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The Minister of Transport in exercise of the powers conferred upon him by section 1 of the Merchant Shipping (Safety Convention) Act, 1949(a), and of all other powers him enabling in that behalf hereby makes the following Rules :—

PART I

GENERAL

Interpretation

1.—(1) These Rules shall come into operation on the nineteenth day of November, 1952, and may be cited as the Merchant Shipping (Construction) Rules, 1952.

(2) In these Rules, unless the context otherwise requires, the following expressions have the meanings hereby respectively assigned to them :—

" ' A ' class division " means a bulkhead or part of a deck, in either case complying with such of the requirements of Rule 44 of these Rules as are expressed to apply to " A " class divisions.

" Accommodation space " includes :—

(*a*) passenger spaces,

(*b*) crew space,

(*c*) offices,

(*d*) pantries, and

(*e*) space similar to any of the foregoing,

not being service spaces or open spaces on deck.

" ' B ' class division " means a bulkhead complying with such of the requirements of Rule 44 of these Rules as are expressed to apply to " B " class divisions.

" Breadth of the ship " means the greatest moulded breadth at or below the ship's deepest subdivision load water line.

" Bulkhead deck " means the uppermost deck up to which transverse watertight bulkheads are carried.

" Cargo space " in Part V of these Rules means space appropriated for cargo, other than mail and bullion, and trunks leading to such spaces.

" Control station " includes :—

(*a*) a radiotelegraph room ;

(*b*) any other enclosed space which houses

(i) a compass, direction-finder, radar equipment, a steering wheel, or other similar equipment used in navigation ;

(ii) a central indicator connected with a system for the detection of fire or smoke ; or

(iii) an emergency generator.

" Crew space " means crew accommodation within the meaning of the Merchant Shipping Act, 1948(b).

" Criterion numeral " in relation to any ship means the criterion numeral of the ship determined in accordance with such of the provisions of the Second Schedule to these Rules as apply to that ship.

" Draught " means the vertical distance from the moulded base line amidships to a subdivision load water line.

(a) 12, 13 & 14 Geo. 6. c. 43. (b) 11 & 12 Geo. 6. c. 44.

" Factor of subdivision " in relation to any ship or portion thereof means the factor of subdivision determined in accordance with such of the provisions of the Second Schedule to these Rules as apply to that ship or portion as the case may be.

" Floodable length " in relation to any portion of a ship at any draught means the maximum length of that portion having its centre at a given point in the ship which, at that draught and under such of the assumptions of permeability set forth in the Second Schedule to these Rules as are applicable in the circumstances, can be flooded without submerging any part of the ship's margin line when the ship has no list.

" Incombustible material " means material which when heated to a temperature of 1382°F (750°C) neither burns nor gives off inflammable vapours in sufficient quantity to ignite at a pilot-flame, and the expression " combustible material " shall be construed accordingly.

" Independent power pump " means a pump operated by power otherwise than from the ship's main engines.

" Length " in relation to a ship means the length of a ship measured between perpendiculars taken at the extremities of the deepest subdivision load water line.

" Machinery space " in every Part of these Rules, other than Parts V and V (A), means space extending from the moulded baseline of the ship to the margin line and between the extreme transverse watertight bulkheads bounding the spaces appropriated to the main and auxiliary propelling machinery, boilers, if any, and the permanent coal bunkers, if any.

" Machinery space " in Parts V and V (A) of these Rules includes space in which propelling or refrigerating machinery, boilers, pumps, engineers' workshops, generators, ventilation or air conditioning machinery, or oil filling stations are situated, and trunkways leading to such spaces.

" Main circulating pump " means the pump installed for circulating water through the main condenser.

" Main vertical zones " means the main vertical zones into which the hull, superstructure and deckhouses of a ship are divided in accordance with paragraph (2) of Rule 45 of these Rules.

" Margin line " means a line drawn at least 3 inches below the upper surface of the bulkhead deck at the side of a ship, and assumed for the purpose of determining the floodable length of the ship.

" Minister " means the Minister of Transport.

" Mile " means a nautical mile of 6080 feet.

" Passenger space " means space provided for the use of passengers.

" Permeability " in relation to a space means the percentage of that space below the ship's margin line which, on the assumption that it is in use for the purpose for which it is appropriated, can be occupied by water.

" Public rooms " includes halls, dining rooms, bars, smoke rooms, lounges, recreation rooms, nurseries and libraries.

" Radiotelegraph room " has the same meaning as in the Merchant Shipping (Radio) Rules, 1952(a).

" Service space " includes galleys, main pantries, laundries, store rooms, paint rooms, baggage rooms, mail rooms, bullion rooms, carpenters' and plumbers' workshops, and trunkways leading to such spaces.

(a) S.I. 1952/1956, p. 1932 below.

"Standard fire test" means a test which develops in a test furnace a series of time-temperature relationships as follows:—

At the end of the first 5 minutes	1000°F (538°C)
At the end of the first 10 minutes	1300°F (704°C)
At the end of the first 30 minutes	1550°F (843°C)
At the end of the first 60 minutes	1700°F (927°C)

"Steamer" includes a ship propelled by electricity or other mechanical power.

"Subdivision load line" has the same meaning as in Section 23 of the Merchant Shipping (Safety and Load Line Conventions) Act, 1932(a).

"Subdivision load water line" means the water line assumed in determining the subdivision of the ship in accordance with these Rules.

"Watertight" in relation to a structure means capable of preventing the passage of water through the structure in any direction under a head of water up to the ship's margin line.

"Weathertight" in relation to a structure means capable of preventing the passage of sea water through the structure in ordinary sea conditions.

(3) These Rules apply to British passenger steamers registered in the United Kingdom. Provided that the Minister may exempt any ship the keel of which was laid before the date on which these Rules come into operation, not being a ship converted on or after that date for service as a passenger steamer, from the requirements of these Rules to the extent that he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

(4) The Interpretation Act, 1889(b), shall apply to the interpretation of these Rules as it applies to the interpretation of an Act of Parliament.

Classification of Ships

2.—(1) For the purposes of these Rules British passenger staeamers registered in the United Kingdom shall be arranged in Classes as follows:—

Ships engaged on International Voyages

Class I. Ships engaged on voyages any of which are long international voyages.

Class II. Ships engaged on voyages (not being long international voyages) any of which are short international voyages.

Ships not engaged on International Voyages

Class II(A). Ships engaged on voyages of any kind other than international voyages.

Class III. Ships engaged only on voyages in the course of which they are at no time more than 70 miles by sea from their point of departure and not more than 18 miles from the coast of the United Kingdom, and which are at sea only in fine weather and during restricted periods.

Class IV. Ships engaged only on voyages of the following descriptions:—

(*a*) voyages in partially smooth waters;

(*b*) voyages in smooth waters.

Class V. Ships engaged only on voyages in smooth waters.

(a) 22 & 23 Geo. 5. c. 9. (b) 52 & 53 Vict. c. 63.

Class VI. Ships engaged only on voyages of the following descriptions: —

(*a*) voyages with not more than 250 passengers on board, to sea or in partially smooth waters, in either case in fine weather and during restricted periods, in the course of which the ships are at no time more than 15 miles, exclusive of any smooth waters, from their point of departure nor more than 3 miles from land;

(*b*) voyages in smooth waters.

Class VI(A). Ships carrying not more than 50 passengers for a distance of not more than 6 miles on voyages to or from isolated communities on the islands or coast of Scotland, and which do not proceed for a distance of more than 3 miles from land.

(2) For the purposes of this Rule the following expressions have the meanings hereby respectively assigned to them, that is to say: —

"Long international voyage" means an international voyage which is not a short international voyage within the meaning of the Merchant Shipping (Safety Convention) Act, 1949.

"Partially smooth waters" means, as respects any period specified in the First Schedule to these Rules, the waters of any of the areas specified in the third column of that Schedule in relation to that period.

"Restricted period" means a period falling wholly within the following limits: —

(*a*) from 1st April to 31st October, both dates inclusive; and

(*b*) between one hour before sunrise and one hour after sunset in the case of ships fitted with navigation lights conforming to the collision regulations, and between sunrise and sunset in the case of any other ships.

"Sea" does not include any partially smooth waters.

"Smooth waters" means any waters not being the sea or partially smooth waters, and in particular means waters of any of the areas specified in the second column of the First Schedule to these Rules.

"Voyage" includes an excursion.

Structural Strength

3. The structural strength of every ship to which these Rules apply shall be sufficient for the service for which the ship is intended.

PART II

WATERTIGHT SUBDIVISION

Application of Part II

4. This Part of these Rules applies to every ship to which these Rules apply, not being an open or partially decked ship of Class V or a ship of Class VI carrying less than 151 passengers or a ship of Class VI(A).

Watertight Subdivision

5. Every ship to which this Part of these Rules applies shall be subdivided by bulkheads, which shall be watertight up to the bulkhead deck, into compartments the maximum length of which shall be calculated in accordance with such of the provisions of the Second Schedule to these Rules as apply to that ship. Every other portion of the internal structure which affects the efficiency of the subdivision of the ship shall be watertight, and shall be of a design which will maintain the integrity of the subdivision.

Peak and Machinery Space Bulkheads, Shaft Tunnels, etc.

6.—(1) Every ship to which this Part of these Rules applies shall be provided with a collision bulkhead which shall be watertight up to the bulkhead deck and shall be fitted at a distance from the ship's forward perpendicular of not less than 5 per cent. of the length of the ship and not more than 10 feet plus 5 per cent. of such length. If the ship has a forward superstructure, the collision bulkhead shall be extended weathertight to the deck next above the bulkhead deck. The extension shall be fitted directly over the collision bulkhead below unless it is at least 5 per cent. of the length of the ship from the forward perpendicular and the part of the bulkhead deck which forms the step is made weathertight. The plating and stiffeners of such extension shall be constructed in accordance with the provisions of the Fourth Schedule to these Rules as if the extension formed part of a bulkhead immediately below the bulkhead deck.

(2) Every such ship shall be provided with a watertight afterpeak bulkhead and with watertight bulkheads dividing the space appropriated to the main and auxiliary propelling machinery, boilers, if any, and the permanent coal bunkers, if any, from other spaces. Such bulkheads shall be watertight up to the bulkhead deck. Provided that the afterpeak bulkhead may be stopped below the bulkhead deck if the safety of the ship is not thereby impaired.

(3) The stern gland of every such ship shall be situated in a watertight shaft tunnel or other watertight space separate from the stern tube compartment and of such a volume that if the tunnel or space is flooded the margin line will not be submerged. The stern tube shall be enclosed in a watertight compartment, the volume of which shall be the smallest compatible with the proper design of the ship.

Double Bottoms

7.—(1) Subject to the provisions of this Rule every ship of Classes I, II and II (A) shall be fitted with a watertight double bottom which shall be at least of the following extent:—

(*a*) in ships of 200 feet but less than 249 feet in length: from the machinery space to the collision bulkhead or as near to that bulkhead as is practicable;

(*b*) in ships of 249 feet but less than 330 feet in length: from the collision bulkhead to the afterpeak bulkhead or as near to those bulkheads as is practicable, but not necessarily in the machinery space;

(*c*) in ships of 330 feet in length and upwards: from the collision bulkhead to the afterpeak bulkhead or as near to those bulkheads as is practicable.

(2) When a double bottom is required by this Rule to be fitted in a ship, 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. The inner bottom shall be deemed to be adequate for this purpose if the line of intersection of the outer edge of the margin plate with the bilge plating is not lower at any point than a horizontal plane passing through the point of intersection with the frame line amidships of a transverse diagonal line inclined at 25 degrees to the base line and cutting it at a point one-half of the ship's moulded breadth from the middle line.

(3) Wells constructed in the double bottom for the purpose of drainage shall not be larger or extend downwards more than is necessary for such purpose, and shall not be less than 18 inches from the outer bottom or from the inner edge of the margin plate. Provided that a well extending to the outer bottom may be constructed at the after end of a shaft tunnel.

(4) Wells for purposes other than drainage shall not be constructed in the double bottom. The Minister may exempt any ship from the requirements of this paragraph in respect of any well which he is satisfied will not diminish the protection given by the double bottom.

(5) Nothing in this Rule shall require a double bottom to be fitted in way of watertight compartments used exclusively for the carriage of liquids, if the safety of the ship will not be impaired in the event of bottom or side damage by reason of the absence of a double bottom in that position.

(6) The Minister may exempt any ship of Class II or II (A) from the requirements of a double bottom in any portion of the ship which is subdivided by application of a factor of subdivision not exceeding ·5, if he is satisfied that the fitting of a double bottom in that portion of the ship would not be compatible with the design and proper working of the ship.

Stability in Damaged Condition

8.—(1) Every ship to which this Part of these Rules applies shall be so constructed as to provide sufficient intact stability in all service conditions to enable the ship to withstand the final flooding of any one of the main compartments into which the ship is subdivided in accordance with the provisions of Rule 5 of these Rules. If two of the main compartments, being adjacent to each other, are separated by a bulkhead which is stepped, the intact stability shall be adequate to withstand the final flooding of those compartments. If the ship's factor of subdivision is ·5 or less, the intact stability shall be adequate to withstand the final flooding of any two of the main compartments which are adjacent to each other.

(2) For the purposes of this Rule the sufficiency of the intact stability of every such ship shall be determined in accordance with the provisions of the Third Schedule to these Rules.

(3) (*a*) Every ship to which this Part of these Rules applies shall be so constructed as to keep unsymmetrical flooding when the ship is in a damaged condition at the minimum consistent with efficient arrangements. If cross-flooding fittings are provided in any such ship the fittings and the maximum heel of the ship before equalisation shall be such as will not endanger the safety of the ship.

(*b*) If the margin line may become submerged during the flooding assumed for the purposes of the calculation referred to in the Third Schedule to these Rules, the construction of the ship shall be such as will enable the master of the ship to ensure

(i) that the maximum angle of heel during any stage of such flooding will not be such as will endanger the safety of the ship ; and

(ii) that the margin line will not be submerged in the final stage of flooding.

(4) (*a*) There shall be provided in every such ship a document for the use of the master of the ship containing information as to the use of any cross-flooding fittings provided in the ship.

(*b*) There shall be provided in every ship of Classes I, II and II (A) a document for the use of the master of the ship containing the following additional information:—

(i) information necessary for the maintenance of sufficient intact stability under service conditions to enable the ship to withstand damage to the extent referred to in the Third Schedule to these Rules ; and

(ii) information as to the conditions of stability on which the calculations of heel have been based, together with the information that excessive heeling might result should the ship sustain damage when in a less favourable condition.

Construction of Watertight Bulkheads, etc.

9.—(1) In every ship to which this Part of these Rules applies every portion of the ship required by these Rules to be watertight shall be constructed in accordance with such of the requirements of the Fourth Schedule to these Rules as apply to it.

(2) In every such ship all tanks forming part of the structure of the ship and used for the storage of oil fuel or other liquids including double bottoms, peak tanks, settling tanks and bunkers, shall be of a design and construction adequate for that purpose.

Openings in Watertight Bulkheads, etc.

10.—(1) In every ship of Classes I, II and II (A) the number of openings in bulkheads and other structures required by these Rules to be watertight shall be the minimum compatible with the design and proper working of the ship.

(2) So far as practicable, trunks installed in connection with ventilation, forced draught or refrigeration systems in any such ship shall not pierce such bulkheads or structures.

(3) Every tunnel above the double bottom, if any, in such a ship whether for access from the crew space to the machinery space, for piping or for any other purpose, which passes through such a bulkhead shall be watertight. The means of access to at least one end of such tunnel, if it may be used as a passage at sea, shall be through a trunkway extending watertight to a height sufficient to permit access above the margin line. The means of access to the other end of the tunnel shall be through a watertight door. No tunnel shall extend through the first subdivision bulkhead abaft the collision bulkhead.

(4) Not more than one doorway (other than a bunker or tunnel doorway) shall pierce such a bulkhead in the machinery space in any such ship. If any such bulkhead is pierced by a doorway the doorway shall be placed so as to have the sill as high as possible in the ship.

(5) Doorways, manholes and access openings shall not be fitted in the collision bulkhead below the margin line of any such ship or in any other bulkhead which is required by these Rules to be watertight and which divides a cargo space from another cargo space or from a permanent or reserve bunker. Provided that the Minister may permit any such ship to be fitted with doorways in bulkheads dividing two between deck cargo spaces if he is satisfied that—

(i) the doorways are necessary for the proper working of the ship;

(ii) the number of such doorways in the ship is the minimum compatible with the design and proper working of the ship, and they are fitted at the highest practicable level; and

(iii) the outboard vertical edges of such doorways are situated at a distance from the ship's shell plating which is not less than one-fifth of the breadth of the ship, such distance being measured at right angles to the centre line of the ship at the level of the deepest subdivision load water line.

(6) In every ship of Classes I, II and II (A) bulkheads outside the machinery space which are required by these Rules to be watertight shall not be pierced by openings which are capable of being closed only by portable bolted plates.

(7) In every ship of Classes III to VI, inclusive, to which this Part of these Rules applies, bulkheads required by these Rules to be watertight shall not be pierced by doorways, ventilation trunks, or other similar openings.

(8) In every ship to which this Part of these Rules applies—

(*a*) (i) valves and cocks not forming part of a pipe system shall not be fitted in any bulkhead required by these Rules to be watertight;

(ii) if any such bulkhead is pierced by pipes, scuppers, electric cables or other similar fittings, provision shall be made which will ensure that the watertightness of the bulkhead is not thereby impaired.

(*b*) The collision bulkhead of such a ship shall not be pierced below the margin line by more than one pipe. Provided that if the forepeak in such a ship is divided to hold two different kinds of liquids the collision bulkhead may be pierced below the margin line by not more than two pipes. Any pipe which pierces the collision bulkhead of such a ship shall be fitted with a screw-down valve capable of being operated from above the bulkhead deck, the valve chest being secured to the forward side of the collision bulkhead.

Means of Closing Openings in Watertight Bulkheads, etc.

11.—(1) In every ship of Classes I, II and II (A) efficient means shall be provided for closing and making watertight all openings in bulkheads and other structures required by these Rules to be watertight.

(2) Every door fitted to any such opening shall be a sliding watertight door. Provided that, in a ship of Class I, or in any ship of Class II or II (A) which is not required by paragraph 9 of the Second Schedule to these Rules to have a factor of subdivision of ·5 or less, hinged watertight doors may be fitted—

(*a*) in passenger, crew and working spaces above any deck the underside of which at its lowest point is at least 7 feet above the deepest subdivision load water line; and

(*b*) in any such bulkhead, not being a collision bulkhead, which divides two cargo between deck spaces.

(3) Every such hinged watertight door shall be fitted with catches capable of being worked from each side of the bulkhead in which the door is fitted.

(4) All doors required by these Rules to be watertight shall be secured by means other than bolts, and shall be closed by means other than gravity or a dropping weight.

(5) In every ship of Classes I, II and II (A) watertight doors fitted in bulkheads between permanent and reserve bunkers, other than the doors referred to in paragraph (3) of Rule 12 of these Rules, shall always be accessible.

Means of Operating Sliding Watertight Doors

12.—(1) If, in any ship of Class I, or a ship of Class II or Class II (A) not required by paragraph 9 of the Second Schedule to these Rules to have a factor of subdivision of ·5 or less, any sliding watertight door fitted in a bulkhead (other than a door at the entrance to a tunnel) is in a position which may require it to be opened at sea and the sill thereof is below the deepest subdivision load water line, the following requirements shall apply:—

(*a*) If the number of such doors exceeds five, all such doors and all tunnel doors shall be operated by power and shall be capable of being simultaneously closed from a central control situated on the bridge;

(*b*) If the number of such doors does not exceed five:—

(i) if the criterion numeral of the ship does not exceed 30, such doors and tunnel doors shall not be required to be operated by power;

(ii) if the criterion numeral of the ship exceeds 30, all such doors and all tunnel doors shall be operated by power and shall be capable of being simultaneously closed from a central control situated on the bridge. Provided that, if there is only one such door and one tunnel door in the ship, both of which are in the machinery space, they shall not be required to be operated by power.

(2) In every ship of Class II or II(A) required by paragraph 9 of the Second Schedule to these Rules to have a factor of subdivision not exceeding ·5, all sliding watertight doors shall be operated by power and shall be capable of being simultaneously closed from a central control situated on the bridge. Provided that, if in any such ship there is only one such door and it is in the machinery space, it shall not be required to be operated by power.

(3) If, in any ship of Class I, II or II(A) any sliding watertight doors which may be opened at sea for the purpose of trimming coal are fitted between bunkers in the between decks below the bulkhead deck, such doors shall be operated by power.

(4) If, in any ship of Class I, II or II(A) a trunkway, being part of a refrigeration, ventilation or forced draught system, is carried through more than one transverse watertight bulkhead and the sills of the openings of such trunkways are less than 7 feet above the deepest subdivision load water line, the sliding watertight doors at such openings shall be operated by power.

(5) If a sliding watertight door is required by these Rules to be operated by power from a central control, the power system shall be so arranged that the door can also be operated by power at the door itself. The arrangement shall be such that the door will close automatically if opened at the door itself after being closed from the central control, and will be capable of being kept closed at the door itself notwithstanding that an attempt may be made to open it from the central control. Handles for controlling the power system shall be provided at both sides of the bulkhead in which the door is situated and shall be so arranged that any person passing through the doorway is able to hold both handles in the open position simultaneously.

(6) In every ship of Classes I, II and II(A) there shall be at least two sources of power for opening and closing all sliding watertight doors which are required by these Rules to be operated by power, and each power unit shall be sufficient to operate simultaneously all such doors in the ship. An indicator shall be fitted at the central control to show whether sufficient power is available for such purposes. Any fluid used for the purpose of operating such doors shall be incapable of freezing at the temperatures likely to be encountered on the voyages on which the ship is engaged.

(7) In every such ship every sliding watertight door which is operated by power shall be provided with efficient hand-operating gear which can be operated both at the door itself and at an accessible position above the bulkhead deck. At the position above the bulkhead deck the hand-operating gear shall be operated with an all-round crank motion.

(8) In every such ship if a sliding watertight door is not required to be operated by power, it shall be provided with efficient hand-operating gear with an all-round crank motion, both at the door itself and at an accessible position above the bulkhead deck.

(9) In every such ship the hand-operating gear for operating the sliding watertight door in the machinery space from above the bulkhead deck shall be placed outside the machinery space unless such a position is inconsistent with the efficient arrangement of the necessary gearing.

Watertight Doors: Signals and Communications

13.—(1) Every sliding watertight door fitted in a ship of Class I, II or II(A) shall be connected with an indicator at each position from which the door may be closed, other than at the door itself, showing whether the door is open or closed.

(2) There shall be provided in connection with every such door which is operated by power a means of giving an audible warning at the door itself when the door is about to be closed. The arrangement shall be such that one movement at the position from which the door is about to be closed will be sufficient to sound the signal and to close the door, the signal preceding the movement of the door by an interval sufficient to allow the movement of persons and articles away from the door.

(3) If any door required by these Rules to be watertight is not capable of being operated from a central control, means of communication by telegraph, telephone or otherwise shall be provided whereby the officer of the watch may communicate with the person responsible for the closing of the door.

Construction of Watertight Doors

14.—(1) Every door required by these Rules to be watertight shall be of such design, material and construction as will maintain the integrity of the watertight bulkhead in which it is fitted.

Any such door giving direct access to any space which may contain bunker coal shall, together with its frame, be made of cast or mild steel. Any such door in any other position shall, together with its frame, be made of cast or mild steel or cast iron.

(2) Every sliding watertight door shall be fitted with rubbing faces of brass or similar material which may be fitted either on the door itself or on the door frame, and which, if they are of less than one inch in width, shall be fitted in recesses.

(3) If screw gear is used for operating such a door, the screw shall work in a nut of suitable non-corrodible metal.

(4) The frame of every vertically sliding watertight door shall have no groove at the bottom thereof in which dirt may lodge. The bottom of such a frame, if it is of skeleton form, shall be so arranged that dirt cannot lodge therein. The bottom edge of every such door shall be tapered or bevelled.

(5) Every vertically sliding watertight door which is operated by power shall be so designed and fitted that, if the power supply ceases, there shall be no danger of the door dropping.

(6) Every horizontally sliding watertight door shall be so installed as to prevent its moving if the ship rolls, and if necessary a clip or other suitable device shall be provided for that purpose. The device shall not interfere with the closing of the door when the door is required to be closed.

(7) The frame of every watertight door shall be properly fitted to the bulkhead in which the door is situated, and the jointing material between the frame and the bulkhead shall be of a type which will not deteriorate or be injured by heat.

(8) Every watertight door, being a coal-bunker door, shall be provided with screens or other devices to prevent coal from interfering with its closing.

Openings in the Shell Plating below the Margin Line

15.—(1) In every ship to which this Part of these Rules applies, the number of side scuttles, scuppers, sanitary discharges and other openings in the shell plating below the margin line shall be the minimum compatible with the design and proper working of the ship.

