[F1 ANNEX I

SAFETY REQUIREMENTS FOR NEW AND EXISTING PASSENGER SHIPS ENGAGED ON DOMESTIC VOYAGES

Textual Amendments

F1 Substituted by Commission Directive 2010/36/EU of 1 June 2010 amending Directive 2009/45/EC of the European Parliament and of the Council on safety rules and standards for passenger ships (Text with EEA relevance).

CHAPTER II-2

FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

PART A

GENERAL

1 **Basic principles (R 2)**

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.1 The fire safety objectives of this chapter are to:

.1 prevent the occurrence of fire and explosion;

.2 reduce the risk to life caused by fire;

.3 reduce the risk of damage caused by fire to the ship, its cargo and the environment;

.4 contain, control and suppress fire and explosion in the compartment of origin; and

.5 provide adequate and readily accessible means of escape for passengers and crew.

.2 In order to achieve the fire objectives set out in paragraph .1 the following basic principles underlie the Regulations in this chapter and are embodied in the Regulations as appropriate, having regard to the type of ships and the potential fire hazard involved:

.1 division of ship into main vertical zones by thermal and structural boundaries;

.2 separation of accommodation spaces from the remainder of the ship by thermal and structural boundaries;

.3 restricted use of combustible materials;

.4 detection of any fire in the zone of origin;

.5 containment and extinction of any fire in the space of origin;

.6 protection of means of escape or access for fire-fighting;

.7 ready availability of fire-extinguishing appliances;

.8 minimisation of possible ignition of flammable cargo vapour.

.3 The fire safety objectives set out in paragraph .1 shall be achieved by ensuring compliance with the prescriptive requirements specified in this chapter or by alternative design and arrangements which comply with Part F of the revised Chapter II-2 of SOLAS 1974, which applies to ships constructed on or after 1 January 2003. A ship shall be considered to meet the functional requirements set out in paragraph .2 and to achieve the fire safety objectives set out in paragraph .1 when either:

.1 the ship's designs and arrangements, as a whole, complies with the relevant prescriptive requirements in this chapter;

.2 the ship's designs and arrangements, as a whole, have been reviewed and approved in accordance with Part F of the revised Chapter II-2 of SOLAS 1974, which applies to ships constructed on or after 1 January 2003;

.3 part(s) of the ship's designs and arrangements have been reviewed and approved in accordance with the above mentioned Part F of the revised SOLAS Chapter II-2 and the remaining parts of the ship comply with the relevant prescriptive requirements of this chapter.

.4 All ships which undergo repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to these ships.

Repairs, alterations and modifications which substantially alter the dimensions of a ship or the passenger accommodation spaces, or substantially increase a ship's service life and outfitting related thereto shall meet the latest requirements for new ships in so far as the Administration of the flag State deems reasonable and practicable.
EXISTING CLASS B SHIPS:

.5 Notwithstanding the provisions of paragraph .4, existing class B ships carrying more than 36 passengers when undergoing repairs, alterations, modifications and outfitting related thereto shall comply with the following:

.1 all materials introduced to these ships shall comply with the requirements with regard to material applicable to new class B ships; and

.2 all repairs, alterations, modifications and outfitting related thereto involving the replacement of material of 50 tonnes or above, other than that required by Regulation II-2/B/16, shall comply with the requirements applicable to new class B ships.

2 **Definitions (R 3)**
NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.1 *Non-combustible material* is a material which neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750 °C, this being determined by a fire test in accordance with the IMO Resolution A.799(19) 'Revised recommendation on test methods for qualifying marine construction materials as non-combustible'. Any other material is a combustible material.

.1.a FOR CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

Non-combustible material is a material which neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750 °C, this being determined in accordance with the Fire Test Procedures Code. Any other material is a combustible material.

