a point at least 5m beyond each fire damper;

or

- (e) constructed of steel in accordance with subparagraphs (a) and (b);
- (f) insulated to “A-60” class standard throughout the spaces they pass through, except in the case of ducts that pass through spaces of category (9) or (10) as described in Rule 99(2)(b).

(6) For the purpose of paragraphs (5)(d) and (f), ducts shall be insulated over their entire cross-sectional external surface. Ducts that are outside but adjacent to the specified space, and share one or more surfaces with it, shall be considered to pass through the specified space and shall be insulated over the surface they share with the space for a distance of 450 mm past the duct having regard to the Unified Interpretations of SOLAS Chapter II-2 in MSC.1/Circ.1276.

(7) Where it is necessary that a ventilation duct passes through a main vertical zone division, an automatic 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 control location shall be readily accessible and shall be clearly and prominently marked. The duct between the division and the damper shall be constructed of steel in accordance with paragraphs (5)(a) and (b) and insulated to at least the same fire integrity as the division penetrated. The damper shall be fitted on at least one side of the division with a visible indicator showing the operating position of the damper.

Ventilation systems – details of fire dampers and duct penetrations in passenger ships constructed on or after 1 January 2018

110. (1) This Rule applies to fire dampers and duct penetrations in a Class B, C or D passenger ship constructed on or after 1 January 2018.

(2) Ducts passing through “A” class divisions shall meet the following requirements:

- (a) where a thin plated duct with a free cross sectional area equal to, or less than, 0.02 m² passes through “A” class divisions, the opening shall be fitted 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 a bulkhead or, in the case of a deck, wholly laid on the lower side of the decks penetrated;
- (b) where ventilation ducts with a free cross-sectional area exceeding 0.02 m², but not greater than 0.075 m², pass through “A” class divisions, the openings shall be lined with steel sheet sleeves. The ducts and 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 division through which the duct passes;
- (c) automatic fire dampers shall be fitted in all ducts with a free cross-sectional area exceeding 0.075 m² that pass through “A” class divisions. Each damper shall be fitted close to the division

penetrated and the duct between the damper and the division penetrated shall be constructed of steel in accordance with Rule 109(5)(e) and (f). The fire damper shall operate automatically, but shall also be capable of being closed manually from both sides of the division. The damper shall be fitted with a visible indicator which shows the operating position of the damper. Fire dampers shall not be 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 penetrate. A duct of cross-sectional area exceeding 0.075 m² shall not be divided into smaller ducts at the penetration of an “A” class division and then recombined into the original duct once through the division to avoid installing the damper required by this provision.

(3) Ventilation ducts with a free cross-sectional area exceeding 0.02 m² 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) All fire dampers shall be capable of manual operation. The dampers shall have a direct mechanical means of release or, alternatively, be closed by electrical, hydraulic, or pneumatic operation. All dampers shall be manually operable from both sides of the division. Automatic fire dampers, including those capable of remote operation, shall have a failsafe mechanism that will close the damper in a fire even upon loss of electrical power or hydraulic or pneumatic pressure loss. Remotely operated fire dampers shall be capable of being reopened manually at the damper.

Ventilation systems for passenger ships carrying more than 36 passengers constructed on or after 1 January 2018

111. (1) This Rule applies to ventilation systems in a Class B, C or D passenger ship constructed on or after 1 January 2018 and carrying more than 36 passengers.

(2) In addition to the requirements in Rules 108, 109 and 110, the ventilation system of a passenger ship carrying more than 36 passengers shall also meet the following requirements:

- (a) in general, the ventilation fans shall be so arranged that the ducts reaching the various spaces remain within a main vertical zone;
- (b) stairway enclosures shall be served by an independent ventilation fan and duct system (exhaust and supply) which shall not serve any other spaces in the ventilation systems;
- (c) a duct, irrespective of its cross-section, serving more than one “between-deck” accommodation space, service space or control station, shall be fitted, near the penetration of each deck of such spaces, with an automatic smoke damper that shall also be capable of being closed manually from the protected deck above the damper. Where a fan serves more than one “between-deck” space through separate ducts within a main vertical zone, whereby each one is dedicated to a single “between-deck” space,

each duct shall be provided with a manually operated smoke damper fitted close to the fan;

- (d) vertical ducts shall, where necessary, be insulated as required by Tables 1 and 2 to Rule 99. Ducts shall be insulated as required for decks between the space they serve and the space being considered, as applicable.

Ventilation systems - exhaust ducts from galley ranges in passenger ships constructed on or after 1 January 2018

112. (1) This Rule applies to exhaust ducts from galley ranges in a Class B, C or D passenger ship constructed on or after 1 January 2018.

- (2) (a) In a passenger ship carrying more than 36 passengers, in addition to the requirements in Rules 108, 109 and 110, exhaust ducts from galley ranges shall be constructed in accordance with Rule 109(5)(e) and (f) and insulated to “A-60” class standard throughout accommodation spaces, service spaces, or control stations through which they pass. They shall also be fitted with:
 - (i) a grease trap readily removable for cleaning, unless an alternative approved grease removal system is fitted;
 - (ii) a fire damper located in the lower end of the duct at the junction between the duct and the galley range hood, which is automatically and remotely operated and, in addition, a remotely operated fire damper located in the upper end of the duct, close to the outlet of the duct;
 - (iii) a fixed means for extinguishing a fire within the duct. The fire extinguishing systems shall comply with the recommendations published by the International Organization for Standardization, in particular publication ISO 15371:2009 “Ships and marine technology — Fire-extinguishing systems for protection of galley cooking equipment”;
 - (iv) remote-control arrangements for shutting off the exhaust fans and supply fans, for operating the fire dampers referred to in clause (ii) and for operating the fire-extinguishing system, which shall be placed in a position outside the galley 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;
 - (v) suitably located hatches for inspection and cleaning, including one provided close to the exhaust fan and one fitted in the lower end where grease accumulates.

- (b) Exhaust ducts from ranges for cooking equipment installed on open decks shall conform to subparagraph (a), as applicable, when passing through accommodation spaces or spaces containing combustible materials.

(3) In a passenger ship carrying not more than 36 passengers, exhaust ducts from galley ranges, when passing through accommodation spaces or spaces containing combustible materials, shall be constructed in accordance with Rule 109(5)(a) and (b). Each such exhaust duct shall be fitted with:

- (a) a grease trap readily removable for cleaning;
- (b) an automatically and remotely operated fire damper located in the lower end of the duct at the junction between the duct and the galley range hood and, in addition, a remotely operated fire damper in the upper end of the duct close to the outlet of the duct;
- (c) arrangements, operable from within the galley, for shutting off the exhaust and supply fans;
- (d) fixed means for extinguishing a fire within the duct.

Ventilation systems – ventilation rooms serving machinery spaces of category A containing internal combustion machinery in passenger ships constructed on or after 1 January 2018

113. (1) This Rule applies to ventilation rooms serving machinery spaces of category A containing internal combustion machinery in a Class B, C or D passenger ship constructed on or after 1 January 2018.

(2) Where a ventilation room only serves an adjacent machinery space referred to in paragraph (1) and there is no fire division between the ventilation room and the machinery space, the means for closing the ventilation duct or ducts serving the machinery space shall be located outside of the ventilation room and machinery space.

(3) Where a ventilation room serves a machinery space referred to in paragraph (1) as well as other spaces and is separated from the machinery space by a “A-0” class division, including penetrations, the means for closing the ventilation duct or ducts for the machinery space may be located in the ventilation room.

Ventilation systems – ventilation systems for laundries in a passenger ship carrying more than 36 passengers constructed on or after 1 January 2018

114. (1) This Rule applies to ventilation systems for laundries in a Class B, C or D passenger ship carrying more than 36 passengers and constructed on or after 1 January 2018.

(2) Exhaust ducts from laundries and drying rooms of category (13) spaces as described in Rule 99(2)(b) shall be fitted with:

- (a) filters readily removable for cleaning purposes;
- (b) a fire damper located in the lower end of the duct which is automatically and remotely operated;
- (c) remote-control arrangements for shutting off the exhaust fans and supply fans from within the space and for operating the fire damper mentioned in subparagraph (b);
- (d) suitably located hatches for inspection and cleaning.

Windows and sidescuttles

115. (1) In a new Class B, C or D passenger ship, the following provisions shall apply:

- (a) all windows and sidescuttles in bulkheads within accommodation and service spaces and control stations other than those to which the provisions of Rule 103(3) apply, shall be so constructed as to preserve the integrity requirements of the type of bulkheads in which they are fitted;
- (b) in a new Class B, C or D passenger ship constructed on or after 1 January 2003, the provisions of subparagraph (a) shall be determined in accordance with the Fire Test Procedures Code;
- (c) notwithstanding the requirements of the Tables to Rules 99 and 100, all 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 bed or angle.

(2) In a new Class B, C or D passenger ship carrying more than 36 passengers, the following provisions shall apply:

- (a) windows facing life-saving appliances, embarkation and assembly areas, external stairs and open decks used for escape routes, and windows situated below life-raft and escape slide embarkation areas shall have the fire integrity as required in the Tables to Rule 99;
- (b) windows located in the ship's side below the lifeboat embarkation areas shall have the fire integrity at least equal to "A-0" class.

(3) In a new Class B, C or D passenger ship carrying not more than 36 passengers, notwithstanding the requirements in the Tables to Rule 100, special attention shall be given to the fire integrity of windows facing open or enclosed lifeboat and life-raft embarkation areas and to the fire integrity of windows situated below such areas in such a position that their failure during a fire would impede the launching of, or embarkation into, lifeboats or life-rafts.

Restricted use of combustible material

116. (1) Unless indicated otherwise, this Rule applies to the use of combustible material in a new Class B, C or D passenger ship.

(2) Except in cargo spaces, mail rooms, baggage rooms, or refrigerated compartments of service spaces, all linings, grounds, draughtstops, ceilings and insulations shall be of non-combustible materials. Partial bulkheads or decks used to subdivide a space for utility or artistic treatment shall also be of non-combustible material.

(3) (a) Subject to subparagraph (b), vapour barriers and adhesives used in conjunction with insulation, as well as insulation of pipe fittings for cold service systems shall not be required to be non-combustible, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have qualities of resistance to the propagation of flame in accordance with the test procedure of IMO Resolution A.653(16).

(b) In the case of a Class B, C or D passenger ship constructed on or after 1 January 2003, vapour barriers and adhesives used in conjunction with insulation, as well as insulation of pipe fittings for cold service systems shall not be required to be non-combustible, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have low flame spread characteristics.

(4) The following surfaces shall have low flame spread characteristics:

(a) exposed surfaces in corridors and stairway enclosures, and of bulkheads, wall and ceiling linings in all accommodation and service spaces and control stations;

(b) concealed or inaccessible spaces in accommodation, service spaces and control stations.

(5) The total volume of combustible facings, mouldings, decorations and veneers in any accommodation and service space shall not exceed a volume equivalent to 2.5 mm veneer on the combined area of the walls and ceilings. Furniture fixed to linings, bulkheads or decks shall not be required to be included in the calculation of the total volume of combustible materials.

(6) Veneers used on surfaces and linings covered by the requirements of paragraph (4) shall have a calorific value not exceeding 45 MJ/m² of the area for the thickness used.