(2) The arrangements for closing each such opening below the margin line shall be consistent with its intended purpose and shall be such as will ensure watertightness.

(3) (*a*) In every ship of Classes I, II and II (A) the number of side scuttles below the margin line which are capable of being opened shall be the minimum compatible with the requirements of the proper operation of the ship.

(*b*) If in a between decks of such a ship the sills of any side scuttles are below a line drawn parallel to the bulkhead deck at side and having its lowest point two and one-half per cent. of the breadth of the ship above the deepest subdivision load water line, every side scuttle in that between decks shall be of a non-opening type. If in a between decks of such a ship all the sills of the side scuttles are above the aforesaid line, every side scuttle in that between decks shall be either of a non-opening type or incapable of being opened except by a person authorised to do so by the master of the ship.

(4) In every ship of Classes III to VI, inclusive, to which this Part of these Rules applies all side scuttles below the margin line shall be of a non-opening type.

(5) In every ship to which this Part of these Rules applies, every side scuttle below the margin line shall be fitted with an efficient hinged deadlight permanently attached so that it can be readily and effectively closed and secured watertight. Provided that abaft a point one-eighth of the length of the ship from the forward perpendicular and above a line drawn parallel to the bulkhead deck at side and having its lowest point at a height of 12 feet plus two and one-half per cent. of the breadth of the ship above the ship's deepest subdivision load water line, deadlights may for the purposes of these Rules be portable in crew spaces and in passenger spaces not appropriated for the use of steerage passengers within the meaning of Part III of the principal Act.

(6) Side scuttles shall not be fitted below the margin line in any space in a ship to which this Part of these Rules applies which is appropriated solely to the carriage of cargo or coal. If side scuttles are fitted in spaces below the margin line which may be appropriated to the carriage either of cargo or of passengers such side scuttles and their deadlights shall be so constructed as to be incapable of being opened except by a person authorised to do so by the master of the ship.

(7) Automatic ventilating side scuttles shall not be fitted below the margin line in the shell plating of any such ship.

(8) (*a*) In every ship to which this Part of these Rules applies each inlet and discharge led through the shell plating below the margin line shall be fitted with efficient and readily accessible means for preventing the accidental admission of water into the ship.

(*b*) Without prejudice to the generality of the foregoing, each discharge led through the shell plating from spaces below the margin line, not being a discharge in connection with machinery, shall be provided with either—

(i) one automatic non-return valve fitted with a positive means by which it can be closed from a readily accessible position above the ship's bulkhead deck and with an indicator at the position from which the valve may be closed to show whether the valve is open or closed ; or

(ii) two automatic non-return valves, the upper of which is so situated above the ship's deepest subdivision load water line as to be always accessible for examination under service conditions and is of a horizontal balanced type which is normally closed.

(*c*) Any valve fitted in compliance with the requirements of sub-paragraph (*b*) which is a geared valve, or the lower of two non-geared valves, shall be secured to the ship's shell plating.

(*d*) All cocks and valves attached to inlets or discharges, other than inlets or discharges connected with machinery, being cocks or valves fitted below the margin line or the failure of which may affect the subdivision of the ship, shall be made of steel, bronze, or other equally efficient material.

(*e*) Main and auxiliary inlets and discharges connected with machinery shall be fitted with readily accessible cocks or valves between the pipes and the ship's shell plating or between the pipes and a fabricated box attached to the shell plating. Such cocks or valves of more than 3″ bore attached to such inlets or discharges shall be made of steel, bronze, or other equally efficient material. If made of steel such cocks and valves shall be protected against corrosion.

(*f*) Discharge pipes led through the shell plating below the margin line of any ship of Classes I to III, inclusive, shall not be fitted in a direct line between the outboard opening and the connection with the deck, water closet or other similar fitting, but shall be arranged with bends or elbows of substantial metal other than cast iron or lead.

(*g*) All discharge pipes led through the shell plating below the margin line in such a ship and the valves relating thereto shall be protected from damage.

(*h*) All bolts connecting cocks, valves, discharge pipes and other similar equipment to the shell plating of such a ship below the margin line shall have their heads outside the shell plating, and shall be either countersunk or cup-headed.

(*i*) Efficient means shall be provided for the drainage of all watertight decks below the margin line in such a ship and any drainage pipes shall be so fitted with valves or otherwise arranged as to avoid the danger of water passing from a damaged to an undamaged compartment.

(*j*) The inboard opening of every ash-shoot, rubbish-shoot and other similar shoot in such a ship shall be fitted with an efficient watertight cover, and, if such opening is below the margin line, it shall also be fitted with an automatic non-return valve in the shoot in a readily accessible position above the ship's deepest subdivision load water line. The valve shall be of the horizontal balanced type, normally closed and provided with local means for securing it in a closed position. The requirements of this paragraph

shall not apply to ash ejectors and expellers the inboard openings of which are in the ship's stokehold and necessarily below the deepest subdivision load water line. Such ejectors and expellers shall be fitted with means which will prevent water entering the ship.

(*k*) Any gangway port, cargo port, or coaling port fitted below the margin line of such a ship shall be of adequate strength and its lowest point shall not be below the ship's deepest subdivision load water line.

(9) The Minister may exempt any ship of Classes IV to VI, inclusive, from the requirements of paragraph (8) of this Rule to the extent that he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

Side and Other Openings above the Margin Line

16. In every ship to which this Part of these Rules applies side scuttles, gangway ports, cargo ports, coaling ports, and other openings in the shell plating above the margin line and their means of closing shall be 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 water line, and to the intended service of the ship.

Weather Deck

17. In every ship to which this Part of these Rules applies the bulkhead deck or a deck above the bulkhead deck shall be weathertight. All openings in a weathertight deck shall have coamings of adequate height and strength and shall be provided with efficient and rapid means of closing so as to make them weathertight. Freeing ports or scuppers shall be provided for clearing such deck of water under all weather conditions.

Subdivision Load Lines

18.—(1) Every ship to which this Part of these Rules applies shall be marked on its sides amidships with the subdivision load lines assigned to it by the Minister. The marks shall consist of horizontal lines one inch in breadth, and nine inches in length in the case of a ship which is a load line ship for the purposes of the Merchant Shipping (Safety and Load Line Conventions) Act, 1932, and twelve inches in length in the case of any other ship. The marks shall be painted in white or yellow on a dark ground or in black on a light ground, and shall also be cut in or centre-punched on iron or steel ships, and cut into the planking on wood ships.

(2) The subdivision load lines shall be identified with the letter C, and, in the case of ships of Classes I and II, with consecutive numbers beginning from the deepest subdivision load line which shall be marked C_1. In the case of ships of Classes II (A) to VI, inclusive,

(*a*) if there is only one subdivision load line it shall be identified with the letter C;

(*b*) if there is more than one subdivision load line the subdivision load lines shall be identified with the letter C and with consecutive letters beginning from the deepest subdivision load line, which shall be marked C_A.

The identifying letters and numerals, shall in every case be painted and cut or centre-punched, as the case may be, on the sides of the ship in the same manner as the lines to which they relate.

PART II (A)

SHIPS NOT REQUIRED TO COMPLY WITH PART II

Application of Part II (A)

19. This Part of these Rules applies to every open or partially decked ship of Class V, and to every ship of Class VI carrying less than 151 passengers, and to every ship of Class VI (A).

Openings in the Sides of the Ship

20.—(1) Efficient means shall be provided for preventing the accidental admission of water into any ship to which this Part of these Rules applies through any openings in the sides of the ship.

(2) Every side scuttle fitted in such a ship shall be of the non-opening type and shall be watertight and of sufficient strength having regard to its position in the ship.

PART III

BILGE PUMPING ARRANGEMENTS

Application of Part III

21. This Part of these Rules applies to every ship to which these Rules apply.

General

22. Except in the case of open ships of Classes V and VI not exceeding 40 feet in length, and not proceeding on voyages to a point more than 3 miles from the starting point, every ship to which these Rules apply shall be provided with an efficient pumping plant capable of pumping from and draining any watertight compartment in the ship under all conditions likely to arise in practice after a casualty, whether or not the ship remains upright. Wing suctions shall be provided if necessary for that purpose. Efficient arrangements shall be provided whereby water in any watertight compartment may find its way to the suction pipes. Efficient means shall be provided for draining water from all insulated holds and insulated between decks in such a ship.

Number and Type of Bilge Pumps: Ships of Classes I and II

23.—(1) Every ship of Classes I and II shall be provided with pumps connected to the bilge main in accordance with the following table:—

Length of Ship	Less than 300 ft.		300 ft. or more	
Criterion numeral	Less than 30	30 and over	Less than 30	30 and over
Number of hand pumps of the crank type (may be replaced by one independent power pump) ...	2	—	—	—
Number of main engine pumps (may be replaced by one independent power pump)	1	1	1	1
Number of independent power pumps	1	3	2	3

(2) The aforesaid pumping plant shall be arranged as follows:—

(*a*) in ships provided with two hand pumps of the crank type in compliance with the foregoing paragraph, one of such pumps shall be installed forward and the other aft;

(*b*) in all other ships of Classes I and II—

(i) one of the pumps shall be an efficient emergency pump of a submersible type having its source of power and the necessary controls situated above the ship's bulkhead deck; or

(ii) the power pumps in the ship and their sources of power shall be so disposed throughout the ship's length that under any condition of flooding which the ship is required to withstand at least one such pump in an undamaged watertight compartment will be available.

Number and Type of Bilge Pumps: Ships of Classes II (A) and III

24.—(1) Every ship of Classes II (A) and III shall be provided with bilge pumps in accordance with the following table:—

Length of Ship in feet	Number of Pumps		
	Main Engine Pump*	Independent Power Pumps	Hand Pumps†
Under 50	1	—	One of the lever type for each watertight compartment, or one of the crank type.
50 and under 100 ...	1	1	One of the lever type for each watertight compartment, or one of the crank type.
100 and under 250 ...	1	1	One of the crank type.
250 and under 300 ...	1	1	Two of the crank type.
300 and over	1	2	—

* The main engine pump may be replaced by one independent power pump.

† The hand pumps specified in this column may be replaced by one independent power pump.

(2) In every such ship of less than 300 feet but not less than 250 feet in length provided with two hand pumps of the crank type in accordance with the foregoing paragraph, in every such ship of 300 feet in length or more and in every ship of under 300 feet in length where the hand pump or pumps are replaced by an independent power pump, paragraph (2) of Rule 23 of these Rules shall apply to the pumping arrangements as it applies to the pumping arrangements in ships of Classes I and II.

Number and Type of Bilge Pumps etc.: Ships of Classes IV to VI (A) inclusive

25.—(1) Every ship of Class IV shall be provided with a power bilge pump, which may be worked by the ship's main engines, and, in addition, a hand pump other than a hand pump of the lever type.

(2) Every ship of Classes V, VI and VI (A) shall be provided with bilge pumps and means for bailing as follows:—

(*a*) Every such ship exceeding 60 feet in length shall be provided with a power pump, which may be worked by the main engine, and, in addition, a hand pump other than a hand pump of the lever type.

(*b*) Every such ship, being a decked ship not exceeding 60 feet in length, shall be provided with a hand pump other than a hand pump of the lever type.

(*c*) Every such ship, being a partially decked ship not exceeding 60 feet in length, shall be provided with a hand pump, and, in addition, two bailers or one bailer and one bucket.

(*d*) Every such ship, being an open ship exceeding 40 feet in length but not exceeding 60 feet in length, shall be provided with a hand pump, and, in addition, two bailers or one bailer and one bucket.

(*e*) Every ship of Classes V and VI, being an open ship not exceeding 40 feet in length, and proceeding beyond 3 miles from the starting point of her voyage, and every ship of Class VI (A), being an open ship not exceeding 40 feet in length, shall be provided with a hand pump, and, in addition, two bailers or one bailer and one bucket.

(*f*) Every ship of Classes V and VI being an open ship not exceeding 40 feet in length, and not proceeding on voyages more than 3 miles from the starting point, shall be provided with two bailers or one bailer and one bucket.

Requirements for Bilge Pumps and Bilge Suctions

26.—(1) Power bilge pumps fitted in any ship to which these Rules apply, shall where practicable be placed in separate watertight compartments so arranged or situated as not to be readily flooded by the same damage, and if the ship's engines and boilers are in two or more watertight compartments the bilge pumps there available shall be distributed through such compartments as far as possible.

(2) Every bilge pump provided in such a ship in compliance with these Rules shall be self-priming unless efficient means of priming are provided. Every such pump, other than a hand pump of the lever type and a pump provided for peak compartments only, shall, whether operated by hand or by power, be so arranged as to be capable of drawing water from any hold or any part of the machinery space in the ship.

(3) Every independent power bilge pump in such a ship shall be capable of giving a speed of water through the ship's main bilge pipe of not less than 400 feet per minute. Every such pump shall have a direct suction from the space in which it is situated. Provided that not more than two direct suctions shall be required in any one space. Every such suction shall be of a diameter not less than that of the ship's main bilge pipe. The direct suctions in the ship's machinery space shall be so arranged that water may be pumped from each side of the space through direct suctions to independent bilge pumps.

(4) There shall be provided in the stokehold of every such ship, being a coal burning ship, a flexible suction hose of sufficient length to reach from a fitting on an independent power bilge pump in the ship to each side of the stokehold bilges. The hose shall be in addition to the other bilge suctions required by this Rule, and shall have an internal diameter of 4 inches, or ½ inch larger than that of the largest branch bilge suction required by Rule 28 of these Rules, whichever is the less.

(5) Any main engine circulating pumps in such a ship shall be fitted with direct suction connections, provided with non-return valves, to the lowest drainage level in the ship's machinery space, or as near thereto as will satisfy the Minister in the case of that ship. Such connections shall be of a diameter at least two-thirds of that of the ship's main sea inlet and the open end thereof or the strainer, if any, attached thereto shall be accessible for clearing.

If the boiler fuel may be coal and there is no watertight bulkhead between the ship's engines and boilers, a direct discharge overboard shall be fitted from at least one of the aforesaid pumps unless a by-pass is fitted to the circulating discharge thereof. The spindles of the ship's main sea inlet and of the direct suction valves shall extend well above the engine room platform.

(6) The hand bilge pumps in such a ship shall be workable from above the ship's bulkhead deck, if any, and shall be so arranged that the bucket and tail valve can be withdrawn for examination and overhaul under flooding conditions. If two hand pumps of the crank type are fitted in such a ship, a shut-off valve or cock operated from above the ship's bulkhead deck or non-return valves shall be provided to enable either of such pumps to be opened up without affecting the efficiency of the other.

Arrangement of Bilge Pipes

27.—(1) In every ship to which these Rules apply all pipes from the pumps for draining cargo spaces or any part of the machinery space shall be distinct from pipes which may be used for filling or emptying spaces in which water or oil is carried.

(2) Lead pipes shall not be fitted in connection with bilge pumps in such a ship in or under coal bunkers, oil fuel storage tanks or in any compartment in which oil settling tanks or oil fuel pumping units are situated.

(3) Bilge suction pipes in such a ship shall not be led through oil tanks unless the pipes are enclosed in an oiltight trunkway. Such pipes shall not be led through double bottom tanks.

(4) Such pipes shall be made with flanged joints and shall be thoroughly secured in position and protected where necessary against the risk of damage. Efficient expansion joints or bends shall be provided in each line of pipe, and where a connection is made at a bulkhead or elsewhere with a lead bend the radius of each bend and the distance between the axes of the straight parts of the pipes shall be not less than three times the diameter of the pipe and the length of any bend shall be not less than eight times that diameter.

Diameter of Bilge Suction Pipes

28.—(1) Subject to the provisions of paragraphs (2) and (3) of this Rule in every ship of Classes I to III, inclusive, and in every ship of Classes IV to VI (A), inclusive, which is required by Rule 25 of these Rules to be provided with a pump, the internal diameter of main and branch bilge suction pipes shall be determined to the nearest $\frac{1}{4}$ inch calculated according to the following formulae:—

$$d_m = \sqrt{\frac{L(B+D)}{2,500}} + 1$$

$$d_b = \sqrt{\frac{l(B+D)}{1,500}} + 1$$

where d_m = internal diameter of the main bilge suction pipes in inches.

d_b = internal diameter of the branch bilge suction pipes in inches.

L = length of ship in feet.

B = breadth of ship in feet.

D = moulded depth of ship at bulkhead deck in feet.

l = length of compartment in feet.

(2) No main bilge suction pipe in any ship of Classes I to III, inclusive, shall be less than 2½ inches in bore, and no branch suction pipe shall be less than 2 inches, or need be more than 4 inches, in bore.

(3) No bilge suction pipe in any ship of Classes IV to VI (A), inclusive, which is required by Rule 25 of these Rules to be provided with a pump, shall be less than 1¼ inches in bore.

Precautions against flooding through Bilge Pipes

29.—(1) The bilge and ballast pumping systems in every ship to which Part II of these Rules applies shall be so arranged as to prevent water passing from the sea or from water ballast spaces into the ship's cargo spaces or into any part of the machinery space or from one watertight compartment in the ship to another. The bilge connection to any pump which effects suction from the sea or from water ballast spaces shall be made by means of either a non-return valve or a cock which cannot be opened at the same time to the bilges and to the sea or to the bilges and the water ballast spaces. Valves in bilge distribution boxes shall be of a non-return type. An arrangement of lock-up valves or of blank flanges shall be provided to prevent any deep tank in such a ship being inadvertently run up from the sea when it contains cargo or pumped out through a bilge pipe when it contains water ballast, and instructions for the working of such arrangement shall be conspicuously displayed nearby.

(2) Provision shall be made in every such ship to prevent the flooding of any watertight compartment served by a bilge suction pipe in the event of the pipe being severed or otherwise damaged, by collision or grounding, in any other watertight compartment. Where any part of such a pipe is situated nearer to the side of the ship than one-fifth of the mid-ship breadth of the ship measured at the level of the deepest subdivision load water line, or in any duct keel a non-return valve shall be fitted to the pipe in the watertight compartment containing the open end of the pipe.

Bilge Valves, Cocks, etc.

30.—(1) In every ship to which Part II of these Rules applies all distribution boxes, valves and cocks fitted in connection with the bilge pumping arrangements shall be in positions which are accessible at all times in ordinary circumstances and shall be so arranged that in the event of flooding one of the bilge pumps may operate on any watertight compartment in the ship. If in any such ship there is only one system of pipes common to all such pumps, the necessary valves or cocks for controlling the bilge suctions shall be capable of being operated from above the ship's bulkhead deck. If an emergency bilge pumping system is provided in addition to the main bilge pumping system it shall be independent of the main system and shall be so arranged that a pump is capable of being operated under flooding conditions on any watertight compartment. Provided that in any ship of Class II (A) or Class III of under 100 feet in length provided with a hand pump of the lever type for each watertight compartment in accordance with the provisions of paragraph (1) of Rule 24 of these Rules, the valves and cocks on the bilge main for controlling the bilge suctions need not be workable from above the ship's bulkhead deck if they are in the same compartment as a power pump.

(2) Every operating rod for bilge suction valves or cocks in every such ship shall be led as directly as possible and shall have an index plate at the position above the bulkhead deck from which it is operated showing the purpose served by the valve or cock and how it may be opened and closed. Every such rod passing through cargo or bunker spaces shall be protected against damage.

Bilge Mud Boxes and Strum Boxes

31. Bilge suctions in the machinery space of every ship to which these Rules apply shall be led from readily accessible mud boxes placed wherever practicable above the level of the working floor of such space. The boxes shall have straight tailpipes to the bilges and covers secured in such a manner as will permit them to be readily opened and closed. The suction ends in hold spaces and tunnel wells shall be enclosed in strum boxes having perforations approximately $\frac{3}{8}$ inch in diameter, and the combined area of such perforations shall be not less than twice that of the end of the suction pipe. Strum boxes shall be so constructed that they can be cleared without breaking any joint of the suction pipe.

Sounding Pipes

32. In every ship to which Part II of these Rules applies all tanks forming part of the structure of the ship and all watertight compartments, not being part of the machinery space, shall be provided with efficient sounding arrangements which shall be protected where necessary against damage. Where such arrangements consist of sounding pipes, a thick steel doubling plate shall be securely fixed below each sounding pipe for the sounding rod to strike upon. All such sounding pipes shall extend to positions above the ship's bulkhead deck which shall at all times be readily accessible. Sounding pipes for bilges, coffer dams and double bottom tanks, being bilges, coffer dams and tanks situated in the machinery space, shall so extend unless the upper ends of the pipes are accessible in ordinary circumstances and are furnished with cocks having parallel plugs with permanently secured handles so loaded that on being released they automatically close the cocks. Sounding pipes for the bilges of insulated holds shall be insulated and not less than $2\frac{1}{2}$ inches in diameter.

PART IV

Electrical Equipment and Installations

Application of Part IV

33. This Part of these Rules applies to every ship to which these Rules apply.

General

34.—(1) In every ship to which these Rules apply the electrical equipment and installations, other than the electrical means of propulsion, if any, shall be such that the electrically operated services essential for the safety of the ship and of persons on board can be maintained under emergency conditions.

(2) Without prejudice to the preceding provisions of this Rule, the electrical equipment and installations (including any electrical means of propulsion) in every such ship shall be such that the ship and all persons on board are protected against electrical hazards and shall conform with the relevant provisions of the Regulations for the Electrical Equipment of Ships issued by the Institution of Electrical Engineers and dated September, 1939, as amended by a supplement dated November, 1947, except in so far as such Regulations as so amended are inconsistent with these Rules.

Main Generating Sets: Ships of Classes I to III, inclusive

35. Every ship of Classes I to III, inclusive, being a ship in which electrical power is the only power for maintaining the auxiliary services essential for the propulsion or safety of the ship, shall be provided with not less than two main generating sets the power of which shall be sufficient to operate the aforesaid services in the event of any one of the sets being out of service.

Arrangements shall be made which will safeguard such sets from being rendered inoperative in the event of the partial flooding of the ship's machinery space through leakage from a damaged compartment or otherwise.

Emergency Source of Electrical Power: Ships of Classes I, II and II (A)

36.—(1) In every ship of Classes I, II and II (A) there shall be provided in a position above the bulkhead deck outside the machinery casings a self-contained emergency source of electrical power capable of operating simultaneously for a period of 36 hours, or for such shorter period as the Minister may permit in the case of any ship regularly engaged on voyages of short duration,

(*a*) the ship's emergency bilge pump, if it is electrically operated;

(*b*) the ship's watertight doors, if they are electrically operated;

(*c*) the ship's emergency lights at every boat station on deck and overside, in all alleyways, stairways and exits, in the machinery space, in the control stations where radio, main navigating and central fire recording equipments are situated, and in the place where the emergency generator, if any, is situated;

(*d*) the ship's navigation lights, if operated solely by electric power; and

(*e*) all communication equipment and signals which may be required in an emergency, if they are electrically operated from the ship's main generating sets.

(2) The emergency source of electrical power may be either an accumulator battery capable of complying with paragraph (1) of this Rule without being recharged or suffering an excessive voltage drop, or a generator driven by a compression ignition engine with an independent fuel supply and with efficient starting arrangements. The fuel provided for such engine shall have a flash point of not less than 110° F.

(3) The emergency source of electrical power shall be so arranged that it will operate efficiently when the ship is listed 22½° and when the trim of the ship is 10° from an even keel.

(4) (*a*) If the emergency source of electrical power is an accumulator battery, the arrangements shall be such that the ship's emergency lighting system will come into operation automatically in the event of the failure of the main source of power for the ship's main lighting system.

(*b*) If the emergency source of electrical power is a generator, an accumulator battery shall be provided as a temporary source of electrical power, so arranged as to come into operation automatically in the event of a failure of the main or emergency source of electrical power, and of sufficient capacity—

(i) to operate the ship's emergency lighting system continuously for half an hour; and

(ii) while such lighting system is in operation, to close the ship's watertight doors if they are electrically operated, but not necessarily to close all of such doors simultaneously.

(*c*) Means shall be provided by which the automatic arrangements referred to in this paragraph can be tested.

Emergency Source of Electrical Power: Ships of Class III

37.—(1) In any ship of Class III which is provided with an emergency bilge pump in compliance with paragraph (2) of Rule 24 of these Rules, being an electrically operated pump, there shall be provided in a position above the bulkhead deck outside the machinery casings a self-contained emergency source of electrical power capable of operating the pump for a period of 24 hours.

(2) The emergency source of electrical power may be either an accumulator battery capable of complying with paragraph (1) of this Rule without being recharged or suffering an excessive voltage drop, or a generator driven by a compression ignition engine with an independent fuel supply and with efficient starting arrangements. The fuel provided for such engine shall have a flash point of not less than 110° F.

(3) Paragraph (3) of Rule 36 of these Rules shall apply to such emergency source of electrical power as it applies to the emergency source of electrical power provided in ships of Classes I, II and II (A).

