SCHEDULES.

FIRST SCHEDULE

INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1929.

ANNEX I

REGULATIONS.

CONSTRUCTION.

REGULATION I

Definitions.

(1) The *subdivision loadline* is the waterline used in determining the subdivision of the ship.

The *deepest subdivision* loadline is that which corresponds to the greatest draught.

(2) The *length of the ship* is the length measured between perpendiculars taken at the extremities of the deepest subdivision loadline.

(3) The *breadth of the ship* is the extreme width from outside of frame to outside of frame at or below the deepest subdivision loadline.

(4) The *bulkhead deck* is the uppermost deck up to which the transverse watertight bulkheads are carried.

(5) The *margin line* is a line drawn parallel to the bulkhead deck at side and 3 inches (76 millimetres) below the upper surface of that deck at side.

(6) The *draught* is the vertical distance from the top of keel amidships to the subdivision loadline in question.

(7) The *permeability* of a space is the percentage of that space which can be occupied by water.

The volume of a space which extends above the margin line shall be measured only to the height of that line.

(8) The *machinery space* is to be taken as extending from the top of keel to the margin line and between the extreme main transverse watertight bulkheads bounding the spaces devoted to the main and auxiliary propelling machinery, boilers when installed, and all permanent coal bunkers.

(9) *Passenger spaces* are those which are provided for the accommodation and use of passengers, excluding baggage, store, provision and mail rooms.

For the purposes of Regulations III and IV, spaces provided below the margin line for the accommodation and use of the crew shall be regarded as passenger spaces.

(10) In all cases *volumes* shall be calculated to moulded lines.

REGULATION II

Floodable Length.

(1) The floodable length at any point of the length of a ship shall be determined by a method of calculation which takes into consideration the form, draught and other characteristics of the ship in question.

(2) In a ship with a continuous bulkhead deck, the floodable length at a given point is the maximum portion of the length of the ship, having its centre at the point in question, which can be flooded under the definite assumptions hereafter set forth in Regulation III without the ship being submerged beyond the margin line.

(3) In the case of a ship not having a continuous bulkhead deck, the floodable length at any point may be determined to an assumed continuous margin line, up to which, having regard to sinkage and trim after damage, the sides of the ship and the bulkheads concerned are carried watertight.

REGULATION III

Permeability.

(1) The definite assumptions referred to in Regulation II relate to the permeabilities of the spaces below the margin line.

In determining the floodable length, a uniform average permeability shall be used throughout the whole length of each of the following portions of the ship below the margin line :—

(a) the machinery space as defined in Regulation I (8);

(b) the portion forward of the machinery space; and

(c) the portion abaft the machinery space.

(2) (a) For steamships the uniform average permeability throughout the machinery space shall be determined from the formula—

$$80 + 12{\cdot}5\left(\frac{a - c}{v}\right)$$

, where

a = volume of the passenger spaces, as defined in Regulation I (9), which are situated below the margin line within the limits of the machinery space.

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

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

(b) For ships propelled by internal combustion engines, the uniform average permeability shall be taken as 5 greater than that given by the above formula.

(c) Where it is shown to the satisfaction of the Administration that the average permeability, as determined by detail calculation, is less than that given by the formula, the calculated value may be substituted. For the purposes of such calculation, the permeabilities of passenger spaces, as defined in Regulation I (9), shall be taken as 95, that of all cargo, coal and store spaces as 60, and that of double bottom, oil fuel and other tanks at such values as may be approved in each case by the Administration.

(3) The uniform average permeability throughout the portion of the ship before (or abaft) the machinery space shall be determined from the formula—

$$63 + 35\,\frac{a}{v}$$

, where

a = volume of the passenger spaces, as defined in Regulation I (9), which are situated below the margin line, before (or abaft) the machinery space, and

v = whole volume of the portion of the ship below the margin line before (or abaft) the machinery space.

(4) If a between deck compartment between two watertight transverse bulkheads contains any passenger or crew space, the whole of that compartment, less any space completely enclosed within permanent steel bulkheads and appropriated to other purposes, shall be regarded as passenger space. If, however, the passenger or crew space in question is completely enclosed within permanent steel bulkheads, only the space so enclosed need be considered as passenger space.

REGULATION IV

Permissible Length of Compartments.

(1) *Factor of Subdivision*.—The maximum permissible length of a compartment having its centre at any point in the ship's length is obtained from the floodable length by multiplying the latter by an appropriate factor called the factor of subdivision.

The factor of subdivision shall depend on the length of the ship, and for a given length shall vary according to the nature of the service for which the ship is intended. It shall decrease in a regular and continuous manner—

(a) as the length of the ship increases, and

(b) from a factor A, applicable to ships primarily engaged in the carriage of cargo, to a factor B, applicable to ships primarily engaged in the carriage of passengers.

