

PART III

CLOSING OF OPENINGS IN HULLS AND WATERTIGHT BULKHEADS BELOW THE BULKHEAD DECK

3.1 Position of and Means of Closing and Operating Watertight Doors

3.1.1 Openings in watertight bulkheads

Regulations 12 and 13 and paragraphs 2.9 and 2.10 of these Instructions set out the conditions under which openings are permitted in watertight bulkheads, and shell plating forming part of the watertight subdivision of the ship.

3.1.2 Position of watertight doors and controls

3.1.2.1 Paragraph 2.9.1 of these Instructions deals with the positioning of watertight doors when permitted.

3.1.2.2 Watertight door controls, including hydraulic piping and electric cables, should be kept as close as practicable to the bulkhead in which the doors are fitted, in order to minimise the likelihood of their being involved in any damage which the ship may sustain.

3.1.2.3 The position of watertight doors or their controls should be such that if the ship sustains damage to the extent outlined in the Regulations, the operation of the watertight doors clear of the damaged portion of the ship is not impaired.

3.1.3 Means of operating watertight doors

3.1.3.1 The arrangements should permit each door to be closed and released locally, from both sides of the bulkhead, when opening and closing can be effected from the remote position.

3.1.3.2 At least two means for opening and closing power operated sliding watertight doors should be provided. If any of the means provided utilises electrical power, then the provisions of Schedule 7 to Merchant Shipping Notice MSN 1699(M) apply, where the operating system is fully electrohydraulic, two sources of hydraulic power will be required, viz, two pumps or their equivalent, in addition to the main and alternative power sources.

3.1.3.3 Electric motors starters, switches, junction boxes and other electrical equipment associated with watertight door systems, or their indicators, if

situated below the bulkhead deck, are to be watertight in accordance with the applicable IP ratings in BS EN 60529.

3.1.3.4 The distribution board for main and control circuits should be installed above the bulkhead deck. Any warning lights on the bridge indicator should be wired into the main and emergency power supplies and continuously illuminated to show that power is available and not illuminated only when the system is activated. An indicator correctly wired in this manner and activated by a test button is acceptable.

3.1.3.5 Motors and associated equipment installed in open car decks are to be deck watertight and certified fit for use in an explosive atmosphere if fitted within 0.5 m of the deck. For enclosed car decks the watertight integrity should not be necessary unless consideration is being given to the effects of a drencher system.

3.1.3.6 *Hand operated gear*

The mechanism for operating sliding watertight doors by hand from above the bulkhead deck should be rapid in its action and be such as to be capable of operating the doors under unfavourable conditions of heel and trim. The mechanical operating gear above the bulkhead deck and, in the case of non-power operated doors, at the door itself, should consist of a crank handle or wheel and handle for all-round operation which should, in general, be permanently attached to the shafting. It is desirable that the hand gear of power operated doors fitted at the door itself should be of similar type, but other types can be considered if the local gear is such that it could not interfere with the operation of the door from above the bulkhead deck. The lead of shafting to the door from above the bulkhead should be as direct as possible. Suitable provision should be made for lubricating the working parts of the mechanism; guards should be fitted where necessary. The hand operated gear of power operated doors should be permanently engaged unless satisfactory means are provided for engaging it from above the bulkhead deck. A suitable hand/hydraulic system for operating the watertight doors from above the bulkhead deck may be accepted.

3.1.3.7 *Watertight doors serving as fireproof doors*

In machinery spaces where there is a fire hazard such as with internal combustion machinery or oil fired boilers, watertight doors should be capable of being operated from outside the space in which the fire hazard is present. This may be arranged by placing the hand operated gear which is above the bulkhead deck outside the machinery space, or by fitting the hand operated gear which is at the door itself to the side of the bulkhead remote from the hazard. Alternatively, the desired object, i.e. access for fire-fighting, may be achieved by fitting a draught-excluding firescreen door to the bulkhead, capable of being closed from outside the space.

3.1.4 Watertight doors - signals and communications

3.1.4.1 Any indicators and warning signals should, if electrically operated, obtain their power from the main and emergency sources provided.

3.1.4.2 Any sound signal, which is required to give warning at the door itself when power operated watertight doors are about to be closed, should precede the movement of the doors by an interval of about 10 seconds.

3.1.5 Construction of watertight doors

3.1.5.1 Every watertight door should be of such design, material and construction as will maintain the integrity of the watertight bulkhead in which it is fitted. For this purpose it may be necessary, particularly with large sliding watertight doors, to arrange points of support in way of the leading and trailing edges of the door at the closed position. The design stress in the door should be such that a factor of safety of approximately three, based on the ultimate tensile strength of the material, will be obtained.

3.1.5.2 Every sliding watertight door should 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 less than 25mm in width, should be fitted in recesses.

3.1.5.3 If screw gear is used for operating such a door, the screw and nut should be of suitable metals which are resistant to corrosion or seizure.

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

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

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

3.1.5.7 In case of sliding watertight doors, care should be taken to ensure a satisfactory connection where the door frame beds on to the bulkhead plating. In compartments where oil fuel may catch fire, these connections should be metal to metal. Any jointing used should not be adversely affected by heat or the local environment.

3.1.6 Tests of watertight doors

3.1.6.1 Every watertight door should be tested by subjecting the door and its frame to a hydraulic pressure equivalent to the head of water measure from the bottom of the door to the margin line in way of the bulkhead to which the door is to be fitted, but in no case should the test pressure be less than 6m head for sliding doors or less than 3m head for hinged doors. The framework to which the door frame is secured for the purpose of testing at the works should not give greater reinforcement to the frame than the stiffening of the bulkheads to which it is to be fitted. The test is to determine whether the door is sufficient strength and reasonably watertight under pressure. The rate of leakage and deflection of the door at the centre should be recorded.

3.1.6.2 After a satisfactory hydraulic test, each watertight door and its frame should be stamped with the following identification marks:

CERTIFYING AUTHORITY

TESTED METRES/FEET HEAD

DATE

SURVEYOR'S INITIALS

3.1.6.3 After being fitted in place on the bulkhead at the ship, the door and the attachment of the door frame to the bulkhead should be included in the hose test required for watertight bulkheads.

3.1.6.4 All sliding watertight doors should be operated by hand and, if power operated, by power in the presence of the surveyor, who should note and records the times taken to close the doors.

3.1.6.5 The surveyor should see that any warning signals are efficient and that the indicators register properly.

3.1.6.6 Hinged watertight doors are to be inspected and tried. The surveyor should see that the lever operated clips are in order and that the joints are watertight.