
STATUTORY INSTRUMENTS

1998 No. 1012

**The Merchant Shipping (Fire Protection:
Large Ships) Regulations 1998**

PASSENGER SHIPS

SHIPS OF CLASSES I, II, AND II(A)

Application

51.—(1) Regulations 52 to 68 inclusive shall apply to passenger ships of Classes I, II and Class II(A) of 21.34 metres in length or over, constructed on or after 25th May 1980. Subject to paragraph (2) the provisions of Schedule 2 in Merchant Shipping Notice MSN 1670 shall apply to such ships constructed before 25th May 1980.

(2) On or after 1st October 2010, Schedule 2 in Merchant Shipping Notice MSN 1670 shall cease to have effect in relation to passenger ships carrying more than 36 passengers when these ships shall comply with the requirements of regulations 52 to 68 inclusive as these regulations apply to ships constructed on or after 25th May 1980.

Structure

52.—(1) The hull, superstructure, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material, except that the crowns and casings of machinery spaces of Category A shall be constructed only of steel.

(2) Where any part of the structure is of aluminium alloy, the following requirements shall apply—

- (a) the insulation of aluminium alloy component of “A” Class divisions or “B” Class divisions, and supports of such divisions, shall be such that the temperature of the structural core does not rise more than 200°C above the ambient temperature at any time during a standard fire test of 60 minutes duration in the case of an “A” Class division and 30 minutes duration in the case of a “B” Class division; and
- (b) the insulation of aluminium alloy components of columns, stanchions and other structural members required to support lifeboat and liferaft stowage, launching and embarkation areas, shall be such that the temperature rise limitation specified in sub-paragraph (a) shall apply for 60 minutes duration.

Helicopter decks

Requirements for ships constructed on or after 1st February 1992

53.—(1) This regulation applies to a ship having a helicopter deck.

(2) Subject to paragraph (4), the helicopter deck shall be of steel or equivalent fire-resistant construction.

(3) If the space below the helicopter deck is of a high fire risk, the insulation standard shall be to the satisfaction of the Secretary of State.

(4) The helicopter deck may be constructed of aluminium or other low melting metal construction that is not made equivalent to steel. If so constructed—

- (a) if the platform is cantilevered over the side of the ship, then, after the occurrence of a fire on the ship or on the platform, the platform shall undergo a structural analysis to determine its suitability for further use; and
- (b) if the platform is located above the ship's deckhouse or similar structure—
 - (i) the deckhouse top and bulkheads under the platform shall have no openings;
 - (ii) all windows under the platform shall be provided with steel shutters;
 - (iii) after a fire on or in close proximity to the platform the platform shall undergo a structural analysis to determine its suitability for further use.

Main vertical zones and horizontal zones

54.—(1) The hull, superstructure and deckhouses shall be subdivided by bulkheads consisting of “A” Class divisions into main vertical zones except in respect of special category spaces or ro-ro cargo spaces to which regulation 65 applies. The mean length of each zone on any one deck, above the bulkhead deck, shall not normally exceed 40 metres. Steps and recesses shall be kept to a minimum, but any which are necessary shall consist of “A” Class divisions. These divisions shall have insulation values in the case of—

- (a) ships carrying more than 36 passengers, in accordance with the Tables given in Schedule 1 in Merchant Shipping Notice MSN 1667; and
- (b) ships carrying 36 passengers or less, in accordance with the Tables given in Schedule 2 in Merchant Shipping Notice MSN 1667, except that where insulation values of “B-0” and “C” appear in Table 1 the value of “A-0” shall be substituted.

(2) Any portions of such divisions which extend above the 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 and in the case of a deckhouse, to the external plating thereof.

(3) Except in the case of a ship built on or after 1st October 1994 carrying more than 36 passengers a main vertical zone may, for the purpose of regulation 64, be subdivided by horizontal “A” Class divisions into two or more parts provided that such horizontal divisions shall extend between adjacent main vertical zone bulkheads and to the shell or exterior boundaries of the ship and shall have insulation and integrity values in the case of—

- (a) ships carrying more than 36 passengers, in accordance with Table 3 of Schedule 1 in Merchant Shipping Notice MSN 1667; and
- (b) ships carrying 36 passengers or less, in accordance with Table 2 of Schedule 2 in Merchant Shipping Notice MSN 1667.

(4) In ships designed for special purposes such as train services, where the provision of main vertical zone bulkheads would conflict with the purpose for which the ship is intended, an equivalent means for controlling and limiting a fire may be substituted.

Additional requirements for a ship constructed on or after 1st October 1994

(5) In the application of paragraph (1) to a ship constructed on or after 1st October 1994 carrying more than 36 passengers, the references to “A” Class divisions shall be references to those divisions insulated to “A-60” standard: provided that if open deck spaces, sanitary and similar spaces and

tanks, voids and auxiliary machinery spaces having little or no fire risk, defined in Category 5, 9 and 10 of Schedule 1 in Merchant Shipping Notice MSN 1667 are on one side of the division, or fuel oil tanks are on both sides the standard may be reduced to “A-0”.

(6) In the case of a ship constructed on or after 1st October 1994, the length and width of main vertical zones may be extended to a maximum of 48 metres in order to bring the ends of main vertical zones to coincide with watertight sub-division bulkheads or in order to accommodate a large public space extending for the whole length of the main vertical zone provided that the total area of the main vertical zone is not greater than 1,600 metres² on any deck. The length or width of a main vertical, zone is the maximum distance between the furthestmost points of the bulkheads bounding it.

Bulkheads within a main vertical zone

55.—(1) Every bulkhead within the accommodation spaces or service spaces not being a bulkhead required to consist of an “A” Class division, shall consist of a “B” Class division or “C” Class division as required in the case of—

- (a) ships carrying more than 36 passengers, by the Tables set out in Schedule 1 in Merchant Shipping Notice MSN 1667; and
- (b) ships carrying 36 passengers or less, by the Tables set out in Schedule 2 in Merchant Shipping Notice MSN 1667.