(7) Furniture in stairway enclosures shall be limited to seating. It shall be fixed, limited to 6 seats on each deck in each stairway enclosure, be of restricted fire risk, and shall not restrict the passenger escape route. The Minister 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. Lockers of non-combustible material, providing storage for safety equipment required by these Rules, 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 provision applies as well to decorative flower or plant arrangements, statues or other objects of art such as paintings and tapestries in corridors and stairways.

- (8) (a) Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke and toxic products.
- (b) In a Class B, C or D passenger ship constructed on or after 1 January 2003, 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 IMO Fire Test Procedures Code.
- (9) (a) Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of approved material which will not readily ignite, in accordance with the fire test procedures of IMO Resolution A.687(17) or give rise to toxic or explosive hazards at elevated temperatures.
- (b) In the case of a Class B, C or D passenger ship constructed on or after 1 January 2003, primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of an approved material which will not readily ignite or give rise to toxic or explosive hazards at elevated temperatures, this being determined in accordance with the IMO Fire Test Procedures Code.

Details of construction

117. In a new Class B, C or D passenger ship, in accommodation and service spaces, control stations, corridors and stairways:

- (a) air spaces enclosed behind ceilings, panelling or linings shall be suitably divided by close-fitting draught stops not more than 14 metres apart;
- (b) in the vertical direction, such enclosed air spaces, including those behind linings of stairways, trunks, and similar arrangements shall be closed at each deck.

Fixed fire detection and fire alarm systems

118. (1) In a new Class B, C or D passenger ship, there shall be installed throughout each separate zone, whether vertical or horizontal, in all accommodation and service spaces and in control stations, except spaces which afford no substantial fire risk such as void spaces or sanitary spaces, a fixed fire detection and fire alarm system of an approved type and complying with the requirements of Rules 88, 89 and 90, and so installed and arranged as to detect the presence of fire in such spaces. In a new Class B, C or D passenger ship constructed on or after 1 January 2003, the system shall also provide smoke

detection in corridors, stairways and escape routes within accommodation spaces.

- (2) (a) In periodically unattended machinery spaces in a new Class B, C or D passenger ship, a fixed fire detection and fire alarm system of an approved type, in accordance with the relevant provisions of Rules 88, 89 and 90, shall be installed.
 - (b) The fire detection system provided in accordance with subparagraph (a) shall be so designed and the detectors so positioned as to detect rapidly the onset of fire in any part of periodically unattended machinery spaces and under any normal conditions of operation of the machinery and variations of ventilation as required by the possible range of ambient temperatures. The detection system shall initiate audible and visual alarms distinct in both respects from the alarms of any other system not indicating fire, in sufficient places to ensure that the alarms are heard and observed on the navigating bridge and by a responsible engineer officer. Where a fire detection system using only thermal detectors is proposed, the approval of the Minister shall be required.
 - (c) When the navigating bridge is unmanned, the alarm shall sound in a place where a responsible member of the crew is on duty.
 - (d) Following installation, the fire detection and fire alarm system shall be tested under varying conditions of engine operation and ventilation.
- (3) In a Class B, C or D passenger ship constructed on or after 1 January 2018:
- (a) a fixed fire detection and fire alarm system of an approved type, in accordance with the relevant provisions of Rules 88, 89 and 90, shall be installed in machinery spaces where:
 - (i) the installation of automatic and remote control systems and equipment has been approved in lieu of continuous manning of the space;
 - (ii) the main propulsion and associated machinery including sources of main source of electrical power are provided with various degrees of automatic or remote control and are under continuous manned supervision from a control room;
 - (b) a fixed fire detection and fire alarm system of an approved type, in accordance with the relevant provisions of Rules 88, 89 and 90, shall be installed in enclosed spaces containing incinerators;
 - (c) with regard to the fixed fire detection and fire alarm system provided in accordance with subparagraphs (a) and (b), the following requirements shall apply:
 - (i) the fire detection system shall be so designed and the detectors so positioned as to detect rapidly the onset of fire in any part of the machinery spaces or enclosed spaces

containing incinerators 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 especially appropriate, detection systems using only thermal detectors shall not be permitted. The detection system shall initiate audible and visual alarms distinct in both respects from the alarms of any other system not indicating fire, in sufficient places to ensure that the alarms are heard and observed on the navigating bridge and by a responsible engineer officer;

- (ii) when the navigating bridge is unmanned, the alarm shall sound in a place where a responsible member of the crew is on duty;
- (iii) following installation, the fire detection and alarm system shall be tested under varying conditions of engine operation and ventilation.

Protection of special category spaces

119. (1) In a new Class B, C or D passenger ship carrying more than 36 passengers, the following general provisions shall apply to special category spaces whether above or below the bulkhead deck:

- (a) where normal main vertical zoning may not be practicable in special category spaces, equivalent protection shall be obtained in such spaces on the basis of a horizontal zone concept and by the provision of an efficient fixed fire-extinguishing system. Under this concept a horizontal zone for the purpose of this Rule may include special category spaces on more than one deck provided that the total overall clear height for vehicles does not exceed 10 metres;
- (b) the requirements of Rules 92, 103 and Rules 105 to 114 for maintaining the integrity of vertical zones shall be applied equally to decks and bulkheads forming the boundaries separating horizontal zones from each other and from the remainder of the ship.

Structural protection

(2) In a new Class B, C or D passenger ship carrying more than 36 passengers, the structural protection of the ship shall comply with the following requirements:

- (a) the boundary bulkheads and decks of special category spaces shall be insulated to "A-60" class standard. However, where an

open deck space as described in Rule 99(2)(b)(5), a sanitary or similar space as described in Rule 99(2)(b)(9), or a tank, void or auxiliary machinery space having little or no fire risk as described in Rule 99(2)(b)(10), is on one side of the division, the standard may be reduced to “A-0”;

- (b) 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.

(3) In a new Class B, C or D passenger ship built before 1 January 2018 and carrying not more than 36 passengers, the boundary bulkheads of special category spaces shall be insulated in accordance with the requirements for category (11) spaces in Table 1 to Rule 100 and the horizontal boundaries in accordance with the requirements for category (11) in Table 3 to Rule 100.

(4) In a Class B, C or D passenger ship built on or after 1 January 2018 and carrying not more than 36 passengers, the boundary bulkheads of special category spaces shall be insulated in accordance with the requirements for category (11) spaces in Table 2 to Rule 100 and the horizontal boundaries in accordance with the requirements for category (11) in Table 4 to Rule 100.

(5) Indicators shall be provided on the navigating bridge which shall indicate when any fire door leading to or from the special category spaces is closed.

(6) Doors to special category spaces shall be of such a construction that they cannot be kept open permanently and shall be kept closed during the voyage.

Fixed fire-extinguishing system

- (7) (a) In a new Class B, C or D passenger ship carrying more than 36 passengers, each special category space 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 space.
- (b) In a Class B, C or D passenger ship constructed on or after 1 January 2003, the water spray systems fitted in accordance with subparagraph (a) shall have:
 - (i) a pressure gauge on the valve manifold;
 - (ii) clear marking on each manifold valve indicating the spaces served;
 - (iii) instructions for maintenance and operation located in the valve room;
 - (iv) a sufficient number of drainage valves.
- (c) The Minister may permit the use of any other fixed fire extinguishing system that has been shown by full-scale test in conditions simulating a flowing petrol fire in a special category space to be not less effective in controlling fires likely to occur in such a space. Such fixed pressure water-spraying system or other equivalent fire-extinguishing system shall comply with the

provisions of IMO Resolution A.123(V) and the IMO MSC.1/Circ.1272 entitled “Guidelines for the approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces equivalent to that referred to in Resolution A.123(V)”, MSC.1/Circ.1430 or, in the case of a system installed on or after 1 January 2021, MSC.1/Circ.1430/Rev.1 entitled “Revised guidelines for the design and approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces”, as appropriate, shall be taken into consideration.

Patrols and detection

- (8) (a) (i) In a new Class B, C or D passenger ship carrying more than 36 passengers, an efficient patrol system shall be maintained in special category spaces. In any such space in which the patrol is not maintained by a continuous fire watch at all times during the voyage, there shall be provided a fixed fire detection and fire alarm system of an approved type complying with the requirements of Rules 88, 89 and 90. The fixed fire detection system shall be capable of rapidly detecting the onset of fire. The type, the spacing and the location of detectors shall be determined taking into account the effects of ventilation and other relevant factors.
- (ii) In a Class B, C or D passenger ship constructed on or after 1 January 2003, following installation the patrol system shall be tested under normal ventilation conditions and shall provide an overall response time to the satisfaction of the Minister.
- (b) (i) Manually operated call points shall be provided as necessary throughout the special category spaces and one call point shall be placed close to each exit from such spaces.
- (ii) In a Class B, C or D passenger ship constructed on or after 1 January 2003, manually operated call points shall be spaced in order that no part of the space is more than 20 metres from a manually operated call point.

Portable fire-extinguishing equipment

- (9) (a) In a Class B, C or D passenger ship carrying more than 36 passengers constructed before 1 January 2003, there shall be provided in each special category space:
- (i) at least 3 water fog applicators;
- (ii) (I) one portable foam applicator unit complying with the provisions of subclause (II), provided that at least two

such units are available in the ship for use in such spaces;

- (II) the portable foam applicator unit shall consist of an air-foam nozzle of an inductor type capable of being connected to the fire main by a fire hose, together with a portable tank containing at least 20 litres of foam-making liquid and one spare tank. The nozzle shall be capable of producing effective foam suitable for extinguishing an oil fire, at a rate of at least 1.5 m³ per min;
 - (iii) at least one portable extinguisher located at each access to such spaces.
- (b) (i) In a Class B, C or D passenger ship carrying more than 36 passengers constructed on or after 1 January 2003, portable extinguishers shall be provided at each deck level in each hold or compartment where vehicles are carried, spaced not more than 20 metres apart on both sides of the space. At least one portable fire extinguisher shall be located at each access to such space.
- (ii) In addition to the requirements of subparagraph (a), the following fire extinguishing appliances shall be provided in special category spaces:
- (I) at least 3 water-fog applicators;
 - (II) 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 ro-ro space.

Ventilation system

- (10) (a) In a new Class B, C or D passenger ship, there shall be provided an effective power ventilation system for the special category spaces sufficient to give at least 10 air changes per hour. The system for such spaces shall be entirely separated from other ventilation systems and shall be operating at all times when vehicles are in such spaces. The number of air changes shall be increased at least to 20 during loading and unloading of vehicles.
- (b) Ventilation ducts serving special category 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.
- (c) The ventilation shall be such as to prevent air stratification and the formation of air pockets.

- (d) Means shall be provided to indicate on the navigating bridge any loss or reduction of the required ventilating capacity.
- (e) Arrangements shall be provided to permit a rapid shutdown and effective closure of the ventilation system in case of fire, taking into account the weather and sea conditions.
- (f) Ventilation ducts, including dampers, shall be made of steel and their arrangement shall be to the satisfaction of the Minister.
- (g) In the case of a Class B, C or D passenger ship constructed on or after 1 January 2003, ventilation ducts that pass through horizontal zones or machinery spaces shall be "A-60" class steel ducts constructed in accordance with Rules 106(5)(a) and (b).