The variations of the factors A and B shall be expressed by the following formulae (i) and (ii), where L is the length of the ship as defined in Regulation I (2) :—

L in feet.

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

L in metres.

$$A = \frac{58 \cdot 2}{L - 60} + \cdot 18 \quad (L = 131 \text{ and upwards}). \qquad \text{.....(i)}$$

L in feet.

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

L in metres.

$$B = \frac{30 \cdot 3}{L - 42} + \cdot 18 \text{ (L = 79 and upwards).} \quad \text{.....(ii)}$$

(2) *Criterion of Service*.—For a ship of given length the appropriate factor of subdivision shall be determined by the Criterion of Service Numeral (hereinafter called the Criterion Numeral) as given by the following formulae (iii) and (iv), where:—

C_s = the Criterion Numeral;
L = length of the ship, as defined in Regulation I (2);
M = the volume of the machinery space, as defined in Regulation I (8); 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 whole volume of the passenger spaces below the margin line, as defined in Regulation I (9);
V = the whole volume of the ship below the margin line;
P_2 = KN, where :—

N = number of passengers for which the ship is to be certified, and

K has the following values:—

	Value of K.
Length in feet and volumes in cubic feet	.6L.
Length in metres and volumes in cubic metres	.056 L.

Where the value of KN is greater than the sum of P and the whole volume of the actual passenger spaces above the margin line, the lower figure may be taken provided that the value of P_1 used is not less than ⅔ KN.

When P, is greater than P

$$C_s = 72 \frac{M + 2P_1}{V + P_1 - P} \quad \text{.....(iii)}$$

and in other cases

$$C_s = 72 \frac{M + 2P}{V} \quad \text{..... (iv)}$$

For ships not having a continuous bulkhead deck the volumes are to be taken up to the actual margin lines used in determining the floodable lengths.

(3) *Rules for Subdivision*.—

(a) *The subdivision abaft the fore peak* of ships 430 feet (131 metres) in length and upwards having a criterion numeral of 23 or less shall be governed by the factor A given by formula (i); of those having a criterion numeral of 123 or more by the factor B given by formula (ii); and of those having a criterion

numeral between 23 and 123 by the factor F obtained by linear interpolation between the factors A and B, using the formula :—

$$F = A - \frac{(A - B)(C_s - 23)}{100} \quad \text{.....(v)}$$

Where the factor F is less than .40 and it is shown to the satisfaction of the Administration to be impracticable to comply with the factor F in a machinery compartment of the ship, the subdivision of such compartment may be governed by an increased factor, which, however, shall not exceed .40.

(b) *The subdivision abaft the fore peak* of ships less than 430 feet (131 metres) but not less than 260 feet (79 metres) in length having a criterion numeral equal to S, where

$$S = \frac{9382 - 20L}{34} \text{ (L in feet)} = \frac{3574 - 25L}{13} \text{ (L in metres)}$$

shall be governed by the factor unity; of those having a criterion numeral of 123 or more by the factor B given by the formula (ii); of those having a criterion numeral between S and 123 by the factor F obtained by linear interpolation between unity and the factor B, using the formula:—

$$F = 1 - \frac{(1 - B)(C_s - S)}{123 - S} \quad \text{.....(vi)}$$

(c) *The subdivision abaft the fore peak* of ships less than 430 feet (131 metres) but not less than 260 feet (79 metres) in length and having a criterion numeral less than S, and of all ships less than 260 feet (79 metres) in length shall be governed by the factor unity, unless it is shown to the satisfaction of the Administration to be impracticable to comply with this factor in my part of the ship, in which case, the Administration may allow such relaxation as may appear to be justified, having regard to all the circumstances.

(c) The provisions of sub-paragraph (c) shall apply also to ships of whatever length, which are to be certified to carry a lumber of passengers exceeding 12 but not exceeding

$$\frac{L^2 \text{ (in feet)}}{7000} \left(\frac{L^2 \text{ (in metres)}}{650} \right) \text{ or 50, whichever is the less.}$$

REGULATION V.

Special Rules concerning Subdivision.

(1) A compartment may exceed the permissible length determined by the rules of Regulation IV provided the combined length of each pair of adjacent compartments to which the compartment in question is common does not exceed either the floodable length or twice the permissible length, whichever is the less.

If one of the two adjacent compartments is situated inside the machinery space, and the second is situated outside the machinery space, and the average permeability of the portion of the ship in which the second is situated differs from that of the

machinery space, the combined length of the two compartments shall be adjusted to the mean average permeability of the two portions of the ship in which the compartments are situated.