All such divisions may be faced with combustible materials in accordance with regulation 62.

(2) Except in the case of ships constructed on or after 1st October 1994 carrying more than 36 passengers, all corridor bulkheads where not required to be “A” Class divisions shall be “B” Class divisions which shall extend from deck to deck except that—

- (a) when continuous “B” Class ceilings and/or linings are fitted on both sides of the bulkhead, the portion of the bulkhead behind the continuous ceiling or lining shall be of material which in thickness and composition meets the requirements of “B” Class divisions, but which is required to meet “B” Class fire integrity standards only so far as is reasonable and practicable; and
- (b) in the case of a ship protected by an automatic sprinkler, fire detection and fire alarm system complying with the provisions of Schedule 1 in Merchant Shipping Notice MSN 1666 the corridor bulkheads of “B” Class materials may terminate at a ceiling in the corridor, provided that such a ceiling is of material which in thickness and composition meets the requirements of “B” Class divisions; notwithstanding the requirements for fire integrity of bulkheads in Merchant Shipping Notice MSN 1667 such bulkheads and ceilings shall be required to meet “B” Class fire integrity standards only so far as is reasonable and practicable; all doors and their frames in such bulkheads shall be of non-combustible materials and shall be constructed and erected so as to provide substantial fire resistance.

(3) Except as provided in paragraph (2), every bulkhead required to be a “B” Class division shall extend from deck to deck and to the shell or other boundaries unless continuous “B” Class ceilings and/or linings fitted on both sides of the bulkhead are of at least the same fire resistance as the bulkhead in which case the bulkhead may terminate at the continuous ceiling or lining.

Fire Integrity of bulkheads and decks

56.—(1) In addition to complying with the specific provisions for fire integrity of bulkheads and decks the minimum fire integrity and insulation standards of all bulkheads and decks shall be as prescribed in the Tables given in Merchant Shipping Notice MSN 1667.

(2) Where due to any structural arrangement there may be doubt in determining from the Tables the minimum fire integrity and insulation standard of any division, such standard shall be determined to the satisfaction of the Secretary of State.

Protection of stairways and lifts in accommodation and service spaces

57.—(1) All stairways shall be of steel frame construction, except where the Secretary of State may approve the use of other equivalent material, and shall be within enclosures formed of “A” Class divisions, except that—

- (a) an isolated stairway connecting only two decks need not be enclosed on both decks provided that the integrity of the deck is maintained by bulkheads or doors at one between-deck space; when a stairway is closed at one between-deck space, the stairway enclosure shall have the same integrity standard as is required in the case of—
 - (i) a passenger ship carrying more than 36 passengers, by the Tables set out in Schedule 1 in Merchant Shipping Notice MSN 1667 for the deck which separates the between-deck space;
 - (ii) a ship carrying 36 passengers or less, by the Tables set out in Schedule 2 in Merchant Shipping Notice MSN 1667 for the deck which separates the between-deck space;
- (b) stairways may be fitted within the open part of a public space, provided that they lie wholly within such public space.

(2) Every opening in a stairway enclosure shall be provided with a means of closure which shall be permanently attached thereto.

(3) Every lift trunk shall be so fitted as to prevent the passage of smoke and flame from one between-deck to another and shall be provided with means of closing so as to permit the control of draught and smoke.

- (a) (4) (a) Stairway enclosures shall have direct access to the corridors and be of a sufficient area to prevent congestion, having in view the number of persons likely to use them in an emergency.
- (b) In ships constructed on or after 1st October 1994 and in ships constructed before 1st October 1994 carrying more than 36 passengers, only public toilets, lifts, lockers of non-combustible material providing storage for safety equipment and open information counters may be located within the stairway enclosure boundaries.
- (c) In ships constructed on or after 1st October 1994 and in ships constructed before 1st October 1994 carrying more than 36 passengers, only public spaces, corridors, public toilets, special category spaces and other escape stairways required by regulation 68(2)(c), open deck spaces and, in the case of ships constructed before 1st October 1997, spaces to which paragraph (5) applies, are permitted to have direct access to these stairway enclosures.

(5) Every ship constructed before 1st October 1994 carrying more than 36 passengers shall comply with the following—

- (a) existing spaces other than those referred to in paragraph (4)(b) within the stairway enclosure boundaries—
 - (i) shall be emptied, permanently closed and disconnected from the electrical system; or
 - (ii) shall be separated from the stairway enclosure by the provision of “A” Class divisions in accordance with regulation 56 except as it applies to ships constructed on or after 1st October 1994. Such spaces may have direct access to stairway enclosures by the provision of “A” Class doors, subject to a sprinkler system being provided in these spaces. However, cabins shall not open directly into the stairway enclosure;

- (b) spaces other than public spaces, corridors, public toilets, special category spaces, other stairways required by regulation 68(3)(c), open deck spaces and spaces covered by paragraph (a)(ii) above are not permitted to have direct access to stairway enclosures;
 - (c) existing machinery spaces of category 10 described in Schedule 1 in Merchant Shipping Notice MSN 1667 and existing back offices for information counters opening directly into the stairway enclosure may be retained, provided that they are protected by smoke detectors connected to a fixed fire detection and fire alarm system complying with the requirements of Schedule 5 in Merchant Shipping Notice MSN 1666 and such offices contain only furniture of restricted fire risk;
 - (d) hinged fire doors in stairway enclosures which are normally kept open shall be self-closing and be capable of release from a central control station and from a position at the door. All other fire doors in stairway enclosures which are normally kept open shall be capable of release from a central control station and from a position at the door;
 - (e) a panel shall be placed in a continuously manned central control station to indicate whether the fire doors in the stairway enclosures are closed.
- (6) Furniture in stairway enclosures shall be limited to seating. It shall be fixed, limited to 6 seats on each deck in each stairway enclosure, be of restricted fire risk, and shall not restrict the passenger escape route. The Secretary of State may permit additional seating in the main reception area within stairway enclosures, if it is fixed, non-combustible, and does not restrict the passenger escape route. Furniture is not permitted in passenger and crew corridors forming escape routes in cabin areas except that lockers of non-combustible material, providing storage for safety equipment are permitted.