Additional provisions applicable only to special category spaces above the bulkhead deck

(11) In a new Class B, C or D passenger ship, in view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or decks consequent on the operation of the fixed pressure water-spraying system, scuppers shall be fitted so as to ensure that such water is rapidly discharged directly overboard.

- (12) (a) In a new Class B, C or D passenger ship, 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 Load Line Rules, shall be kept open while the ships are at sea.
- (b) Any operation of the valves referred to in subparagraph (a) shall be recorded in the logbook.

Precautions against ignition of flammable vapours

- (13) (a) In a new Class B, C or D passenger ship, on any deck or platform, if fitted, on which vehicles are carried and on which explosive vapours might be expected to accumulate, except platforms with openings of sufficient size permitting penetration of petrol gases downwards, equipment which may constitute a source of ignition of flammable vapours and, in particular, electrical equipment and wiring, shall be installed at least 450 mm above the deck or platform. Electrical equipment installed at more than 450 mm above the deck or platform shall be of a type so enclosed and protected as to prevent the escape of sparks. However, where the installation of electrical equipment and wiring at less than 450 mm above the deck or platform is necessary for the safe operation of the ship, such electrical equipment and wiring may be installed provided that it is of a certified safe type approved for use in an explosive petrol and air mixture.
- (b) Electrical equipment and wiring, where it is 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.

Additional provisions applicable only to special category spaces below the bulkhead deck

(14) (a) In special category spaces below the bulkhead deck on a new Class, B, C or D passenger ship, in view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or tank top consequent on the operation of the fixed pressure water-spraying system, the Minister may require pumping and drainage facilities to be provided in addition to the requirements of Rule 39.

(b) In the case of a Class B, C or D passenger ship constructed on or after 1 January 2003, the drainage system shall be sized to remove not less than 125 per cent of the combined 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 metres in each watertight compartment.

(15) In a Class B, C or D passenger ship, as a precaution against the ignition of flammable vapours:

(a) electrical equipment and wiring, if fitted, shall be of a type suitable for use in explosive petrol and air mixtures. Other equipment that may constitute a source of ignition of flammable vapours shall not be permitted;

(b) 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.

(16) In a Class B, C or D passenger ship constructed on or after 1 January 2003, permanent openings in the side plating, the ends or deckhead of special category spaces shall be so situated that a fire in the special category 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 special category spaces.

Fire patrols, detection, alarms and public address systems

120. (1) In a new Class B, C or D passenger ship:
- (a) manually operated call points complying with the requirements of Rules 88, 89 and 90 shall be installed;
 - (b) all 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;
 - (c) a special alarm, operated from the navigating bridge or fire control station, shall be fitted to summon the crew. The alarm may be part of the ship's general alarm system but it shall be capable of being sounded independently of the alarm to the passenger spaces;
 - (d) a public address system or other effective means of communication shall be available throughout the accommodation and service spaces and control stations and open decks;
 - (e) in a Class B, C or D passenger ship constructed on or after 1 January 2003, the public address system specified in subparagraph (d) shall comply with the requirements of Rule 7(5) of the Rules of 2018.

(2) In a new Class B, C or D passenger ship carrying more than 36 passengers, 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 or she may be called upon to use. Each member of the fire patrol shall be provided with a two-way portable radio telephone apparatus.

- (3) (a) A new Class B, C or D passenger ship carrying more than 36 passengers shall have the detection alarms for fire detection and fire alarm systems centralised 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 centralised in the same location. The ventilation fans shall be capable of reactivation by the crew at the continuously manned control station. The control panel in the central control station shall be capable of indicating open or closed positions of fire doors, closed or off status of the detectors, alarms and fans. The control panel shall be continuously powered and should have an automatic changeover 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 as required by Rule 55 unless other arrangements are permitted by the Rules, as applicable.
- (b) The control panel shall be designed on the fail-safe principle whereby an open detector circuit shall cause an alarm condition.

Special requirements for ships carrying dangerous goods

121. (1) In the case of a new Class B, C or D passenger ship constructed before 1 January 2003, the Merchant Shipping (Dangerous Goods) Rules 1992 (S.I. No. 391 of 1992) shall apply, as appropriate, to passenger ships carrying dangerous goods.

(2) In the case of a Class B, C or D passenger ship constructed on or after 1 January 2003, the requirements of Regulation 19 of Part G of the Safety Convention Chapter II-2, as revised per 1 January 2003, shall apply, as appropriate, to passenger ships carrying dangerous goods.

PART 4

RULES FOR LIFE-SAVING APPLIANCES

Interpretation – Part 4

122. In this Part –

“anti-exposure suit” means a protective suit designed for use by rescue boat crews and marine evacuation system parties;

“embarkation ladder” means the ladder provided at survival craft embarkation stations to permit safe access to survival craft after launching;

“float-free launching” means that method of launching a survival craft whereby the craft is automatically released from a sinking ship and is ready for use;

“immersion suit” means a protective suit that reduces the body heat loss of a person wearing it in cold water;

“inflatable appliance” means an appliance which depends upon non-rigid, gas-filled chambers for buoyancy and which is normally kept uninflated until ready for use;

“inflated appliance” means an appliance which depends upon non-rigid, gas-filled chambers for buoyancy and which is kept inflated and ready for use at all times;

“International Life-Saving Appliance (LSA) Code” (referred to as “the LSA Code” in these Rules) means the International Life-Saving Appliance (LSA) Code adopted by the Maritime Safety Committee of the IMO by resolution MSC.48(66), as it may be amended by the IMO, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Safety Convention concerning the amendment procedures applicable to the annex other than Chapter I;

“launching appliance or arrangement” means a means of transferring a survival craft or rescue boat from its stowed position safely to the water;

“lightest seagoing condition” means the loading condition with the ship on even keel, without cargo, with 10 per cent stores and fuel remaining

and, in the case of a passenger ship, with the full number of passengers and crew and their luggage;

“marine evacuation system” means an appliance for the rapid transfer of persons from the embarkation deck of a ship to a floating survival craft;

“novel life-saving appliance or arrangement” means a life-saving appliance or arrangement which embodies new features not fully covered by the provisions of these Rules or the Code but which provides an equal or higher standard of safety;

“recovery time” means, in the case of a rescue boat, the time required to raise the boat to a position where persons on board can disembark to the deck of the ship. Recovery time includes the time required to make preparations for recovery on board the rescue boat such as passing and securing a painter, connecting the rescue boat to the launching appliance, and the time to raise the rescue boat. Recovery time does not include the time needed to lower the launching appliance into position to recover the rescue boat;

“rescue boat” means a boat designed to rescue persons in distress and to marshal survival craft;

“retrieval” means the safe recovery of survivors;

“search and rescue locating device” means an approved 9 GHz Search and Rescue Radar Transponder (SART) or an approved Automatic Identification System Search and Rescue Transmitter (AIS-SART);

“survival craft” means a craft capable of sustaining the lives of persons in distress from the time of abandoning the ship;

“thermal protective aid” means a bag or suit made of waterproof material with low thermal conductance.

Life-saving appliances on a new Class A passenger ship

123. The Rules of 2018 shall apply to a new Class A passenger ship.

Communication, survival craft and rescue boats, personal life-saving appliances

124. (1) This Rule applies to a new Class B, C or D passenger ship.

(2) A passenger ship shall at a minimum be provided with and carry the number of radio life-saving appliances, search and rescue locating devices, personal life-saving appliances, survival craft and rescue boats, distress flares, line-throwing appliances specified in Table 1 to this Rule and in accordance with the related notes, having regard to the Class of passenger ship concerned.

(3) (a) The life-saving appliances and equipment referred to in paragraph (2), including any applicable launching appliances, shall comply with the Rules of 2018 and the LSA Code, unless expressly provided otherwise in the following paragraphs.

(b) Unless expressly provided otherwise, existing life-saving appliances and equipment provided on a passenger ship shall at a minimum comply with the requirements that were in force at the time of the installation of the equipment.

(c) Where the carriage of an approved rescue boat is considered impracticable having regard to the space available on board a ship, the Minister may accept a rescue boat that is less than 3.8 metres in length but not less than 3.3 metres in length, subject to the rescue boat being of a standard that is acceptable to the Minister.

(4) (a) A passenger ship shall carry for each lifeboat on the ship at least 3 immersion suits complying with the requirements of section 2.3 of the LSA Code and, in addition, thermal protective aid complying with the requirements of section 2.5 of the LSA Code for every person to be accommodated in the lifeboat and not provided with an immersion suit.

(b) Immersion suits and thermal protective aids are not required to be carried for persons to be accommodated in totally enclosed lifeboats.

(5) An immersion suit complying with the requirements of section 2.3 of the LSA Code or an anti-exposure suit complying with section 2.4 of the LSA Code, of an appropriate size, shall be provided for every person assigned to crew the rescue boat or assigned to the marine evacuation system party.

(6) A passenger ship that does not carry a lifeboat or a rescue boat shall for rescue purposes be provided with at least one immersion suit.

Table 1						
Class of Ship	B		C		D	
	> 250	≤ 250	> 250	≤ 250	> 250	≤ 250
Number of persons (N) Number of passengers (P)	> 250	≤ 250	> 250	≤ 250	> 250	≤ 250
Survival craft capacity ⁽¹⁾ ⁽²⁾ ⁽³⁾ ⁽⁴⁾ :						
- new passenger ships	1,25 N	1,25 N	1,25 N	1,25 N	1,25 N	1,25 N
Rescue boats ⁽⁴⁾ ⁽⁵⁾	1	1	1	1	1	1
Lifebuoys ⁽⁶⁾	8	8	8	4	8	4
Life jackets ⁽⁸⁾ ⁽⁹⁾ ⁽¹²⁾ ⁽¹³⁾	1,05 N	1,05 N	1,05 N	1,05 N	1,05 N	1,05 N
Child life jackets ⁽⁹⁾ ⁽¹³⁾	0,10 P	0,10 P	0,10 P	0,10 P	0,10 P	0,10 P
Infant life jackets ⁽¹⁰⁾ ⁽¹³⁾	0,025 P	0,025 P	0,025 P	0,025 P	0,025 P	0,025 P
Distress flares ⁽⁷⁾	12	12	12	12	6	6
Search and rescue locating devices	1	1	1	1	1	1
Two-way VHF radiotelephone apparatus	3	3	3	3	3	2

Notes in relation to Table 1

⁽¹⁾ Survival craft may be lifeboats or liferafts or a combination of them in compliance with Rule 124(3). Ro-ro passenger ships shall comply with the requirements in Rule 128(1), (2) or (3) as applicable. A marine evacuation system or systems complying with section 6.2 of the LSA Code may be substituted for the equivalent capacity of liferafts required by Table 1, including its launching appliances where applicable.

⁽²⁾ Survival craft shall, as far as practicable, be equally distributed on each side of the ship.

⁽³⁾ The total/aggregated capacity of survival craft, including additional liferafts, shall be in accordance with the requirements in Table 1, that is 1,25 N equals 125 per cent of the total number of persons (N) the ship is certified to carry. Sufficient number of survival craft shall be carried in order to ensure that in the event of any one survival craft being lost or rendered unserviceable, the remaining survival craft can accommodate the total number of persons the ship is certified to carry. If the stowage requirement for liferafts in Rule 131(5) is not

complied with, additional liferafts may be required to the satisfaction of the Minister.