Where the two adjacent compartments have different factors of subdivision, the combined length of the two compartments shall be determined proportionately.

(2) In ships 430 feet (131 metres) in length and upwards, one of the main transverse bulkheads abaft the fore peak shall be fitted at a distance from the forward perpendicular which is not greater than the permissible length.

(3) A main transverse bulkhead may be recessed provided that all parts of the recess lie inboard of vertical surfaces on both sides of the ship, situated at a distance from the shell plating equal to one-fifth the breadth of the ship, as defined in Regulation I (3), and measured at right angles to the centreline at the level of the deepest subdivision loadline.

Any part of a recess which lies outside these limits shall be dealt with as a step in accordance with the following paragraph.

(4) A main transverse bulkhead may be stepped provided that—

(a) the combined length of the two compartments, separated by the bulkhead in question, does not exceed 90 per cent. of the floodable length, or

(b) additional subdivision is provided in way of the step to maintain the same measure of safety as that secured by a plane bulkhead.

(5) Where a main transverse bulkhead is recessed or stepped, an equivalent plane bulkhead shall be used in determining the subdivision.

(6) If the distance between two adjacent main transverse bulkheads, or their equivalent plane bulkheads, or the distance between the transverse planes passing through the nearest stepped portions of the bulkheads, is less than 10 feet (3.05 metres) plus 2 per cent. of the length of the ship, only one of these bulkheads shall be regarded as forming part of the subdivision of the ship in accordance with the provisions of Regulation IV.

(7) Where a main transverse watertight compartment contains local subdivision and it can be shown to the satisfaction of the Administration that, after any assumed side damage extending over a length of 10 feet (3.05 metres) plus 2 per cent. of the length of the ship, 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.

(8) Where it is proposed to fit watertight decks, inner skins or longitudinal bulkheads, watertight or non-watertight, the Administration shall be satisfied that the safety of the ship will not be diminished in any respect, particularly having in view the possible listing effect of flooding in way of such structural arrangements.

REGULATION VI

Peak and Machinery Space Bulkheads, Shaft Tunnels, &c.

(1) Every ship shall have a forepeak or collision bulkhead, which shall be watertight up to the bulkhead deck. This bulkhead shall be fitted not less than 5 per cent. of the length of the ship, and not more than 10 feet (3-05 metres) plus 5 per cent. of the length of the ship from the forward perpendicular.

If the ship has a long forward superstructure, the forepeak bulkhead shall be extended weathertight to the deck next above the bulkhead deck. The extension need not be fitted directly over the bulkhead below, provided 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 effectively weathertight.

(2) An afterpeak bulkhead, and bulkheads dividing the machinery space, as defined in Regulation I (8), from the cargo and passenger spaces forward and aft, shall also be fitted and made watertight up to the bulkhead deck. The afterpeak bulkhead may, however, be stopped below the bulkhead deck, provided the degree of safety of the ship as regards subdivision is not thereby diminished.

(3) In all cases stern tubes shall be enclosed in watertight spaces. The stern gland shall be situated within a watertight shaft tunnel or other space of such volume that if flooded by leakage through the stern gland the margin line will not be submerged.

REGULATION VII

Assigning, Marking and Recording of Subdivision Loadlines.

(1) The subdivision loadlines assigned and marked under the provisions of Article 5 of the Convention shall be recorded in the Safety Certificate, and shall be distinguished by the notation C.I for the principal passenger condition, and C.2, 0.3, &c, for the alternative conditions.

(2) The freeboard corresponding to each of these loadlines inserted in the Safety Certificate shall be measured at the same position and from the same deck line as the freeboards determined by recognised National Freeboard Regulations.

(3) In no case shall any subdivision loadline mark be placed above the deepest loadline in salt water as determined by the strength of the ship and/or recognised National Freeboard Regulations.

(4) Whatever may be the position of the subdivision loadline marks, a ship shall in no case be loaded so as to submerge the loadline mark appropriate to the season and locality as determined by the recognised National Freeboard Regulations.

REGULATION VIII

Construction and Initial Testing of Watertight Bulkheads, &c.

(1) Watertight subdivision bulkheads, whether transverse or longitudinal, shall be constructed in such a manner that they shall be capable of supporting with a proper margin of resistance, the pressure due to a head of water up to the margin line in way of each bulkhead. The construction of these bulkheads shall be to the satisfaction of the Administration.

(2) Steps and recesses in bulkheads shall be watertight and as strong as the bulkhead at the place where each occurs.

Where frames or beams pass through a watertight deck or bulkhead, such deck or bulkhead shall be made structurally watertight without the use of wood or cement.