Openings in “A” Class divisions

58.—(1) Where an “A” Class division is pierced for the passage of electric cables, pipes, trunks, girders, beams or for other purposes, the arrangements shall be such that the effectiveness of the division in resisting fire is not thereby impaired except as provided in paragraph (7).

(2) Where ventilation ducts pass through “A” Class divisions the requirements of regulation 60 shall apply.

(3) Except for hatches between special category spaces or ro-ro cargo spaces within a single horizontal zone, or hatches between cargo spaces or stores or baggage spaces, and hatches between such spaces and the weather decks, every opening shall be provided with permanently attached means of closing which shall be at least as effective for resisting fire as the division in which it is fitted.

(4) Every door and door frame in an “A” Class division shall be constructed of steel or other equivalent material and the means of securing the door when closed shall provide resistance to fire as well as to the passage of smoke and flame, as far as practicable, equivalent to that of the bulkhead in which the door is situated: provided that a watertight door shall not be required to be insulated.

(5) 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.

(6) In ships constructed before 1st October 1994 carrying more than 36 passengers—

- (a) hinged fire doors in main vertical zone bulkheads and galley boundaries which are normally kept open shall be self-closing and be capable of release from a central control station and from a position at the door;
- (b) all other fire doors in main vertical zone bulkheads and galley boundaries which are normally kept open shall be capable of release from a central control station and from a position at the door; and

- (c) a panel shall be placed in a continuously manned central control station to indicate whether the fire doors in main vertical zone bulkheads and galley boundaries are closed.

(7) In the case of a ship constructed before 1st October 1994, every door in a division constructed in compliance with regulation 54(1) or 57(1) except a watertight door or one which is normally locked shut, shall be self-closing and capable of closing against an adverse inclination of up to 3.5 degrees. The speed of door closure shall be controlled so as to prevent undue danger to personnel. All such doors which are held in the open position shall be capable of release from a control station, either simultaneously or in groups, and also individually from a position at the door. The release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system; except that this requirement shall not apply to a watertight door. Hold-back hooks, not subject to control station release, are not permitted.

(8) In the case of a ship constructed on or after 1st October 1994, every door in a division constructed in compliance with regulations 54(1) or 57(1), shall satisfy the following requirements—

- (a) it shall be self-closing and be capable of closing against an adverse inclination of up to 3.5 degrees at an approximately uniform rate of not more than 40 seconds and no less than 10 seconds with the ship in the upright position;
- (b) remote-controlled sliding or power-operated doors shall be equipped with an alarm that sounds at least 5 seconds but no more than 10 seconds before the door begins to move and continues sounding until the door is completely closed. A door designed to re-open upon contacting an object in its path shall re-open sufficiently to allow a clear passage of at least 0.75 metres but not more than 1 metre;
- (c) all doors shall be capable of remote and automatic release from a continuously manned central control station, either simultaneously or in groups, and also individually from a position at both sides of the door;
- (d) a panel shall be placed in the continuously manned central control station to indicate whether each of the remote-controlled doors are closed;
- (e) the release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system or central power supply;
- (f) release switches shall have on-off function to prevent automatic resetting of the system;
- (g) hold-back hooks not subject to central control station release are prohibited;
- (h) local power accumulators for power-operated doors shall be provided in the immediate vicinity of the doors to enable the doors to be operated at least 10 times (fully opened and closed) using the local controls;
- (i) double-leaf doors equipped with a latch necessary to their fire integrity shall have a latch that is automatically activated by the operation of the doors when released by the system;
- (j) doors giving direct access to special category spaces which are power-operated and automatically closed need not be equipped with the alarms and remote-release mechanisms specified in sub-paragraph (b).

(9) In ships carrying not more than 36 passengers and in ships carrying more than 36 passengers constructed before 1st October 1994, where a space is protected by an automatic sprinkler, fire detection and fire alarm system complying with the provisions of Schedule 1 in Merchant Shipping Notice MSN 1666 or fitted with a continuous “B” Class ceiling, the closing of openings in decks not forming steps in main vertical zones or bounding horizontal zones shall be reasonably tight and such decks shall meet the “A” Class integrity requirements in so far as is reasonable and practicable.

(10) The requirements for “A” Class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles, subject to the requirements of regulation 61 provided that, in the case of ships constructed on or after 1st October 1994 there is no requirement for such boundaries to have “A” Class integrity in regulation 61(3). The requirements for “A” Class integrity

shall not apply to exterior doors in superstructures and deckhouses, except that doors opening on to lifeboat and liferaft handling and embarkation areas shall be of such construction as to protect these areas from a space having a potential fire hazard,

(11) In the case of a ship constructed on or after 1st October 1994 all “A” Class doors located in stairways, public spaces and main vertical zone bulkheads in escape routes shall be equipped with a self-closing hose port of material, construction and fire resistance which is equivalent to the door in which it is fitted, and which shall furnish a 150 mm square clear opening with the port open and door closed, and shall be inset into the lower edge of the door opposite the door hinges or, in the case of sliding doors, nearest the opening.

Openings in “B” Class divisions

59.—(1) Where a “B” Class division is pierced for the passage of electric cables, pipes, trunks, girders, beams or for other purposes the arrangements shall be such that the effectiveness of the division in resisting fire is not thereby impaired except as provided in paragraph (4). Where ventilation ducts pass through “B” Class divisions the requirements of paragraph 6 of Schedule 3 of Merchant Shipping Notice MSN 1667 shall apply.