(⁴) The number of lifeboats and/or rescue boats shall be sufficient to ensure that in providing for abandonment by the total number of persons the ship is certified to carry, no more than 9 liferafts are required to be marshalled by each lifeboat or rescue boat.

(⁵) Launching appliances for rescue boats shall comply with the requirements of Rule 135. Where a rescue boat complies with the requirements in section 4.5 or 4.6 of the LSA Code, the rescue boat may be included in the capacity of the survival craft specified in Table 1. A lifeboat may be accepted as a rescue boat provided that it and its launching and recovery arrangements also comply with the requirements of a rescue boat.

Where the Minister considers that the installation of a rescue boat on board a passenger ship is physically impossible, the passenger ship may be exempted from carrying a rescue boat, provided the ship meets all of the following requirements:

- (a) the ship is arranged to allow a person who is unable to help themselves to be recovered from the water;
- (b) recovery of the helpless person can be observed from the navigating bridge; and
- (c) the ship is sufficiently manoeuvrable to close and recover persons in the worst intended conditions.

(⁶) At least one lifebuoy on each side of a passenger ship shall be equipped with a buoyant lifeline equal in length to not less than twice the height at which it is stowed above the waterline in the lightest seagoing condition or 30 metres, whichever is the greater. Two lifebuoys shall be equipped with a self-activating smoke signal and a self-activating light; and these lifebuoys shall be capable of quick release from the navigation bridge. The remainder of the lifebuoys shall be equipped with self-igniting lights in compliance with paragraph 2.1.2 of the LSA Code.

(⁷) Distress flares complying with the requirements of section 3.1 of the LSA Code shall be stowed on the navigation bridge or steering position.

(⁸) An inflatable life jacket shall be provided for each person who has to carry out work on board the passenger ship in exposed areas. These inflatable life jackets may be included in the total number of life jackets required by these Rules.

(⁹) A number of lifejackets suitable for children equal to at least 10 per cent of the number of passengers on board a passenger ship shall be provided or such greater number as may be required to provide a lifejacket for each child on board the ship.

(¹⁰) A number of lifejackets suitable for an infant equal to at least 2.5 per cent of the number of passengers on board the passenger ship shall be provided or such greater number as may be required to provide a lifejacket for each infant on board the ship.

⁽¹¹⁾ All passenger ships shall carry a sufficient number of lifejackets for persons on watch and for use at remotely located survival craft stations. The lifejackets carried for persons on watch shall be stowed on the bridge, in the engine control room and at any other manned watch station. Not later than the first periodical survey after 1 January 2012, all passenger ships shall comply with footnotes (12) and (13).

⁽¹²⁾ Where the adult lifejackets provided are not designed to fit persons weighing up to 140 kg and with a chest girth of up to 1750 mm, a sufficient number of suitable accessories shall be available on board a passenger ship to allow the lifejackets to be secured to such persons.

⁽¹³⁾ On all passenger ships, each life jacket shall be fitted with a light complying with the requirements of paragraph 2.2.3 of the LSA Code. All ro-ro passenger ships shall comply with Rule 128(6)(c).

Emergency alarm system, public address system, muster list and emergency instructions, radiocommunications personnel, operating instructions, training manual and instructions for maintenance

125. (1)(a) A new Class B, C or D passenger ship shall be provided with a general emergency alarm system that complies with the requirements of paragraph 7.2.1.1 of the LSA Code and is suitable for summoning passengers and crews to muster stations and to initiate the actions included in the muster list.
- (b) In all passenger ships carrying more than 36 passengers, the emergency alarm system provided in accordance with subparagraph (a) shall be supplemented by a public address system that can be used from the bridge. The system shall be of such a nature and so arranged and located that messages read out over the system are readily audible when the main engine is in operation, in all places on the ship where persons are likely to stay.
- (c) In a new Class B, C or D passenger ship constructed on or after 1 January 2003, the general emergency alarm system shall be audible throughout all the accommodation, normal crew working spaces and on all open decks, and minimum sound pressure levels for the emergency alarm tone shall be in accordance with paragraphs 7.2.1.2 and 7.2.1.3 of the LSA Code.
- (2) (a) In addition to the requirements of Rule 120(1)(d) and (e) and of paragraph (1), a new Class B, C or D passenger ship carrying more than 36 passengers shall be fitted with a public address system.
- (b) The public address system provided in accordance with subparagraph (a) shall be a loudspeaker installation enabling the broadcast of messages into all spaces where crew members or passengers, or both, are normally present, and to muster stations. It shall allow for the broadcast of messages from the navigation bridge and such other places on board the ship as the Minister

deems necessary. It shall be installed with due regard to acoustically marginal conditions and not require any action from the addressee.

- (c) The public address system shall be protected against unauthorised use and be clearly audible above the ambient noise in all spaces referred to in subparagraph (b) and shall be provided with an override function controlled from one location on the navigation bridge and such other places on board the ship as the Minister deems necessary, so that all emergency messages will be broadcast if any loudspeaker in the spaces concerned has been switched off, its volume has been turned down or the public address system is used for other purposes.
 - (d) In a new Class B, C or D passenger ship constructed on or after 1 January 2003, the minimum sound pressure levels for broadcasting emergency announcements on the public address system shall be in accordance with paragraph 7.2.2.2 of the LSA Code.
- (3) In a new Class B, C or D passenger ship:
- (a) the public address system shall have at least two loops which shall be sufficiently separated throughout their length and have two separate and independent amplifiers;
 - (b) the public address system and its performance standards shall be approved by Minister having regard to the recommendations of the IMO in IMO MSC/Circ.808.
- (4) The public address system shall be connected to the emergency source of electrical power.
- (5)
- (a) Clear instructions to be followed in the event of an emergency shall be provided for every person on board a passenger ship in accordance with Rule 9 of the Rules of 2018. The instructions shall be drawn up in the English language or languages required by the Minister.
 - (b) Muster lists and emergency instructions complying with the requirements of Rule 38 of the Rules of 2018 shall be exhibited in conspicuous places throughout the ship including the navigating bridge, engine room and crew accommodation spaces.
 - (c) Illustrations and instructions in appropriate languages shall be posted in passenger cabins and be conspicuously displayed at muster stations and other passenger spaces to inform passengers of:
 - (i) their muster station;
 - (ii) the essential actions they must take in an emergency;
 - (iii) the method of donning life jackets.
- (6)
- (a) In accordance with Rule 17 of the Radio Rules of 2018, a new Class B, C or D passenger ship shall carry personnel qualified for

distress and safety radiocommunication purposes to the satisfaction of the Minister.

- (b) The personnel referred to in subparagraph (a) shall at a minimum each be holders of a Global Maritime Distress and Safety System (GMDSS) Restricted Operator's Certificate of Competency granted under Regulation 6 of the Wireless Telegraphy (Maritime Radio Operator) (Certificates of Competency) Regulations 2010 (S.I. No. 8 of 2010), and any one of the personnel shall be designated to have primary responsibility for radiocommunications during distress incidents, which shall be reflected in the emergency instructions required by paragraph (5).
- (c) In a new Class B or C passenger ship, at least one person qualified in accordance with subparagraph (b) shall be assigned to perform only radiocommunication duties during distress incidents, which shall be reflected in the emergency instructions required by paragraph (5).

(7) In a new or existing Class B or C passenger ship, posters or signs shall be provided on or in the vicinity of survival craft and their launching controls and shall:

- (a) illustrate the purpose of controls and the procedures for operating the appliance and give relevant instructions or warnings;
 - (b) be easily seen under emergency lighting conditions;
 - (c) use symbols in accordance with IMO Resolution A.760(18) as amended by IMO Resolution MSC.82(70).
- (8) (a) In a passenger ship, a training manual complying with the requirements of Rule 36(3) of the Rules of 2018 shall be provided in the wheelhouse and in each crew mess room and recreation room or in each crew cabin where applicable.
- (b) Every ship fitted with a marine evacuation system shall be provided with on-board training aids in the use of the system.
 - (c) The training manual provided in accordance with subparagraph (a) shall be written in the working language of the ship.

(9) In a passenger ship, instructions for on-board maintenance of life-saving appliances or a shipboard planned maintenance programme which includes the maintenance of life-saving appliances, shall be provided on board the ship and maintenance shall be carried out accordingly. The instructions shall include the following for each appliance:

- (a) a checklist for use when carrying out the inspections required by Rule 138(6);
- (b) maintenance and repair instructions;
- (c) a schedule of periodic maintenance;
- (d) a diagram of lubrication points with the recommended lubricants;
- (e) a list of replaceable parts;

- (f) a list of sources of spare parts;
- (g) a log for records of inspections and maintenance.

Manning of survival craft and supervision

126. (1) This Rule applies to a new Class B, C or D passenger ship.
- (2) There shall be a sufficient number of trained persons on board the ship for mustering and assisting untrained persons.
- (3) There shall be a sufficient number of crew members on board for operating the survival craft and launching arrangements required for abandonment of the total number of persons on board the ship.
- (4) An officer or certified person shall be placed in charge of each survival craft to be used. However, the Minister, having due regard to the nature of the voyage, the number of persons on board and the characteristics of the ship, may permit a crew member practised in the handling and operation of liferafts, to be placed in charge of each liferaft or group of liferafts in lieu of persons qualified as above. Every rescue boat and motorised survival craft shall have a person assigned who is capable of operating the engine and carrying out minor adjustments.
- (5) The master of the ship shall ensure the equitable distribution of persons referred to in paragraphs (2), (3) and (4) among the ship's survival craft.

Survival craft muster and embarkation arrangements

127. (1) This Rule applies to a new Class B, C or D passenger ship.
- (2) Lifeboats and liferafts for which approved launching appliances are required shall be stowed as close to accommodation and service spaces as possible.
- (3) (a) A muster station shall be provided close to each embarkation station and shall be readily accessible from accommodation and work areas and have ample room for marshalling and instruction of the passengers. Clear deck space at least 0.35 m² per person shall be provided.
- (b) On a ship constructed before 1 July 1998, each muster station shall have sufficient space to accommodate all persons assigned to muster at that station.
- (4) (a) Muster and embarkation stations, alleyways, stairways and exits giving access to the muster and embarkation stations shall be adequately illuminated.
- (b) Lighting provided in accordance with subparagraph (a) shall be capable of being supplied by the emergency source of electrical power required by Rules 55 and 56.
- (c) In addition to and as part of the markings required under Rule 101(1)(f) for a new Class B, C or D passenger ship, routes to muster stations shall be indicated with the muster station symbol,

intended for that purpose, in accordance with the recommendations of the IMO.

- (d) A lifeboat shall be capable of being boarded either directly from the stowed position or from an embarkation deck, but not both.
 - (e) A davit-launched liferaft shall be capable of being boarded from a position immediately adjacent to the stowed position or from a position the liferaft is transferred to prior to launching.
 - (f) Where necessary, means shall be provided for bringing the davit-launched survival craft against the ship's side and holding them alongside so that persons can safely embark.
 - (g) There shall be at least one embarkation ladder, complying with the requirements of paragraph 6.1.6 of the LSA Code, on each side of the ship. The Minister may exempt a passenger ship from this requirement provided that, to the satisfaction of the Minister, in all undamaged and prescribed damage conditions of trim and heel, the freeboard between the intended embarkation position and the waterline is not greater than 1.5 metres in height.
- (5) (a) In a new Class B, C or D passenger ship, an approved type of MES (Marine Evacuation System) complying with section 6.2 of the LSA Code shall be installed if a survival craft launching arrangement does not allow embarkation into the survival craft before it is on the water and the height from the embarkation station to the water is greater than 4.5 metres above the waterline in the lightest seagoing condition.
- (b) On a passenger ship fitted with a marine evacuation system, communication between the embarkation station and the platform of the survival craft shall be ensured.