Distribution Systems

38.—(1) In every ship to which these Rules apply every open-type switchboard shall be arranged so as to allow ready access to the back and front thereof without danger to any person who in the course of his duties may inspect or repair the switchboard or its connections or operate the devices thereon. The sides and backs of the switchboard shall be guarded by a hand rail, wire netting, expanded metal or other equally efficient means of protection and a non-conducting mat or grating shall be provided as a floor covering. No exposed parts which may have a voltage to earth exceeding 250 volts direct current or 150 volts alternating current shall be installed on the face of any switchboard or control panel.

(2) Hull return shall not be used in any such ship for the power, heat and light distribution systems thereof.

(3) If, in any such ship, two or more generating sets may be in operation at the same time for maintaining the auxiliary services essential for the propulsion or safety of the ship, provision shall be made for the sets to operate in parallel and means shall be provided so that in the event of overload or a partial failure of the power supply the services not essential to the propulsion and safety of the ship will be cut out first, the services essential for those purposes being retained in circuit with such of the generators as may remain in service.

(4) In every such ship any electrically operated steering gear shall be served by two sets of feeder cables from the ship's main switchboard. Such sets of feeder cables shall be separated from each other throughout their length as widely as practicable. Each feeder cable shall have a capacity adequate for serving all motors which may operate simultaneously in connection with steering gear. Such cables and motors shall be protected by fuses, circuit breakers or other similar devices against short circuits, but shall not be so protected against lesser loads.

(5) If in any such ship the power supply for an automatic sprinkler system, requiring not less than two sources of power supply for sea-water pumps, air compressors and automatic alarms, is electrical, such power supply shall be taken through the emergency switchboard by a feeder reserved solely for that purpose. There shall be no switch in the circuit other than that at the switchboard. The switch shall be clearly and permanently labelled to indicate its purpose and to indicate that it shall normally be kept closed.

(6) In every such ship the main and emergency feeder cables shall be separated vertically and horizontally as widely as practicable.

General Electrical Precautions

39.—(1) In every ship to which these Rules apply all exposed metal parts of electrical equipment which are not intended to have a voltage above that of earth but which may have such a voltage under fault conditions shall be earthed, and all such equipment shall be so constructed and installed that there will be no danger of injury to a person handling it in a proper manner. The metal frames of all portable lamps and tools and other portable apparatus provided in such a ship and operating on an electric supply of a voltage of 100 volts or more shall be earthed through a conductor in the supply cable.

(2) Every electrical cable in such a ship shall, at every position at which an electrical fault may cause a fire, be covered by metal sheaths, metal armour or other equally effective means of protection. All metal sheaths and metal armour of electrical cable in such a ship shall be electrically continuous and shall be earthed.

(3) Wiring in every such ship shall be supported in such a manner as to avoid chafing and other injury.

(4) In every such ship the joints in all electrical conductors shall be made only in junction or outlet boxes except in the case of low voltage communication circuits. All such junctions or outlet boxes shall be so constructed as to prevent the spread of fire therefrom.

(5) All lighting fittings in every such ship shall be so arranged as to prevent rises in temperature which would be injurious to the electrical wiring thereof or which would result in a risk of fire in the surrounding material.

(6) Every electric space-heater forming part of the equipment of such a ship shall be fixed in position and shall be so constructed as to reduce the risk of fire to a minimum. No such heater shall be constructed with an element so exposed that clothing, curtains, or other similar material can be scorched or set on fire by heat from the element.

(7) In every such ship each separate electrical circuit, other than a circuit which operates the ship's steering gear, shall be protected against overload. There shall be clearly and permanently indicated on or near each overload protective device the current carrying capacity of the circuit which it protects and the rating or setting of the device.

(8) In every such ship all accumulator batteries shall be housed in boxes or compartments which are so constructed as to protect the batteries from damage and are so ventilated as to minimise the accumulation of explosive gas. Electrical devices which are likely to arc shall not be installed in any compartment used to house accumulator batteries unless such devices are flame-proof.

Spare Parts and Tools

40. Every ship of Classes I, II and II (A) shall be provided with an adequate quantity of replacements for those parts of the ship's electrical equipment and installations which, having regard to the intended service of the ship, it would be essential for the safety of the ship and of persons on board to replace in the event of failure while the ship is at sea, together with such tools as are necessary for the fitting of those replacements.

PART V

FIRE PROTECTION: SHIPS OF CLASSES I, II AND II (A)

Application of Part V

41. This Part of these Rules applies to ships of Classes I, II and II (A).

Exemption from Part V

42.—(1) The Minister may exempt from any of the requirements of Rules 47 to 54, inclusive and 56 to 60, inclusive, of these Rules any ship carrying not more than 36 passengers if he is satisfied that the ship is fitted with an efficient fire detection system capable of giving a visible and audible alarm signal at one or more points in the ship so as to come rapidly to the notice of the master and crew of the ship, which will indicate the presence and position of any fire in any accommodation space or service space, other than a space which in the opinion of the Minister affords no substantial fire risk.

(2) The Minister may further exempt any ship of Class II or II (A) from the requirements of this Part of these Rules to the extent that he is satisfied that compliance therewith is unreasonable or impracticable by reason of the intended service of the ship.

Exhibition of Plans

43. In every ship to which this Part of these Rules applies there shall be provided for the guidance of the master of the ship plans showing for each deck the sections of the ship enclosed by "A" Class divisions and the sections of the ship enclosed by "B" Class divisions, together with particulars of the fire alarm and fire detecting systems, sprinkler installations and fire extinguishing appliances provided in the ship, the means of entry into and exit from the various compartments and decks in the ship, and of the ship's ventilating system, including in particular the positions of the dampers thereof and the identification numbers of the ventilation fans serving each section of the ship. Such plans shall be protected by glass or similar material and shall be permanently affixed to a bulkhead, table or desk near the place from which the ship is normally navigated.

"A" and "B" Class Divisions

44.—(1) Every "A" Class division required by these Rules shall be constructed of steel or similar material, in either case stiffened so as to be capable of preventing the passage of smoke and flame throughout a standard fire test of 60 minutes duration. The division shall have an adequate insulating value having regard to the nature of the spaces adjacent thereto, and if the division is between spaces either of which contains adjacent combustible material it shall be so insulated that if either face of the division is exposed to a standard fire test of 60 minutes duration the average temperature on the unexposed face of the division will not increase at any time during the test by more than 250° F. (139° C.) above the initial temperature on that face nor shall the temperature at any one point thereon increase by more than 325° F. (180° C.) above the initial temperature.

(2) Every "B" class division required by these Rules shall be capable of preventing the passage of smoke and flame throughout a standard fire test of 30 minutes duration. Every such division shall have an adequate insulating value having regard to the nature of the spaces adjacent thereto. The division shall be so constructed that if either face thereof is exposed to a standard fire test of 30 minutes duration the average temperature on the

unexposed face of the division will not increase by more than 250° F. (139° C.) above the initial temperature on that face, nor shall the temperature at any one point thereon increase by more than 325° F. (180° C.) above the initial temperature. Provided that any division which is constructed wholly of incombustible material shall be required to comply with the foregoing requirement relating to increase of temperature only during the first 15 minutes of a standard fire test.

(3) The Minister may exempt any ship from the requirements of this Rule relating to insulation to the extent that he is satisfied that compliance therewith is unnecessary having regard to the degree of fire hazard present.

Structure of the Ship

45.—(1) The hull, superstructure, structural bulkheads, decks and deckhouses of every ship to which this Part of these Rules applies shall be constructed of steel. The Minister may exempt any ship wholly or in part from the requirement of this paragraph if he is satisfied that the aforesaid parts of the ship are constructed of material equally resistant to fire.

(2) The hull, superstructure and deckhouses of every ship to which this Part of these Rules applies shall be subdivided by bulkheads consisting of "A" class divisions into main vertical zones. The mean length of each zone, above the bulkhead deck, shall not exceed 131 feet. Any steps in such bulkheads shall consist of "A" class divisions.

(3) Any portions of such divisions which extend above the ship's bulkhead deck shall, whenever possible, be in line with watertight subdivision bulkheads situated immediately below the bulkhead deck and shall extend from deck to deck and to the ship's shell plating and, in the case of a deckhouse, to the external plating thereof.

(4) The Minister may exempt any ship from the requirements of paragraphs (2) and (3) of this Rule to the extent that he is satisfied that compliance therewith is incompatible with the purpose for which the ship is designed and that other equally effective methods of fire protection have been adopted in the ship.

Openings in "A" Class Divisions

46.—(1) If, in any ship to which this Part of these Rules applies, any "A" class division is pierced for the passage of electric cables, pipes, trunkways, girders or beams, or for other purposes, the arrangements shall be such that the effectiveness of the division in resisting fire is not thereby impaired.

(2) Dampers shall be fitted in any trunkways which pass through an "A" class division and shall be provided with a suitable means of local control capable of being operated from both sides of the division. The positions from which such means of control may be operated shall be readily accessible and shall be permanently marked in red. Indicators shall be provided to show whether the dampers are open or shut.

(3) Any opening in such a division shall be provided with means of closure permanently attached to the division. The means of closure shall be as effective as the division in resisting fire.

(4) Any door in such a division shall be so constructed that it can be opened and closed by one person from either side of the division. The door and the means of keeping it closed shall be as effective as the division in resisting fire. Provided that a watertight door shall not be required to be insulated. If the division is constructed in compliance with paragraph (2) of Rule 45 of these Rules and any door therein is not a watertight door, such door shall be self-closing and shall be provided with a device by which it may readily be released from the open position.

Separation of Accommodation Spaces from other Enclosed Spaces

47. In every ship to which this Part of these Rules applies the bulkheads and decks separating accommodation spaces from other enclosed spaces shall consist of "A" class divisions.

Protection of Stairways

48.—(1) In every ship to which this Part of these Rules applies every stairway within an accommodation space or service space shall be of steel frame construction and shall lie within an enclosure constructed of "A" class divisions. Provided that

(*a*) a stairway serving only two decks shall not be required to be enclosed by "A" class divisions at more than one deck;

(*b*) a stairway in a public room shall not be required to be so enclosed if it lies wholly within the room.

The Minister may exempt any ship, being a ship in which Method II of fire protection, within the meaning of Rule 56 of these Rules, has been adopted, from the requirements of this paragraph in relation to any stairway which he is satisfied is an auxiliary stairway adequately protected by sprinklers.

(2) Every opening in a bulkhead forming part of a stairway enclosure shall be provided with a means of closure which shall be permanently attached thereto. The means of closure shall be as effective as the bulkhead in resisting fire, and shall be self-closing unless it is a watertight door.

(3) Every stairway enclosure in such a ship shall communicate directly with the corridors adjacent thereto and shall have an area sufficient to prevent congestion, having regard to the number of persons likely to use the stairway in an emergency. Every such enclosure shall contain as little accommodation space or service space as is practicable in the circumstances.

Protection of Lifts and Vertical Trunks for Light and Air

49.—(1) In every ship to which this Part of these Rules applies every lift trunk, and every light-and-air and similar trunk in an accommodation space or service space, shall be constructed of "A" class divisions. Provided that a lift trunk within a stairway enclosure shall not be required to be insulated. Every door in such a trunk shall be constructed of steel or other incombustible material and shall be as effective as the trunk in resisting fire.

(2) Every lift trunk in such a ship shall be so fitted as to prevent the passage of smoke and flame from one between decks to another and shall be provided with means of closure which will enable draught and smoke to be controlled.

(3) If in such a ship a light-and-air or similar trunk communicates with more than one between-deck space and smoke and flame may be conducted from one between decks to another, smoke shutters shall be fitted so as to enable each such space to be isolated in the event of fire.

(4) Every other trunk in such a ship shall be so constructed as not to afford a passage for fire from one between decks or compartment to another.

Protection of Control Stations

50.—(1) Every control station in a ship to which this Part of these Rules applies shall be separated from the rest of the ship by bulkheads and decks consisting of "A" class divisions.

(2) The radiotelegraph room in such a ship shall not be situated directly above any stairway.

Protection of Store Rooms, etc.

51.—(1) In every ship to which this Part of these Rules applies the boundary bulkheads separating a galley, baggage room, mail room, store room, paint room, lamp room, or any similar space from any other space shall consist of "A" class divisions.

(2) Spaces appropriated for the storage of highly inflammable stores shall be so constructed and situated as to minimise the danger to persons on board in the event of fire.

Deck Sheathing

52. In every ship to which this Part of these Rules applies any permanent deck sheathing within an accommodation space, service space, control station, stairway or corridor shall be such as will not readily ignite.

Ventilation Systems

53.—(1) The inlets of every air supply system and the outlets of every air exhaust system in every ship to which this Part of these Rules applies shall have readily accessible means by which they can be closed in the event of fire. Wherever practicable the system of ducts leading from each ventilating fan shall be within one main vertical zone.

(2) Every such ship shall be equipped with two master controls, situated as far apart as is practicable, either of which shall be capable of stopping all the fans in the power ventilation systems of the ship, other than the ventilation systems in the machinery space. Every power ventilation system serving the machinery space shall have two master controls, one of which shall be capable of being operated from outside such space. Any exhaust ducts from galley ranges in such a ship shall be constructed of "A" class divisions which shall be insulated where the ducts pass through accommodation spaces or service spaces.

Miscellaneous Items of Fire Protection

54.—(1) Every air space enclosed behind a ceiling, panel or lining in the accommodation spaces or service spaces of a ship to which this Part of these Rules applies shall be divided by close fitting draught-stops spaced not more than 45 feet apart in the fore and aft direction, and shall be closed at each deck.

(2) Every such ceiling, panel and lining shall be so constructed as to enable a fire patrol to detect any smoke originating in a concealed or inaccessible space, without impairing the efficiency of the fire protection of the ship.

(3) In every such ship the concealed surfaces of every bulkhead, lining, panelling, stairway, wood grounds and other structure in accommodation spaces and service spaces shall be such that they will be surfaces of low flame spread within the meaning of Amendment No. 2 dated July, 1945, to the British Standard Definitions for Fire-Resistance, Incombustibility and Non-Inflammability of Building Materials and Structures (B.S. 476: 1932).

(4) In such a ship, paints, varnishes or similar preparations shall not be applied if they contain a nitro-cellulose base, and fabrics containing nitro-cellulose shall not be fitted.

(5) In such a ship overboard scuppers, sanitary discharges or other outlets shall not be made of lead if they are close to the water line or in such a position that the fusing of the lead in the event of fire would give rise to a danger of flooding.

(6) In such a ship the use of wood for the construction and equipment of galleys, bakeries and main pantries shall be restricted so far as is practicable.

(7) Every window and side scuttle in the accommodation spaces and service spaces of such a ship shall be constructed with metal frames. The glass therein shall be retained by a metal ring or bead. If the window or side scuttle is in a position in which the fusion of the frame, ring or bead, may give rise to a danger of flooding, the frame, ring or bead, as the case may be, shall consist of metal which is not likely to fuse in the event of fire. Every window and side scuttle in such a ship opening on to a corridor or stairway shall be as effective in resisting fire as the bulkhead in which it is fitted.

Provision for Cinematograph Exhibitions

55. If any inflammable film is carried in a ship to which this Part of these Rules applies for exhibition therein the ship and the cinematograph equipment provided therein shall comply with the requirements specified in the Fifth Schedule to these Rules.

Methods of Fire Protection

56. The accommodation spaces and service spaces in every ship to which this Part of these Rules applies shall be constructed in accordance with one of the following methods of fire protection and shall comply with such of the following requirements of this Part of these Rules as are expressed to apply to ships in which that method has been adopted:—

Method I: The construction in the accommodation spaces and service spaces of a system of internal bulkheading consisting of "B" class divisions, together with an automatic fire alarm and fire detection system in these spaces.

Method II: The fitting of an automatic sprinkler, fire detection and fire alarm system in the accommodation spaces and service spaces.

Method III: The subdivision of the accommodation spaces and service spaces by "A" class and "B" class divisions, together with the fitting of an automatic fire alarm and fire detection system in all accommodation spaces and service spaces and a restriction of the provision of combustible material in these spaces.

Bulkheads within Main Vertical Zones

(Methods I and III)

57.—(1) Method I:

(*a*) Every bulkhead within the accommodation spaces or service spaces of a ship in which Method I of fire protection has been adopted, not being a bulkhead required by these Rules to consist of "A" class divisions, shall consist of "B" class divisions. The bulkheads shall be joined together in a manner which will ensure the maximum resistance to fire. If such a ship carries more than 100 passengers, the said "B" class divisions shall be constructed of incombustible material but, subject to the provisions of paragraph (1) (*b*) of Rule 60 of these Rules, may be faced with combustible material.

(*b*) Every such bulkhead shall extend from deck to deck. Provided that a bulkhead, other than a corridor bulkhead, may terminate at a ceiling consisting of incombustible material.

(*c*) Where the ship's shell plating forms the boundary of an accommodation space or a service space, the adjacent transverse bulkheads shall extend to the shell plating. Where the external plating of a deckhouse forms the boundary of an accommodation space or service space, the adjacent transverse and longitudinal bulkheads shall extend to the external plating. Provided that any such bulkhead, other than a corridor bulkhead, may terminate at a lining consisting of incombustible material.

(*d*) Any ventilation opening in a corridor bulkhead shall be in the lower part of the bulkhead wherever practicable and shall be provided with a grille constructed of incombustible material.

(2) Method III:

(*a*) Bulkheads within the accommodation spaces and service spaces of every ship in which Method III of fire protection has been adopted, not being a bulkhead required by these Rules to consist of "A" class divisions, shall be constructed of "B" class divisions so as to form a continuous network of "B" class divisions or, together with such bulkheads as are constructed of "A" class divisions, a continuous network of "A" and "B" class divisions. The area of any one compartment formed by such network shall not exceed 1,600 square feet and shall wherever practicable not exceed 1,300 square feet.

(*b*) Every public room in such a ship, being a space without interior subdivisions, shall, except at the shell plating of the ship or the external plating of a deckhouse, be bounded by bulkheads consisting of "B" class divisions unless the bulkheads enclosing the room are required by these Rules to consist of "A" class divisions.

(*c*) Every corridor bulkhead in such a ship shall consist of "B" class divisions unless it is required by these Rules to consist of "A" class divisions and shall extend from deck to deck. Provided that ventilation openings having grilles of incombustible material may be installed in such bulkhead at points where no ceilings are fitted above such bulkhead or where the ceilings there fitted are constructed of incombustible material.

(*d*) If such a ship carries more than 100 passengers, every "B" class division constructed in accordance with this paragraph shall be constructed of incombustible material but, subject to the provisions of paragraph (2) of Rule 60 of these Rules, may be faced with combustible material. If such a ship carries 100 passengers or less, every such division shall have an incombustible core or shall be assembled with internal layers of sheet asbestos or similar incombustible material, and in either case shall comply with the requirements of paragraph (2) of Rule 44 of these Rules as if it were constructed wholly of combustible material.

Automatic Fire Alarm and Fire Detection Systems
(Methods I and III)

58.—(1) In every ship in which Method I or Method III of fire protection has been adopted a fire alarm and fire detection system shall be installed which will detect the presence of fire in any accommodation space or service space and will indicate the presence and position of the fire by a signal given at one or more points in the ship so as to come rapidly to the notice of the master and crew of the ship.

(2) The Minister may exempt any ship from the requirements of this Rule to the extent that he is satisfied that the accommodation spaces and service spaces therein afford no substantial fire risk.

Automatic Sprinkler, Fire Alarm and Fire Detection Systems

(Method II)

59.—(1) In every ship in which Method II of fire protection has been adopted an automatic sprinkler and fire alarm and fire detection system complying with the requirements specified in the Sixth Schedule to these Rules shall be installed and so arranged as to protect all accommodation spaces and service spaces in the ship.

(2) The Minister may exempt any ship from the requirements of this Rule—

(*a*) to the extent that he is satisfied that the accommodation spaces and service spaces therein afford no substantial fire risk ;

(*b*) in respect of any baggage room or store room which he is satisfied is provided with adequate arrangements for the detection of fire or for the smothering of fire by gas or steam.

Restriction of Combustible Material, etc.

(Methods I and III)

60.—(1) Method I:

(*a*) In every ship in which Method I of fire protection has been adopted all linings, grounds, ceilings and insulation shall consist of incombustible material except in cargo spaces, mail rooms, bullion rooms, baggage rooms and refrigerated store rooms. Provided that the linings, grounds and ceilings in ships carrying not more than 100 passengers may be constructed of combustible material having the same fire-resisting properties as the material of the bulkheads enclosing the spaces in which they are situated.

(*b*) The total volume of combustible materials installed as facings, mouldings, decorations or veneers in any accommodation space or service space in a ship in which Method I of fire protection has been adopted, being a ship carrying more than 100 passengers, shall not exceed a volume equal to that of a veneer of one-tenth of an inch on the combined area of the walls and ceiling of such space. Any facings, mouldings, decorations or veneers installed in the corridors or stairway enclosures in such a ship shall consist of incombustible materials.

(2) Method III :

In every ship in which Method III of fire protection has been adopted the provision of combustible materials for linings, grounds, ceilings, fittings and furnishings in any space in the accommodation spaces or service spaces shall be restricted to the minimum compatible with the use for which that space is appropriated. In the public rooms in such a ship the grounds and supports for the linings and ceilings shall be constructed of steel or other material equally effective in resisting fire. All exposed surfaces and their coatings in the accommodation spaces of such a ship shall be surfaces of low flame spread within the meaning of paragraph (3) of Rule 54 of these Rules.

PART V (A)

Fire Protection: Ships of Classes III to VI (A) Inclusive

Application of Part V (A)

61. This Part of these Rules applies to ships of Classes III to VI (A), inclusive.

Structure of the Ship

62. The hull, superstructure, structural bulkheads, decks and deckhouses of every ship of Classes III and IV shall be constructed of steel. The Minister may exempt any ship wholly or in part from the requirement of this Rule.

Divisions

63. In every ship to which this Part of these Rules applies, being a ship fitted with internal combustion propelling machinery or oil-fired boilers, the accommodation spaces shall be separated from machinery spaces by "A" class divisions.

PART VI

Boilers and Machinery

Application of Part VI

64. This Part of these Rules applies to every ship to which these Rules apply.

General

65. The boilers and machinery provided in any ship to which these Rules apply shall be of a design and construction adequate for the service for which they are intended, and shall be so installed and protected as not to constitute a danger to persons on board. Without prejudice to the generality of the foregoing, means shall be provided which will prevent overpressure in any part of such boilers and machinery, and in particular every boiler and other pressure vessel used for generating steam shall be provided with not less than two safety valves.

Power for Going Astern

66. The propelling machinery of every ship to which these Rules apply shall have sufficient power for going astern, and the propulsion of the ship shall be capable of being reversed with sufficient speed, to enable the ship to be properly handled.

Boilers, Superheaters, Economisers, Evaporators, Distillers and Other Steam or Water Pressure Vessels

67.—(1) In every ship to which these Rules apply, every boiler, superheater, economiser, evaporator, distiller and other steam or water pressure vessel, and their respective mountings, shall be so designed and constructed as to withstand the maximum working stresses to which they may be subjected, with a factor of safety which is adequate, having regard to—

(*a*) their design and the material of which they are constructed;

(*b*) the purpose for which they are intended to be used; and

(*c*) the working conditions under which they are intended to be used.

Provision shall be made which will facilitate the cleaning and inspection of such pressure vessels.

(2) Without prejudice to the generality of the foregoing—

(*a*) every such boiler and superheater, when put into service for the first time in such a ship, shall be capable of withstanding for a period of not less than thirty minutes a test by hydraulic pressure to the following extent :—

(i) to one and one-half times the maximum working pressure of the boiler plus 50 lb. per square inch, if such working pressure is more than 100 lb. per square inch ; or

(ii) to twice the maximum working pressure of the boiler, if such working pressure is 100 lb. per square inch or less ;

(*b*) every such boiler and superheater, being a boiler or superheater of such dimensions and form that an adequate internal examination thereof can be made, shall, at any time after first being put into service in such a ship, be capable of withstanding for a period of not less than thirty minutes a test by hydraulic pressure to one and one-half times the maximum working pressure of the boiler ;

(*c*) every such boiler and superheater, being a boiler or superheater of such dimensions and form that an adequate internal examination thereof cannot be made, shall, at any time after first being put into service in any such ship, be capable of withstanding a test by hydraulic pressure to the extent specified in sub-paragraph (*a*) of this paragraph.

(3) Every such economiser shall be capable at all times of withstanding a test by hydraulic pressure to the following extent :—

(*a*) if the economiser cannot be shut off from the boiler, to the same extent as is required by sub-paragraph (*a*) of paragraph (2) of this Rule in relation to the boiler to which the economiser is connected ; or

(*b*) if the economiser can be shut off from the boiler, to one and one-half times the maximum working pressure of the safety valve of the economiser plus 50 lb. per square inch.

(4) Each mounting of every such boiler, not being a mounting in the boiler feed system, shall be capable of withstanding a test by hydraulic pressure to twice the maximum working pressure of the boiler.