- (a) (2) (a) Doors and door frames in “B” Class divisions and the means of securing them shall provide a method of closure which shall have resistance to fire as far as practicable equivalent to the division, except that ventilation openings may be permitted in the lower portion of such doors. Where such an opening is in or under a door, its total net area shall not exceed 0.05 square metre. When such an opening is cut in a door, it shall be fitted with a grille made of steel and shall be capable of being manually closed from each side of the door. Doors shall be non-combustible, except that in ships carrying 36 passengers or less a door which separates a cabin from an individual interior sanitary space such as a shower space may be of combustible material.
- (b) In the case of a ship constructed on or after 1st October 1994, cabin doors in “B” Class divisions shall be of the self-closing type. Hold-backs are not permitted.

(3) The requirements for “B” Class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles subject to the requirements of regulation 61. The requirements for “B” Class integrity shall not apply to exterior doors in superstructures and deckhouses, except that doors opening on to lifeboat and liferaft handling and embarkation areas shall be of such construction as to protect these areas from a space having a potential fire hazard.

(4) Except in the case of a ship constructed on or after 1st October 1994 carrying more than 36 passengers, where an automatic sprinkler, fire detection and fire alarm system complying with the provisions of Schedule 1 of Merchant Shipping Notice MSN 1666 is fitted—

- (a) the closing of openings in decks need only meet the “B” Class integrity requirements in so far as is reasonable and practicable;
- (b) openings in corridor bulkheads of “B” Class materials shall be protected in accordance with the provisions of regulation 55.

Ventilation systems

60.—(1) Wherever practicable the system of ducts leading from each ventilation fan shall be within one main vertical or horizontal zone.

(2) Where ventilation systems penetrate decks precautions shall be taken, in addition to those relating to the fire integrity of the decks required by regulation 58(1), to reduce the likelihood of smoke and hot gases passing from one between-deck space to another through the system. In addition to insulation requirements contained in this regulation, vertical ducts shall be insulated as required by the Tables in Schedules 1 and 2 in Merchant Shipping Notice MSN 1667 as appropriate.

- (a) (3) (a) Ducts serving a stairway enclosure shall be taken from the fan room independently of other ducts in the ventilation system and shall not serve any other space.
- (b) In the case of a ship constructed on or after 1st October 1994, carrying more than 36 passengers stairway enclosures shall be ventilated and shall be served only by an independent fan and duct system which shall not serve any other spaces in the ventilation system.

(4) There shall be provided for every control station situation below deck, other than a control station situated in the machinery space, means to ensure ventilation, visibility and freedom from smoke within it so that, in the event of a fire in the ship, the equipment it contains may be operated effectively. Unless a control station is situated on, and has access to, an open deck or is provided with local closing arrangements equally effective to maintain ventilation, visibility and freedom from smoke in the event of a fire in the ship, there shall be provided at least two entirely separate means of supplying air to such control stations and the air inlets to these sources of supply shall be so situated that the risk of both drawing in smoke simultaneously is, as far as practicable, eliminated.

(5) Ventilation ducts except those in cargo spaces, shall be constructed in accordance with the specifications set out in Schedule 3 in Merchant Shipping Notice MSN 1667.

Additional requirements for a ship constructed on or after 1st January 1994

(6) Where a public space spans three or more decks by means of permanent openings and contains combustibles (such as furniture) and enclosed spaces (such as shops, offices and restaurants), the space shall be equipped with a smoke extraction system; and—

- (a) the smoke extraction system shall—
 - (i) be activated by operation of the smoke detection system required by regulation 11(10); and
 - (ii) be capable of being manually controlled; and
- (b) the size of the fan or fans shall be such that the entire volume within the space can be exhausted in not more than 10 minutes.

Windows and sidescuttles

61.—(1) All windows and sidescuttles in bulkheads within accommodation and service spaces and control stations other than those to which regulations 58(8) and 59(3) apply, shall be constructed so as to preserve the integrity requirements of the type of bulkheads in which they are fitted.

(2) Notwithstanding the requirements of the Tables set out in Schedules 1 and 2 in Merchant Shipping Notice MSN 1667 as appropriate the following shall apply—

- (a) all windows and sidescuttles in bulkheads separating accommodation and service spaces and control stations from weather shall be constructed with frames of steel or other suitable materials; the glass shall be retained by a metal glazing bead or angle; and
- (b) except in the case of ships built on or after 1st October 1994 carrying more than 36 passengers, the fire integrity of windows facing open or enclosed lifeboat and liferaft embarkation areas and of windows situated below such areas in such a position that their failure during a fire would impede the launching of, or embarkation into, lifeboats or liferafts shall be such that any potential fire hazard is kept to a minimum.

(3) In the case of a ship constructed on or after 1st October 1994, carrying more than 36 passengers, windows facing life-saving appliances, lifeboat and liferaft embarkation and muster areas, external stairs and open decks used for escape routes, and windows situated below liferaft and escape slide embarkation areas shall have fire integrity as required in Table 5 of Schedule 1 in Merchant Shipping Notice MSN 1667. Where automatic sprinkler heads are provided for such

windows, and where windows are located in the ship's side below the lifeboat embarkation areas they shall have fire integrity at least to "A-0" Standard.

Restriction of combustible materials

62.—(1) The following surfaces shall be such that a surface spread of flame of Class 1 and in the case of ships constructed before 1st September 1984, Class 1 and 2 will not be exceeded—

- (a) exposed surfaces in corridors and stairway enclosures; and
- (b) within all accommodation spaces, service spaces and control stations—
 - (i) bulkheads, wall and ceiling linings; and
 - (ii) concealed or inaccessible spaces.