Requirements for ro-ro passenger ships

128. (1) In a Class B, C or D ro-ro passenger ship constructed before 1 January 2003, the following applies in respect of liferafts:

- (a) the ro-ro passenger ship's liferafts shall be served by marine evacuation systems complying with section 6.2 of the LSA Code or launching appliances complying with section 6.1 of the LSA Code, equally distributed on each side of the ship;
- (b) communication between the embarkation station and the platform shall be ensured;
- (c) notwithstanding subparagraphs (a) and (b), when marine evacuation systems on a ro-ro passenger ship are replaced or such a passenger ship undergoes repairs, alterations or modifications of a major character, which involve replacement of, or any addition to, their existing life-saving appliances or arrangements, a ro-ro passenger ship's liferafts shall be served with marine evacuation systems complying with section 6.2 of the LSA Code or launching appliances complying with paragraph 6.1.5 of the LSA Code equally distributed on each side of the ship.

(2) In a Class B, C or D ro-ro passenger ship constructed on or after 1 January 2003, the liferafts shall be served by marine evacuation systems complying with section 6.2 of the LSA Code or launching appliances complying with paragraph 6.1.5 of the LSA Code equally distributed on each side of the ship. Communication between the embarkation station and the platform shall be ensured.

(3) In a Class B, C or D ro-ro passenger ship, every liferaft on board shall:

- (a) be provided with float free stowage arrangements complying with the requirements of Rule 131(3);
- (b) be of a type fitted with a boarding ramp complying with the requirements of paragraph 4.2.4.1 or 4.3.4.1 of the LSA Code as appropriate;
- (c) be either automatically self-righting or be a canopied reversible liferaft which is stable in a seaway and is capable of operating safely whichever way up it is floating;
- (d) as an alternate to subparagraphs (a), (b) or (c), a ship may carry automatically self-righting liferafts or canopied reversible liferafts in addition to its normal complement of liferafts, of such aggregate capacity as will accommodate at least 50 per cent of the persons not accommodated in lifeboats;
- (e) the additional liferaft capacity referred to in subparagraph (d) shall be determined on the basis of the difference between the total number of persons on board the ship and the number of persons

accommodated in lifeboats. Every such liferaft shall be approved by the Minister having regard to the Regulations of 2017 or the recommendations in IMO MSC/Circ.809.

(4) In a Class B ro-ro passenger ship, the following applies in respect of search and rescue locating devices:

- (a) a liferaft carried on a Class B ro-ro passenger ship shall be fitted with a search and rescue locating device in the ratio of one search and rescue locating device for every 4 liferafts;
- (b) the search and rescue locating device shall be mounted inside the liferaft in order that its antenna is greater than one metre above the sea level when the liferaft is deployed, except that in the case of canopied reversible liferafts, the search and rescue locating device shall be so arranged as to be readily accessed and erected by survivors;
- (c) each search and rescue locating device shall be arranged to be manually erected when the liferaft is deployed;
- (d) containers of liferafts fitted with search and rescue locating devices shall be clearly marked.

(5) In a Class B, C or D ro-ro passenger ship, the following applies in respect of the means of rescue:

- (a) each ro-ro passenger ship shall be equipped with efficient means for rapidly recovering survivors from the water and transferring survivors from rescue units or survival craft to the ship;
 - (b)
 - (i) the means of transfer of survivors to the ship may be part of a marine evacuation system, or may be part of a system designed for rescue purposes;
 - (ii) the means referred to in clause (i) shall be approved by the Minister having regard to the recommendations in IMO MSC/Circ.810;
 - (c) where the slide of a marine evacuation system is intended to provide the means of transfer of survivors to the deck of the passenger ship, the slide shall be equipped with hand lines or ladders to aid in climbing up the slide.
- (6) (a) Rules 8(2) and 23(2) of the Rules of 2018 shall apply to a Class B, C and D ro-ro passenger ship to which these Rules apply.
- (b) Notwithstanding subparagraph (a), a sufficient number of life jackets shall be stowed in the vicinity of the muster stations so that passengers do not have to return to their cabins to collect their life jackets.

- (c) Each life jacket on a ro-ro passenger ship shall be fitted with a light complying with the requirements of paragraph 2.2.3 of the LSA Code.

Decision support system for masters

129.(1) In a new and existing Class B, C or D ro-ro passenger ship, a decision support system for emergency management shall be provided on the navigation bridge.

(2) The decision support system provided in accordance with paragraph (1) shall, as a minimum, consist of a printed emergency plan or plans. All foreseeable emergency situations shall be identified in the emergency plan or plans including, but not limited to, the following main groups of emergencies:

- (a) fire;
- (b) damage to ship;
- (c) pollution;
- (d) unlawful acts threatening the safety of the ship and the security of its passengers and crew;
- (e) personnel accidents;
- (f) cargo-related accidents;
- (g) emergency assistance to other ships.

(3) The emergency procedures established in the emergency plan or plans shall provide decision support to masters for handling any combination of emergency situations.

(4) The emergency plan or plans shall have a uniform structure and be easy to use. Where applicable, the actual loading condition as calculated for the ship's voyage stability shall be used for damage control purposes.

(5) In addition to the printed emergency plan or plans, the Minister may accept the use of a computer-based decision-support system on the navigation bridge which provides all the information contained in the emergency plan or plans, procedures, check lists, which is able to present a list of recommended actions to be carried out in foreseeable emergencies.

Launching stations

130. In a new Class B, C or D ro-ro passenger ship launching stations shall be in such positions as to ensure safe launching having particular regard to clearance from the propeller and steeply overhanging portions of the hull, and so that survival craft can be launched down the straight side of the ship. If positioned forward, a launching station shall be positioned abaft the collision bulkhead, in a sheltered position.

Stowage of survival craft

131. (1) In a new Class B, C or D ro-ro passenger ship, each survival craft shall be stowed:

- (a) so that neither the survival craft nor its stowage arrangements will interfere with other survival craft launching operations;
 - (b) as near to the water surface as is safe and practicable; in the case of a davit-launched survival craft, the height of the davit head, with the survival craft in embarkation position, shall, as far as practicable, not exceed 15 metres to the waterline when the ship is in its lightest seagoing condition, and the position of a davit launched survival craft in the embarkation position shall be such that it stays clear of the waterline with the ship in the fully loaded condition under all conditions of trim of up to 10° and listed up to 20° either way for new ships, respectively up to at least 15° either way for existing ships, or to the angle at which the ship's weatherdeck becomes submerged, whichever is less;
 - (c) in a state of continuous readiness so that two crew members can prepare the craft for embarkation and launching in less than 5 minutes;
 - (d) as far forward of the propeller as is practicable;
 - (e) fully equipped, as required by the relevant Safety Convention Regulations.
- (2) Lifeboats shall be stowed attached to launching appliances.
- (3) Every liferaft shall be stowed:
- (a) with its painter permanently attached to the ship;
 - (b) with a float-free arrangement, complying with the requirements of paragraph 4.1.6 of the LSA Code enabling the liferaft to float free and, if inflatable, to inflate automatically when the ship sinks. One float-free arrangement may be used for two or more liferafts if the float-free arrangement is sufficient to comply with the requirements of paragraph 4.1.6 of the LSA Code;
 - (c) so as to permit manual release from its securing arrangements.

(4) Davit-launched liferafts shall be stowed within reach of the lifting hooks, unless some means of transfer is provided which is not rendered inoperable within the limits of trim of up to 10° and list up to 20° either way for new ships, respectively up to at least 15° either way for existing ships, or by ship motion or power failure.

(5) Liferafts intended for throw-overboard launching shall be so stowed as to be in a position providing easy side to side transfer at a single open deck level. Where this stowing arrangement cannot be met, additional liferafts shall be provided so that the total capacity available on each side will accommodate 75 per cent of the total number of persons on board.

- (6) A liferaft associated with a Marine Evacuation System (MES) shall:
- (a) be stowed close to the container containing the MES;
 - (b) be capable of release from its stowage rack with arrangements which will enable it to be moored and inflated alongside the boarding platform;
 - (c) be capable of release as an independent survival craft;
 - (d) be provided with retrieving lines to the boarding platform.

Stowage of rescue boats

132. In a new Class B, C or D passenger ship, a rescue boat shall be stowed:
- (a) in a state of continuous readiness for launching in not more than 5 minutes and if the inflated type, in a fully inflated condition at all times;
 - (b) in a position suitable for launching and recovery;
 - (c) so that neither the rescue boat nor its stowage arrangements will interfere with the operation of any survival craft at any other launching station;
 - (d) where it is also a lifeboat, in compliance with the requirements of Rule 131.

Stowage of marine evacuation systems

133. (1) This Rule applies to a new Class B, C or D passenger ship.
- (2) The ship's side shall not have any openings between the embarkation station of the marine evacuation system and the waterline in the lightest seagoing condition and means shall be provided to protect the system from any projections.
- (3) Marine evacuation systems shall be in such position as to ensure safe launching having particular regard to clearance from the propeller and steeply overhanging positions of the hull and so that, as far as practicable, the system can be launched down the straight side of the ship.

(4) Each marine evacuation system shall be stowed so that neither the passage nor the platform nor its stowage or operational arrangements will interfere with the operation of any other life-saving appliance at any other launching station.

(5) Where appropriate, the ship shall be so arranged that the marine evacuation systems in their stowed positions are protected from damage by heavy seas.

Survival craft launching and recovering arrangements

134. (1) In a new Class B, C or D passenger ship, launching appliances complying with the requirements of section 6.1 of the LSA Code shall be provided for all survival craft.

(2) In the case of a new Class B, C or D passenger ship, where, subject to survival craft and rescue boat embarkation arrangements being effective within the environmental conditions in which the ship is likely to operate and in all undamaged and prescribed damage conditions of trim and heel, the freeboard between the intended embarkation position and the waterline in the lightest seagoing condition is not more than 4.5 metres, the Minister may accept a system where persons board liferafts directly.

(3) (a) Each lifeboat shall be provided with an appliance that is capable of launching and recovering the lifeboat.

(b) In the case of a new Class B, C or D passenger ship constructed on or after 1 January 2003, there shall be an additional provision for hanging-off the lifeboat to free the release gear for maintenance.

(4) Launching and recovering arrangements shall be such that the appliance operator on the ship is able to observe the survival craft at all times during launching and for lifeboats during recovery.

(5) Only one type of release mechanism shall be used for similar survival craft carried on board the ship.

(6) Falls, where used, shall be long enough for survival craft to reach the water with the ship in its lightest seagoing condition, under all conditions of trim of up to 10° and list of up to 20° either way for new ships.

(7) Preparation and handling of survival craft at any one launching station shall not interfere with the prompt preparation and handling of any other survival craft or rescue boat at any other station.

(8) Means shall be available to prevent any discharge of water on survival craft during abandonment.