Each mounting of every such superheater and economiser, not being a mounting in the boiler feed system, shall be capable of withstanding a test by hydraulic pressure to twice the maximum working pressure of the boiler to which the superheater or economiser, as the case may be, is connected.

Machinery

68.—(1) In every ship to which these Rules apply a governor shall be provided for any ahead turbine or set of turbines which drives a single gear wheel forming part of the main propelling machinery, so as to shut off the steam automatically in the event of overspeed. A hand-trip gear shall also be provided for that purpose.

(2) In every such ship means shall be provided which will shut off automatically the steam from any ahead turbine, and any other machinery served by the same lubricating oil system as the turbine, in the event of any failure of that system.

(3) (*a*) The nozzle boxes of every impulse steam turbine fitted in such a ship shall be capable of withstanding a test by hydraulic pressure to one and one-half times the maximum pressure to which they may be subjected in service.

(*b*) The steam casings of every turbine fitted in such a ship shall be capable of withstanding a test by hydraulic pressure to one and one-half times the maximum working pressure in such casings or 30 lb. per square inch, whichever shall be the greater.

(4) The cylinders of all steam reciprocating machinery fitted in such a ship shall be capable of withstanding a test by hydraulic pressure to the following extent:—

Type of engine	*Cylinder pressure*	*Pressure of test*
Compound expansion ...	High	1½ × M.W.P.
Compound expansion ...	Low	30 lb. per square inch
Triple expansion... ...	High	1½ × M.W.P.
Triple expansion... ...	Intermediate	½ × M.W.P.
Triple expansion... ...	Low	30 lb. per square inch
Quadruple expansion ...	High	1½ × M.W.P.
Quadruple expansion ...	1st intermediate ...	⅔ × M.W.P.
Quadruple expansion ...	2nd intermediate ...	⅔ × M.W.P.
Quadruple expansion ...	Low	30 lb. per square inch

In the foregoing table "M.W.P." means, in relation to a cylinder, the maximum working pressure of the boiler to which the machinery of which the cylinder forms a part is connected.

(5) The cylinder liners of every compression ignition engine fitted in such a ship, shall be capable of withstanding a test by hydraulic pressure to 100 lb. per square inch. The cooling passages of the cylinders, covers and other fluid-cooled parts of such engine shall be capable of withstanding a test by hydraulic pressure to 30 lb. per square inch.

(6) Subject to the provisions of paragraph (2) of Rule 36 of these Rules and paragraph (2) of Rule 37 thereof, no machinery or boilers shall be fitted in such a ship which are designed to be operated by means of oil fuel having a flash point of less than 150° F.

Shafts

69. In every ship to which these Rules apply every shaft shall be so designed and constructed that it will withstand the maximum working stresses to which it may be subjected, with a factor of safety which is adequate having regard to—

(*a*) the material of which it is constructed;

(*b*) the service for which it is intended; and

(*c*) the type of the engines by which it is driven or of which it forms a part.

Boiler Feed Systems

70.—(1) Every boiler fitted in a ship to which these Rules apply shall be provided with not less than two efficient and separate feed systems so arranged that either of such systems may be opened up for inspection or overhaul without affecting the efficiency of the other. Means shall be provided which will prevent overpressure in any part of the systems.

(2) If it is possible for oil to enter the feed water system in such a ship, the arrangements for supplying boiler feed water shall provide for the interception of oil in the feed water.

(3) Every feed check valve, fitting and pipe through which feed water passes from a pump to the boilers in such a ship shall be of efficient design and of sufficient strength to withstand with an adequate factor of safety the maximum working pressure to which the feed line may be subjected. Such valve, fitting and pipe shall also be capable of withstanding a test by hydraulic

pressure to two and one-half times the maximum working pressure of the boiler to which they are connected or twice the maximum working pressure of the feed line, whichever shall be the greater. The feed pipes shall be adequately supported.

Steam Pipe Systems

71.—(1) In every ship to which these Rules apply, every steam pipe and every fitting connected thereto through which steam may pass shall be so designed and constructed as to withstand the maximum working stresses to which it may be subjected, with a factor of safety which is adequate having regard to—

(*a*) the material of which it is constructed ; and

(*b*) the working conditions under which it will be used.

The steam pipes shall be adequately supported.

(2) Without prejudice to the generality of the foregoing, every such steam pipe and fitting shall be capable of withstanding a test by hydraulic pressure to twice the maximum working pressure to which it may be subjected.

(3) Provision shall be made which will avoid excessive stress likely to lead to the failure of any such steam pipe, whether by reason of variation in temperature, vibration or otherwise.

(4) Efficient means shall be provided for draining every such steam pipe so as to ensure that the interior of the pipe is kept free of water and that water hammer action will not occur under any conditions likely to arise in the course of the intended service of the ship.

(5) If, in any ship to which these Rules apply, a steam pipe may receive steam from any source at a higher pressure than it can withstand with an adequate factor of safety, an efficient reducing valve, relief valve and pressure gauge shall be fitted to such pipe.

Air Pressure Systems

72.—(1) Every ship to which these Rules apply, being a ship propelled by compression ignition engines designed to be started by compressed air, shall be provided with at least two starting air compressors, each of which shall be of efficient design and of sufficient strength and capacity for the service for which it is intended. Provided that in ships of Classes III to VI (A), inclusive, only one such compressor shall be required.

(2) Without prejudice to the generality of the foregoing—

(*a*) every cylinder forming part of an air compressor in a ship to which these Rules apply shall be capable of withstanding a test by hydraulic pressure to twice its maximum working pressure ;

(*b*) every cooling coil of each stage forming part of such air compressor shall be capable of withstanding a test by hydraulic pressure to twice the maximum working pressure of that stage ;

(*c*) the cooling passages of such air compressor and the cooler casings thereof shall be capable of withstanding a test by hydraulic pressure to 30 lb. per square inch ; and

(*d*) a relief valve shall be fitted in the high pressure discharge from such compressor, and a relief valve or safety diaphragm shall be fitted on the casing of the high pressure cooler.

(3) Every such ship shall be provided with a starting air compressor which can be put into operation without a supply of compressed air, and which shall be additional to the compressors required by paragraph (1) of this

Rule. Provided that such additional compressor shall not be required if a compressor fitted in accordance with the said paragraph can be put into operation without a supply of compressed air.

(4) Every ship to which these Rules apply, being a ship propelled by compression ignition engines designed to start by compressed air, shall be provided with at least two air receivers, which shall be of such aggregate capacity that, when they are filled with compressed air, the air contained therein will be sufficient to start each of the ship's main engines twelve times if such engines are reversible, and six times if such engines are non-reversible. Provided that in ships of Classes III to VI (A), inclusive, only one such air receiver shall be required.

(5) Every air receiver provided in such a ship shall be so designed and constructed as to withstand the maximum working stresses to which it may be subjected, with a factor of safety which is adequate having regard to—

(*a*) its design and the material of which it is constructed ; and

(*b*) the working conditions under which it is intended to be used.

Without prejudice to the generality of the foregoing, every air receiver shall be capable of withstanding a test by hydraulic pressure to the extent set forth in the following table:—

Construction of Receiver	*M.W.P. of Receiver*	*Pressure of test*
Riveted	Not over 100	2 × M.W.P.
Riveted	Over 100 but not over 300	1½ × M.W.P. + 50
Riveted	Over 300	M.W.P. + 200
Fusion welded	Not over 100	2 × M.W.P.
Fusion welded	Over 100	1½ × M.W.P. + 50

In the foregoing table pressures are indicated in lb. per square inch and " M.W.P." means maximum working pressure.

(6) Every air bottle provided in a ship to which these Rules apply shall be of efficient design and shall be made of seamless steel tube with the ends of the bottle worked down from the tube or shall be of equally efficient construction. The bottle shall be annealed and shall be capable of withstanding a test by hydraulic pressure to twice its maximum working pressure.

(7) Every air receiver and air bottle provided in such a ship shall be fitted with means of access for purposes of inspection and shall be provided with efficient drains for the removal of oil and water, and with efficient relief valves to prevent overpressure. If the air receiver or air bottle can be isolated from the relief valve, it shall be fitted with one or more fusible plugs so as to discharge its contents in the event of fire.

(8) (*a*) Every air pressure pipe provided in such a ship and every fitting connected to such pipe, shall be capable of withstanding the maximum working stresses to which it may be subjected with a factor of safety which is adequate having regard to—

(i) the material of which it is constructed ; and

(ii) the working conditions under which it is intended to be used.

(*b*) Without prejudice to the generality of the foregoing, every such pipe and fitting shall be capable of withstanding a test by hydraulic pressure to twice its maximum working pressure.

(*c*) Every such pipe shall be properly supported. Provision shall be made which will keep the interior of the pipe free from oil and either will prevent the passage of flame from the cylinders of the engine to the pipe, or will protect the pipe from the effects of an internal explosion.

(9) If, in any ship to which these Rules apply, an air pressure pipe may receive air from any source at a higher pressure than it can withstand with an adequate factor of safety, an efficient reducing valve, relief valve and pressure gauge shall be fitted to such pipe.

Engine Cooling Systems

73.—(1) In every ship to which these Rules apply, being a ship propelled by internal combustion machinery or provided with internal combustion engines for the maintenance of services essential for the safety of the ship or of persons on board, two pumps shall be provided each of which shall be capable of supplying adequate cooling water to such machinery or engines, as the case may be, and to any oil coolers or fresh water coolers fitted thereto. Provided that in ships of Classes III to VI (A), inclusive, only one such pump shall be required.

(2) If direct sea water cooling is used for any such machinery or engines, the sea water suctions shall be provided with strainers which can be cleaned without interruption of the supply of water.

(3) Means shall be provided for ascertaining whether the cooling systems are working properly and for preventing overpressure in any part thereof.

(4) The exhaust pipes and silencers of every internal combustion engine provided in a ship to which these Rules apply shall be efficiently cooled or lagged.

Lubricating Oil Systems

74.—(1) In every ship to which these Rules apply, being a ship in which oil for the lubrication of the main engines is circulated under pressure, at least two pumps shall be provided each of which shall be adequate for circulating such oil. Provided that in ships of Classes III to VI(A), inclusive, only one such pump shall be required.

(2) Strainers shall be provided for straining the lubricating oil, and, except in ships of Classes III to VI(A), inclusive, shall be capable of being cleaned without interrupting the supply of such oil.

(3) Means shall be provided for ascertaining whether the lubricating system is working properly, and for preventing overpressure in any part of the system. If the means of preventing overpressure is a relief valve it shall be in close circuit.

Oil Fuel Installations: (Boilers and Machinery)

75.—(1) In every ship to which these Rules apply, being a ship propelled by means of oil-fired boilers or internal combustion machinery, every double bottom compartment appropriated for the storage of oil fuel, not being a compartment situated at the extreme forward or after end of the ship, shall be fitted with a watertight centre division.

(2) Every oil fuel tank in such a ship shall be properly constructed and shall be provided with save-alls or gutters which will catch any oil which may leak from the tank. No such tank shall be situated directly above boilers or other heated surfaces. Without prejudice to the generality of the foregoing, every such tank shall be capable of withstanding a test by hydraulic pressure in the case of a storage tank, settling tank or service tank, equal to that of a head of water one foot greater than the greatest head to which the tank may be subject when in service, but in the case of a settling tank, to not less than 15 lb. per square inch.

(3) The oil fuel carried in such a ship shall be effectively isolated from water ballast which may be carried therein. The pumping arrangements shall be such as will permit the oil fuel to be transferred from any storage tank or settling tank appropriated for oil fuel into any other storage tank or settling tank so appropriated. Provision shall be made to prevent the accidental discharge or overflow of oil overboard. If fresh water is stored in a tank adjacent to a tank appropriated for the storage of oil fuel a coffer dam shall be provided which will prevent contamination of the fresh water by the oil.

(4) In every such ship efficient means shall be provided for sounding every oil fuel tank therein and to prevent overpressure in such tank.

(5) In every such ship, an air pipe shall be led from every oil fuel tank to the open air, and the outlet thereof shall be in such a position that there will be no danger of fire or explosion resulting from the emergence of oil vapour from the pipe when the tank is being filled. Every such pipe shall be fitted with a detachable wire gauze diaphragm. If such pipe also serves as an overflow pipe provision shall be made which will prevent the overflow from running into or near a boiler room, galley or other place in which it might be ignited.

(6) Every drain provided in such a ship for the purpose of removing water from oil fuel in storage or settling tanks or in separators shall be of the self-closing type.

(7) The oil fuel filling stations in every such ship shall be isolated from other spaces in the ship and shall be efficiently drained and ventilated. Provision shall be made which will prevent overpressure in any oil-filling pipe lines.

(8) In every such ship, every oil pressure pipe shall be made of seamless steel, and, if used for conveying heated oil, shall be situated in a conspicuous position above the platforms in well-lighted parts of the boiler room or engine room. Every such pipe and joint therein and every fitting connected to such pipe, shall be capable of withstanding a test by hydraulic pressure to 400 lb. per square inch or to twice its maximum working pressure, whichever shall be the greater.

(9) In every such ship, every oil pipe, not being an oil pressure pipe, shall be made of steel and shall be led at such a height above the ship's inner bottom, if any, as will facilitate the inspection and repair of the pipe. Every such pipe and joint therein, and every fitting connected to such pipe, shall be capable of withstanding a test by hydraulic pressure to 50 lb. per square inch or to twice its maximum working pressure, whichever shall be the greater.

(10) In every such ship every steam heating pipe which may be in contact with oil shall be made of steel and, together with its joints, shall be capable of withstanding a test by hydraulic pressure to twice its maximum working pressure.

(11) In every such ship every suction pipe from any oil fuel tank situated above an inner bottom, and every oil fuel levelling pipe within a boiler room or engine room shall be fitted with a valve or cock secured to each tank to which the pipe is connected. Every such valve or cock fitted to an oil fuel suction pipe shall be so arranged that it may be closed both from the compartment in which it is situated and from a readily accessible position outside such compartment and not likely to be cut off in the event of fire in that compartment. Every such valve or cock fitted to an oil fuel levelling pipe shall be so arranged that it can be closed or opened from a readily accessible

position above the bulkhead deck and not likely to be cut off by a fire in the compartment in which the pipe is situated. If any oil tank filling pipe is not connected to an oil fuel tank at or near the top of the tank, it shall be fitted with a non-return valve or with a valve or cock secured to the tank to which it is connected and so arranged that it may be closed both from the compartment in which it is situated and from a readily accessible position outside such compartment and not likely to be cut off in the event of fire in that compartment.

(12) In every such ship every master valve at the furnace fronts which controls the supply of oil fuel to sets of burners shall be of a quick-closing type, and fitted in a conspicuous position and readily accessible. Provision shall be made to prevent oil from being turned on to any burner unless such burner has been correctly coupled up to the oil supply line.

(13) In every such ship every valve used in connection with the oil fuel installation shall be so designed and constructed as to prevent the cover of the valve chest being slackened back or loosened when the valve is operated.

(14) In every such ship every pump provided for use in connection with the oil fuel system shall be separate from the ship's feed pumps, bilge pumps and ballast pumps and the connections of any of such pumps, and shall be provided with an efficient relief valve which shall be in close circuit. Provision shall be made by which every oil fuel pressure pump and transfer pump may be stopped from a position outside the compartment in which such pump is situated.

(15) Every such ship shall be provided with not less than two oil fuel units, each comprising a pressure pump, filters and a heater. Such pump, filters and heater shall be of efficient design and substantial construction. Provision shall be made which will prevent overpressure in any part of the oil fuel units. The parts of such oil fuel units which are subject to oil pressure, and the joints thereof, shall be capable of withstanding a test by hydraulic pressure to 400 lb. per square inch or twice their maximum working pressure, whichever shall be the greater. Any relief valves fitted to prevent overpressure in the oil fuel heater shall be in close circuit. If steam is used for heating oil fuel in bunkers, tanks, heaters or separators in any such ship, exhaust drains shall be provided to discharge the water of condensation into an observation tank.

(16) In every such ship save-alls or gutters shall be provided under every oil fuel pump, filter and heater to catch any oil which may leak or be spilled therefrom. Save-alls or gutters shall be provided in way of the furnace mouths to catch oil which may escape from the burners. Provision shall be made which will prevent oil which may escape from any oil fuel pump, filter or heater from coming into contact with boilers or other heated surfaces.

(17) Every oil fuel separator in such a ship shall be of efficient design and substantial construction. Provision shall be made which will prevent overpressure in any part thereof, and which will prevent the discharge of oil vapour therefrom into confined spaces.

(18) If, in any ship to which these Rules apply, being a ship propelled by means of oil-fired boilers, dampers are fitted to the funnels or boilers, provision shall be made for securing the dampers in the open position, and an indicator shall be provided to show whether the dampers are open or shut.

(19) For the purposes of this Rule the expression " oil fuel tank " includes an oil fuel storage tank, an oil fuel settling tank, an oil fuel service tank and an oil fuel overflow tank.

Oil Fuel Installations: (Cooking Ranges)

76.—(1) If, in any ship to which these Rules apply, a cooking range is supplied with fuel from an oil tank, the tank shall not be situated in a galley, and the supply of oil to the burners shall be capable of being controlled from a position outside the galley. No range or burners shall be fitted which are designed to be operated by means of oil fuel having a flash point of less than 150° F.

(2) The tank shall be provided with an air pipe leading to the open air. The pipe shall be in such a position that there will be no danger of fire or explosion resulting from the emergence of oil vapour from the pipe when the tank is being filled. The pipe shall be fitted with a detachable wire gauze diaphragm.

(3) Efficient means shall be provided for filling every such tank and for preventing overpressure therein.

Ventilation

77. In every ship to which these Rules apply, every space in which an oil fuel tank or any part of an oil fuel installation is situated shall be adequately ventilated.

Steering Gear

78.—(1) Every ship to which these Rules apply shall be provided with efficient main and auxiliary steering gear. Provided that auxiliary steering gear shall not be required if the ship's main steering gear is fitted with duplicate power units and duplicate connections up to the rudder stock.

(2) The auxiliary steering gear shall be capable of being rapidly brought into action and shall be of adequate strength, and of sufficient power to enable the ship to be steered at a navigable speed. The auxiliary steering gear shall be operated by power in any such ship which is fitted with a rudder stock of over 9 inches in diameter in way of the tiller.

(3) In every ship to which these Rules apply means shall be provided by which the ship can be steered from a position aft.

Stores, Spare Gear and Tools

79. Every ship of Classes I, II and II (A) shall be provided with such stores, spare gear and tools as are sufficient, having regard to the intended service of the ship, to enable running repairs to the ship's boilers and machinery to be made while the ship is at sea.

PART VII

MISCELLANEOUS

Application of Part VII

80. This Part of these Rules applies to every ship to which these Rules apply.

Compasses

81.—(1) (*a*) Every ship of Class I shall be provided with three efficient magnetic compasses which shall be sited on the ship's centre line. One of such compasses shall be provided for use as a steering compass and shall be sited at the normal steering position, and another shall be provided for

use as a standard compass and shall be sited near to the normal steering position and in a position from which the view of the horizon is least obstructed. A third such compass shall be provided at the after steering position, and shall, together with its gimbal units, be interchangeable with the steering compass.

Provided that a magnetic steering compass shall not be required if

(i) the standard compass is of the reflector or projector type and is equipped with a device by which it may be read from the normal steering position;

(ii) the standard compass is interchangeable with the after steering compass; and

(iii) a card of a gyroscopic compass or of a repeater thereof can be read from the normal steering position.

(*b*) Every magnetic compass provided in such a ship shall be mounted on a binnacle. Provided that the after steering compass may be mounted on a pedestal.

(2) Every ship of Classes II, II (A) and III shall be provided with two efficient magnetic compasses sited on the ship's centre line, one of which shall be for use as a steering compass and shall be sited at the normal steering position, and the other of which shall be for use as a standard compass, and shall be sited near to the normal steering position and in a position from which the view of the horizon is least obstructed. Each of such compasses shall be mounted on a binnacle.

(3) Every ship of Classes IV, VI and VI (A) shall be provided with one efficient magnetic compass which shall be readily available at the normal steering position.

Depth-Sounding Devices

82.—(1) Every ship of Classes I, II and II (A) shall be provided with an efficient mechanical depth-sounding device operated by means of a line, and with such spare parts as are sufficient, having regard to the type of the device and to the intended service of the ship, to enable the device to be maintained in working order while the ship is at sea. Provided that a mechanical depth-sounding device shall not be required in any ship of Class II or II (A) which is under 1,600 tons.

(2) Every ship of Classes I to III, inclusive, shall be provided with two hand lead-lines, each at least 25 fathoms long, and each with a lead weighing at least 7 lbs.

Anchors and Chain Cables

83. Every ship to which these Rules apply shall be provided with such anchors and chain cables as are sufficient in number, weight and strength, having regard to the size and intended service of the ship.

Hawsers and Warps

84. Every ship to which these Rules apply shall be provided with such hawsers and warps as are sufficient in number and strength, having regard to the size and intended service of the ship.

Means of Escape

85.—(1) Every ship to which these Rules apply, not being an open or partially-decked ship of Classes V, VI or VI (A), shall be provided with such doorways, stairways, ladderways and other means of escape as will provide readily accessible means of escape for all persons in the ship. The means of escape shall be so designed and constructed as to be capable of being

easily used by the persons for whom they are intended. The number and width of such means of escape shall be sufficient, having regard to the number of persons by whom they may be used and shall not pass through any doorway which may be closed by a door required by these Rules to be watertight.

(2) In every ship of Classes I, II and II (A) at least two such means of escape shall be provided in each portion of a between decks above the bulkhead deck falling within a main vertical zone, and one of the means of escape provided in each such portion shall give access to a stairway leading upwards from the between decks. Provided that in ships of Class I the means of escape from the lifeboat embarkation deck shall not be required to give access to a stairway leading upwards from that deck.

(3) In every ship of Class I such means of escape shall lead to the lifeboat embarkation deck.

(4) In every ship of Classes II and II (A) such means of escape shall lead to the lifeboat embarkation deck and to an open deck of sufficient area, having regard to the number of persons whom the ship may carry.

(5) In every ship of Classes III to VI (A), inclusive, not being an open or partially-decked ship of Classes V, VI or VI (A), such means of escape shall lead to an open deck of sufficient area, having regard to the number of persons whom the ship may carry.

(6) Every ship of Classes V, VI and VI (A), being an open or partially-decked ship, shall be provided with readily accessible means of escape from all enclosed spaces in the ship. Such means of escape shall be sufficient in number and width, having regard to the number of persons who may be in the said spaces.

Guard Rails, Stanchions and Bulwarks

86.—(1) In every ship to which these Rules apply, bulwarks or guard rails shall be provided on every deck to which any persons may have access. Such bulwarks or guard rails, together with stanchions supporting the guard rails, shall be so placed, designed and constructed, and in particular shall be of such a height above the deck, as to prevent any person who may have access to that deck from accidentally falling therefrom. Any freeing ports fitted in such a bulwark shall be covered by a grid or bars which will prevent any person from falling through the port.

(2) In every open or partially-decked ship of Classes V, VI or VI (A), every washstrake, covering board and coaming shall be so placed, designed and constructed and in particular shall be of such a height above the floor-boards, as to prevent any person from accidentally falling overboard.

Alternative Construction, Equipments and Machinery

87. 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 allow 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 he is satisfied that that other construction or equipment, or other provision, is at least as effective as that required by these Rules.

Given under the Official Seal of the Minister of Transport this eleventh day of November, 1952.

(L.S.) *Gilmour Jenkins,*
Secretary of the Ministry of Transport.

Rule 2

FIRST SCHEDULE

LIMITS OF SMOOTH WATER AND PARTIALLY SMOOTH WATER AREAS

District	Smooth Water Areas	Partially Smooth Water Areas*†
Cromarty	In Cromarty Firth but not below Cromarty.	Within a line from North Sutor to Nairn.
Inverness	Within a line from Fort George to Chanonry Point to Fort William.	Within a line from North Sutor to Nairn.
Aberdeen	Within a line from South Jetty to Abercromby Jetty.	No partially smooth waters.
Dundee	Within a line from Fish Dock, Dundee to Craig Head, East Newport.	Within a line from Broughty Castle to Tayport.
Queensferry	Above the Forth Bridge ...	Within a line from Kirkcaldy to Portobello.
Leith	Inside the Breakwaters	Within a line from Kirkcaldy to Portobello.
Lerwick	—	In winter, within a line from Point of Scotland to Heogan to the northward and from Holm of Mel to the lighthouse situated some 3 cables to the eastward of the Nabb to the southward. In summer, within a line from Easter Rova Head to Score Head to the northward and from the south end of Ness of Sound to Kirkabisterness to the Southward.
Kirkwall	—	Between Kirkwall and Rousay.
Stromness	—	To Scapa but not outside Scapa Flow.
Berwick-on-Tweed ...	Within a line from Spittal Point to the inner end of Breakwaters.	No partially smooth waters.
Amble	Inside the Breakwaters	No partially smooth waters.
Blyth	Inside the Pier Heads	No partially smooth waters.
Newcastle, North and South Shields.	Inside the Tyne Pier Heads ...	No partially smooth waters.
Sunderland	Inside the Sunderland Pier Heads	No partially smooth waters.
Hartlepool, East ...	Inside the Breakwaters	No partially smooth waters.
Stockton, Middlesbrough.	Above Fourth Buoy	No partially smooth waters.
Whitby	Inside the Whitby Pier Heads ...	No partially smooth waters.
Hull	—	In winter, within a line from New Holland to Paull. In summer, within a line from Cleethorpes Pier to Patrington Church.
Goole, Gainsborough, Lincoln, Nottingham, York.	Within a line from North Ferriby to South Ferriby.	In winter, within a line from New Holland to Paull. In summer, within a line from Cleethorpes Pier to Patrington Church.