(2) Within accommodation spaces, service spaces and control stations the following shall apply—

- (a) the total volume of combustible facings, mouldings, decorations and veneers shall not exceed a volume equivalent to 2.5 millimetres of veneer on the combined area of walls and ceilings; in the case of ships fitted with an automatic sprinkler, fire alarm and fire detection system complying with the provisions of Schedule 1 in Merchant Shipping Notice MSN 1666 the above volume may include some combustible material used for the erection of "C" Class divisions;
- (b) veneers used on surfaces and linings to which paragraph (1) applies shall not have a gross calorific potential exceeding 45 megajoules per square metre of surface area for the thickness used as measured in accordance with the method specified in International Standard ISO 1716–1973 (E), or with—
 - (i) any International Standard replacing the same or any British Standard which (in either case) the Secretary of State considers relevant from time to time and specifies in a Merchant Shipping Notice; or
 - (ii) with any relevant standard of a member State other than the United Kingdom;
- (c) furniture in the corridors and stairway enclosures shall be kept to a minimum;
- (d) primary deck coverings shall be of approved material which will not readily ignite or give rise to toxic or explosive hazards at elevated temperatures; and
- (e) waste paper receptacles shall be constructed of non-combustible materials and with solid sides and bottoms.

(3) Within accommodation spaces, service spaces, control stations and machinery spaces the following shall apply—

- (a) all ceilings, linings, grounds, draught stops and insulating materials shall be of non-combustible materials except in respect of—&
 - (i) mail rooms and baggage rooms;
 - (ii) materials used to insulate refrigerated compartments;
 - (iii) materials used to insulate valves associated with hot and cold service systems provided that their exposed surfaces are such that a surface spread of flame of Class 1, and in the case of ships constructed before 1st September 1984 Classes 1 and 2, will not be exceeded; and
 - (iv) vapour barriers and adhesives used in conjunction with insulating materials, if their exposed surfaces are such that a surface spread of flame of Class 1, and in the case of ships constructed before 1st September 1984 Class 1 or 2, will not be exceeded; and
- (b) paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke and toxic products.

Miscellaneous items of fire protection

63.—(1) The following provisions shall apply to all parts of the ship—

- (a) any pipe which penetrates an “A” Class division or “B” Class division shall be of suitable material having regard to the temperature such divisions are required to withstand;
- (b) pipes intended for oil or other flammable liquids shall be of suitable material having regard to the risk of fire;
- (c) overboard scuppers, sanitary discharges or other outlets close to or below the waterline shall not be of a material likely to fail in the event of fire and thereby give rise to a danger of flooding; and
- (d) in spaces where penetration of oil products is possible the exposed surface of insulation shall be impervious to oil or oil vapours.

(2) The following provisions shall apply to the accommodation spaces, service spaces, and control stations—

- (a) every air space enclosed behind a ceiling, panel or lining, shall be divided longitudinally and transversely by close fitting draught stops which shall be spaced not more than 14 metres apart and shall be closed at each deck;
- (b) every ceiling 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; the Secretary of State may exempt any ship from the requirement of this regulation if he is satisfied that there is no risk of fire originating in such a space;
- (c) electric space heaters shall be fixed in position and shall be so constructed as to reduce risk of fire to a minimum; no such heater shall be fitted with an element so exposed that clothing, curtains or similar materials can be scorched or set on fire by heat from the element;
- (d) cellulose-nitrate film shall not be used for cinematograph installations.

Automatic sprinkler, fire detection and fire alarm system or fixed fire detection and fire alarm system

Requirements for a ship constructed on or after 25th May 1980

64.—(1) In every ship there shall be installed in all accommodation spaces, service spaces and control stations throughout each separate main vertical zone or, if a main vertical zone is divided horizontally in accordance with regulation 54(3) into parts, throughout each part vertical zone either—

- (a) (i) an automatic sprinkler, fire detection and fire alarm system of an approved type complying with the requirements specified in Schedule 1 in Merchant Shipping Notice MSN 1666 and so arranged as to protect all such spaces in the ship; or
- (ii) a fixed fire detection and fire alarm system of an approved type complying with the requirements specified in Schedule 5 in Merchant Shipping Notice MSN 1666 and so arranged as to detect the presence or the signs of a fire and its location in any such spaces.

Additional requirements for a ship constructed on or after 1st July 1986

(2) In a ship constructed on or after 1st July 1986 complying with paragraph (1)(a)(i) there shall be installed in addition a fixed fire detection and fire alarm system of an approved type complying with the requirements of Schedule 5 in Merchant Shipping Notice MSN 1666 arranged so as to provide smoke detection in corridors, stairways and escape routes within the accommodation spaces.

Additional requirements for a ship constructed on or after 1st January 1994

(3) In a ship constructed on or after 1st January 1994, where a public space spans three or more decks by means of permanent openings and contains combustibles (such as furniture) and enclosed spaces (such as shops, offices and restaurants), the entire main vertical zone containing the space shall be protected throughout with an automatic sprinkler, fire detection and fire alarm system complying with the requirements specified in Schedule 1 in Merchant Shipping Notice MSN 1666.

Ships Constructed before 1st October 1994

(4) On or after 1st October 1997, every ship constructed before 1st October 1994 carrying more than 36 passengers shall be equipped in all accommodation and service spaces, stairway enclosures and corridors with a fixed fire detection and fire alarm system of an approved type and complying with the requirements of Schedule 5 in Merchant Shipping Notice MSN 1666 so installed and arranged as to provide smoke detection in such spaces. Such systems need not be fitted in private bathrooms, and spaces having little or no fire risks such as voids and similar spaces. Detectors operated by heat instead of smoke shall be installed in galleys.