(3) Testing main compartments by filling them with water is not compulsory. A complete examination of the bulkheads shall be made by a surveyor; and, in addition, a hose test shall be made in all cases.

(4) The fore peak shall be tested with water to a head up to the deepest subdivision loadline.

(5) Double bottoms, including duct keels, and inner skins are to be subjected to a head of water up to the margin line.

(6) Tanks which are intended to hold liquids, and which form part of the subdivision of the ship, shall be tested for tightness with water to a head up to the deepest subdivision loadline or to a head corresponding to two-thirds of the depth from the top of keel to the margin line in way of the tanks, whichever is the greater; provided that in no case shall the test head be less than 3 feet (.92 metre) above the top of the tank.

REGULATION IX

Openings in Watertight Bulkheads.

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

(2) (a) Where pipes, scuppers, electric-light cables, &c, are carried through watertight subdivision bulkheads, arrangements shall be made to ensure the integrity of the watertightness of the bulkheads.

(b) Sluice valves shall not be permitted in the watertight subdivision bulkheads.

(3) (a) No doors, manholes, or access openings are permitted—

(i) in the collision bulkhead below the margin line;

(ii) in watertight transverse bulkheads dividing a cargo space from an adjoining cargo space or from a permanent or reserve bunker, except as provided in paragraph (7).

(b) The collision bulkhead may be pierced below the margin line by not more than one pipe for dealing with fluid in the fore peak tank, provided that the pipe is fitted with a screwdown valve capable of being operated from above the bulkhead deck, the valve chest being secured inside the fore peak to the collision bulkhead.

(4) (a) Watertight doors fitted in bulkheads between permanent and reserve bunkers, shall be always accessible, except as provided in sub-paragraph 9(b) for between deck bunker doors.

(b) Satisfactory arrangements shall be made, by means of screens or otherwise, to prevent the coal from interfering with the closing of watertight bunker doors.

(5) Within the machinery space and apart from bunker and shaft tunnel doors, not more than one door may be fitted in each main transverse bulkhead for

intercommunication. These doors shall be located so as to have the sills as high as practicable.

(6) (a) The only types of watertight doors permissible are hinged doors, sliding doors, and doors of other equivalent patterns, excluding plate doors secured only by bolts.

(b) A hinged door shall be fitted with catches workable from each side of the bulkhead.

(c) A sliding door may have a horizontal or vertical motion. If required to be hand operated only, the gearing shall be capable of being worked at the door itself and also at an accessible position above the bulkhead deck.

(d) If a door is required to be closed by dropping or by the action of a dropping weight, it shall be fitted with a suitable arrangement to regulate the closing movement, and the gearing shall be so arranged that the door can be released both at the door itself and at an accessible position above the bulkhead deck. Hand gear shall also be provided, so arranged as to operate at the door itself and above the bulkhead deck, and also, so that after being disengaged for dropping, it can be quickly re-engaged from either the upper or the lower position.

(e) If a door is required to be power operated from a central control, the gearing shall be so arranged that the door can be operated by power also at the door itself. The arrangement shall be such that the door will close automatically if opened by the local control after being closed from the central control, and also such that any door can be kept closed by local arrangements, which will prevent that door from being opened from the central control. Such power operated doors shall be provided with hand gear, workable both at the door itself and from an accessible position above the bulkhead desk.

(f) In all classes of doors indicators shall be fitted at all operating stations other than at the door itself, showing whether the door is opened or closed.

(7) (a) Hinged watertight doors in passenger, crew, and working spaces are only permitted above a deck, the underside of which, at its lowest point at side, is at least 7 feet (2-13 metres) above the deepest subdivision loadline, and they are not permitted in those spaces below such deck.

(b) Hinged watertight doors of satisfactory construction may be fitted in bulkheads dividing cargo between decks spaces, in levels in which side cargo doors would be permitted under the provisions of Regulation X (11). These doors shall be closed before the voyage commences and shall be kept closed during the voyage, and the time of opening such doors in port and of closing them before the ship leaves port shall be entered in the official log book. Where it is proposed to fit such doors, the number and arrangements shall receive the special consideration of the Administration, and a statement shall be required from the owners certifying as to the absolute necessity of such doors.

(8) All other watertight doors shall be sliding doors.

(9) (a) When any watertight doors which may be sometimes opened at sea, excluding those at the entrances of tunnels, are fitted in the main transverse watertight bulkheads at such a height that their sills are below the deepest subdivision loadline, the following rules shall apply :—

(I) When the number of such doors exceeds five all the watertight sliding doors shall be power operated and shall be capable of

being simultaneously closed from a station situated on the bridge, simultaneous closing of these doors being preceded by a warning sound signal.