* The outer limits of the smooth water areas specified in the second column of this Schedule shall be taken to be the corresponding inner limits of the partially smooth water areas specified in the third column of this Schedule.

† Unless otherwise indicated these limits apply at all times of the year. In this Schedule "summer" means the months of April to October, inclusive, and "winter" means the months of November to March, inclusive.

District	Smooth Water Areas	Partially Smooth Water Areas*†
Grimsby	—	In winter, no partially smooth waters. In summer, within a line from Cleethorpes Pier to Patrington Church.
Boston	Inside the New Cut	No partially smooth waters.
Wisbech	Inside Wisbech Cut	No partially smooth waters.
King's Lynn	Inside Lynn Cut	No partially smooth waters.
Yarmouth and Lowestoft.	On all inland navigation inside the Harbour Entrances at Yarmouth or Lowestoft.	No partially smooth waters.
Harwich, Ipswich, or Felixstowe Railway Pier.	On the River Orwell or on the River Stour and within a line from Dovercourt Breakwater to Landguard Point.	No partially smooth waters.
Woodbridge	On the River Deben to the Mouth	No partially smooth waters.
Maldon	On the River Blackwater within a line from West Mersea Point to Bradwell Point.	In summer, within a line from Clacton Pier to Reculvers. In winter, within a line from Colne Point to Whitstable.
Burnham-on-Crouch	On the River Crouch within a line from Hollywell Point to Foulness Point.	In summer, within a line from Clacton Pier to Reculvers. In winter, within a line from Colne Point to Whitstable.
London	Above Gravesend	In summer, within a line from Clacton Pier to Reculvers. In winter, within a line from Colne Point to Whitstable.
Rochester	Sheerness and Whitstable inside Sheppey.	In summer, within a line from Clacton Pier to Reculvers. In winter, within a line from Colne Point to Whitstable.
Dover	Within a line drawn across the East and West Entrances to the Harbour.	No partially smooth waters.
Littlehampton ...	On the River Arun above Littlehampton Pier.	No partially smooth waters.
Chichester	Not seaward of a line drawn between Eastoke Point and West Wittering (Tower).	No partially smooth waters.
Langston Harbour ...	Not seaward of a line drawn between Eastney Point and Gunner Point.	Inside the Isle of Wight within an area bounded by a line drawn between Gunner Point and Trinity Church, Bembridge, to the eastward and the Needles and Hurst Point to the westward.
Portsmouth	Within Portsmouth Harbour ...	Inside the Isle of Wight within an area bounded by a line drawn between Gunner Point and Trinity Church, Bembridge, to the eastward and The Needles and Hurst Point to the westward.
Southampton ...	Within a line from Calshot Castle to Hook Beacon.	Inside the Isle of Wight within an area bounded by a line drawn between Gunner Point and Trinity Church, Bembridge, to the eastward and The Needles and Hurst Point to the westward.

* The outer limits of the smooth water areas specified in the second column of this Schedule shall be taken to be the corresponding inner limits of the partially smooth water areas specified in the third column of this Schedule.

† Unless otherwise indicated these limits apply at all times of the year. In this Schedule "summer" means the months of April to October, inclusive, and "winter" means the months of November to March, inclusive.

District	Smooth Water Areas	Partially Smooth Water Areas*†
Cowes	Between East and West Cowes within the River Medina.	Inside the Isle of Wight within an area bounded by a line drawn between Gunner Point and Trinity Church, Bembridge, to the eastward and The Needles and Hurst Point to the Westward.
Christchurch	Within Christchurch Harbour excluding the Run.	No partially smooth waters.
Poole	Inside the Harbour not seaward of the line of the Chain Ferry between Sandbanks and S. Haven Point.	No partially smooth waters.
Weymouth	—	Within Portland Harbour and between River Wey and Portland Harbour.
Exeter	Within a line from Warren Point to the Coastguard Flag Staff at Exmouth.	No partially smooth waters.
Teignmouth	Within the Harbour	No partially smooth waters.
Dartmouth	River Dart within a line from Kettle Point to Battery Point.	No partially smooth waters.
Salcombe and Kingsbridge.	River Salcombe not seaward of a line Sandhill Point to Biddlehead.	No partially smooth waters.
Plymouth	Within a line from the inside of Drakes Island to Mount Batten Pier. The River Yealm within a line from Warren Point to Misery Point.	Within a line from Cawsand to the Breakwater and the Breakwater to Staddon Pier.
Fowey	Inside the Harbour	No partially smooth waters.
Falmouth	Within a line from St. Anthony Head to Pendennis Point.	In winter, no partially smooth waters. In summer, within a line from St. Anthony Head to Nare Point.
Padstow	Padstow Harbour, within a line from Gun Point to Brae Hill.	Within a line from Stepper Point to Trebetherick Point.
Barnstaple	Within the Bar.	No partially smooth waters.
Bridgwater	Inside Stert Point	Within the Bar.
Bristol	Within a line from Avonmouth Pier to Wharf Point.	In winter, within a line from Blackmore Point to Portskewet. In summer, within a line from Barry Dock Pier to Steepholm, thence to Brean Down. Winter and summer, inner limit not above No. 1 beacon at the southern entrance to "The Shoots".
Gloucester	River Severn or Avon to Sharpness Point via Gloucester Canal.	No partially smooth waters.
Chepstow	River Wye, above Chepstow ...	No partially smooth waters.

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† Unless otherwise indicated these limits apply at all times of the year. In this Schedule "summer" means the months of April to October, inclusive, and "winter" means the months of November to March, inclusive.

District	Smooth Water Areas	Partially Smooth Water Areas*†
Cardiff	Within a line from Low Water Pier Head to the Lifeboat House near Penarth Dock entrance.	In winter, no partially smooth waters. In summer, within a line from Barry Dock Pier to Steepholm, thence to Brean Down. Winter and summer, inner limit, not above No. 1 beacon at the southern entrance to "The Shoots".
Barry Dock	Inside the Dock	In winter, no partially smooth waters. In summer, within a line from Barry Dock Pier to Steepholm, thence to Brean Down. Winter and summer, inner limit, not above No. 1 beacon at the southern entrance to "The Shoots".
Neath	Inside the Bar	No partially smooth waters.
Swansea	Inside the Dock	No partially smooth waters.
Llanelly and Burry Port.	Outer limit, on a line Burry Port Western Pier to Whiteford Point; Inner limit, Lougher Railway Bridge.	No partially smooth waters.
Milford	Within a line from South Hook Point to Thorn Point.	No partially smooth waters.
Cardigan	Inside the Bar	No partially smooth waters.
Barmouth	Within a line from Barmouth Pier to Penrhyn Point.	No partially smooth waters.
Aberdovey	Within a line from Aberdovey Station to Trwyn Bach.	No partially smooth waters.
Portmadoc	Inside the Bar Buoy	No partially smooth waters.
Holyhead	Inside the Breakwater	No partially smooth waters.
Caernarvon, Bangor...	Within the Menai Straits to Aber Menai or Beaumaris.	Within the Menai Straits from Caernarvon Bar to Puffin Island.
Conway	Within a line from Mussel Hill to Tremlyd Point.	No partially smooth waters.
Chester	River Dee, not below Connah's Quay.	Inside the West Hoyle Bank.
Liverpool	Above the Rock Light House ...	In winter, no partially smooth waters. In summer, within a line from Formby Point to Hilbre Point.
Preston	Within a line from Lytham to Southport.	Within a line from Southport to Blackpool inside the Banks.
Fleetwood	Within a line from Low Light to Knott End Pier.	In winter, no partially smooth waters. In summer, within a line from Rossal Point to Humphrey Head.
Lancaster	Within a line from Sunderland Point to Chapel Point.	In winter, no partially smooth waters. In summer, within a line from Rossal Point to Humphrey Head.
Heysham	—	In winter, no partially smooth waters. In summer, within a line from Rossal Point to Humphrey Head.

* The outer limits of the smooth water areas specified in the second column of this Schedule shall be taken to be the corresponding inner limits of the partially smooth water areas specified in the third column of this Schedule.

† Unless otherwise indicated these limits apply at all times of the year. In this Schedule "summer" means the months of April to October, inclusive, and "winter" means the months of November to March, inclusive.

District	Smooth Water Areas	Partially Smooth Water Areas*†
Morecambe	On the Kendal/Preston Canal ...	In winter, no partially smooth waters. In summer, within a line from Rossal Point to Humphrey Head.
Barrow	Between Walney Island and the Mainland.	No partially smooth waters.
Douglas	From Battery Pier to Victoria Pier.	No partially smooth waters.
Carlisle	Above Port Carlisle	Within a line from Southerness to Silloth.
Dumfries	Inside Aird Point and Glenhaven Point.	Within a line from Southerness to Silloth.
Stranraer	Within a line from Cairn Ryan to Kirkcolm Point.	Loch Ryan, within a line from Finnart's Point to Milleur Point.
Ayr	Inside the Bar	No partially smooth waters.
Glasgow	Above partially smooth waters	*Outer limit:* a line from Skipness to Farland Head round Garroch Head. *Inner limit:* In winter, a line from Cloch Lighthouse to Dunoon Pier. In summer, a line from Bogany Point, Isle of Bute to Skelmorlie Castle and Ardlamont Point inside the Kyles of Bute, extended between 5th June and 5th September, both dates inclusive, by a line from a point two miles off the Ayrshire Coast at Skelmorlie Castle to Tormont End, Cumbrae, and a line from Millport round Farland Point to Fairlie Pier.
Campbeltown ...	Inside the Harbour but not outside Davarr Island.	No partially smooth waters.
Oban	—	Inside the Island of Kerrera and to Dunstaffnage.
Ballachulish	Within Loch Leven and not outside Peter Straits.	No partially smooth waters.
Fort William ...	Loch Linnhe but not south of Keppanach. Loch Eil and on the Canal to Inverness.	No partially smooth waters.
Kyle of Lochalsh ...	Between Kyle of Lochalsh and Kyleakin on the Isle of Skye.	Through Loch Alsh to the Head of Loch Duich.
Belfast	Within a line from Holywood to Macedon Point.	In winter, no partially smooth waters. In summer, within a line from Carrickfergus to Bangor.
Carlingford Lough ...	Within a line from Greenore to Greencastle Point.	No partially smooth waters.
Larne	Within a line from Larne Pier to the Ferry Pier on Island Magee.	No partially smooth waters.
Lough Erne	Upper or Lower Lough Erne ...	No partially smooth waters.
Lough Neagh ...	Within 2 miles of the shore ...	At a greater distance than 2 miles from the shore.
Londonderry ...	Within a line from Magilligan Point to Greencastle.	No partially smooth waters.

* The outer limits of the smooth water areas specified in the second column of this Schedule shall be taken to be the corresponding inner limits of the partially smooth water areas specified in the third column of this Schedule.

† Unless otherwise indicated these limits apply at all times of the year. In this Schedule "summer" means the months of April to October, inclusive, and "winter" means the months of November to March, inclusive.

SECOND SCHEDULE Rule 5

CALCULATION OF MAXIMUM LENGTH OF WATERTIGHT COMPARTMENTS

PART I

1. *General.* (1) For the purposes of this Schedule, except where otherwise specified,

(*a*) all linear measurements shall be in feet; and

(*b*) all volumes shall be in cubic feet and shall be calculated from measurements taken to moulded lines.

(2) In this Schedule the symbol " L " denotes the length of the ship.

(3) In this Schedule the expression " passenger spaces " shall include galleys, laundries and other similar spaces provided for the service of passengers, in addition to space provided for the use of passengers.

2. *Permissible Length.* Subject to the provisions of paragraph 6 of this Schedule the length of a compartment shall not exceed its permissible length. The permissible length of a compartment having its centre at any point shall be the product of the floodable length at that point and the factor of subdivision of the ship.

PART II

SHIPS OF CLASSES I, II AND II(A), OTHER THAN SHIPS TO WHICH PART III OF THIS SCHEDULE APPLIES

3. *Assumptions of Permeability*

The assumptions of permeability which shall be taken into account in determining the floodable length at any point in ships to which this Part of this Schedule applies shall be as follows:—

(*a*) Machinery space:—

(i) In the case of ships not propelled by internal combustion engines the assumed average permeability throughout the machinery space shall be determined by the following formula:—

$$80 + 12{\cdot}5\,\frac{(a - c)}{v} \text{ where}$$

a = volume of the passenger spaces and crew spaces below the margin line within the limits of the machinery space;

c = volume of the between deck spaces below the margin line within the limits of the machinery space which are appropriated to cargo, coal or stores; and

v = volume of the machinery space below the margin line.

(ii) In the case of ships propelled by internal combustion engines the average permeability throughout the machinery space shall be taken as 5 greater than that given by the aforesaid formula.

(iii) In any case in which the average permeability throughout the machinery space, as determined by detailed calculation, is less than that given by the aforesaid formula, the calculated value may be substituted. For the purposes of such calculation, the permeability of passenger spaces and crew spaces shall be taken to be 95, that of all spaces appropriated for cargo, coal or stores shall be taken to be 60, and that of double bottom, oil fuel and other tanks forming part of the structure of the ship shall be taken to be 95 or such lesser figure as the Minister may approve in the case of that ship.

(*b*) Portions before and abaft the machinery space:—

(i) the assumed average permeability throughout the portions of the ship before and abaft the machinery space shall be determined—

(*a*) by the following formula:—

$$63 + 35\frac{a}{v} \text{ where}$$

a = volume of the passenger spaces and crew spaces which are situated below the margin line before or abaft the machinery space, as the case may be, and

v = volume of the portion of the ship below the margin line before or abaft the machinery space, as the case may be; or

(*b*) if the Minister so determines in the case of any ship at any time not later than 40 days after a Surveyor of Ships has received a plan of the ship showing the watertight subdivision thereof, by detailed calculation for the purpose of which the permeability of spaces shall be assumed to be as follows:—

passenger spaces	95
crew spaces	95
spaces appropriated to machinery	80
spaces appropriated to cargo, coal, stores or baggage rooms	60
tanks forming part of the structure of the ship and double bottoms	95, or such lesser figure as the Minister may permit in the case of any ship.

(ii) For the purposes of this paragraph a space within a passenger space or crew space shall be deemed to be a part thereof unless it is appropriated for other purposes and is enclosed by permanent steel bulkheads.

4. *Factor of Subdivision*

(1) Subject to the provisions of sub-paragraph (4) of this paragraph, in the case of ships the length of which is 430 feet or more, the factor of subdivision F shall be determined by the following formula:—

$$F = A - \frac{(A - B)(C_s - 23)}{100}$$

where A and B are respectively determined in accordance with the provisions of sub-paragraph (5) of this paragraph and C_s is the criterion numeral determined in accordance with the provisions of paragraph 5 of this schedule. Provided that where in the case of any ship the factor F is less than ·4 and the Minister is satisfied that it is impracticable to apply the factor F in determining the permissible length of a compartment appropriated for machinery, the Minister may allow an increased factor not exceeding ·4 to be applied to that compartment.

(2) Subject to the provisions of sub-paragraph (4) of this paragraph, in the case of ships the length of which is less than 430 feet but not less than 260 feet having a criterion numeral of not less than

$$\frac{4691 - 10L}{17}$$

(hereinafter in this paragraph referred to as S), the factor of subdivision F shall be determined by the following formula:—

$$F = 1 - \frac{(1 - B)(C_s - S)}{123 - S}$$

where B is the factor determined in accordance with the provisions of sub-paragraph (5) of this paragraph and C_s is the criterion numeral determined in accordance with the provisions of paragraph 5 of this Schedule.

(3) In the case of ships the length of which is less than 430 feet but not less than 260 feet and having a criterion numeral less than S or in the case of ships the length of which is less than 260 feet the factor of subdivision shall be unity.

(4) In the case of a ship of any length which is intended to carry a number of passengers exceeding 12 but not exceeding

$$\frac{L^2}{7000} \text{ or } 50$$

whichever is the lower, the factor of subdivision shall be determined in the manner provided in sub-paragraph (3) of this paragraph.

(5) For the purposes of this paragraph the factors A and B shall be determined by the following formulae:—

$$A = \frac{190}{L - 198} + \cdot 18 \text{ (where } L = 430 \text{ and upwards)}$$

$$B = \frac{100}{L - 138} + \cdot 18 \text{ (where } L = 260 \text{ and upwards)}$$

5. *Criterion of Service*

The criterion numeral for ships to which this Part of this Schedule applies shall be determined by the following formulae:—

when P_1 is greater than P

$$C_s = 72\frac{M + 2P_1}{V + P_1 - P}$$

and in all other cases

$$C_s = 72\frac{M + 2P}{V}$$

where:—

C_s = the criterion numeral;

M = the volume of the machinery space, with the addition thereto of the volume of any permanent oil fuel bunkers which may be situated above the inner bottom and before or abaft the machinery space;

P = the volume of the passenger spaces and crew spaces below the margin line;

V = the volume of the ship below the margin line;

N = number of passengers which the ship is intended to carry; and

$P_1 = \cdot 6LN$

Provided that:

(*a*) where the value of $\cdot 6LN$ is greater than the sum of P and the whole volume of the passenger spaces above the margin line, the figure to be taken as P_1 shall be that sum or $\cdot 4LN$ whichever is the greater;

(*b*) values of C_s less than 23 shall be taken as 23; and

(*c*) values of C_s greater than 123 shall be taken as 123.

6. *Special Rules for Subdivision*

(1) Compartments exceeding the permissible length:—

(*a*) A compartment may exceed its permissible length provided that 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 the less.

(*b*) If one compartment of either of such pairs of adjacent compartments is situated inside the machinery space, and the other compartment thereof is situated outside the machinery space, the combined length of the two compartments shall be adjusted in accordance with the mean average permeability of the two portions of the ship in which the compartments are situated.

(*c*) Where the lengths of two adjacent compartments are governed by different factors of subdivision, the combined length of the two compartments shall be determined proportionately.

(*d*) Where in any portion of a ship bulkheads required by these Rules to be watertight are carried to a higher deck than in the remainder of the ship, separate margin lines may be used for calculating the floodable length of that portion of the ship, if—

(i) the two compartments adjacent to the resulting 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 determined by reference to the lower margin line of such compartments;

(ii) the sides of the ship are extended throughout the ship's length to the deck corresponding to the uppermost margin line and all openings in the shell plating below that deck throughout the length of the ship comply with the requirements of Rule 15 of these Rules as if they were openings below the margin line.

(2) Additional subdivision at forward end:—

In ships 430 feet in length and upwards, the watertight bulkhead next abaft the collision bulkhead shall be fitted at a distance from the forward perpendicular which is not greater than the premissible length appropriate to a compartment bounded by the forward perpendicular and such bulkhead.

(3) Steps in bulkheads:—

If a bulkhead required by these Rules to be watertight is stepped it shall comply with one of the following conditions:—

(i) In ships having a factor of subdivision not greater than ·9, the combined length of the two compartments separated by such bulkhead shall not exceed 90 per cent. of the floodable length or twice the permissible length whichever is the less. In ships having a factor of subdivision greater than ·9, the combined length of the two compartments shall not exceed the permissible length.

(ii) Additional subdivision is provided in way of the step to maintain the same measure of safety as that secured by a plane bulkhead; or

(iii) The compartment over which the step extends does not exceed the permissible length corresponding to a margin line taken 3 inches below the step.

(4) Recesses in bulkheads:—

If any part of a recess lies outside 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 centre line at the level of the deepest subdivision load water line, the whole of such recess shall be deemed to be a step in a bulkhead for the purposes of sub-paragraph (3) of this paragraph.

(5) Equivalent plane bulkheads:—

Where a bulkhead required by these Rules to be watertight is recessed or stepped an equivalent plane bulkhead shall be assumed in determining the subdivision.

(6) Minimum spacing of bulkheads:—

If the distance between two adjacent bulkheads required by these Rules to be watertight, or their equivalent plane bulkheads, or the distance between transverse planes passing through the nearest stepped portions of the bulkheads, is less than ·03L+10 feet, or 35 feet, or ·1L, whichever is the least, only one of those bulkheads shall be regarded as forming part of the subdivision of the ship.

(7) Allowance for local subdivision:—

Where in any ship a main transverse watertight compartment contains local subdivision and the Minister is satisfied that, after any assumed side damage extending over a length of ·03L+10 feet, or 35 feet, or ·1L, whichever is the least, 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 effective buoyancy assumed on the undamaged side shall not be greater than that assumed on the damaged side.

PART III

SHIPS OF CLASSES II AND II(A) WHICH ARE PERMITTED BY THE MINISTER, IN EXERCISE OF HIS POWER UNDER PARAGRAPH (5) OF RULE 5 OF THE MERCHANT SHIPPING (LIFE-SAVING APPLIANCES) RULES 1952, (a) TO CARRY PERSONS IN EXCESS OF THE LIFEBOAT CAPACITY PROVIDED ON BOARD.

7. *General Rules for Subdivision*

Subject to the modifications set forth in this Part of this Schedule the maximum length of compartments in ships to which this Part of this Schedule applies shall be determined as if they were ships to which Part II of this Schedule applies.

8. *Assumption of Permeability in Portions before and abaft the Machinery Space*

In ships to which this Part of this Schedule applies the assumed average permeability throughout the portions of the ship before and abaft the machinery space shall be determined—

(*a*) by the following formula:—

$$95-35\frac{b}{v} \text{ where}$$

b = the volume of the spaces which are situated below the margin line before or abaft the machinery space, as the case may be, and above the tops of floors, inner bottom, or peak tanks, and which are appropriated for use as coal or oil fuel bunkers, store rooms, baggage rooms, mail rooms, chain lockers or fresh water tanks and of spaces appropriated for cargo if the Minister is satisfied the greater part of the volume of the space is intended to be occupied by cargo; and

v = the volume of the portion of the ship below the margin line before or abaft the machinery space, as the case may be; or

(*b*) if the Minister so determines in the case of any ship at any time not later than 40 days after a Surveyor of Ships has received a plan of the ship showing the watertight subdivision thereof, by detailed calculation for the purpose of which the permeability of spaces shall be assumed to be as follows:—

passenger spaces	95
crew spaces	95
spaces appropriated to machinery	80
spaces appropriated to bunker coal, stores or baggage rooms	60
spaces appropriated to cargo, tanks forming part of the structure of the ship and double bottoms ...	95, or such lesser figure as the Minister may permit in the case of any ship.

9. *Factor of Subdivision*

(1) Subject to the provisions of this paragraph, the factor of subdivision of ships to which this Part of this Schedule applies shall be the factor determined in the manner provided in paragraph 4 of this Schedule, or ·5 whichever is the less. Provided that if the Minister is satisfied in the case of any ship the length of which is less than 300 feet that it is impracticable to apply that factor to any compartment, he may allow a higher factor to be applied to that compartment.

(a) S.I. 1952/1949, p. 1889 below.

(2) If in the case of any ship to which this Part of this Schedule applies the Minister is satisfied that the quantity of cargo to be carried in the ship will be such as to render impracticable the application abaft the collision bulkhead of a factor of subdivision not exceeding ·5, the factor of subdivision of the ship shall be determined as follows:—

(*a*) in the case of ships the length of which is 430 feet and upwards, by the formula:—

$$F = A - \frac{(A - BB)(C_s - 23)}{100}$$

(*b*) in the case of ships the length of which is less than 430 feet but not less than 180 feet, and having a criterion numeral not less than S_1, by the formula:—

$$F = 1 - \frac{(1 - BB)(C_s - S_1)}{123 - S_1}$$

For the purposes of the above formulae:—

$$A = \frac{190}{L - 198} + \cdot 18 \text{ (where L = 430 and upwards)}$$

$$BB = \frac{57 \cdot 6}{L - 108} + \cdot 20 \text{ (where L = 180 and upwards)}$$

$$S_1 = \frac{1950 - 4L}{10}$$

C_s = the criterion numeral determined in accordance with paragraph 5 of this Schedule where P_1 has the following values:

(*a*) ·6LN or 125N whichever is the greater for berthed passengers.

(*b*) 125N for unberthed passengers.