- (a) (5) (a) In every ship constructed before 1st October 1994 carrying more than 36 passengers there shall be installed in all accommodation and service spaces, stairway enclosures and corridors so as to protect such spaces, an automatic sprinkler, fire detection and fire alarm system of an approved type complying with the requirements of Schedule 1 in Merchant Shipping Notice MSN 1666. In a ship which complies with Resolutions MSC 1 (XLV), MSC 6(48), MSC 11(55), MSC 12(56), MSC 13(57) and MSC 22(59) the implementation date may be extended to 1st October 2005 or 15 years after the date of construction of such a ship whichever is later.

Ships Constructed on or after 1st October 1994

- (b) (5) (b) In every ship constructed on or after 1st October 1994 carrying more than 36 passengers there shall be installed in all service spaces, control stations and accommodation spaces including corridors and stairways so as to protect such spaces, an automatic sprinkler, fire detection and fire alarm system of an approved type complying with the requirements of Schedule 1 in Merchant Shipping Notice MSN 1666 and so as to provide smoke detection, a fixed fire detection and fire alarm system complying with the requirements of Schedule 5 in Merchant Shipping Notice MSN 1666. Smoke detectors need not be fitted in private bathrooms and galleys. Spaces having little or no fire risk such as voids, public toilets and similar spaces need not be fitted with such automatic sprinkler system or fixed fire detection and alarm system. Control stations where water may cause damage to essential equipment may be fitted with an approved fixed fire-extinguishing system of another type.
- (6) The Secretary of State may exempt any ship from the requirements of paragraphs (1), (2), (4) and (5) in respect of—
- (a) any spaces which afford no substantial fire risk; or
 - (b) except in ships constructed on or after 1st October 1994 carrying more than 36 passengers, any control station.

Protection of special category spaces and ro-ro cargo spaces

65. —The following provisions shall apply to special category spaces and ro-ro cargo spaces whether above or below the bulkhead deck—

- (a) if it is not practicable to divide such spaces into main vertical zones, equivalent protection shall be obtained by dividing such spaces into horizontal zones; such a horizontal zone for the purpose of this regulation may include special category spaces or ro-ro cargo spaces on more than one deck provided that the total overall clear height for vehicles does not exceed 10 metres; the bulkheads and decks forming the boundaries of such a horizontal zone shall be insulated respectively—
 - (i) in the case of ships carrying more than 36 passengers constructed before 1st October 1994, as required for Category 11 spaces in Tables 1 and 3 of Schedule 1 in Merchant Shipping Notice MSN 1667;
 - (ii) in ships constructed on or after 1st October 1994 carrying more than 36 passengers, the boundary bulkheads and decks shall be insulated to “A-60” standard. However when a space classified in accordance with Schedule 1 in Merchant Shipping Notice MSN 1667 as Category 5, 9 or 10 is on one side of the division the standard may be reduced to “A-0”;
 - (iii) in the case of ships carrying 36 passengers or less as required for Category 11A spaces in Tables 1 and 2 of Schedule 2 in Merchant Shipping Notice MSN 1667.
- (b) the requirements of regulations 58 and 60 for maintaining the integrity of vertical zones shall apply to bulkheads and decks forming the boundaries separating horizontal zones from each other and from the remainder of the ship;
- (c) a fixed pressure water-spraying system complying with the requirements specified in Schedule 3 in Merchant Shipping Notice MSN 1666 shall be provided;
- (d) indicators shall be provided on the navigating bridge which shall show when any access fire door in the boundary of a special category space or ro-ro cargo space is closed; and
- (e) the outlet from any exhaust ventilation duct shall be sited in a safe position having regard to possible sources of ignition; ventilation ducts, including dampers, shall be of steel and arrangements shall be provided to permit a rapid shut-down and effective closure of the ventilation system in case of fire.

Protection of cargo spaces, other than special category spaces and ro-ro cargo spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion

66. In every ship the following provisions shall apply to any cargo space, other than a special category space or ro-ro cargo space containing motor vehicles with fuel in their tanks for their own propulsion—

- (a) a fixed fire detection and fire alarm system of an approved type complying with the requirements specified in Schedule 5 or a sample extraction smoke detection system complying with Schedule 6 in Merchant Shipping Notice MSN 1666 shall be provided;
- (b) a fixed pressure water-spraying system complying with the requirements specified in Schedule 3 in Merchant Shipping Notice MSN 1666 or a fixed gas fire-extinguishing system complying with the requirements specified in Schedule 4 in Merchant Shipping Notice MSN 1666 shall be provided; and
- (c) the outlet from any exhaust ventilation duct shall be sited in a safe position having regard to possible sources of ignition; ventilation ducts, including dampers, shall be of steel.

Special arrangements in machinery spaces

67. —The following provisions shall apply to machinery spaces—

- (a) the number of openings to machinery spaces shall be the minimum compatible with the proper working of the ship;
- (b) windows shall not be fitted in machinery space boundaries;
- (c) doors in the boundaries of machinery spaces of Category A, other than watertight doors and the fire-screen door referred to in paragraph (d), shall be arranged so that the closure of the door will be assured in the event of fire in the space; and the doors shall be provided with closing arrangements which either comply with the requirements of regulation 58(7) as it applies to ships constructed before 1st October 1994 or are provided with power-operated closing arrangements operable from the control position required by regulation 47(2); and
- (d) any machinery space of Category A which is accessible from an adjacent shaft tunnel shall be provided with a lightweight steel fire-screen door in addition to any watertight door; the fire-screen door shall be operable from each side and shall be located at the shaft tunnel side of the bulkhead.

Means of escape

68.—(1) Every ship shall be provided with doorways, stairways, ladderways and other ways to provide readily accessible means of escape to the lifeboat and liferaft embarkation decks for all persons in the ship from accommodation spaces, service spaces and other spaces in which the crew is normally employed, other than machinery spaces. 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, width and continuity of such means of escape shall be sufficient, having regard to the number of persons by whom they may be used.