.2 A *standard fire test* is one in which specimens of the relevant bulkheads or decks are exposed in a test furnace to temperatures corresponding approximately to the standard time-temperature curve. The specimen shall have an exposed surface of not less than 4,65 m^2 and height (or length of deck) of 2,44 metres, resembling as closely as possible the intended construction and including where appropriate at least one joint. The standard time-temperature curve is defined by a smooth curve drawn through the following internal furnace temperature points:

initial internal furnace temperature	20 °C
at the end of the first 5 minutes	576 °C
at the end of 10 minutes	679 °C
at the end of 15 minutes	738 °C
at the end of 30 minutes	841 °C
at the end of 60 minutes	945 °C

.2a. FOR CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

A standard fire test is one in which the specimens of the relevant bulkheads and decks are exposed in a test furnace to temperatures corresponding approximately to the standard temperature curve. The test methods shall be in accordance with the Fire Test Procedures Code.

.3 *'A' class divisions* are those divisions formed by bulkheads and decks which comply with the following:

.1 they shall be constructed of steel or other equivalent material;

.2 they shall be suitably stiffened;

.3 they shall be so constructed as to be capable of preventing the passage of smoke and flame to the end of the one-hour standard fire test;

.4 they shall be insulated with approved non-combustible materials such that the average temperature of the unexposed side will not rise more than 140 °C above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180 °C above the original temperature, within the time listed below:

class 'A-60'	60 minutes
class 'A-30'	30 minutes
class 'A-15'	15 minutes
class 'A-0'	0 minutes

.5 The Administration of the flag State shall require a test of a prototype bulkhead or deck to ensure that it meets the above requirements for integrity and temperature rise in accordance with the IMO Resolution A.754(18).

For class B, C and D ships constructed on or after 1 January 2003, 'IMO Resolution A.754(18)' shall read 'Fire Test Procedures Code'.

.4 *'B' class divisions* are those divisions formed by bulkheads, decks, ceilings or linings which comply with the following:

.1 they shall be so constructed as to be capable of preventing the passage of flame to the end of the first half hour of the standard fire test;

.2 they shall have an insulation value such that the average temperature of the unexposed side will not rise more than 140 °C above the original temperature, nor will the temperature at any one point, including any joint, rise more than 225 °C above the original temperature within the time listed below:

class 'B-15'	15 min
class 'B-0'	0 min

.3 they shall be constructed of approved non-combustible materials and all materials entering into the construction and erection of 'B' class divisions shall be non-combustible, with the exception that combustible veneers may be permitted provided they meet other requirements of this chapter;

.4 the Administration of the flag State shall require a test of a prototype division to ensure that it meets the above requirements for integrity and temperature rise in accordance with IMO Resolution A.754(18).

For class B, C and D ships constructed on or after 1 January 2003, 'IMO Resolution A.754(18)' shall read 'Fire Test Procedures Code'.

.5 *'C' class divisions* are divisions constructed of approved non-combustible materials. They need meet neither requirements relative to the passage of smoke and flame nor limitations relative to the temperature rise. Combustible veneers are permitted provided they meet other requirements of this chapter.

.6 *Continuous 'B' class ceilings or linings* are those 'B' class ceilings or linings which terminate only at an 'A' or 'B' class division.

.7 *Steel or other equivalent material.* Where the words 'steel or other equivalent material' occur, 'equivalent material' means any non-combustible material which, by itself or due to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable exposure to the standard fire test (e.g. aluminium alloy with appropriate insulation).

.8 *Low flame spread* means that the surface thus described will adequately restrict the spread of flame, this being determined by a fire test according to IMO Resolution A.653(16), for bulkhead, ceiling and deck finish materials.

.8a FOR CLASS B, C, AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

Low flame spread means that the surface thus described will adequately restrict the spread of flame, this being determined in accordance with the Fire Test Procedures Code.

.9 *Main vertical zones* are those sections into which the hull, superstructure, and deckhouses are divided by 'A' class divisions, the mean length and width of which on any deck does not in general exceed 40 metres.

.10 *Accommodation spaces* are those spaces used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, games and hobbies rooms, barber shops, pantries containing no cooking appliances and similar spaces.