(*c*) in the case of ships the length of which is less than 430 feet but not less than 180 feet and having a criterion numeral less than S_1, and of all ships the length of which is less than 180 feet, the factor of subdivision shall be unity.

PART IV

SHIPS OF CLASSES III TO VI INCLUSIVE

10. *General Rules for Subdivision*

Subject to the modifications set forth in this Part of this Schedule the maximum length of compartments in ships to which this Part of this Schedule applies shall be determined as if they were ships to which Part II of this Schedule applies.

11. *Assumptions of Permeability*

In ships to which this Part of this Schedule applies, the assumed average permeability shall be as follows:—

(*a*) of the machinery space

(i) in ships propelled by internal combustion engines 85

(ii) in all other ships 80

(*b*) of spaces other than the machinery space 95

12. *Factor of Subdivision*

The factor of subdivision of ships to which this Part of this Schedule applies shall be as follows:—

Length of Ship in feet	*Factor of Subdivision*
Over 350	·5
Over 300 but not over 350	·5 for compartments in machinery space and forward thereof. Unity for all other compartments.
Over 250 but not over 300	·5 for compartments forward of machinery space. Unity for all other compartments.
Over 200 but not over 250	Unity for combined forepeak and adjacent compartment, and for each other compartment.
200 and under	Unity.

THIRD SCHEDULE Rule 8

STABILITY IN DAMAGED CONDITION

1. *Calculations of Stability in Damaged Condition*

The sufficiency of intact stability of every ship to which Part II of these Rules applies shall be determined by calculation which has regard to the design and construction of the ship and the damaged compartments, and which is in accordance with the following assumptions:—

(*a*) the ship shall be assumed to be in the worst condition as regards stability which is likely to be experienced having regard to the intended service of the ship;

(*b*) the volume permeabilities and surface permeabilities shall be assumed to be as follows:—

Spaces	*Permeability*
Appropriated to cargo, coal or stores ...	60
Appropriated to accommodation for passengers and crew	95
Appropriated to machinery	85
Appropriated to liquids	0 or 95, whichever results in the more onerous requirements.

(*c*) The minimum extent of damage shall be assumed to be as follows:—

(i) Longitudinal extent ... 10 feet plus 3 per cent. of the length of the ship, or 35 feet, or 10 per cent. of the length of the ship, whichever is the least.

(ii) Transverse extent ... 20 per cent. of the breadth of the ship. (measured inboard from the ship's side at right angles to the centre line at the level of the deepest subdivision load water line.)

(iii) Vertical extent ... from the top of the double bottom up to the margin line.

(iv) If any damage of lesser extent than that indicated in the foregoing sub-paragraphs (i), (ii) and (iii) would result in a more severe condition regarding heel or loss of metacentric height, such damage shall be assumed for the purposes of the calculation.

(*d*) Where the ship is fitted with decks, inner skins or longitudinal bulkheads of sufficient tightness to restrict the flow of water, regard shall be had to such restrictions in the calculation.

2. *Sufficiency of Stability in Damaged Condition*

The intact stability of the ship shall be deemed to be sufficient if the aforesaid calculation shows that, after the assumed damage and after equalisation measures have been taken, the final condition of the ship is as follows:—

(i) in the event of symmetrical flooding the metacentric height is positive;

(ii) in the event of unsymmetrical flooding the heel does not exceed seven degrees;

(iii) in the event of unsymmetrical flooding the margin line is not submerged.

FOURTH SCHEDULE Rule 9

CONSTRUCTION OF WATERTIGHT BULKHEADS, ETC.

PART I

SHIPS OF CLASS I

1. *Strength and Construction*

(1) Every bulkhead and other portion of the internal structure forming part of the watertight subdivision of the ship shall be of such strength and so constructed as to be capable of supporting, with an adequate margin of resistance, the pressure due to a head of water up to the margin line.

(2) Every such bulkhead and portion shall be constructed of mild steel and, if of riveted construction, shall comply with the requirements of paragraphs 2 to 6 inclusive of this Schedule, and if of welded construction shall not be of less strength, stiffness or efficiency than if it had been riveted and had complied with such requirements.

2. *Bulkheads*

(1) Every bulkhead required by these Rules to be watertight shall be constructed with plating of thicknesses not less than those indicated in Table 1 of Part IV of this Schedule. If a bulkhead is at the end of a stokehold space in a coal burning ship, the lower part of the bulkhead plating to a height of at least 24 inches above the stokehold floor shall be at least ·1 inch thicker than is required by the said Table. If a bulkhead is at the end of a coal bunker space, the lowest strake thereof shall be at least 36 inches high and ·1 inch thicker than is required by the said Table. In all other bulkheads the lowest strake shall be at least ·04 inch thicker than is required by the said Table and any limber plates shall be at least ·1 inch thicker.

(2) Every boundary angle shall be at least ·1 inch thicker than the thickness required by the said Table for the bulkhead plating to which it is attached.

(3)—(*a*) Save as provided in Table 3 of Part IV of this Schedule, every such bulkhead shall be fitted with stiffeners which shall have brackets or lug end connections. If the stiffeners are spaced 30 inches apart, they shall comply with such of the specifications in Tables 2 and 3 of the said Part as apply to them in the circumstances. Provided that other forms of stiffeners may be used if they afford not less strength and stiffness than the stiffeners indicated in the said Tables. If any stiffeners are spaced otherwise than 30 inches apart on such a bulkhead, their strength and stiffness shall be increased or decreased, as the case may be, in direct proportion to their distance apart. Stiffeners shall not be spaced more than 24 inches apart on a collision bulkhead, or more than 36 inches apart on any other bulkhead.

(*b*) The lower end of each stiffener shall be attached to the shell plating, to the inner bottom plating or to horizontal plating which will support it properly.

(*c*) At each deck level which forms the top of a system of stiffeners plating shall be so provided as to ensure horizontal rigidity in the bulkhead.

(*d*) In the case of bracketed hold stiffeners the lower bracket or its connecting angle shall extend over the floor adjacent to the bulkhead and the upper bracket shall be connected to an angle which extends over the beam space, or other equally effective means shall be adopted for securing structural rigidity.

(*e*) Where stiffeners are cut in way of watertight doors in the lower part of a bulkhead, the opening shall be properly framed and bracketed, and a tapered web plate or buttress, stiffened on its edge, shall be fitted at each side of the door from the base of the bulkhead to above the door opening.

(*f*) All brackets, lugs and other end connections for stiffeners shall comply with the requirements of Table 4 of Part IV of this Schedule.

(4)—(*a*) The rivets in seams and connections of plating and boundary bars of all bulkheads required by these Rules to be watertight shall be spaced not more than 4½ diameters apart centre to centre, except in the case of the flange of a boundary angle, being the flange connected to the inner bottom plating, shell plating or deck plating, in which case they shall be spaced 5 diameters apart centre to centre.

(*b*) Boundary angles fitted more than 35 feet below the bulkhead deck shall be double riveted in both flanges except on parts of a bulkhead within a double bottom, and the vertical connection of plates so fitted shall be double riveted.

(*c*) The rivets connecting stiffeners, having bracket end connections, to bulkhead plating shall be spaced not more than 7 diameters apart centre to centre. All other stiffeners shall be connected to the bulkhead plating by rivets spaced not more than 4 diameters apart centre to centre for 15 per cent. of the length of the stiffeners at each end thereof and not more than 7 diameters apart centre to centre elsewhere.

(*d*) Where frames or beams pass through a bulkhead required by these Rules to be watertight, the bulkhead shall be made watertight without the use of wood or cement.

3. *Watertight Decks, Steps and Flats*

(1) The horizontal plating of decks, steps and flats required by these Rules to be watertight shall be at least ·04 inch thicker than that required for watertight bulkheads at corresponding levels.

(2) The beams of such decks, steps and flats shall be of sizes indicated for stiffeners spaced 30 inches apart in Table 3 of Part IV of this Schedule. Provided that beams divided into portions which are bracketed at each end may be of the sizes indicated for such stiffeners in Table 2 of Part IV of this Schedule. If any beams are spaced otherwise than 30 inches apart, their strength and stiffness shall be increased or decreased, as the case may be, in direct proportion to their distance apart.

For the purposes of the said Tables the greatest distance between the points of support shall be deemed to be the length of the beam. Provided that, if a beam is bracketed, the length thereof for the purposes of the said Table 3 shall be reduced by the width of the brackets. The distance from the bulkhead deck to the deck, step or flat concerned, minus half the length of the beam, shall be deemed to be the height for the purposes of the said Tables.

(3) Adequate supports for such beams shall be provided by bulkheads, or by girders pillared where necessary, and the rivet connections of the pillars shall be sufficient to withstand the load due to water pressure.

(4) Where frames pass through a deck, step or flat required by these Rules to be watertight, such deck, step or flat shall be made watertight without the use of wood or cement.

4. *Watertight Recesses and Trunkways*

Every recess and trunkway required by these Rules to be watertight shall be so constructed as to provide strength and stiffness at all parts not less than that required for watertight bulkheads at a corresponding level.

5. *Watertight Tunnels*

(1) Every tunnel required by these Rules to be watertight shall be constructed with plating of thicknesses not less than those indicated in Table I of Part IV of this Schedule.

(2) Every such tunnel shall be fitted with stiffeners which, if spaced 36 inches apart, shall comply with such of the specifications in Table 5 of Part IV of this Schedule as apply to them in the circumstances. Provided that other forms of stiffeners may be used if they afford not less strength and stiffness than the stiffeners indicated in the said Table. If any stiffeners are spaced otherwise than 36 inches apart on such a tunnel their strength and stiffness shall be increased or decreased as the case may be in direct proportion to their distance apart. The feet of all stiffeners, however spaced, shall overlap the tunnel base angle, and shall be attached thereto.

6. *Watertight Inner Skins*

Every inner skin required by these Rules to be watertight shall be of such strength and construction as will enable it to withstand a head of water up to the margin line.

PART II

SHIPS OF CLASSES II AND II(A)

7. *General*

Subject to the modifications set forth in this Part of this Schedule, Part I of this Schedule shall apply in relation to ships of Classes II and II(A) as it applies in relation to ships of Class I.

8. *Bulkheads, etc.*

(1) Every riveted portion of the ship's internal structure required by these Rules to be watertight shall be constructed as follows:—

(*a*) In ships not exceeding 150 feet in length, in accordance with Tables 1A, 2A, 3A, 4 and 5A of Part IV of this Schedule.

(*b*) In ships 250 feet in length and upwards, in accordance with Tables 1, 2, 3, 4 and 5 of Part IV of this Schedule.

(*c*) In ships between 150 feet and 250 feet in length, in a manner determined by interpolation between the two foregoing standards. Provided that in ships of any length the subdivision of which is determined in accordance with sub-paragraph (1) of paragraph 9 of the Second Schedule to these Rules, every riveted portion of such internal structure may be constructed in accordance with Tables 1A, 2A, 3A, 4 and 5A of Part IV of this Schedule.

(2) Any bulkheads required by these Rules to be watertight in ships not exceeding 150 feet in length and in ships the subdivision of which is determined in accordance with sub-paragraph (1) of paragraph 9 of the Second Schedule to these Rules may, if the stiffeners comply with the specifications in Table 3B of Part IV of this Schedule, be fitted with stiffeners not having bracket or lug end connections.

PART III

SHIPS OF CLASSES III TO VI INCLUSIVE

9. *General*

Subject to the modifications set forth in this Part of this Schedule, Part I of this Schedule shall apply in relation to ships of Classes III to VI, inclusive, as it applies in relation to ships of Class I.

10. *Bulkheads, etc.*

(1) Any bulkheads required by these Rules to be watertight may be fitted with stiffeners not having bracket or lug end connections.

(2) Every riveted portion of the ship's internal structure required by these Rules to be watertight shall be constructed in accordance with such of the provisions of Tables 1A, 2A, 3A, 3B, 4 and 5A of Part IV of this Schedule as apply to it in the circumstances.

PART IV

TABLE 1

(paragraphs 2, 5 and 8 of this Schedule)

THICKNESSES OF BULKHEAD AND TUNNEL PLATING

Plating of Collision Bulkhead: Stiffeners spaced 24 inches apart. Plating of Bulkheads (other than the Collision Bulkhead) and Flat Plating of Tunnels: Stiffeners spaced 30 inches apart Curved Plating of Tunnels: Stiffeners spaced 36 inches apart			Plating of Bulkheads (other than the Collision Bulkhead) and Flat Plating of Tunnels: Stiffeners spaced 36 inches apart		
Depth at Middle Line from Bulkhead Deck to Lower Edge of Plate in feet		Thickness in inches	Depth at Middle Line from Bulkhead Deck to Lower Edge of Plate in feet		Thickness in inches
Above	*Not above*		*Above*	*Not above*	
—	8	·26	—	7	·28
8	12	·28	7	10·5	·30
12	16	·30	10·5	14	·32
16	20	·32	14	17·5	·34
20	24	·34	17·5	21	·36
24	28	·36	21	24·5	·38
28	32	·38	24·5	28	·40
32	36	·40	28	31·5	·42
36	40	·42	31·5	35	·44
40	44	·44	35	38·5	·46
44	48	·46	38·5	42	·48
48	52	·48	42	45·5	·50
52	56	·50	45·5	49	·52
56	60	·52	49	52·5	·54
			52·5	56	·56
			56	59·5	·58

If the stiffeners are spaced otherwise than is specified above, the thicknesses of the plating shall be such as will result in a strength equivalent to that resulting from the thicknesses and spacings specified above.

TABLE 2

(paragraphs 2, 3 and 8 of this Schedule)

SIZES OF BULKHEAD STIFFENERS SPACED 30 INCHES APART AND FITTED WITH BRACKET END CONNECTIONS AT TOP AND BOTTOM IN ACCORDANCE WITH TABLE 4

Overall Length of Stiffener, including End Connections, in feet		Height of Bulkhead Deck above Top of Stiffener, in feet				
		0	2	4	6	8
8	Angles	4×3×·30	4½×3×·30	4½×3×·34	5×3×·32	6×3×·32
9		4½×3×·32	5×3×·32	5×3×·36	6×3×·32	6×3×·36
10		5×3×·34	6×3×·32	6×3×·34	6×3×·38	5½×3×·32
11		6×3×·32	6×3×·34	5½×3×·32	5½×3×·38	6×3×·34
12		6×3×·38	5½×3×·34	6×3×·34	6×3½×·35	7×3×·33
13	Bulb Angles	5½×3×·37	6×3×·35	7×3×·33	7×3×·33	7×3×·38
14		6×3×·35	7×3×·33	7×3×·36	7×3×·40	8×3×·35
15		7×3×·33	7×3×·36	8×3×·35	8×3×·35	8×3×·40
16		7×3×·36	8×3×·35	8×3×·37	8×3×·42	9×3½×·38
17		8×3×·35	8×3×·37	8×3½×·46	9×3½×·38	9×3½×·40
18		8×3×·37	8×3½×·46	9×3½×·38	9×3½×·44	9×3½×·51
19		8×3½×·46	9×3½×·38	9×3½×·45	10×3½×·40	10×3½×·42
20		9×3½×·38	9×3½×·51	10×3½×·40	11×3½×·43	11×3½×·43
21		9×3½×·51	10×3½×·40	10×3½×·50	11×3½×·43	11×3½×·44
22		10×3½×·40	10×3½×·50	11×3½×·43	11×3½×·50	12×3½×3½×·50/·38
23		10×3½×·50	11×3½×·43	11×3½×·50	12×3½×3½×·50/·38	12×3½×3½×·50/·42
24		11×3½×·43	11×3½×·50	12×3½×3½×·50/·38	12×3½×3½×·60/·44	12×3½×3½×·60/·44
				←Channels→		

(1) The sizes of stiffeners are specified in inches.

(2) Sizes for intermediate lengths of stiffeners and heights of bulkhead deck shall be determined by interpolation.

(3) In the case of Channel Sections the lower thickness is that of the web and the upper thickness that of the flange.

(4) The above stiffeners shall comply with the specifications set forth in British Standard Specifications Numbers 4A–1934, 6–1924 and 4–1932 applicable to stiffeners of the scantlings and type indicated.

TABLE 2—*continued*

SIZES OF BULKHEAD STIFFENERS SPACED 30 INCHES APART AND FITTED WITH BRACKET END CONNECTIONS AT TOP AND BOTTOM IN ACCORDANCE WITH TABLE 4

Overall Length of Stiffener, including End Connections, in feet		Height of Bulkhead Deck above Top of Stiffener, in feet			
		10	12	14	16
8	← Angles →	6×3×·32	6×3×·34	6×3×·36	5½×3×·32
9		6×3×·38	5½×3×·32	5½×3×·37	6×3×·34
10		6×3×·34	6×3×·35	6×3½×·35	7×3×·33
11		7×3×·33	7×3×·33	7×3×·34	7×3×·38
12		7×3×·36	7×3×·38	8×3×·35	8×3×·35
13		8×3×·35	8×3×·35	8×3×·37	8×3×·42
14		8×3×·37	8×3×·42	8×3½×·46	9×3½×·38
15	Bulb Angles	8×3½×·46	9×3½×·38	9×3½×·38	9×3½×·45
16		9×3½×·38	9×3½×·44	9×3½×·51	10×3½×·40
17		9×3½×·51	10×3½×·40	10×3½×·42	11×3½×·43
18		10×3½×·40	10×3½×·50	11×3½×·43	11×3½×·44
19		11×3½×·43	11×3½×·43	11×3½×·52	12×3½×3½×·50/·38
20		11×3½×·43	11×3½×·52	12×3½×3½×·50/·38	12×3½×3½×·50/·42
21		11×3½×·54	12×3½×3½×·50/·38	12×3½×3½×·60/·44	12×3½×3½×·60/·46
22	Channels	12×3½×3½×·50/·39	12×3½×3½×·60/·44	12×4×4×·60/·40	12×4×4×·60/·48
23		12×3½×3½×·60/·44	12×4×4×·60/·40	12×4×4×·60/·50	12×4×4×·60/·67
24		12×4×4×·60/·48	12×4×4×·60/·54	12×4×4×·60/·70	15×4×4×·62/·41

(1) The sizes of stiffeners are specified in inches.

(2) Sizes for intermediate lengths of stiffeners and heights of bulkhead deck shall be determined by interpolation.

(3) In the case of Channel Sections the lower thickness is that of the web and the upper thickness that of the flange.

(4) The above stiffeners shall comply with the specifications set forth in British Standard Specifications Numbers 4A–1934, 6–1924 and 4–1932 applicable to stiffeners of the scantlings and type indicated.

TABLE 2—*continued*

SIZES OF BULKHEAD STIFFENERS SPACED 30 INCHES APART AND FITTED WITH BRACKET END CONNECTIONS AT TOP AND BOTTOM IN ACCORDANCE WITH TABLE 4

Overall Length of Stiffener, including End Connections, in feet		Height of Bulkhead Deck above Top of Stiffener, in feet			
		18	20	22	24
8	Bulb Angles	$5\frac{1}{2}\times3\times\cdot32$	$5\frac{1}{2}\times3\times\cdot37$	$6\times3\times\cdot34$	$6\times3\times\cdot35$
9		$6\times3\times\cdot35$	$7\times3\times\cdot33$	$7\times3\times\cdot33$	$7\times3\times\cdot33$
10		$7\times3\times\cdot33$	$7\times3\times\cdot36$	$7\times3\times\cdot40$	$8\times3\times\cdot35$
11		$8\times3\times\cdot35$	$8\times3\times\cdot35$	$8\times3\times\cdot37$	$8\times3\times\cdot37$
12		$8\times3\times\cdot37$	$8\times3\times\cdot40$	$8\times3\frac{1}{2}\times\cdot46$	$9\times3\frac{1}{2}\times\cdot38$
13		$8\times3\frac{1}{2}\times\cdot46$	$9\times3\frac{1}{2}\times\cdot38$	$9\times3\frac{1}{2}\times\cdot38$	$9\times3\frac{1}{2}\times\cdot44$
14		$9\times3\frac{1}{2}\times\cdot38$	$9\times3\frac{1}{2}\times\cdot51$	$9\times3\frac{1}{2}\times\cdot51$	$10\times3\frac{1}{2}\times\cdot40$
15		$9\times3\frac{1}{2}\times\cdot51$	$10\times3\frac{1}{2}\times\cdot40$	$10\times3\frac{1}{2}\times\cdot50$	$11\times3\frac{1}{2}\times\cdot43$
16		$10\times3\frac{1}{2}\times\cdot50$	$11\times3\frac{1}{2}\times\cdot43$	$11\times3\frac{1}{2}\times\cdot43$	$11\times3\frac{1}{2}\times\cdot44$
17		$11\times3\frac{1}{2}\times\cdot43$	$11\times3\frac{1}{2}\times\cdot52$	$11\times3\frac{1}{2}\times\cdot52$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot50}{\cdot38}$
18		$11\times3\frac{1}{2}\times\cdot52$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot50}{\cdot38}$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot50}{\cdot38}$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot60}{\cdot44}$
19	Channels	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot50}{\cdot38}$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot60}{\cdot44}$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot60}{\cdot44}$	$12\times4\times4\times\frac{\cdot60}{\cdot40}$
20		$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot60}{\cdot44}$	$12\times4\times4\times\frac{\cdot60}{\cdot40}$	$12\times4\times4\times\frac{\cdot60}{\cdot48}$	$12\times4\times4\times\frac{\cdot60}{\cdot52}$
21		$12\times4\times4\times\frac{\cdot60}{\cdot48}$	$12\times4\times4\times\frac{\cdot60}{\cdot50}$	$12\times4\times4\times\frac{\cdot60}{\cdot67}$	$12\times4\times4\times\frac{\cdot60}{\cdot70}$
22		$12\times4\times4\times\frac{\cdot60}{\cdot67}$	$12\times4\times4\times\frac{\cdot60}{\cdot70}$	$15\times4\times4\times\frac{\cdot62}{\cdot41}$	$15\times4\times4\times\frac{\cdot62}{\cdot41}$
23		$15\times4\times4\times\frac{\cdot62}{\cdot41}$	$15\times4\times4\times\frac{\cdot62}{\cdot41}$	$15\times4\times4\times\frac{\cdot62}{\cdot46}$	$15\times4\times4\times\frac{\cdot62}{\cdot50}$
24		$15\times4\times4\times\frac{\cdot62}{\cdot46}$	$15\times4\times4\times\frac{\cdot62}{\cdot48}$		

(1) The sizes of stiffeners are specified in inches.

(2) Sizes for intermediate lengths of stiffeners and heights of bulkhead deck shall be determined by interpolation.

(3) In the case of Channel Sections the lower thickness is that of the web and the upper thickness that of the flange.

(4) The above stiffeners shall comply with the specifications set forth in British Standard Specifications Numbers 6–1924 and 4–1932 applicable to stiffeners of the scantlings and type indicated.

TABLE 2—*continued*

SIZES OF BULKHEAD STIFFENERS SPACED 30 INCHES APART AND FITTED WITH BRACKET END CONNECTIONS AT TOP AND BOTTOM IN ACCORDANCE WITH TABLE 4

Overall Length of Stiffener, including End Connections, in feet		Height of Bulkhead Deck above Top of Stiffener, in feet			
		26	28	30	32
8	Bulb Angles	6×3×·39	7×3×·33	7×3×·33	7×3×·33
9		7×3×·36	7×3×·40	8×3×·35	8×3×·35
10		8×3×·35	8×3×·35	8×3×·37	8×3×·40
11		8×3×·42	8×3½×·46	9×3½×·38	9×3½×·38
12		9×3½×·38	9×3½×·38	9×3½×·45	9×3½×·51
13		9×3½×·51	10×3½×·40	10×3½×·40	10×3½×·42
14		10×3½×·42	10×3½×·50	11×3½×·43	11×3½×·43
15		11×3½×·43	11×3½×·44	11×3½×·50	11×3½×·54
16		11×3½×·52	12×3½×3½×·50/·38	12×3½×3½×·50/·38	12×3½×3½×·50/·39
17	Channels	12×3½×3½×·50/·38	12×3½×3½×·60/·44	12×3½×3½×·60/·44	12×3½×3½×·60/·46
18		12×3½×3½×·60/·44	12×4×4×·60/·40	12×4×4×·60/·48	12×4×4×·60/·50
19		12×4×4×·60/·48	12×4×4×·60/·52	12×4×4×·60/·67	12×4×4×·60/·70
20		12×4×4×·60/·67	12×4×4×·60/·70	15×4×4×·62/·41	15×4×4×·62/·41
21		15×4×4×·62/·41	15×4×4×·62/·41	15×4×4×·62/·46	15×4×4×·62/·50
22		15×4×4×·62/·46	15×4×4×·62/·50		
23					
24					

(1) The sizes of stiffeners are specified in inches.

(2) Sizes for intermediate lengths of stiffeners and heights of bulkhead deck shall be determined by interpolation.