(2) Notwithstanding the generality of paragraph (1), in every ship the following shall be complied with—

- (a) there shall be provided below the bulkhead deck at least two means of escape from each watertight compartment or from each similarly restricted space or group of spaces; at least one of the means of escape provided from each such compartment or from each such space or group of spaces shall be independent of watertight doors; one of the means of escape may be dispensed with, in an exceptional case, having regard to the nature and location of spaces and to the number of persons who normally might be employed or, except in case of a ship constructed on or after 1st October 1994 accommodated there. Where one of the means of escape is dispensed with, the sole means of escape shall provide satisfactory safe escape, provided that in a ship constructed on or after 1st October 1994 the clear width of stairways in such escapes may be less than 900 millimetres but shall not be less than 800 millimetres, with handrails on both sides;
- (b) there shall be provided above the bulkhead deck at least two means of escape from each space bounded by main vertical zone bulkheads or from each similarly restricted space or group of spaces;
- (c) (i) in the case of a ship constructed before 1st October 1994, at least one of the means of escape required by sub-paragraphs (a) and (b) shall be by means of a readily accessible enclosed stairway, which shall provide continuous fire shelter from the level of its origin to the appropriate lifeboat and liferaft embarkation decks or the highest level served by the stairway, whichever level is the highest; however, where only one means of escape is permitted for the purpose of compliance with sub-paragraph (a), the sole means of escape shall provide satisfactory safe escape;

- (ii) in the case of a ship constructed on or after 1st October 1994 at least one of the means of escape required by sub-paragraphs (a) and (b) shall consist of a readily accessible enclosed stairway, which shall provide continuous fire shelter from the level of its origin to the appropriate lifeboat and liferaft embarkation decks, or to the uppermost weather deck if the embarkation deck does not extend to the main vertical zone being considered. In the latter case, direct access to the embarkation deck by way of external open stairways and passageways shall be provided and shall have emergency lighting in accordance with regulation 48 of the Merchant Shipping (Passenger Ship Construction and Survey) Regulations 1984 and slip-free surfaces underfoot. In such ships boundaries facing external open stairways and passageways forming part of an escape route and boundaries in such a position that their failure during a fire would impede escape to the embarkation deck shall have fire integrity, including insulation values, in accordance with the appropriate Tables in regulation 55. In such ships the widths, number and continuity of escapes shall be as follows—
- (aa) stairways shall not be less than 900 millimetres in clear width. Stairways shall be fitted with handrails on each side. The minimum clear width of stairways shall be increased by 10 millimetres for every one person provided for in excess of 90 persons. The maximum clear width between handrails where stairways are wider than 900 millimetres shall be 1,800 millimetres. The total number of persons to be evacuated by such stairways shall be assumed to be two thirds of the crew and the total number of passengers in the areas served by such stairways. The width of the stairways shall conform to standards not inferior to those set out in IMO resolution A757(18);
 - (bb) all stairways sized for more than 90 persons shall be aligned fore and aft;
 - (cc) doorways and corridors and intermediate landings included in means of escape shall be sized in the same manner as stairways;
 - (dd) stairways shall not exceed 3.5 metres in vertical rise without the provision of a landing and shall not have an angle of inclination greater than 45°;
 - (ee) landings at each deck shall be not less than 2 square metres in area and shall increase by 1 square metre for every 10 persons provided for in excess of 20 persons but need not exceed 16 square metres, except for those landings servicing public spaces having direct access onto the stairway enclosure;
- (d) satisfactory protection of access from the stairway enclosures to the lifeboat and liferaft embarkation areas shall be provided;
 - (e) lifts shall not be considered as forming one of the required means of escape;
 - (f) stairways serving only a space and a balcony in that space shall not be considered as forming one of the required means of escape;
 - (g) if a radio office has no direct access to a weather deck, two means of escape shall be provided from the office; the Secretary of State may permit one of these escapes to be an opening type window or sidescuttle of sufficient size;
 - (h) dead-end corridors shall not be permitted to exceed 7 metres in ships carrying not more than 36 passengers and 13 metres in ships carrying more than 36 passengers; and in ships constructed on or after 1st October 1994 they shall be prohibited. For the purpose of this sub-paragraph a dead-end corridor is a corridor, or part of a corridor from which there is only one escape route;
 - (i) in special category spaces and ro-ro cargo spaces the number and disposition of the means of escape both below and above the bulkhead deck shall be adequate, and, in general, the

safety of access to the lifeboat and liferaft embarkation decks shall be at least equivalent to that required by sub-paragraphs (a), (b), (c), (d) and (e).

(3) In every ship the means of escape from any public room which may be used for the purpose of concerts, cinema shows and similar forms of entertainment shall be adequate, having regard to the number of persons who may be in the audience, and the seating shall be arranged in rows to ensure free access to the exits. When in any such public room subdued lighting is used, the exits shall be clearly marked with illuminated signs and any doors shall be constructed to open outwards.

(4) In every ship suitable signs shall be displayed in passageways and stairways indicating the direction of escape to passenger assembly stations. Such signs shall be continuously illuminated and shall be adequate in number and distribution. They shall be capable of being illuminated by the ship's emergency lighting system.

(5) In the machinery spaces in every ship there shall be provided from each machinery space two means of escape in compliance with the following provisions—

(a) where the space is below the bulkhead deck the two means of escape shall consist of either—

(i) two sets of steel ladders as widely separated as possible, leading to doors in the upper part of the space similarly separated and from which access is provided to the appropriate lifeboat and liferaft embarkation decks; one of these ladders shall be provided with continuous fire shelter from the lower part of the space to a safe position outside the space; or

(ii) one steel ladder leading to a door in the upper part of the space from which access is provided to such embarkation deck and additionally in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides a safe escape route to the lifeboat and liferaft embarkation deck;

(b) where the space is above the bulkhead deck, the two means of escape shall be as widely separated as possible and the doors leading from such means of escape shall be in a position from which access is provided to the appropriate lifeboat and liferaft embarkation decks; where such escapes require the use of ladders these shall be of steel;

(c) in a ship of less than 1,000 tons the Secretary of State may permit one of the means of escape required by this paragraph to be dispensed with having regard to the width and disposition of the upper part of the machinery space; in a ship of 1,000 tons or over one of the means of escape required by this paragraph may be dispensed with provided that either a door or a steel ladder provides a safe escape route to the embarkation deck having regard to the nature and location of the space and whether persons are normally employed in that space; and

(d) in the case of ships constructed on or after 1st October 1994, two means of escape shall be provided from a machinery control room located within a machinery space, at least one of which will provide continuous fire shelter to a safe position outside the machinery space.