(9) During preparation and launching, the survival craft, its launching appliance, and the area of water into which it is to be launched shall be adequately illuminated by lighting supplied from the emergency source of electrical power required by Rules 55 and 56.

Rescue boat embarkation, launching and recovery arrangements

135. (1) In a new Class B, C or D passenger ship, the rescue boat embarkation and launching arrangements shall be such that the rescue boat can be boarded and launched in the shortest possible time.

(2) The rescue boat shall be capable of being boarded and launched directly from the stowed position with the number of persons assigned to crew the rescue boat on board.

(3) Where the rescue boat is included in the capacity of the survival craft and the other lifeboats are boarded from the embarkation deck, the rescue boat shall, in addition to paragraph (2), be capable of being boarded from the embarkation deck.

(4) Launching arrangements shall comply with the requirements of Rule 134. However, all rescue boats shall be capable of being launched, where necessary utilizing painters, with the ship making headway at speeds up to 5 knots in calm water.

(5) Recovery time of the rescue boat shall be not more than 5 minutes in moderate sea conditions when loaded with its full complement of persons and equipment. If the rescue boat is also a lifeboat, this recovery time shall be possible when loaded with its lifeboat equipment and the approved rescue boat complement of at least 6 persons.

(6) In the case of a new Class B, C or D passenger ship constructed on or after 1 January 2003, rescue boat embarkation and recovery arrangements shall allow for safe and efficient handling of a stretcher case. Foul weather recovery strops shall be provided for safety if heavy fall blocks constitute a danger.

Recovery of persons from the water

136. (1) This Rule applies to a Class B, C or D passenger ship.

(2) A passenger ship shall have ship-specific plans and procedures for recovery of persons from the water, taking into account the guidelines developed by the IMO in MSC.1/Circ.1447. The plans and procedures shall identify the equipment that is intended to be used for recovery purposes and measures to be taken to minimize the risk to shipboard personnel involved in recovery operations.

(3) A ro-ro passenger ship which complies with Rule 128(5) shall be deemed to comply with this Rule.

Emergency instructions

137. (1) In a new Class B, C or D passenger ship, whenever new passengers embark, a passenger safety briefing shall be given immediately before or after departure. The briefing shall at least include the instructions required by Rule 125(5) and it shall be made by means of an announcement in one or more languages likely to be understood by the passengers.

(2) The announcement referred to in paragraph (1) shall be made on the ship's public address system or by other suitable means that are likely to be heard at least by the passengers who have not yet heard it during the voyage.

Operational readiness, maintenance and inspections

138. (1) In a new Class B, C or D passenger ship, before the ship leaves port and at all times during the voyage, all life-saving appliances shall be in working order and ready for immediate use.

(2) (a) Maintenance and inspections of life-saving appliances shall be carried out in accordance with the guidelines developed by the IMO and in a manner having due regard to ensuring the reliability of such appliances. Testing of life-saving appliances shall be carried out in a manner having due regard to ensuring the reliability of such appliances.

(b) Instructions for on-board maintenance of life-saving appliances complying with Rule 125(9) shall be provided and maintenance shall be carried out accordingly.

(c) The Minister may accept, in compliance with the requirements of subparagraph (b), a shipboard planned maintenance programme which includes the requirements of Rule 125(9).

(3) 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 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) The following tests and inspections shall be carried out weekly and a report of the inspection shall be entered in the logbook:

(a) all survival craft, rescue boats and launching appliances shall be visually inspected to ensure that they are ready for use. The inspection shall include, but is not limited to, the condition of hooks, their attachment to the lifeboat and the on-load release gear being properly and completely re-set;

(b) all engines in lifeboats and rescue boats shall be run for a total period of not less than 3 minutes provided the ambient temperature is above the minimum temperature required for starting and running the engine. During this period of time, it shall be demonstrated that the gear box and gear box train are engaging satisfactorily. Where the special characteristics of an outboard motor fitted to a rescue boat would not allow it to be run other than with its propeller submerged for a period of 3 minutes, a suitable water supply may be provided. In special cases the Minister may waive this requirement for ships constructed before 1 July 1986;

- (c) lifeboats shall be moved from their stowed position, without any persons on board, to the extent necessary to demonstrate satisfactory operation of launching appliances, when weather and sea conditions so allow;
 - (d) the general emergency alarm system shall be tested.
- (6) The following tests and inspections shall be carried out monthly:
 - (a) all lifeboats shall be turned out from their stowed position, without any persons on board, when weather and sea conditions so allow;
 - (b) inspection of the life-saving appliances, including lifeboat equipment, shall be carried out monthly using the checklist required by Rule 125(9)(a) to ensure that they are complete and in good order. A report of the inspection shall be entered in the logbook.
- (7) Every inflatable liferaft, inflatable lifejacket, and marine evacuation system shall be serviced:
 - (a) at intervals not exceeding 12 months, provided that where in any case this is impracticable, the Minister may extend this period to 17 months;
 - (b) at an approved servicing station which is competent to service them, maintains proper servicing facilities and uses only properly trained personnel.
- (8) In addition to or in conjunction with the servicing intervals of marine evacuation systems required by paragraph (7), each marine evacuation system shall be deployed from the ship on a rotational basis at intervals to be agreed by the Minister provided that each system is to be deployed at least once every 6 years.
- (9) Where new and novel inflatable liferaft arrangements are approved by the Minister, the Minister may allow extended service intervals on the following conditions:
 - (a) the new and novel liferaft arrangement has proved to maintain the same standard, as required by testing procedure, during extended service intervals;
 - (b) the liferaft system shall be checked on board by certified personnel in accordance with paragraph (7)(a);
 - (c) service at intervals not exceeding 5 years shall be carried out in accordance with the recommendations of the IMO.
- (10) All repairs and maintenance of inflated rescue boats shall be carried out in accordance with the manufacturer's instructions. Emergency repairs may be

carried out on board the ship. However, permanent repairs shall be effected at an approved servicing station.

(11) Where the Minister permits an extension of liferaft service intervals in accordance with paragraph (9), the Minister shall notify the IMO of such action in accordance with Safety Convention regulation I/5(b).

(12) Hydrostatic release units, other than disposable hydrostatic release units, shall be serviced:

- (a) at intervals not exceeding 12 months, provided that where in any case this is impracticable, the Minister may extend this period to 17 months;
- (b) at a servicing station which is competent to service them, maintains proper servicing facilities and uses only properly trained personnel.

(13) Containers, brackets, racks, and other similar stowage locations for life-saving equipment shall be marked with symbols in accordance with the recommendations of the IMO, indicating the devices stowed in that location and for that purpose. Where more than one device is stowed in a location, the number of devices shall also be indicated.

(14) (a) Launching appliances shall be:

- (i) maintained in accordance with instructions for on-board maintenance as required by Rule 125(9);
- (ii) subject to a thorough examination during the annual survey carried out in accordance with section 6 of the Act of 1992;
- (iii) upon completion of the examination in clause (ii), be subjected to a dynamic test of the winch brake at maximum lowering speed. The load to be applied shall be the mass of the survival craft or rescue boat without persons on board, except that, at intervals not exceeding 5 years, the test shall be carried out with a proof load equal to 1.1 times the weight of the survival craft or rescue boat and its full complement of persons and equipment.

(b) Lifeboat or rescue boat release gear shall be:

- (i) maintained in accordance with instructions for on-board maintenance as required by Rule 125(9);
- (ii) subject to a thorough examination and test during the annual survey carried out in accordance with section 6 of the Act of 1992 by properly trained personnel familiar with the system;

- (iii) in the case of on-load release gear, operationally tested under a load of 1.1 times the total mass of the boat when loaded with its full complement of persons and equipment whenever the release gear is overhauled. Such over-hauling and test shall be carried out at least once every 5 years.
- (c) Davit-launched liferaft automatic release hooks shall be:
 - (i) maintained in accordance with instructions for on-board maintenance as required by Rule 125(9);
 - (ii) subject to a thorough examination and test during the annual survey carried out in accordance with section 6 of the Act of 1992 by properly trained personnel familiar with the system;
 - (iii) operationally tested under a load of 1.1 times the total mass of the liferaft when loaded with its full complement of persons and equipment whenever the automatic release hook is overhauled. Such over-hauling and test shall be carried out at least once every 5 years.

Abandon ship training and drills

139. (1) This Rule applies to a new Class B, C or D passenger ship.
- (2) Notwithstanding paragraph (10)(a), every crew member with assigned emergency duties shall be familiar with these duties before the voyage begins.
- (3) (a) An abandon ship drill and fire drill shall take place weekly.
- (b) Each member of the crew shall participate in at least one abandon ship drill and one fire drill every month.
- (c) The drills of the crew shall take place before the departure of the ship where more than 25 per cent of the crew have not participated in abandon ship and fire drills on board that particular ship in the previous month.
- (d) When a ship enters into service for the first time, after modification of a major character or when a new crew is engaged, the drills required by this Rule shall be held before the ship sails.
- (4) Each abandon ship drill shall, as far as practicable, be conducted as if there were an actual emergency and shall have regard to the guidelines in IMO MSC.1/Circ.1206/Rev.1 in its updated version, "Measures to prevent accidents with lifeboats".
- (5) Each abandon ship drill shall include:
- (a) summoning of passengers and crew to muster stations with the alarm required by Rule 125(1) followed by drill announcement on the public address or other communication system and

ensuring that the passengers and crew are made aware of the order to abandon ship;

- (b) reporting to stations and preparing for the duties described in the muster list;
 - (c) checking that passengers and crew are suitably dressed;
 - (d) checking that lifejackets are correctly donned;
 - (e) lowering of at least one lifeboat after any necessary preparation for launching;
 - (f) starting and operating the lifeboat engine;
 - (g) operation of davits used for launching liferafts;
 - (h) a mock search and rescue of passengers trapped in their staterooms;
 - (i) instruction in the use of radio life-saving appliances.
- (6) (a) Different lifeboats and rescue boats shall, as far as practicable, be lowered at successive drills in compliance with the requirements of paragraph (5)(e).
- (b) Except as provided in subparagraph (c), each lifeboat shall be launched, and manoeuvred in the water by its assigned operating crew, at least once every 3 months during an abandon ship drill.
- (c) As far as is reasonable and practicable, rescue boats other than lifeboats which are also rescue boats, shall be launched each month with their assigned crew aboard and manoeuvred in the water. In all cases, this requirement shall be complied with at least once every 3 months.
- (d) Where lifeboat and rescue boat launching drills are carried out with the ship making headway, such drills shall, because of the dangers involved, be practised in sheltered waters only and under the supervision of an officer experienced in such drills, having regard to the guidelines in IMO Resolution A.624(15) "Guidelines on training for the purpose of launching lifeboats and rescue boats from ships making headway through the water".
- (e) The Minister may allow ships not to launch the lifeboats on one side where their berthing arrangements in port and their trading patterns do not permit launching of lifeboats on that side. However, all such lifeboats shall be lowered at least once every 3 months and launched at least annually.

(7) Where a ship is fitted with marine evacuation systems, drills shall include exercising of the procedures required for the deployment of such a system up to the point immediately preceding actual deployment of the system. This aspect of drills shall be augmented by regular instruction using the on-board training aids required by Rule 125(8). Additionally every system party member shall, as far as practicable, be further trained by participation in a full deployment of a similar system into water, either on board a ship or ashore, at intervals of not longer than

2 years, but in no case longer than 3 years. This training may be associated with the deployments required by Rule 138(8).