(II) When the number of such doors does not exceed five—

(i) if the criterion numeral does not exceed 30, all the watertight sliding doors may be operated by hand only;

(ii) if the criterion numeral exceeds 30, but does not exceed 60, all the watertight sliding doors may be either dropping doors fitted with releasing and hand gear operated at the door and from above the bulkhead deck or doors operated by power;

(iii) if the criterion numeral exceeds 60, all the watertight sliding doors shall be operated by power.

(b) If watertight doors which have sometimes to be open at sea for the purpose of trimming coal are fitted between bunkers in the between-decks below the bulkhead deck, these doors shall be operated by power. The opening and closing of these doors shall be recorded in the official log book.

(c) When trunkways in connection with refrigerated cargo are carried through more than one main transverse watertight bulkhead, and the sills of the openings are less than 7 feet (2-13 metres) above the deepest subdivision loadline, the watertight doors at such openings shall be operated by power.

(10) Portable plates on bulkheads shall not be permitted except in machinery spaces. Such plates shall always be in place before the ship leaves port, and shall not be removed at sea except in case of urgent necessity. The necessary precautions shall be taken in replacing them to ensure that the joints shall be watertight.

(11) All watertight doors shall be kept closed during navigation except when necessarily opened for the working of the ship, and shall always be ready to be immediately closed.

(12) Where trunkways or tunnels for access from crew's accommodation to the stokehold, for piping, or for any other purpose are carried through main transverse watertight bulkheads, they shall be watertight and in accordance with the requirements of Regulation XII. The access to at least one end of each such tunnel or trunkway, if used as a passage at sea, shall be through a trunk extending watertight to a height sufficient to permit access above the margin line. The access to the other end of the trunkway or tunnel may be through a watertight door of the type required by its location in the ship. Such trunkways or tunnels shall not extend through the first subdivision bulkhead abaft the collision bulkhead.

Where it is proposed to fit tunnels or trunkways for forced draft, piercing main transverse watertight bulkheads, these shall receive the special consideration of the Administration.

REGULATION X

Openings in Ship's Sides below the Margin Line.

(1) The arrangement and efficiency of the means for closing any opening in the ship's sides shall be consistent with its intended purpose and the position in which it is fitted and generally to the satisfaction of the Administration.

(2) (a) If in a between decks, the sills of any sidescuttles are below a line drawn parallel to the bulkhead deck at side and having its lowest point 2 ½ per

cent. of the breadth of the ship above the deepest subdivision loadline, all sidescuttles in that between deck shall be of a non-opening type.

(b) If in a between decks, the sills of any sidescuttles other than those required to be of a non-opening type by sub-paragraph (a) are below a line drawn parallel to the bulkhead deck at side and having its lowest point at a height of 12 feet (3.66 metres) plus 2 ½ per cent. of the breadth of the ship above the deepest subdivision loadline, all sidescuttles in that between decks shall be of such construction as will effectively prevent any person opening them without the consent of the master of the ship.

(c) Other sidescuttles may be of any ordinary opening type.

(d) If in a between decks, the .sills of any of the sidescuttles referred to in sub-paragraph (b) are below a line drawn parallel to the bulkhead deck at side and having its lowest point 4 ½ feet (1.37 metres), plus 2 ½ per cent. of the breadth of the ship above the loadline at which the ship is floating on her departure from any port, all the sidescuttles in that between decks shall be closed watertight and locked before the ship leaves port and they shall not be opened during navigation.

The time of opening such sidescuttles in port and of closing and locking them before the ship leaves port shall be entered in the official log book.

The Administration may indicate the limiting mean draught at which these sidescuttles will have their sills above the line defined in this paragraph and at which it will be permissible to open them at sea on the responsibility of the master. In tropical waters in fair weather this limiting draught may be increased by 1 foot (.305 metres).

(3) Efficient hinged inside deadlights arranged so that they can be easily and effectively closed and secured watertight shall be fitted to all sidescuttles—

(a) which are required to be of a non-opening type;

(b) which are to be fitted within one-eighth of the ship's length of the forward perpendicular;

(c) which are to be fitted in positions defined in sub-paragraph (2)(b);

(d) which will not be accessible during navigation;

(e) which are to be fitted in spaces intended for the accommodation of sailors and firemen;

(f) which are to be fitted in spaces intended for the accommodation of steerage passengers.

(4) Sidescuttles fitted below the bulkhead deck, other than those referred to in the preceding paragraph, shall be fitted with efficient inside deadlights which may be portable and stowed adjacent to the sidescuttles.

(5) Sidescuttles and their deadlights, which will not be accessible during navigation, shall be closed and secured before the ship proceeds to sea.