(3) In the case of Channel Sections the lower thickness is that of the web and the upper thickness that of the flange.

(4) The above stiffeners shall comply with the specifications set forth in British Standard Specifications Numbers 6–1924 and 4–1932 applicable to stiffeners of the scantlings and type indicated.

TABLE 2—*continued*

SIZES OF BULKHEAD STIFFENERS SPACED 30 INCHES APART AND FITTED WITH BRACKET END CONNECTIONS AT TOP AND BOTTOM IN ACCORDANCE WITH TABLE 4

Overall Length of Stiffener, including End Connections, in feet		Height of Bulkhead Deck above Top of Stiffener, in feet			
		34	36	38	40
8	Bulb Angles	$7\times3\times\cdot36$	$7\times3\times\cdot36$	$7\times3\times\cdot40$	$8\times3\times\cdot35$
9		$8\times3\times\cdot35$	$8\times3\times\cdot37$	$8\times3\times\cdot37$	$8\times3\times\cdot40$
10		$8\times3\frac{1}{2}\times\cdot44$	$8\times3\frac{1}{2}\times\cdot46$	$9\times3\frac{1}{2}\times\cdot38$	$9\times3\frac{1}{2}\times\cdot38$
11		$9\times3\frac{1}{2}\times\cdot38$	$9\times3\frac{1}{2}\times\cdot44$	$9\times3\frac{1}{2}\times\cdot45$	$9\times3\frac{1}{2}\times\cdot51$
12		$9\times3\frac{1}{2}\times\cdot51$	$10\times3\frac{1}{2}\times\cdot40$	$10\times3\frac{1}{2}\times\cdot40$	$10\times3\frac{1}{2}\times\cdot50$
13		$10\times3\frac{1}{2}\times\cdot50$	$11\times3\frac{1}{2}\times\cdot43$	$11\times3\frac{1}{2}\times\cdot43$	$11\times3\frac{1}{2}\times\cdot43$
14		$11\times3\frac{1}{2}\times\cdot44$	$11\times3\frac{1}{2}\times\cdot50$	$11\times3\frac{1}{2}\times\cdot54$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot50}{\cdot38}$
15	Channels	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot50}{\cdot38}$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot50}{\cdot38}$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot50}{\cdot39}$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot60}{\cdot44}$
16		$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot60}{\cdot44}$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot60}{\cdot44}$	$12\times4\times4\times\frac{\cdot60}{\cdot40}$	$12\times4\times4\times\frac{\cdot60}{\cdot48}$
17		$12\times4\times4\times\frac{\cdot60}{\cdot48}$	$12\times4\times4\times\frac{\cdot60}{\cdot48}$	$12\times4\times4\times\frac{\cdot60}{\cdot52}$	$12\times4\times4\times\frac{\cdot60}{\cdot67}$
18		$12\times4\times4\times\frac{\cdot60}{\cdot67}$	$12\times4\times4\times\frac{\cdot60}{\cdot67}$	$12\times4\times4\times\frac{\cdot60}{\cdot70}$	$15\times4\times4\times\frac{\cdot62}{\cdot41}$
19		$15\times4\times4\times\frac{\cdot62}{\cdot41}$	$15\times4\times4\times\frac{\cdot62}{\cdot41}$	$15\times4\times4\times\frac{\cdot62}{\cdot46}$	$15\times4\times4\times\frac{\cdot62}{\cdot46}$
20		$15\times4\times4\times\frac{\cdot62}{\cdot46}$	$15\times4\times4\times\frac{\cdot62}{\cdot48}$		
21					
22					
23					
24					

(1) The sizes of stiffeners are specified in inches.

(2) Sizes for intermediate lengths of stiffeners and heights of bulkhead deck shall be determined by interpolation.

(3) In the case of Channel Sections the lower thickness is that of the web and the upper thickness that of the flange.

(4) The above stiffeners shall comply with the specifications set forth in British Standard Specifications Numbers 6–1924 and 4–1932 applicable to stiffeners of the scantlings and type indicated.

TABLE 3
(paragraphs 2, 3 and 8 of this Schedule)

SIZES OF BULKHEAD STIFFENERS SPACED 30 INCHES APART AND FITTED WITH LUG END CONNECTIONS AT TOP AND BOTTOM IN ACCORDANCE WITH TABLE 4

Overall Length of Stiffener, including End Connections, in feet		Height of Bulkhead Deck above Top of Stiffener, in feet				
		0	2	4	6	8
8	Angles	*4½×3×·34	5×3×·36	6×3×·32	6×3×·38	5½×3×·34
9	Angles	*6×3×·32	6×3×·32	5½×3×·34	5½×3×·38	6×3×·34
10	Angles	*6×3×·38	5½×3×·37	6×3×·34	7×3×·33	7×3×·33
11	Bulb Angles	5½×3×·38	6×3½×·35	7×3×·33	7×3×·36	7×3×·40
12	Bulb Angles	6×3×·39	7×3×·33	7×3×·38	8×3×·35	8×3×·35
13	Bulb Angles	7×3×·33	7×3×·40	8×3×·35	8×3×·40	8×3½×·46
14	Bulb Angles	7×3×·41	8×3×·35	8×3½×·46	9×3½×·38	9×3½×·40
15	Bulb Angles	8×3×·35	8×3×·47	9×3½×·38	9×3½×·45	10×3½×·40
16	Bulb Angles	8×3½×·46	9×3½×·38	9×3½×·51	10×3½×·40	10×3½×·48
17	Bulb Angles	9×3½×·40	9×3½×·51	10×3½×·42	11×3½×·43	11×3½×·43
18	Bulb Angles	9×3½×·51	10×3½×·45	11×3½×·43	11×3½×·44	11×3½×·56
19	Bulb Angles	10×3½×·42	11×3½×·43	11×3½×·45	12×3½×3½×·50/·38	12×3½×3½×·50/·39
20	Bulb Angles	11×3½×·43	11×3½×·48	12×3½×3½×·50/·38	12×3½×3½×·60/·44	12×3½×3½×·60/·46
21	Bulb Angles	11×3½×·48	12×3½×3½×·50/·38	12×3½×3½×·60/·44	12×4×4×·60/·40	12×4×4×·60/·48
22	Channels	12×3½×3½×·50/·38	12×3½×3½×·60/·44	12×4×4×·60/·40	12×4×4×·60/·52	12×4×4×·60/·67
23	Channels	12×3½×3½×·60/·44	12×4×4×·60/·40	12×4×4×·60/·54	12×4×4×·60/·70	15×4×4×·62/·41
24	Channels	12×4×4×·60/·40	12×4×4×·60/·56	12×4×4×·60/·74	15×4×4×·62/·41	15×4×4×·62/·48

Channels

(1) The sizes of stiffeners are specified in inches.

(2) Sizes for intermediate lengths of stiffeners and heights of bulkhead deck shall be determined by interpolation.

(3) The ends of upper between deck stiffeners marked * may be riveted to boundary bars only without lug end connections.

(4) In the case of Channel Sections the lower thickness is that of the web and the upper thickness that of the flange.

(5) The above stiffeners shall comply with the specifications set forth in British Standard Specifications Numbers 4A–1934, 6–1924 and 4–1932 applicable to stiffeners of the scantlings and type indicated.

TABLE 3—*continued*

SIZES OF BULKHEAD STIFFENERS SPACED 30 INCHES APART AND FITTED WITH LUG END CONNECTIONS AT TOP AND BOTTOM IN ACCORDANCE WITH TABLE 4

Overall Length of Stiffener, including End Connections, in feet		Height of Bulkhead Deck above Top of Stiffener, in feet			
		10	12	14	16
8	Bulb Angles	$5\frac{1}{2}\times3\times\cdot38$	$6\times3\times\cdot34$	$6\times3\times\cdot40$	$7\times3\times\cdot33$
9		$6\times3\times\cdot39$	$7\times3\times\cdot33$	$7\times3\times\cdot36$	$7\times3\times\cdot36$
10		$7\times3\times\cdot36$	$7\times3\times\cdot40$	$8\times3\times\cdot35$	$8\times3\times\cdot35$
11		$8\times3\times\cdot35$	$8\times3\times\cdot37$	$8\times3\times\cdot42$	$8\times3\frac{1}{2}\times\cdot46$
12		$8\times3\times\cdot42$	$9\times3\frac{1}{2}\times\cdot38$	$9\times3\frac{1}{2}\times\cdot38$	$9\times3\frac{1}{2}\times\cdot40$
13		$9\times3\frac{1}{2}\times\cdot38$	$9\times3\frac{1}{2}\times\cdot44$	$9\times3\frac{1}{2}\times\cdot51$	$10\times3\frac{1}{2}\times\cdot40$
14		$9\times3\frac{1}{2}\times\cdot51$	$10\times3\frac{1}{2}\times\cdot40$	$10\times3\frac{1}{2}\times\cdot45$	$11\times3\frac{1}{2}\times\cdot43$
15		$10\times3\frac{1}{2}\times\cdot42$	$10\times3\frac{1}{2}\times\cdot50$	$11\times3\frac{1}{2}\times\cdot43$	$11\times3\frac{1}{2}\times\cdot45$
16		$11\times3\frac{1}{2}\times\cdot43$	$11\times3\frac{1}{2}\times\cdot44$	$11\times3\frac{1}{2}\times\cdot45$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot50}{\cdot38}$
17		$11\times3\frac{1}{2}\times\cdot48$	$11\times3\frac{1}{2}\times\cdot56$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot50}{\cdot39}$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot60}{\cdot44}$
18	Channels	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot50}{\cdot38}$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot60}{\cdot44}$	$12\times4\times4\times\frac{\cdot60}{\cdot40}$	$12\times4\times4\times\frac{\cdot60}{\cdot48}$
19		$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot60}{\cdot44}$	$12\times4\times4\times\frac{\cdot60}{\cdot48}$	$12\times4\times4\times\frac{\cdot60}{\cdot52}$	$12\times4\times4\times\frac{\cdot60}{\cdot67}$
20		$12\times4\times4\times\frac{\cdot60}{\cdot48}$	$12\times4\times4\times\frac{\cdot60}{\cdot67}$	$12\times4\times4\times\frac{\cdot60}{\cdot70}$	$15\times4\times4\times\frac{\cdot62}{\cdot41}$
21		$12\times4\times4\times\frac{\cdot60}{\cdot67}$	$15\times4\times4\times\frac{\cdot62}{\cdot41}$	$15\times4\times4\times\frac{\cdot62}{\cdot41}$	$15\times4\times4\times\frac{\cdot62}{\cdot50}$
22		$15\times4\times4\times\frac{\cdot62}{\cdot41}$	$15\times4\times4\times\frac{\cdot62}{\cdot46}$		
23		$15\times4\times4\times\frac{\cdot62}{\cdot46}$			
24					

(1) The sizes of stiffeners are specified in inches.

(2) Sizes for intermediate lengths of stiffeners and heights of bulkhead deck shall be determined by interpolation.

(3) In the case of Channel Sections the lower thickness is that of the web and the upper thickness that of the flange.

(4) The above stiffeners shall comply with the specifications set forth in British Standard Specifications Numbers 6–1924 and 4–1932 applicable to stiffeners of the scantlings and type indicated.

TABLE 3—*continued*

SIZES OF BULKHEAD STIFFENERS SPACED 30 INCHES APART AND FITTED WITH LUG END CONNECTIONS AT TOP AND BOTTOM IN ACCORDANCE WITH TABLE 4

Overall Length of Stiffener, including End Connections, in feet		Height of Bulkhead Deck above Top of Stiffener, in feet			
		18	20	22	24
8	Bulb Angles	7×3×·33	7×3×·36	7×3×·38	7×3×·41
9		7×3×·46	8×3×·35	8×3×·37	8×3×·40
10		8×3×·40	8×3½×·46	9×3½×·38	9×3½×·38
11		9×3½×·38	9×3½×·40	9×3½×·45	9×3½×·51
12		9×3½×·51	10×3½×·40	10×3½×·42	10×3½×·46
13		10×3½×·45	11×3½×·43	11×3½×·43	11×3½×·44
14		11×3½×·43	11×3½×·45	11×3½×·55	12×3½×3½×·50/·38
15		11×3½×·56	12×3½×3½×·50/·38	12×3½×3½×·60/·44	12×3½×3½×·60/·44
16	Channels	12×3½×3½×·50/·42	12×3½×3½×·60/·44	12×4×4×·60/·40	12×4×4×·60/·48
17		12×4×4×·60/·40	12×4×4×·60/·48	12×4×4×·60/·67	12×4×4×·60/·70
18		12×4×4×·60/·67	12×4×4×·60/·70	15×4×4×·62/·41	15×4×4×·62/·41
19		15×4×4×·62/·41	15×4×4×·62/·41	15×4×4×·62/·46	
20		15×4×4×·62/·46	15×4×4×·62/·53		
21					
22					
23					
24					

(1) The sizes of stiffeners are specified in inches.

(2) Sizes for intermediate lengths of stiffeners and heights of bulkhead deck shall be determined by interpolation.

(3) In the case of Channel Sections the lower thickness is that of the web and the upper thickness that of the flange.

(4) The above stiffeners shall comply with the specifications set forth in British Standard Specifications Numbers 6–1924 and 4–1932 applicable to stiffeners of the scantlings and type indicated.

TABLE 3—*continued*

SIZES OF BULKHEAD STIFFENERS SPACED 30 INCHES APART AND FITTED WITH LUG END CONNECTIONS AT TOP AND BOTTOM IN ACCORDANCE WITH TABLE 4

Overall Length of Stiffener, including End Connections, in feet		Height of Bulkhead Deck above Top of Stiffener, in feet			
		26	28	30	32
8	Bulb Angles	8×3×·35	8×3×·35	8×3×·37	8×3×·40
9		8×3½×·46	9×3½×·38	9×3½×·38	9×3½×·38
10		9×3½×·40	9×3½×·45	9×3½×·51	10×3½×·40
11		10×3½×·40	10×3½×·42	10×3½×·50	11×3½×·43
12		10×3½×·50	11×3½×·43	11×3½×·45	11×3½×·52
13		11×3½×·52	11×3½×·55	12×3½×3½×·50/·38	12×3½×3½×·50/·42
14	Channels	12×3½×3½×·50/·42	12×3½×3½×·60/·44	12×3½×3½×·60/·44	12×4×4×·60/·40
15		12×4×4×·60/·40	12×4×4×·60/·48	12×4×4×·60/·52	12×4×4×·60/·67
16		12×4×4×·60/·67	12×4×4×·60/·67	15×4×4×·62/·41	15×4×4×·62/·41
17		15×4×4×·62/·41	15×4×4×·62/·41	15×4×4×·62/·46	15×4×4×·62/·50
18		15×4×4×·62/·46	15×4×4×·62/·53		
19					
20					
21					
22					
23					
24					

(1) The sizes of stiffeners are specified in inches.

(2) Sizes for intermediate lengths of stiffeners and heights of bulkhead deck shall be determined by interpolation.

(3) In the case of Channel Sections the lower thickness is that of the web and the upper thickness that of the flange.

(4) The above stiffeners shall comply with the specifications set forth in British Standard Specifications Numbers 6–1924 and 4–1932 applicable to stiffeners of the scantlings and type indicated.

TABLE 3—*continued*

SIZES OF BULKHEAD STIFFENERS SPACED 30 INCHES APART AND FITTED WITH LUG END CONNECTIONS AT TOP AND BOTTOM IN ACCORDANCE WITH TABLE 4

Overall Length of Stiffener, including End Connections, in feet		Height of Bulkhead Deck above Top of Stiffener, in feet			
		34	36	38	40
8	Bulb Angles	$8\times3\times\cdot44$	$9\times3\frac{1}{2}\times\cdot38$	$9\times3\frac{1}{2}\times\cdot38$	$9\times3\frac{1}{2}\times\cdot38$
9		$9\times3\frac{1}{2}\times\cdot40$	$9\times3\frac{1}{2}\times\cdot45$	$9\times3\frac{1}{2}\times\cdot51$	$10\times3\frac{1}{2}\times\cdot40$
10		$10\times3\frac{1}{2}\times\cdot40$	$10\times3\frac{1}{2}\times\cdot42$	$10\times3\frac{1}{2}\times\cdot50$	$11\times3\frac{1}{2}\times\cdot43$
11		$11\times3\frac{1}{2}\times\cdot43$	$11\times3\frac{1}{2}\times\cdot43$	$11\times3\frac{1}{2}\times\cdot45$	$11\times3\frac{1}{2}\times\cdot52$
12		$11\times3\frac{1}{2}\times\cdot55$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot50}{\cdot38}$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot50}{\cdot39}$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot60}{\cdot44}$
13	Channels	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot60}{\cdot44}$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot60}{\cdot44}$	$12\times3\frac{1}{2}\times3\frac{1}{2}\times\frac{\cdot60}{\cdot46}$	$12\times4\times4\times\frac{\cdot60}{\cdot48}$
14		$12\times4\times4\times\frac{\cdot60}{\cdot48}$	$12\times4\times4\times\frac{\cdot60}{\cdot50}$	$12\times4\times4\times\frac{\cdot60}{\cdot67}$	$12\times4\times4\times\frac{\cdot60}{\cdot67}$
15		$12\times4\times4\times\frac{\cdot60}{\cdot67}$	$15\times4\times4\times\frac{\cdot62}{\cdot41}$	$15\times4\times4\times\frac{\cdot62}{\cdot41}$	$15\times4\times4\times\frac{\cdot62}{\cdot46}$
16		$15\times4\times4\times\frac{\cdot62}{\cdot46}$	$15\times4\times4\times\frac{\cdot62}{\cdot46}$	$15\times4\times4\times\frac{\cdot62}{\cdot50}$	
17					
18					
19					
20					
21					
22					
23					
24					

(1) The sizes of stiffeners are specified in inches.
(2) Sizes for intermediate lengths of stiffeners and heights of bulkhead deck shall be determined by interpolation.
(3) In the case of Channel Sections the lower thickness is that of the web and the upper thickness that of the flange.
(4) The above stiffeners shall comply with the specifications set forth in British Standard Specifications Numbers 6–1924 and 4–1932 applicable to stiffeners of the scantlings and type indicated.

TABLE 4

(paragraphs 2, 8 and 10 of this Schedule)

END CONNECTIONS FOR STIFFENERS

Type and Depth of Stiffener	Bracket End Connections			Lug End Connections
	Thickness of Bracket in inches	Width of Flange in inches	Number and Size of Rivets in each arm of Bracket	Number and Size of Rivets in Lugs
Angles 6″ and under ...	·34		3 @ $\frac{3}{4}$″ diameter	2 @ $\frac{3}{4}$″ diameter
Bulb Angles 6″ and under	·36		3 @ $\frac{3}{4}$″ ,,	2 @ $\frac{3}{4}$″ ,,
Bulb Angles 7″	·40		4 @ $\frac{3}{4}$″ ,,	3 @ $\frac{3}{4}$″ ,,
,, ,, 8″	·42		5 @ $\frac{3}{4}$″ ,,	3 @ $\frac{3}{4}$″ ,,
,, ,, 9″	·34	$2\frac{1}{4}$	6 @ $\frac{3}{4}$″ ,,	4 @ $\frac{3}{4}$″ ,,
,, ,, 10″	·36	$2\frac{1}{2}$	7 @ $\frac{3}{4}$″ ,,	4 @ $\frac{3}{4}$″ ,,
,, ,, 11″	·38	$2\frac{3}{4}$	7 @ $\frac{7}{8}$″ ,,	4 @ $\frac{7}{8}$″ ,,
,, ,, 12″	·4	3	8 @ $\frac{7}{8}$″ ,,	5 @ $\frac{7}{8}$″ ,,
Channels 12″×3½″×3½″	·4	3	9 @ $\frac{7}{8}$″ ,,	6 @ $\frac{7}{8}$″ ,,
,, 12″×4″×4″ ...	·4	3	10 @ $\frac{7}{8}$″ ,,	7 @ $\frac{7}{8}$″ ,,
,, 15″×4″×4″ ...	·44	$3\frac{1}{2}$	13 @ $\frac{7}{8}$″ ,,	8 @ $\frac{7}{8}$″ ,,

Flanged

(1) The distance from the heel of the boundary bar to the extremities of the arms of the bracket shall not be less than two and one-half times the depth of the stiffener to which the bracket is connected.

(2) The overlap of stiffeners on brackets shall not be less than ·12 of the span.

TABLE 5
(paragraphs 5 and 8 of this Schedule)

SIZES OF TUNNEL STIFFENERS SPACED 36 INCHES APART

Mean Height from Base of Tunnel to Bulkhead Deck in feet	Height from Base of Tunnel to the Top of Flat Side in feet					
	3	4	5	6	7	8
12	3×2½×·24	4×2½×·26	4½×3×·30	5×3×·34	6×3×·32	5½×3×·32
16	3½×2½×·25	4×3×·30	5×3×·32	6×3×·32	5½×3×·32	6×3×·34
20	3½×2½×·26	4½×3×·30	6×3×·32	6×3×·38	6×3×·34	7×3×·33
24	4×2½×·28	5×3×·32	6×3×·32	5½×3×·37	6×3½×·35	7×3×·36
28	4×3×·30	5×3×·36	6×3×·40	6×3×·34	7×3×·33	8×3×·35
32	4½×3×·30	6×3×·32	5½×3×·37	7×3×·33	7×3×·38	8×3×·37
36	4½×3×·32	6×3×·32	6×3×·34	7×3×·33	7×3×·45	8×3×·42
40	4½×3×·34	6×3×·38	6×3×·35	7×3×·36	8×3×·37	9×3½×·38
44	5×3×·32	6×3×·40	7×3×·33	8×3×·35	8×3×·42	9×3½×·38
48	5×3×·36	5½×3×·32	7×3×·33	8×3×·35	8×3½×·46	9×3½×·45
52	6×3×·32	5½×3×·37	7×3×·36	8×3×·37	9×3½×·38	10×3½×·40
56	6×3×·32	6×3×·34	7×3×·36	8×3×·42	9×3½×·38	10×3½×·40
60	6×3×·32	6×3×·35	8×3×·35	8×3½×·46	9×3½×·51	10×3½×·50
	← Angles →	← Bulb Angles →				

Angles

(1) The sizes of the stiffeners are specified in inches.
(2) Sizes for intermediate heights shall be determined by interpolation.
(3) Angle stiffeners of 6 inches in depth and all bulb angle stiffeners shall be connected to the inner bottom plating by a lug.
(4) The above stiffeners shall comply with the specifications set forth in British Standard Specifications 4A–1934 and 6–1924 applicable to stiffeners of the scantlings and type indicated.

TABLE 1A

(paragraphs 8 and 10 of this Schedule)

THICKNESSES OF BULKHEAD AND TUNNEL PLATING

Plating of Collision Bulkhead: Stiffeners spaced 24 inches apart. Plating of Bulkheads (other than the Collision Bulkhead) and Flat Plating of Tunnels: Stiffeners spaced 30 inches apart Curved Plating of Tunnels: Stiffeners spaced 36 inches apart			Plating of Bulkheads (other than the Collision Bulkhead) and Flat Plating of Tunnels: Stiffeners spaced 36 inches apart		
Depth at Middle Line from Bulkhead Deck to Lower Edge of Plate in feet		Thickness in inches	Depth at Middle Line from Bulkhead Deck to Lower Edge of Plate in feet		Thickness in inches
Above	*Not above*		*Above*	*Not above*	
—	7	·18	—	8	·22
7	9	·20	8	10	·24
9	11	·22	10	12	·26
11	14	·24	12	14	·28
14	16·5	·26	14	16	·30
16·5	19	·28	16	18	·32
19	22	·30	18	21	·34
22	25	·32	21	23	·36
—	—	—	23	26	·38
25	28	·34	26	29	·40
28	31	·36	29	31·5	·42

If the stiffeners are spaced otherwise than is specified above, the thicknesses of the plating shall be such as will result in a strength equivalent to that resulting from the thicknesses and spacings specified above.