(8) Emergency lighting for mustering and abandonment shall be tested at each abandon ship drill.

(9) (a) Fire drills shall be planned in such a way that due consideration is given to regular practice in the various emergencies that may occur depending on the type of ship and the cargo.

(b) Each fire drill shall include:

- (i) reporting to stations and preparing for the duties described in the muster list;
- (ii) starting of a fire pump, using at least the 2 required jets of water to show that the system is in proper working order;
- (iii) checking of personal protective and rescue equipment;
- (iv) checking of relevant communication equipment;
- (v) checking the operation of watertight doors, fire doors, fire dampers and main inlets and outlets of ventilation systems in the drill area;
- (vi) checking the necessary arrangements for subsequent abandoning of the ship.

(c) The equipment used during drills shall immediately be brought back to its fully operational condition and any faults and defects discovered during the drills shall be remedied as soon as possible.

(10) (a) On-board training in the use of the ships life-saving appliances, including survival craft equipment, and in the use of the ships fire-extinguishing appliances shall be given as soon as possible but not later than 2 weeks after a crew member joins the ship. However, if the crew member is on a regularly scheduled rotating assignment to the ship, such training shall be given not later than 2 weeks after the time of first joining the ship. Instructions in the use of the ship's fire-extinguishing appliances, life-saving appliances, and in survival at sea shall be given at the same interval as the drills. Individual instruction may cover different parts of the ships life-saving and fire-extinguishing appliances, but all the ships life-saving and fire-extinguishing appliances shall be covered within any period of 2 months.

(b) Every crew member shall be given instructions which shall include but not necessarily be limited to:

- (i) operation and use of the ships inflatable liferafts;
- (ii) problems of hypothermia, first-aid treatment for hypothermia and other appropriate first-aid procedures;

- (iii) special instructions necessary for use of the ships life-saving appliances in severe weather and severe sea conditions;
 - (iv) operation and use of fire-extinguishing appliances.
- (c) On-board training in the use of davit-launched liferafts shall take place at intervals of not more than 4 months on every ship fitted with such appliances. Whenever practicable this training shall include the inflation and lowering of a liferaft. This liferaft may be a special liferaft intended for training purposes only, which is not part of the ships life-saving equipment; such a special liferaft shall be conspicuously marked.
- (11) (a) Crew members with enclosed space entry or rescue responsibilities shall participate in an enclosed space entry and rescue drill to be held on board the passenger ship with an interval to be established by the Minister, but not less than once a year.
- (b) Enclosed space entry and rescue drills shall be planned and conducted in a safe manner, taking into account, as appropriate, the guidance provided by the IMO in resolution A.1050(27).
- (c) Each enclosed space entry and rescue drill shall include checking and use of:
- (i) personal protective equipment required for entry;
 - (ii) communication equipment and procedures;
 - (iii) instruments for measuring the atmosphere in enclosed spaces;
 - (iv) rescue equipment and procedures;
 - (v) instructions in first aid and resuscitation techniques.

Records

140. (1) In a new Class B, C or D passenger ship, the date when musters are held, details of abandon ship drills and fire drills, enclosed space entry and rescue drills, drills of other life-saving appliances and on board training shall be recorded in the official logbook.

(2) Where a full muster, drill or training session is not held at the appointed time, an entry shall be made in the logbook referred to in paragraph (1) stating the circumstances and the extent of the muster, drill or training session held.

PART 5
RADIO RULES

Radiocommunications – application

141. (1) The Radio Rules of 2018 shall apply to a new passenger ship of Class A, B or C.

(2) Subject to Rule 143, the Radio Rules of 1992 shall apply to a new passenger ship of Class D.

Radiocommunications equipment on Class D passenger ships

142. (1) A Class D passenger ship shall at a minimum be provided with a fixed VHF radio installation capable of transmitting and receiving:

- (a) DSC on the frequency 156.525 MHz (channel 70). It shall be possible to initiate the transmission of distress alerts on channel 70 from the position from which the ship is normally navigated;
- (b) radiotelephony on the frequencies 156.300 MHz (channel 6), 156.650 MHz (channel 13) and 156.800 MHz (channel 16).

(2) The VHF radio installation provided in accordance with paragraph (1) shall be capable of transmitting and receiving general radiocommunications using radiotelephony.

(3) In this Rule –

“DSC” means Digital Selective Calling, a technique using digital codes which enables a radio station to establish contact with, and transfer information to, another station or group of stations;

"general radiocommunications" means operational and public correspondence traffic, other than distress, urgency and safety messages, conducted by radio;

“VHF” means very high frequency, being the frequency spectrum between 30 MHz and 300 MHz.

Sources of energy on Class D passenger ships

143. Notwithstanding Rule 12(2) of the Radio Rules of 1992, the reserve source of energy on a Class D passenger ship shall be capable of operating the radio installations referenced in that Rule for a period of at least 6 hours on a ship that is not provided with an emergency source of electrical power complying with all relevant provisions in Rule 55, including the supply of such power to the radio installations.

SCHEDULE 1

Rule 2(3)

SEA AREAS

East Coast of Ireland

Carlingford Lough to Tuskar Rock Lighthouse

Location	Sea Area		Sea Area		Region
	Area D		Area C		
	Summer	All Year	Summer	All Year	
Carlingford Lough Entrance to Dunany Point	✓	X	✓	X	Carlingford Lough
Clogher Head to Cardy Rocks	✓	X	✓	X	Louth Coast
Rush to Baily Lighthouse	✓	X	✓	X	Dublin Coast
Baily Lighthouse to Dalkey Island	✓	X	✓	X	Dublin Bay
Dalkey Island to Wicklow Head (Lighthouse)	✓	X	✓	X	Dublin to Wicklow
Wicklow Head to Cahore Point	✓	X	✓	X	Wicklow/Wexford
Raven Point to Rosslare Harbour	✓	X	✓	X	Wexford

South Coast of Ireland

Tuskar Rock Lighthouse to Mizen Head Lighthouse

Location	Sea Area		Sea Area		Region
	Area D		Area C		
	Summer	All Year	Summer	All Year	
Carnsore Point to Hook Head	X	X	✓	X	South Wexford Coast
Hook Head to Brownstown Head	X	X	✓	X	Approaches to Waterford

Helvick Head to Ballyvoyle Head	✓	X	✓	X	Approaches to Dungarvan
Ram Head to Knockadoon Head	✓	X	✓	X	Approaches to Youghal
Knockadoon Head to Ballycotton Island	X	X	✓	X	Approaches to Ballycotton
Power Head to Roberts Head	X	X	✓	X	Approaches to Cork
Frower Point to Old Head of Kinsale	X	X	✓	X	Approaches to Kinsale
Old Head of Kinsale to Galley Head	X	X	✓	X	Courtmacsherry to Clonakilty
Galley Head to Toe Head	X	X	✓	X	Rosscarberry to Castle Haven
Toe Head to Cape Clear South Harbour	✓	X	✓	X	Approaches to Baltimore and Cape Clear Island
Cape Clear North Harbour to Streek Head	✓	X	✓	X	Long Island Bay

Southwest Coast of Ireland

Mizen Head Lighthouse to Loop Head Lighthouse

Location	Sea Area		Sea Area		Region
	Area D		Area C		
	Summer	All Year	Summer	All Year	
Rough Point to Crow Rock	X	X	✓	X	Tralee Bay
Kilcredaun Head to Beal Point	X	X	✓	X	Shannon Estuary
Beal Point to Kilrush	✓	X	✓	✓	Shannon Estuary
Dunmanus Bay East of Longitude 9°40.4'W.	✓	✓	✓	✓	Dunmanus Bay

Sheep's Head to Three Castle Head	X	X	✓	X	Dunmanus Bay
Sheep's Head to Blackball Head	X	X	✓	X	Bantry Bay
Bantry Bay, East of Longitude 9°32.4'W.	✓	X	✓	X	Bantry Bay
Lamb's Head to Cod's Head	X	X	✓	X	Kenmare River
East of Longitude 9°54.7'W.	✓	✓	✓	✓	Kenmare River
Ballinskelligs Bay Hogs Head to Horse Island	X	X	✓	X	Ballinskelligs Bay
Parkmore Point to Keownglas Head	✓	X	✓	X	Dingle Bay
East Sister to Duncapple Islets	✓	X	✓	X	Smerwick Harbour
Brandon Point to Inishtooskert Island	X	X	✓	X	Brandon Bay

West Coast of Ireland

Loop Head Lighthouse to Eagle Island Lighthouse

Location	Sea Area		Sea Area		Region
	Area D		Area C		
	Summer	All Year	Summer	All Year	
Inside of a line joining Errislanann Point to Inishshark Island to Bofin Harbour to Inishturk	X	X	✓	X	Cleggan to Inishshark Island to Inishbofin Island to Inishturk Island

Island to Rinvyle Point					
Ballaghline Point to Trawkeera Point	X	X	✓	X	Doolin to Aran Islands
Pipe Rock to Clogharone	X	X	✓	X	Inisheer to Inishmaan
Aillinera to Illaunanaur	X	X	✓	X	Inishmaan to Inishmore
Curranghduff to Golam Head	X	X	✓	X	Inishmore to Mainland
Black Head to Ballywilliam Point	✓	X	✓	X	Midway Galway Bay
Finavarra Point to Mutton Island	✓	✓	✓	✓	Upper end Galway Bay
Inside of a line joining Ardmore Point to Illaunmaan to North Point of Inishbarra Island	✓	✓	✓	✓	Kilkieran Bay Inner
Inside of a line joining Baun Rock to Inishlackan to Treh Point	✓	X	✓	X	Roundstone Bay
Baun Rock to Inishlackan to Treh Point	X	X	✓	X	Roundstone
Clifden Bay. East of	✓	X	✓	✓	Clifden

Longitude 10°05'W.					
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Northwest Coast of Ireland

Eagle Island Lighthouse to Lough Foyle

Location	Sea Area		Sea Area		Region
	Area D		Area C		
	Summer	All Year	Summer	All Year	
Erris Head to Kid Island	X	X	✓	X	Off Broadhaven Bay
Kilcummin Head to Lenadoon Point	X	X	✓	X	Killala Bay
Lenadoon Point to Ballyconnell Point	X	X	✓	X	Sligo Bay
Ballyconnell Point to Carrigan Head	X	X	✓	X	Donegal Bay
St. John's Point to Drumanoo	✓	X	✓	X	Killybegs
Inside Aran Island	✓	X	✓	X	Burtonport
South of a line joining Horn Head to Rinnafeaghla Point	X	X	✓	X	Sheephaven Bay

South of a line joining Binrobin to Rinnaskeagh	✓	✓	✓	✓	Sheephaven Bay
South of a line joining Greencastle Pier to Magilligan Point	✓	✓	✓	✓	Lough Foyle
Inishowen Head to Ballyaghan Point	X	X	✓	X	Lough Foyle

Area B is any area within the sea areas of the State whose geographical coordinates are at no point more than 20 miles from the line of coast but which is outside Areas C and D.

Area A is any area within the sea areas of the State outside of Areas B, C and D.