(6) No sidescuttles shall be fitted in any spaces which are appropriated exclusively to the carriage of cargo or coal.

(7) Automatic ventilating sidescuttles shall not be fitted in the ship's sides below the margin line without the special sanction of the Administration.

(8) All machinery and other inlets and discharges in the ship's sides shall be arranged so as to prevent the accidental admission of water into the ship.

(9) The number of scuppers, sanitary discharges and other similar openings in the ship's sides shall be reduced to the minimum either by making each discharge serve for as many as possible of the sanitary and other pipes, or in any other satisfactory manner.

(10) Discharges led through the ship's sides from spaces below the margin line shall be fitted with efficient and accessible means for preventing water from passing inboard. It is permissible to have for each separate discharge either one automatic non-return valve fitted with a positive means of closing it from above the bulkhead deck, or alternatively, two automatic non-return valves without such means, the upper of which valves is so situated above the deepest subdivision loadline as to be always accessible for examination under service conditions.

Where a positive action valve is fitted, the operating position above the bulkhead deck shall always be readily accessible and means shall be provided for indicating whether the valve is open or closed.

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

Cargo and coaling ports which are to be fitted partly or entirely below the deepest subdivision loadline shall receive the special consideration of the Administration.

(12) The inboard opening of each ash-shoot, rubbish-shoot, &c, shall be fitted with an efficient cover.

If the inboard opening is situated below the margin line, the cover shall be watertight, and in addition an automatic non-return valve shall be fitted in the shoot in an easily accessible position above the deepest subdivision loadline. When the shoot is not in use both the cover and the valve shall be kept closed and secured.

REGULATION XI

Construction and Initial Tests of Watertight Doors, Sidescuttles, die.

(1) The design, materials and construction of all watertight doors, sidescuttles, gangway, cargo and coaling ports, valves, pipes, ash-shoots and rubbish-shoots referred to in these Regulations shall be to the satisfaction of the Administration.

(2) Each watertight door shall be tested by water pressure to a head up to the margin line. The test shall be made before the ship is put in service, either before or after the door is fitted.

REGULATION XII

Construction and Initial Tests of Watertight Decks, Trunks, &c.

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

(2) After completion a hose or flooding test shall be applied to watertight decks and a hose test to watertight trunks, tunnels and ventilators.

REGULATION XIII

Periodical Operation and Inspection of Watertight Doors, &c.

In all new and existing ships drills for the operating of watertight doors, sidescuttles, valves, and closing mechanisms of scuppers, ash-shoots and rubbish-shoots, shall take place weekly. In ships in which the voyage exceeds one week in duration a complete drill shall be held before leaving port, and others thereafter at least once a week during the voyage, provided that all watertight power doors and hinged doors, in main transverse bulkheads, in use at sea shall be operated daily.

The watertight doors and all mechanisms and indicators connected therewith, and all valves the closing of which is necessary to make a compartment watertight, shall be periodically inspected at sea, at least once a week.

REGULATION XIV

Entries in the Official Log Book.

In all new and existing ships hinged doors, portable plates, sidescuttles, gangway, cargo and coaling ports and other openings, which are required by these Regulations to be kept closed during navigation, shall be closed before the ship leaves port. The time of closing, and the time of opening (if permissible under these Regulations), shall be recorded in the official log book.

A record of all drills and inspections required by Regulation XIII shall be entered in the official log book with an explicit record of any defects which may be disclosed.

REGULATION XV

Double Bottoms.

(1) In ships 200 feet (61 metres) and under 249 feet (76 metres) in length a double bottom shall be fitted at least from the machinery space to the fore peak bulkhead, or as near thereto as practicable.

(2) In ships 249 feet (76 metres) and under 330 feet (100 metres) in length a double bottom shall be fitted at least outside the machinery space, and shall extend to the fore and after peak bulkheads, or as near thereto as practicable.

(3) In ships 330 feet (100 metres) in length and upwards a double bottom shall be fitted amidships, and shall extend to the fore and after peak bulkheads, or as near thereto as practicable.

(4) Where a double bottom is required to be fitted 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 bilge.

Such protection will be deemed satisfactory if the line of intersection of the outer edge of the margin plate with the bilge plating is not lower at any part than a horizontal plane passing through the point of intersection with the frame line amidships of a transverse diagonal line inclined at 25 degrees to the base line and cutting it at a point one-half the ship's moulded breadth from the middle line.

(5) Wells constructed in the double bottom in connection with the drainage arrangements shall not extend downwards more than necessary, nor shall they be less than 18 inches (457 millimetres) from the outer bottom or from the inner edge of the margin plate. A well extending to the outer bottom is, however, permitted at the after end of the shaft tunnel of screw ships.