(6) In every ship one of the means of escape from the machinery spaces where the crew is normally employed shall avoid access to any special category space or ro-ro cargo spaces.

(7) In the case of ships constructed on or after 1st October 1994, and from 1st October 1997 in ships constructed before 1st October 1994 carrying more than 36 passengers—

(a) the means of escape including stairways and exits shall be marked, at all points of the escape route including angles and intersections, by lighting or photoluminescent strip indicators placed not more than 0.3 metres above the deck. The marking must enable passengers to identify all routes of escape and readily identify the escape exits;

- (b) if electric illumination is used, it shall be supplied by the emergency source of power and it shall be so arranged that the failure of any single light, or cut in a lighting strip, will not result in the marking being ineffective;
- (c) additionally, all escape route signs and fire equipment location markings shall be of photoluminescent material or marked by lighting;
- (d) such lighting and photoluminescent material shall comply with guidelines set out in IMO Resolution A752(18);
- (e) the requirements of these sub-paragraphs are in addition to the emergency lighting required by regulation 48 of the Merchant Shipping (Passenger Ship Construction and Survey) Regulations 1984; and

Additional requirement for a ship constructed on or after 1st January 1994

(8) Where a ship constructed on or after 1st January 1994 has a public space spanning three or more decks by means of permanent openings and containing combustibles (such as furniture) and enclosed spaces (such as shops, offices and restaurants)—

- (a) each level within the space shall have two means of escape; and
- (b) one of those means of escape shall give direct access to an enclosed vertical means of escape meeting the requirements of paragraph (2)(c) for a readily accessible enclosed stairway.

Additional requirements for ro-ro passenger ships

- (a) (9) (a) Ro-ro passenger ships shall comply with subparagraphs (b) to (h) of this paragraph on and after 1st July 1997: provided that such ships constructed before that date need not comply before the first periodical survey date after the coming into force of these Regulations.
- (b) (i) Handrails or suitable handholds shall be provided in all corridors along the entire escape route to the assembly and embarkation stations so that a firm handhold is available, where practicable, every step of the way.
- (ii) Such fittings shall be provided on both sides of corridors exceeding, in the case of side to side corridors, 1 m in width and in the case of forward to aft corridors, 1.8 m in width.
- (iii) Suitable means shall be provided to assist the crossing of lobbies, atria and other large open spaces on such escape routes with the ship at large angles of heel or trim.
- (iv) Handrails shall be capable of supporting a distributed load of 750 N/m acting horizontally towards the vertical mid plane of the corridor, and acting vertically downwards, with the ship upright. The two loads need not be supported simultaneously.
- (c) (i) In public spaces and along escape routes deck coverings and furniture, including cabinets but excluding portable tables and chairs, shall be securely fixed.
- (ii) Except when the ship is secured in her berth, and so far as practicable passengers are not aboard, escape routes shall be kept clear of obstructions such as cleaning carts, bedding, luggage and boxed goods.
- (d) escape routes from normally occupied spaces to assembly stations shall be as direct as practicable, and shall be marked with signs in accordance with Merchant Shipping Notice M 1293.
- (e) Openings from enclosed spaces to weather decks shall where practicable be of a type suitable for use as emergency exits.

- (f) (i) Decks shall be sequentially numbered commencing with deck one which shall be the lowest or tank top level.
- (f) (ii) Deck numbers shall be displayed in prominent and continuously illuminated positions at stair landings and lift lobbies.
- (f) (iii) Where decks are also named, the deck number shall be displayed with the name.
- (g) (i) Diagrammatic plans showing escape routes shall be prominently exhibited in public spaces and on the inside of each cabin or stateroom door where any person is accommodated.
- (g) (ii) Such plans shall be as far as practicable correctly oriented with respect to their viewing position and such position shall be indicated on each plan in relation to the escape routes.
- (h) The doors of cabins and staterooms where any person is accommodated and all doors in escape routes shall not require the use of keys or similar devices to open them when moving in the direction of escape.
- (a) (10) (a) This paragraph applies to ro-ro passenger ships constructed on or after 1st July 1997.
- (b) The lowest 0.5 metre of any bulkhead, lining or partition adjacent to an escape route shall be capable of supporting a loading of 1500 Pa acting perpendicular to the plane of the bulkhead, lining or partition.
- (c) It shall not be necessary to climb more than two decks up or down in order to reach an assembly station or open deck from any passenger space, neither shall it be necessary to cross from one side of the ship to the other to attain an escape route.
- (d) From open decks provided in compliance with sub paragraph (c) of this paragraph, external open routes shall be provided to the appropriate lifeboat and liferaft embarkation areas.
- (11) An evacuation analysis demonstrating compliance with paragraph (1) shall be produced for ro-ro passenger ships constructed on or after 1st July 1999. Such analysis shall—
 - (a) be carried out concurrently with the design of the vessel;
 - (b) identify and as far as practicable eliminate congestion arising due to the intended movement of passengers and crew along escape routes during mustering and embarkation into lifeboats and liferafts;
 - (c) demonstrate that escape routes can reasonably accommodate the loss of any route, assembly station, embarkation station, evacuation system, lifeboat or liferaft as a result of a casualty.