SCHEDULE 2

Rule 3(3)

FIRE APPLIANCES RULES

Merchant Shipping (Fire Appliances) (Post-1980 Ships) Rules 1983 (S.I. No. 303 of 1983)

Merchant Shipping (Fire Appliances) (Amendment) Rules 1983 (S.I. No. 304 of 1983)

Merchant Shipping (Fire Appliances – Application to Other Ships) Rules 1983 (S.I. No. 305 of 1983)

Merchant Shipping (Fire Appliances) (Amendment) Rules 1985 (S.I. No. 277 of 1985)

Merchant Shipping (Fire Appliances) (Post-1980 Ships) (Amendment) Rules 1985 (S.I. No. 278 of 1985)

FIRE PROTECTION RULES

Merchant Shipping (Fire Protection) Rules 1985 (S.I. No. 279 of 1985)

Merchant Shipping (Fire Protection) (Amendment) Rules 1990 (S.I. No. 86 of 1990)

LIFE-SAVING APPLIANCES

Merchant Shipping (Life-Saving Appliances) (Amendment) Rules 1978 (S.I. No. 216 of 1978)

Merchant Shipping (Life-Saving Appliances) Rules 1983 (S.I. No. 302 of 1983)

Merchant Shipping (Life-Saving Appliances) Rules 1993 (S.I. No. 380 of 1993)

Merchant Shipping (Life-Saving Appliances) Rules 1983 (Amendment) (No. 2) Rules 1993 (S.I. No. 382 of 1993)

PASSENGER SHIP CONSTRUCTION

Merchant Shipping (Passenger Ship Construction) Rules 1983 (S.I. No. 300 of 1983)

Merchant Shipping (Passenger Ship Construction and Survey) Rules 1985 (S.I. No. 274 of 1985)

Merchant Shipping (Passenger Ship Construction and Survey) (Amendment) Rules 1994 (S.I. No. 12 of 1994)

Merchant Shipping (Passenger Ship Construction and Survey) (Amendment No. 2) Rules 1994 (S.I. No. 131 of 1994)

SCHEDULE 3

*Rule 6*GUIDELINES FOR SAFETY REQUIREMENTS FOR PASSENGER SHIPS FOR PERSONS
WITH REDUCED MOBILITY

In applying the guidelines of this Schedule, regard shall be had to the relevant recommendations of the IMO, including IMO MSC/Circ. 735 concerning the design and operation of passenger ships to respond to elderly and disabled persons' needs, and the Guidelines for Accessible Maritime Passenger Transport (Department of Transport/National Disability Authority, 2010).

1. *Access to the ship*

The ship shall be constructed and equipped in such a way that a person with reduced mobility can embark and disembark easily and safely, and can be ensured access between decks, either unassisted or by means of ramps, elevators or lifts. Directions to such access shall be posted at the other accesses to the ship and at other appropriate locations throughout the ship.

2. *Signage*

Signs provided on a ship to aid passengers shall be accessible and easy to read for persons with reduced mobility, including persons with sensory disabilities, and be positioned at key points.

3. *Means to communicate messages*

The operator should have the means on board the vessel visually and verbally to provide announcements, such as those regarding delays, schedule changes and on-board services, to persons with reduced mobility.

4. *Alarm*

The alarm system and alarm buttons shall be designed so as to be accessible by and to alert all passengers with reduced mobility, including persons with sensory disabilities and persons with learning disabilities.

5. *Additional requirements ensuring mobility inside the ship*

Handrails, corridors and passageways, doorways and doors shall accommodate the movement of a person in a wheelchair. Elevators, vehicle decks, passenger lounges, accommodation and washrooms shall be designed in order to be accessible in a reasonable and proportionate manner to persons with reduced mobility.

SCHEDULE 4

Rule 31

STABILITY INFORMATION

The information relating to the stability of a passenger ship to be provided for the master pursuant to Rule 31 shall include particulars appropriate to the ship in relation to the matters specified in this Schedule. Such particulars shall be in the form of a statement unless the contrary is indicated. Metric units shall be used.

1. The ship's name, official number, port of registry, gross and net tonnages, principal dimensions, displacement, deadweight, draught to the subdivision load line(s).

2. A profile view and plan views of the ship drawn to scale showing with their names all compartments, tanks, storerooms and crew and passenger accommodation spaces, and also showing the mid-length position.

3. (1) The capacity and the centre of gravity (longitudinally and vertically) of every compartment available for the carriage of cargo, fuel, stores, feed water, domestic water or water ballast.

(2) In the case of a vehicle ferry, the vertical centre of gravity of compartments for the carriage of vehicles shall be based on the estimated centres of gravity of the vehicles and not on the volumetric centres of the compartments.

4. The estimated total weight of (a) passengers and their effects, and (b) crew and their effects, and the centre of gravity (longitudinally and vertically) of each such total weight. In assessing such centres of gravity, passengers and crew shall be assumed to be distributed about the ship in the spaces they will normally occupy, including the highest decks to which either or both have access.

5. The estimated weight and the disposition and centre of gravity of the maximum amount of deck cargo which the ship may reasonably be expected to carry on an exposed deck.

6. A diagram or scale showing the load line mark and sub-division load lines in accordance with Rule 21, with particulars of the corresponding freeboards, and showing the displacement, tonnes per centimetre immersion, and deadweight corresponding in each case to a range of mean draughts extending between the waterline representing the deepest load line and the waterline of the ship in the light condition.

7. A diagram or tabular statement showing the hydrostatic particulars of the ship, including –

- (a) the height of the transverse metacentre, and
- (b) the values of the moment to change trim one centimetre,

for a range of mean draughts extending at least between the waterline representing the deepest load line and the waterline of the ship in the light condition. Where a tabular statement is used, the intervals between such draughts shall be sufficiently close to permit accurate interpolation. In the case of ships having raked keels, the same datum for the heights of centres of buoyancy and metacentres shall be used as for the centres of gravity referred to in paragraphs 3, 4 and 5.

8. The effect on stability of free surface in each tank in the ship in which liquids may be carried, including an example to show how the metacentre height is to be corrected.

9. (1) A diagram showing cross curves of stability indicating the height of the assumed axis from which the righting levers are measured and the trim which has been assumed. In the case of ships having raked keels, where a datum other than the top of keel has been used, the position of the assumed axis shall be clearly defined. The cross curves shall be determined taking into account the change in trim due to heel.

(2) Subject to subparagraph (3), only enclosed superstructures shall be taken into account in deriving the curves referred to in subparagraph (1).

(3) The following structures may be taken into account in deriving such curves if the Minister is satisfied that their location, integrity and means of closure will contribute to the ship's stability:

- (a) superstructures located above the superstructure deck;
- (b) deckhouses on or above the freeboard deck, whether so located wholly or in part only;
- (c) hatchway structures on or above the freeboard deck.

(4) An example shall be given showing how to obtain a curve of righting levers (GZ) from the cross curves of stability.

(5) Where the buoyancy of a superstructure is to be taken into account in the calculation of stability information in the case of a vehicle ferry or similar ship having bow doors, ship's side doors or stern doors, there shall be included in the stability information a specific statement that such doors shall be secured weathertight before the ship proceeds to sea and that the cross curves of stability are based upon the assumption that such doors have been so secured.

10. (1) The diagrams and statement referred to in subparagraph (2) shall be provided separately for each of the following conditions of the ship:

(a) light condition. If the ship has permanent ballast, such diagrams and statement shall be provided for the ship in the light condition both

- (i) with such ballast, and
- (ii) without such ballast;

(b) ballast condition, both

- (i) on departure, and
- (ii) on arrival,

it being assumed for the purpose of the latter in this and the following subparagraphs that oil fuel, fresh water, consumable stores and the like are reduced to 10 per cent of their capacity;

(c) loading conditions, both

- (i) on departure, and
- (ii) on arrival,

when loaded to the deepest subdivision load line with cargo filling all spaces available for cargo, cargo for this purpose being taken to be homogeneous cargo except where this is clearly inappropriate, for example in the case of cargo spaces in a ship which are intended to be used exclusively for the carriage of vehicles or containers;

(d) service loaded conditions, both

- (i) on departure, and
- (ii) on arrival;

(e) a worst anticipated service condition, showing compliance with the curve required by paragraph 10(2) of this Schedule;

(f) intermediate conditions, in any case where ballasting/deballasting or loading/unloading takes place at sea.

(2) A curve of minimum operational metacentric height versus draught or maximum operational vertical centre of gravity versus draught based upon compliance with the intact stability requirements of Rule 11 and the damage stability requirements of Rules 16, 17 and 18.

(3) (a) A profile diagram of the ship drawn to a suitable small scale showing the disposition of all components of the deadweight.

(b) A statement showing the lightweight, the disposition and the total weights of all components of the deadweight, the displacement,

the corresponding positions of the centre of gravity, the metacentre and the metacentric height (GM).

- (c) A diagram showing a curve of righting levers (GZ) derived from the cross curves of stability referred to in paragraph 9.

(4) The metacentric height and the curve of righting levers (GZ) shall be corrected for liquid free surface.

(5) Where there is a significant amount of trim in any of the conditions referred to in subparagraph (1), the metacentric height and the curve of righting levers (GZ) shall be required to be determined from the trimmed waterline.

(6) Where, in the opinion of the Minister, the stability characteristics in either or both of the conditions referred to in subparagraph (1)(c) are not satisfactory, such conditions shall be marked accordingly and an appropriate warning to the master shall be inserted.

11. Where special procedures such as partly filling or completely filling particular spaces designated for cargo, passengers, fuel, fresh water or other purposes are necessary to maintain adequate stability, instructions as to the appropriate procedure in each case.

12. Such information, as is necessary to enable the master by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service, shall be provided in order that Rules 11, 16 and 17 will be complied with. This information shall be presented in the form of either required metacentric heights (GM) or maximum allowable vertical centre of gravity (KG) values and shall be presented in either graphical or tabular form. This information shall be provided on the basis of the ship being at level keel and at trims of 0.4 per cent L and 0.8 per cent L by the bow and by the stern over the range of displacements or mean draughts which are likely to occur in service: provided that for any such ships which are intended to operate at greater trims than are specified in this paragraph, such additional information as the Minister specifies shall be included. The Minister may approve the substitution of less trims by the bow and stern as specified in this paragraph if the Minister is satisfied that such a lesser range of trims are sufficient for the purpose intended because of the characteristics of the particular ship.

13. A copy of the report on the inclining test and of the calculation therefrom of the light condition particulars.



GIVEN under my Official Seal,
15 December, 2020.

EAMON RYAN,
Minister for Transport.

EXPLANATORY NOTE

(This note is not part of the Instrument and does not purport to be a legal interpretation.)

These Rules provide a safety regime for passenger ships (other than high-speed passenger craft to which the European Union (Passenger Ships) Regulations 2019 (S.I. No. 676 of 2019) apply) of less than 24 metres in length, constructed of steel or aluminium, when engaged on domestic voyages. The Rules apply to a new passenger ship within the meaning of the Rules, a passenger ship the keel of which was laid or which was at a similar stage of construction on or after 1 July 1998, or a ship that is converted to a passenger ship on or after that date.

The Rules maintain an appropriate safety regime for such passenger ships following recent changes in associated European Union legislation and include safety standards and requirements in relation to ship construction, fire protection, life-saving appliances and radiocommunications.

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