TABLE 2A
(paragraphs 8 and 10 of this Schedule)

SIZES OF BULKHEAD STIFFENERS SPACED 30 INCHES APART AND FITTED WITH BRACKET END CONNECTIONS AT TOP AND BOTTOM IN ACCORDANCE WITH TABLE 4

Overall Length of Stiffener, including End Connections, in feet		Height of Bulkhead Deck above Top of Stiffener, in feet									
		0	2	4	6	8	10	12	14	16	18
6	Angles					4×2½×·25	4×2½×·26	4×3×·30	4×3×·34	4½×3×·30	4½×3×·32
7						4½×2½×·28	4½×3×·30	4½×3×·32	5×3×·30	5×3×·34	5×3×·36
8		3×2½×·24	3½×2½×·26	4×2½×·28	4½×3×·30	5×3×·30	6×3×·32	6×3×·32	6×3×·32	5×2½×·34	5×2½×·34
9		3½×2½×·26	4×2½×·28	4½×3×·30	5×3×·30	6×3×·32	6×3×·32	5×2½×·34	5×2½×·36	5½×3×·32	5½×3×·34
10		4×2½×·28	4½×3×·30	5×3×·32	6×3×·32	5×2½×·34	5×2½×·36	5½×3×·34	5½×3×·37	6×3×·34	6×3×·35
11		4½×3×·30	5×3×·32	6×3×·32	5×2½×·34	5½×3×·32	5½×3×·34	6×3×·34	7×3×·33	7×3×·33	7×3×·36
12		5×3×·32	6×3×·32	5×2½×·34	5½×3×·32	6×3×·34	6×3×·35	7×3×·33	7×3×·36	7×3×·36	8×3×·35
13		6×3×·32	5×2½×·34	5½×3×·32	6×3×·34	7×3×·33	7×3×·33	7×3×·36	8×3×·35	8×3×·35	
14	Bulb Angles	5×2½×·34	5½×3×·32	6×3×·34	7×3×·33	7×3×·36	7×3×·38	8×3×·35	8×3×·37	8×3×·37	
15		5½×3×·32	6×3×·34	7×3×·33	7×3×·36	7×3×·40	8×3×·35	8×3×·37	8×3½×·46		
16		6×3×·34	7×3×·33	7×3×·36	8×3×·35	8×3×·37	8×3×·37	8×3½×·46	9×3½×·38		
17		7×3×·33	7×3×·36	8×3×·35	8×3×·37	8×3½×·46	9×3½×·38	9×3½×·38			
18		7×3×·36	8×3×·35	8×3×·37	8×3½×·46	9×3½×·38	9×3½×·38	9×3½×·51			
19		8×3×·35	8×3×·37	8×3½×·46	9×3½×·38	9×3½×·40	9×3½×·51				
20		8×3×·37	8×3½×·46	9×3½×·38	9×3½×·40	9×3½×·51	10×3½×·40				

(1) The sizes of stiffeners are specified in inches.
(2) Sizes for intermediate lengths of stiffeners and heights of bulkhead deck shall be determined by interpolation.
(3) The above stiffeners shall comply with the specifications set forth in British Standard Specifications 4A–1934 and 6–1924 applicable to stiffeners of the scantlings and type indicated.

TABLE 3A

(paragraphs 8 and 10 of this Schedule)

SIZES OF BULKHEAD STIFFENERS SPACED 30 INCHES APART AND FITTED WITH LUG END CONNECTIONS AT TOP AND BOTTOM IN ACCORDANCE WITH TABLE 4

Overall Length of Stiffener, including End Connections, in feet		Height of Bulkhead Deck above Top of Stiffener, in feet									
		0	2	4	6	8	10	12	14	16	18
8	Angles					6×3×·32	6×3×·38	5½×3×·32	5½×3×·35	6×3×·34	6×3½×·35
9			5×3×·32	6×3×·32	6×3×·36	5½×3×·32	5½×3×·37	6×3×·34	7×3×·33	7×3×·33	7×3×·36
10		5×3×·30	6×3×·32	6×3×·38	5½×3×·34	6×3½×·35	7×3×·33	7×3×·33	7×3×·36	7×3×·41	8×3×·35
11		6×3×·32	5½×3×·32	5½×3×·38	6×3½×·35	7×3×·33	7×3×·36	7×3×·41	8×3×·35	8×3×·37	8×3×·42
12		6×3×·36	6×3×·34	6×3×·39	7×3×·33	7×3×·40	8×3×·35	8×3×·35	8×3×·42	9×3½×·38	9×3½×·38
13	Bulb Angles	6×3×·34	7×3×·33	7×3×·33	7×3×·41	8×3×·35	8×3×·40	8×3½×·46	9×3½×·38	9×3½×·44	
14		7×3×·33	7×3×·36	8×3×·35	8×3×·37	8×3½×·46	9×3½×·38	9×3½×·40	9×3½×·51	10×3½×·40	
15		7×3×·33	8×3×·35	8×3×·37	8×3½×·46	9×3½×·38	9×3½×·51	10×3½×·40	10×3½×·42		
16		7×3×·40	8×3×·37	8×3½×·46	9×3½×·38	9×3½×·51	10×3½×·40	10×3½×·50	11×3½×·43		
17		8×3×·35	8×3½×·46	9×3½×·38	9×3½×·51	10×3½×·40	11×3½×·43	11×3½×·43			
18		8×3½×·46	9×3½×·38	9×3½×·51	10×3½×·42	11×3½×·43	11×3½×·45	12×3½×3½×·50/·38			
19		9×3½×·38	9×3½×·51	10×3½×·42	11×3½×·43	11×3½×·48	12×3½×3½×·50/·38				
20		9×3½×·51	10×3½×·42	11×3½×·43	11×3½×·48	12×3½×3½×·50/·38	12×3½×3½×·50/·44				
						← Channels →					

(1) The sizes of stiffeners are specified in inches.
(2) Sizes for intermediate lengths of stiffeners and heights of bulkhead deck shall be determined by interpolation.
(3) In the case of Channel Sections the lower thickness is that of the web and the upper thickness that of the flange.
(4) The above stiffeners shall comply with the specifications set forth in British Standard Specifications Numbers 4A–1934, 6–1924 and 4–1932 applicable to stiffeners of the scantlings and type indicated.

TABLE 3B

(paragraphs 8 and 10 of this Schedule)

SIZES OF BULKHEAD STIFFENERS SPACED 30 INCHES APART NOT FITTED WITH BRACKET OR LUG END CONNECTIONS

Overall Length of Stiffener, including End Connections, in feet		Height of Bulkhead Deck above Top of Stiffener, in feet									
		0	2	4	6	8	10	12	14	16	18
6	Angles	3×2½×·23	3½×2½×·26	4×2½×·28	4×3×·32	4½×3×·32	5×3×·32	6×3×·32	6×3×·32	6×3×·34	6×3×·38
7		3½×2½×·25	4×2½×·28	4½×3×·30	5×3×·32	6×3×·32	6×3×·32	6×3×·38	5½×3×·32	5½×3×·34	6×3×·34
8		4×2½×·25	4½×3×·30	5×3×·34	6×3×·32	6×3×·38	5½×3×·32	6×3×·34	6×3×·35	7×3×·33	7×3×·33
9		4½×3×·30	6×3×·32	6×3×·34	5½×3×·32	6×3×·34	6×3½×·35	7×3×·33	7×3×·36	7×3×·38	8×3×·35
10		6×3×·32	6×3×·34	5½×3×·32	6×3×·34	7×3×·33	7×3×·36	7×3×·38	8×3×·35	8×3×·35	8×3×·37
11		6×3×·32	5½×3×·32	6×3×·35	7×3×·33	7×3×·36	8×3×·35	8×3×·35	8×3×·40	8×3½×·46	9×3½×·38
12	Bulb Angles	5½×3×·32	6×3×·35	7×3×·33	7×3×·40	8×3×·35	8×3×·37	8×3×·40	9×3½×·38	9×3½×·40	9×3½×·51
13		6×3×·34	7×3×·33	7×3×·40	8×3×·35	8×3×·42	9×3½×·38	9×3½×·38	9×3½×·40	10×3½×·40	
14		7×3×·33	7×3×·40	8×3×·37	8×3½×·46	9×3½×·38	9×3½×·45	10×3½×·40	10×3½×·42	10×3½×·50	
15		7×3×·38	8×3×·37	8×3½×·44	9×3½×·38	9×3½×·51	10×3½×·40	10×3½×·50	11×3½×·43		
16		8×3×·35	8×3½×·46	9×3½×·38	9×3½×·51	10×3½×·40	11×3½×·43	11×3½×·50	11×3½×·52		
17		8×3×·42	9×3½×·38	9×3½×·51	10×3½×·45	11×3½×·43	11×3½×·50	11×3½×·56			
18		9×3½×·38	9×3½×·51	10×3½×·45	11×3½×·43	11×3½×·50	12×3½×3½×·50/·38	12×3½×3½×·50/·44			
19		9×3½×·51	10×3½×·42	11×3½×·43	11×3½×·52	12×3½×3½×·50/·38	12×3½×3½×·60/·44				
20		10×3½×·40	11×3½×·43	11×3½×·50	12×3½×3½×·50/·38	12×3½×3½×·60/·44	12×4×4×·60/·48				
		← Channels →									

(1) The sizes of stiffeners are specified in inches.
(2) Sizes for intermediate lengths of stiffeners and heights of bulkhead deck shall be determined by interpolation.
(3) The ends of the stiffeners shall be riveted to the bulkhead boundary angle.
(4) In the case of Channel Sections the lower thickness is that of the web and the upper thickness that of the flange.
(5) The above stiffeners shall comply with the specifications set forth in British Standard Specifications Numbers 4A–1934, 6–1924 and 4–1932 applicable to stiffeners of the scantlings and type indicated.

TABLE 5A

(paragraphs 8 and 10 of this Schedule)

SIZES OF TUNNEL STIFFENERS SPACED 36 INCHES APART

Mean Height from Base of Tunnel to Bulkhead Deck in feet	Height from Base of Tunnel to Top of Flat Side in feet						
	3 feet 0 inches	3 feet 6 inches	4 feet 0 inches	4 feet 6 inches	5 feet 0 inches	5 feet 6 inches	6 feet 0 inches
8	$2\frac{1}{2}\times2\frac{1}{2}\times\cdot20$	$2\frac{1}{2}\times2\frac{1}{2}\times\cdot24$	$3\times2\frac{1}{2}\times\cdot23$				
12	$2\frac{1}{2}\times2\frac{1}{2}\times\cdot24$	$3\times2\frac{1}{2}\times\cdot26$	$3\frac{1}{2}\times2\frac{1}{2}\times\cdot25$	$4\times2\frac{1}{2}\times\cdot25$	$4\times2\frac{1}{2}\times\cdot28$	$4\times3\times\cdot30$	
16	$3\times2\frac{1}{2}\times\cdot24$	$3\frac{1}{2}\times2\frac{1}{2}\times\cdot26$	$4\times2\frac{1}{2}\times\cdot26$	$4\times3\times\cdot32$	$4\frac{1}{2}\times3\times\cdot32$	$5\times3\times\cdot32$	$5\times3\times\cdot38$
20	$3\frac{1}{2}\times2\frac{1}{2}\times\cdot25$	$4\times2\frac{1}{2}\times\cdot26$	$4\times3\times\cdot32$	$4\frac{1}{2}\times3\times\cdot34$	$5\times3\times\cdot32$	$6\times3\times\cdot32$	$6\times3\times\cdot32$
24	$3\frac{1}{2}\times2\frac{1}{2}\times\cdot30$	$4\times3\times\cdot30$	$4\frac{1}{2}\times3\times\cdot32$	$5\times3\times\cdot32$	$6\times3\times\cdot32$	$6\times3\times\cdot34$	$6\times3\times\cdot40$
28	$4\times2\frac{1}{2}\times\cdot28$	$4\frac{1}{2}\times3\times\cdot30$	$4\frac{1}{2}\times3\times\cdot38$	$5\times3\times\cdot38$	$6\times3\times\cdot32$	$6\times3\times\cdot40$	$5\frac{1}{2}\times3\times\cdot34$ Bulb Angles

Angles

(1) The sizes of the stiffeners are specified in inches.

(2) Sizes for intermediate heights shall be determined by interpolation.

(3) The ends of tunnel stiffeners shall be riveted to the tunnel boundary angles.

(4) The above stiffeners shall comply with the specifications setforth in British Standard Specifications Numbers 4A–1934 and 6–1924 applicable to stiffeners of the scantlings and type indicated.

FIFTH SCHEDULE Rule 55

PROVISION FOR CINEMATOGRAPH EXHIBITIONS

1. *Exits from Public Rooms*

Any public room in which cinematograph exhibitions are intended to be given shall be provided with means of escape which are remote from the projector and are adequate having regard to the number of persons who may be in the audience. The doors by which such escape may be made shall be clearly marked with the word " Exit," and shall be so constructed as easily to open outwards. The seating shall be arranged in rows for the exhibitions so as not to interfere with free access to such doors.

2. *Storage of films*

(1) There shall be provided in the ship:

(*a*) a storage room bounded by " A " class divisions; or

(*b*) a locker constructed of material capable of resisting fire as efficiently as an " A " class division,

appropriated solely for the storage of cinematograph films intended to be exhibited in the ship. Such storage room or locker, as the case may be, shall, whenever practicable, be situated on an upper deck and in a position remote from passenger spaces. It shall be provided with an outlet to the open air with an area of not less than one square inch for each 5 pounds weight of film that may be stored in the room or locker.

(2) A metal spool box, with means of closure which will prevent the passage of flame into the box, shall be provided for the storage and projection of each spool of film, and shall be capable of being attached to and removed from the projector without being opened. Metal containers with self-closing lids shall be provided in sufficient number for the storage of the spool boxes.

3. *Projector rooms and cabinets*

(1) If the ship is provided with a film projector intended for giving cinematograph exhibitions in a public room therein, not being a portable projector, there shall be provided in the ship:—

(*a*) a permanent projector room, which shall be bounded by " A " class divisions, and to which access shall be obtained from a space in which the audience are not accommodated, and shall, whenever practicable, be from the open air; or

(*b*) a fixed or portable projector cabinet made wholly of, or lined with, incombustible material.

In the following sub-paragraphs of this paragraph the expression " projector room " shall be deemed to include a projector cabinet.

(2) All fittings in the projector room shall be made wholly of, or lined with, incombustible material. The projector room shall be large enough to enable the projector to be properly operated.

(3) Every entrance to a projector room shall be provided with a self-closing door which shall open outwards and shall be well-fitting and as effective in resisting fire as the structure in which it is fitted.

(4) There shall not be provided more than two openings in the structure of the projector room for each projector in the room, whether for the projection of light or the observation of the screen. The openings shall be no larger than is required for such purposes and shall be glazed with stout plate glass.

(5) Means shall be provided which will ensure an adequate supply of fresh air within the projector room. The ventilation openings shall be covered with wire netting of mesh not less than 16 per square inch. The ventilation shall, wherever practicable, be to the open air.

(6) The openings in the projector room for projection, observation and ventilation purposes shall be fitted with close-fitting self-closing shutters capable of being simultaneously released. Means for releasing the shutters shall be provided both inside and outside the projector room. All openings through which cables pass into the projector room shall be sealed in a manner which will prevent the passage of smoke. The projector room and the doors and shutters thereof shall be so constructed that when the doors and shutters are closed the passage of smoke from the projector room will be prevented.

(7) Separate electrical circuits shall be provided for the illuminant of the projector and for the lighting of the projector room. The supply of electrical energy for the illuminant of the projector shall be capable of being controlled by two switches situated respectively inside the projector room and outside the projector room at a position sufficiently distant therefrom to enable the switch to be safely operated despite a fire in the projector room.

(8) Devices shall be provided which will prevent the films from coming into contact with any electric lamp, terminal or other electrical fitting within the projector room. All switches and fuses in the projector room shall be completely protected, and all resistances in that room shall be of a design which will prevent overheating.

4. *Projectors*

Every projector, not being a portable projector, provided in the ship and intended for giving cinematograph exhibitions in a public room therein shall be firmly fixed in position and shall rest upon supports constructed of incombustible material. The projector shall be fitted with a metal shutter which can be readily inserted by hand between the projector lamp and the film-gate, and with a second shutter so arranged as automatically to cut off the film-gate from the illuminant when the projector stops. The film-gate shall be of substantial construction and shall afford sufficient heating surface to dissipate the heat which may be engendered by the illuminant. The opening for the film shall be sufficiently narrow to prevent flames travelling upwards or downwards from the light-opening.

5. *Exhibitions on deck*

If the ship is provided with a projector, not being a portable projector, intended for giving cinematograph exhibitions on an open deck, and the illuminant of such projector is not hermetically sealed in a glass bulb, the provisions of paragraphs 3 and 4 of this Schedule shall apply to the ship and to the projector as they apply in the case of a ship provided with a projector, not being a portable projector, intended for giving cinematograph exhibitions in a public room.

6. *Portable projectors*

(1) Portable projectors and the illuminant thereof shall be enclosed in casing constructed of incombustible material. There shall be no openings in such casing other than those necessary for the proper operation of the projector and for ventilation of the projector casing.

(2) Spool boxes for use with portable projectors shall be so designed that they cannot contain a reel exceeding 10 inches in diameter.

(3) The electric lamp provided as the illuminant for a portable projector shall be hermetically sealed in a glass bulb and shall not exceed 1,000 watts in power.

(4) Every portable projector shall be provided with a filter or other device which shall be permanently attached thereto and shall be capable of intercepting the heat in the light rays emitted by the illuminant so as to prevent the ignition of a stationary inflammable film if the film is exposed to the rays for a period of three minutes.

7. *Illuminant for projectors*

The Illuminant provided for a projector shall be an electric lamp.

8. " *No Smoking* " *notices*

(1) Legible notices prohibiting smoking within 3 feet of the projector or of the projector room or cabinet, as the case may be, shall be provided for display to the audience.

(2) Legible notices prohibiting smoking shall be provided for display in the projector room or cabinet, as the case may be, the re-winding room, if any, and the film storage room.

SIXTH SCHEDULE Rule 59

AUTOMATIC SPRINKLER, FIRE ALARM AND FIRE DETECTION SYSTEM

1. *Type and charging of system*

The automatic sprinkler and fire alarm and detection system shall be of the wet type with overhead sprinklers, and shall at all times be fully charged.

2. *Details of the system*

The system shall comply with the following requirements:—

(*a*) Pressure tank:—

(i) A pressure tank of adequate strength and construction having regard to the charge of water specified in this sub-paragraph shall be provided and shall have a capacity of net less than twice the standing charge of fresh water required for the automatic operation of the system. A standing charge of not less than 500 gallons of fresh water shall be capable of being maintained in the pressure tank under an air pressure of not less than 70 lb. per square inch plus the pressure due to a head of water measured from the bottom of the tank to the highest sprinkler in the system.

(ii) The pressure tank shall be fitted with an efficient relief valve and with a water gauge glass and a pressure gauge. Stop valves or cocks shall be provided at each of the gauge connections.

(*b*) Air Compressor:—

The pressure tank shall be connected to an air compressor capable of maintaining in the tank the pressure required by sub-paragraph (*a*) of this paragraph.

(*c*) Pipes:—

(i) The pipes forming part of the system shall be made of steel of adequate strength having regard to the pressure to which they may be subjected, and shall be properly jointed and supported.

(ii) Connections shall be provided which will supply a replenishment of the standing fresh water charge in the pressure tank, and which will enable the pipes to be flushed with fresh water after the use of salt water in the system.

(iii) Any pipes which may be affected by frost shall be insulated so as to prevent the water therein from freezing.

(*d*) External Connections:—

The sprinkler system shall be a self-contained unit, and no external connections shall be fitted to it other than the following:—

(i) Hose couplings with shut-off valves, and non-return valves situated close to the couplings, for the purpose of coupling to a shore supply.

(ii) A connection with the ship's fire main, provided with a shut-off screw-down non-return valve at the connection which will prevent a back flow from the sprinkler system to the fire main. Shut-off valves for the shore supply and the ship's fire main connection shall be clearly and permanently marked to show their purpose, and shall be capable of being locked in the closed position.

(*e*) Pump:—

(i) An independent power pump shall be provided solely for the purpose of continuing automatically the discharge of water from the sprinkler heads. The pump shall be brought into action automatically by the pressure drop in the system before the standing fresh water charge in the pressure tank is completely exhausted.

(ii) The pump shall have a suction direct from the sea which shall be independent of any other suction. The pump shall have fitted close to it on the delivery side a 2 inch diameter waste valve with a short open-ended discharge pipe for testing purposes.

(iii) The arrangements shall be such as will prevent the pump from passing sea water into the pressure tank.

(iv) The pump shall be capable of maintaining a pressure of 25 lb. per square inch at the level of the highest sprinkler with the 2 inch diameter waste valve fully open.

(*f*) Sprinkler Heads:—

(i) Sprinkler heads shall be grouped into separate sections, each of which contains not more than 150 sprinkler heads. A section of sprinkler heads shall not serve more than two decks, and shall not be in more than one main vertical zone or in more than one watertight compartment. Provided that, in any ship, a section of sprinkler heads may serve more than two decks or be in more than one main vertical zone if the Minister is satisfied that the protection of the ship against fire is thereby improved.

(ii) Each section of sprinkler heads shall be controlled by one control valve, and no other valves shall be provided for controlling any of the sprinklers in that section. The control valves shall be readily accessible, and their locations shall be clearly and permanently indicated. Means shall be provided to prevent the operation of the control valves by any person not authorised to do so by the master of the ship.

(iii) A pressure gauge shall be provided at each control valve and at a central station to indicate the pressure of water available throughout the system.

(iv) The sprinkler heads shall be capable of operating with salt water and shall come into operation at a temperature of not less than 155°F. (68°C.). They shall come into operation at a temperature of not more than 200°F. (93°C.), except in drying rooms and similar spaces.

(v) Each sprinkler head shall be capable of discharging water at a rate of not less than 20 gallons of water per minute under a supply pressure of 25 lb. per square inch.

(vi) At least six spare sprinkler heads shall be provided for each section. They shall be stowed in boxes or holders provided for that purpose near the control valve for the section, and the boxes or holders shall be clearly and permanently marked to show their contents.

(*g*) Spacing of Sprinkler Heads:—

Sprinkler heads shall be spaced not more than 13 feet apart and not more than 6 feet 6 inches from a bulkhead. They shall be placed as clear as may be of beams or other objects likely to obstruct the projection of water and in such positions that all combustible material in the space concerned will be well sprayed.

(*h*) Automatic Alarm:—

The sprinkler system shall include means for giving a visible and audible alarm signal automatically whenever any sprinkler comes into operation. The alarm signal shall indicate at one or more points in the ship, so as to come rapidly to the attention of the master and crew of the ship, the presence and position of any fire in the spaces served by the system. If such alarm is operated by electricity it shall be constructed so as to operate if any derangement occurs in the electrical circuit.

(*i*) Power Supply:—

There shall be provided not less than two sources of power to operate the independent pump, air compressor and automatic alarm.

(*j*) Provisions for Testing:—

(i) A test valve shall be provided for testing the automatic alarm for each section of sprinklers by a discharge of water equivalent to the operation of one sprinkler head. The test valve for each section shall be situated near the control valve for that section.

(ii) Means shall be provided for testing the automatic cutting in of the pump.

(iii) Switches shall be provided at one of the points referred to in sub-paragraph (*h*) of this paragraph which will enable the alarm and the indicators for each section of sprinklers to be tested.

EXPLANATORY NOTE

(This Note is not part of the Rules, but is intended to indicate their general purport)

These Rules arrange British passenger steamers registered in the United Kingdom into classes according to the voyages on which they are engaged and regulate the construction and equipment (other than equipment for which provision is made in other rules—see S.I. 1952/1949, S.I. 1952/1950, S.I. 1952/1952, S.I. 1952/1956, S.I. 1952/1957 and S.R. & O. 1910/1113; Rev. XIV, p. 515; 1910, p. 457) of each class of steamer with regard to *inter alia* watertight subdivision, bilge pumping arrangements, electrical equipment and installations, fire protection, boilers and machinery. The Rules include such requirements as appear to the Minister of Transport to implement the provisions of the International Convention for the Safety of Life at Sea, 1948.

1952 No. 1977

The Merchant Shipping (Dangerous Goods) Rules, 1952

Made - - - -	12*th November*, 1952
Laid before Parliament	13*th November*, 1952
Coming into Operation	19*th November*, 1952

The Minister of Transport in exercise of the powers conferred upon him by Section 23 of the Merchant Shipping (Safety Convention) Act, 1949(a) and of all other powers him enabling in that behalf hereby makes the following Rules:—

Interpretation

1.—(1) These Rules shall come into operation on the 19th day of November, 1952, and may be cited as the Merchant Shipping (Dangerous Goods) Rules, 1952.

(2) In these Rules, unless the context otherwise requires, the following expressions have the meanings hereby respectively assigned to them, that is to say:—

"Explosive" has the same meaning as in the Explosives Act, 1875(b);

"The Minister" means the Minister of Transport;

"Steamer" includes a ship propelled by electricity or other mechanical power.

(3) Rules 2 to 8 of these Rules apply to—

(*a*) British ships registered in the United Kingdom;

(*b*) other ships while they are loading cargo within any port in the United Kingdom or within the territorial waters of the United Kingdom.

Rule 9 of these Rules applies to all ships to which Rules 2 to 8 do not apply as aforesaid while they are within any port in the United Kingdom or are embarking or disembarking passengers within the territorial waters of the United Kingdom or are loading or discharging cargo or fuel within these waters.

(4) For the purposes of these Rules, the following shall not be included in the expression "dangerous goods":—

(*a*) goods forming part of the equipment or stores of the ship in which they are carried;

(a) 12, 13 & 14 Geo. 6. c. 43. (b) 38 & 39 Vict. c. 17.