REGULATION XVI

Fire-resisting Bulkheads.

Ships shall be fitted above the bulkhead deck with fire-resisting bulkheads which shall be continuous from side to side of the ship and arranged to the satisfaction of the Administration.

They shall be constructed of metal or other fire-resisting material, effective to prevent for one hour, under the conditions for which the bulkheads are to be fitted in the ship, the spread of fire generating a temperature of 1,500° F. (815° C.) at the bulkhead.

Steps and recesses and the means for closing all openings in these bulkheads shall be fire-resisting and flametight.

The mean distance between any two adjacent fire-resisting bulkheads in any superstructure shall in general not exceed 131 feet (40 metres).

REGULATION XVII

Side and other Openings, &c., above the Margin Line.

(1) Sidescuttles, gangway, cargo and coaling ports, and other means for closing openings in the ship's sides above the margin line 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 loadline.

(2) The bulkhead deck or a deck above it shall be weathertight in the sense that in ordinary sea conditions water will not penetrate in a downward direction. All openings in the exposed weather deck shall have coamings of ample height and strength, and shall be provided with efficient means for expeditiously closing them weathertight.

(3) Freeing ports and/or scuppers shall be fitted as necessary for rapidly clearing the weather deck of water under all weather conditions.

REGULATION XVIII

Exits from Watertight Compartments.

(1) In passenger and crew spaces, practicable means of exit to the open deck shall be provided for the occupants from each watertight compartment.

(2) Practicable means of escape for the crew shall be provided from each engine room, shaft tunnel, stokehold compartment, and other working spaces, independent of watertight doors.

REGULATION XIX

Pumping Arrangements.

Steamships.

(1) Ships shall be provided with an efficient pumping plant capable of pumping from and chaining any watertight compartment under all practicable conditions after a casualty whether the ship is upright or listed. For this purpose wing suctions will generally be necessary except hi narrow compartments at the ends of the ship. Where close ceiling is fitted over the bilges, arrangements shall be made whereby water in the

compartment may find its way to the suction pipes. Efficient means shall be provided for draining water from insulated holds.

(2) In addition to the ordinary bilge pump, worked by the main engines, or its equivalent engine room pump, two independent power bilge pumps shall be provided, except that in ships less than 300 feet (91.5 metres) in length, having a criterion numeral less than 30, either two efficient hand pumps of the crank type fitted one forward and one aft, or a portable power pump, may be substituted for one of the additional independent power bilge pumps.

Sanitary, ballast and general service pumps may be accepted as independent power bilge pumps if fitted with the necessary connections to the bilge pumping system.

(3) Where two or more independent power pumps are required, the arrangement shall be such that at least one power pump will be available for use in all ordinary circumstances in which a vessel may be flooded at sea. One of the power pumps shall, therefore, be an emergency pump of a reliable submersible type. A source of power situated above the bulkhead deck shall be available for this pump in any case of emergency.

(4) Where practicable, the power bilge pumps shall be placed in separate watertight compartments so arranged or situated that these compartments will not readily be flooded by the same damage. If the engines and boilers are in two or more watertight compartments, the pumps available for bilge service shall be distributed through these compartments as far as is possible.

(5) With the exception of pumps which may be provided for peak compartments only, each bilge pump, whether operated by hand or by power, shall be arranged to draw water from any hold or machinery compartment in the ship.

(6) Each independent power bilge pump shall be capable of giving a speed of water through the main bilge pipe of not less than 400 feet (122 metres) per minute, and it shall have a separate direct suction, to the compartment in which it is situated of a diameter not less than that of the bilge main. The direct suctions from each independent power bilge pump shall be arranged to pump from either side of the ship.

(7) Main circulating pumps shall have direct suction connections, provided with non-return valves, to the lowest drainage level in the machinery space, and of a diameter at least two-thirds that of the main sea inlet. Where the fuel is, or may be, coal, and there is no watertight bulkhead between the engines and boilers, a direct discharge overboard shall be fitted from at least one circulating pump, or, alternatively, a bye-pass may be fitted to the circulating discharge.

(8) (a) All pipes from the pumps which are required for draining, cargo or machinery spaces shall be entirely distinct from pipes which may be used for filling or emptying spaces where water or oil is carried.

(b) Lead pipes shall not be used under coal bunkers or oil fuel storage tanks, nor in boiler or machinery spaces, including motor rooms in which oil settling tanks or oil fuel pump units are situated.

(9) The Administration shall make rules relating to the diameters of the bilge main and branch pipes which shall be proportioned respectively in relation to the size of the ship and the sizes of the compartments to be drained.

(10) The arrangement of the bilge and ballast pumping system shall be such as to prevent the possibility of water passing from the sea and from water ballast spaces into the

cargo and machinery spaces, or from one compartment to another. Special provision shall be made to prevent any deep tank having bilge and ballast connections being inadvertently run up from the sea when containing cargo, or pumped out through a bilge pipe when containing water ballast.

(11) Provision shall be made to prevent the compartment served by any bilge suction pipe being flooded, in the event of the pipe being severed or otherwise damaged, by collision or grounding, in any other compartment. For this purpose, where the pipe is at any part situated near the side of the ship or in a duct keel, there shall be fitted to the pipe in the compartment containing the open end either a non-return valve, or a screw-down valve which can be operated from a position above the bulkhead deck.

(12) All distribution boxes, cocks, and valves in connection with the bilge pumping arrangement shall be in positions which are accessible at all times under ordinary circumstances. They shall be so arranged that in the event of flooding the emergency bilge pump may be operative on any compartment. If there is only one system of pipes common to all the pumps, the necessary cocks or valves for controlling the bilge suctions must be workable from above the bulkhead deck. If in addition to the main bilge pumping system an emergency bilge pumping system is provided, it shall be independent of the main system and so arranged that the emergency pump is capable of operating on any compartment under flooding conditions.

Motor Ships.

(13) The bilge pumping arrangements in motor ships shall, so far as practicable, be equivalent to those required for steamships of similar size, except as regards main circulating pumps.

REGULATION XX

Power for Going Astern.

Ships shall have sufficient power for going astern to secure proper control of the ship in all circumstances.

REGULATION XXI

Auxiliary Steering Apparatus.

Ships shall be provided with an auxiliary steering apparatus which, however, may be of less power than the main apparatus, and need not be worked by steam or other mechanical power, provided adequate arrangements for manual operation are practicable. A duplicate main steering power plant shall be considered as an auxiliary steering apparatus within the meaning of this Regulation.

REGULATION XXII

Initial and Subsequent Surveys of Ships.

(1) Every new or existing ship shall be subjected to the surveys specified below :—

(a) A survey before the ship is put in service.

(b) A periodical survey once every twelve months.

(c) Additional surveys, as occasion arises.

(2) The surveys referred to above shall be carried out as follows:—

(a) *The survey before the ship is put in service* shall include a complete inspection of the hull, machinery and equipments, including the outside of the ship's bottom and the inside and outside of the boilers. This survey shall be such as to ensure that the arrangements, material, and scantlings of the hull, boilers, and their appurtenances, main and auxiliary machinery, life-saving appliances, and other equipments, fully comply with the requirements of the present Convention and of the detailed regulations promulgated as a result thereof by the Government of the country to which the ship belongs for ships of the service for which it is intended. The survey shall also be such as to ensure that the workmanship of all parts of the ship and its equipments is in all respects satisfactory.

(b) *The periodical survey* shall include an inspection of the whole of the hull, boilers, machinery, and equipments, including the outside of the ship's bottom. The survey shall be such as to ensure that the ship, as regards the hull, boilers, and their appurtenances, main and auxiliary machinery, life-saving appliances, and other equipments, is in satisfactory condition and fit for the service for which it is intended, and that it complies with the requirements of the present Convention, and of the detailed regulations promulgated as a result thereof by the Government of the country to which the ship belongs.

(c) *A survey either general or partial*, according to the circumstances, shall be made every time an accident occurs or a defect is discovered which affects the safety of the ship or the efficiency or completeness of its life-saving appliances or other equipments, or whenever any important repairs or renewals are made. The survey shall be such as to ensure that the necessary repairs or renewals have been effectively made, that the material and workmanship of such repairs or renewals are in all respects satisfactory, and that the ship complies in all respects with the provisions of the present Convention and of the detailed regulations promulgated as a result thereof by the Government of the country to which the ship belongs.

(3) The detailed regulations referred to in sub-paragraph (2) shall prescribe the requirements to be observed as to the initial and subsequent hydraulic tests to which the main and auxiliary boilers, connections, steam-pipes, high-pressure receivers, and fuel tanks for oil motors are to be submitted, including the test pressure to be applied, and the intervals between two consecutive tests.

Main and auxiliary boilers, connections, tanks and receivers, also steam-piping of more than 3 inches (76 millimetres) internal diameter shall be satisfactorily tested by hydraulic pressure when new. Steam pipes of more than 3 inches (76 millimetres) internal diameter shall be tested by hydraulic pressure periodically.

REGULATION XXIII

Maintenance of Conditions after Survey.

After the survey of the ship as provided in Regulation XXII has been completed no change shall be made in the structural arrangements, machinery, equipments, &c, covered by the survey, without the sanction of the Administration.