.11 *Public spaces* are those portions of the accommodation which are used for halls, dining rooms, lounges and similar permanently enclosed spaces.

.12 *Service spaces* are those spaces used for galleys, pantries containing cooking appliances, lockers, mail and specie rooms, storerooms, workshops other than those forming part of the machinery spaces, and similar spaces and trunks to such spaces.

.13 *Cargo spaces* are all spaces used for cargo (including cargo oil tanks) and trunks to such spaces.

.13-1 *Vehicle spaces* are cargo spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion.

.14 *Ro-ro cargo spaces* are spaces not normally subdivided in any way and extending to either a substantial length or the entire length of the ship in which motor vehicles with fuel in their tanks for their own propulsion and/or goods (packaged or in bulk, in or on rail or road cars, vehicles (including road and rail tankers), trailers, containers, pallets, dismountable tanks or in or on similar stowage units or other receptacles) can be loaded and unloaded normally in a horizontal direction.

.15 *Open ro-ro cargo spaces* are ro-ro cargo spaces either open at both ends, or open at one end and provided with adequate natural ventilation effective over the entire length through permanent openings in the side plating or deckhead, or from above, and for ships constructed on or after 1 January 2003 having a total area of at least 10 % of the total area of the space sides.

.15-1 *Open vehicle spaces* are those vehicle spaces either open at both ends or having an opening at one end and being provided with adequate natural ventilation effective over their entire length through permanent openings distributed in the side plating or deckhead or from above, and for ships constructed on or after 1 January 2003 having a total area of at least 10 % of the total area of the space sides.

.16 *Closed ro-ro cargo spaces* are ro-ro cargo spaces which are neither open ro-ro cargo spaces nor weather decks.

.16-1 *Closed vehicle spaces* are vehicle spaces which are neither open vehicle spaces nor weather decks.

.17 *Weather deck* is a deck which is completely exposed to the weather from above and from at least two sides.

.18 *Special category spaces* are those enclosed vehicle spaces above or below the bulkhead deck into and from which such vehicles can be driven and to which passengers have access. Special category spaces may be accommodated on more than one deck provided that the total overall clear height for vehicles does not exceed 10 metres.

.19.1 *Machinery spaces* of category A are those spaces and trunks to such spaces which contain:

.1 internal combustion machinery used for main propulsion; or

.2 internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW; or

.3 any oil-fired boiler or oil fuel unit.

.19.2 *Machinery spaces* are all machinery spaces of category A and all other spaces containing propelling machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilising, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces.

.20 *Oil fuel unit* is the equipment used for the preparation of oil fuel for delivery to an oil-fired boiler, or equipment used for the preparation for delivery of heated oil to an internal combustion engine, and includes any oil pressure pumps, filters and heaters dealing with oil at a pressure of more than 0,18 N/mm^2.

.21 *Control stations* are those spaces in which the ship's radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralised.

.21.1 *Central control station* is a control station in which the following control and indicator functions are centralised:

.1 fixed fire detection and alarm systems;

.2 automatic sprinklers, fire detection and alarm systems;

.3 fire door indicator panels;

.4 fire doors closures;

.5 watertight door indicator panels;

.6 watertight door closures;

.7 ventilation fans;

.8 general/fire alarms;

.9 communication systems including telephones; and

.10 microphones to public address systems.

.21.2 *Continuously manned central control station* is a central control station which is continuously manned by a responsible member of the crew.

.22 *Rooms containing furniture and furnishings of restricted fire risk* are, for the purpose of Regulation II-2/B/4, those rooms containing furniture and furnishings of restricted fire risk (whether cabins, public spaces, offices and other types of accommodation) in which:

.1 all case furniture such as desks, wardrobes, dressing tables, bureaux, dressers, is constructed entirely of approved non-combustible materials, except that a combustible veneer not exceeding 2 mm may be used on the working surface of such articles;

.2 all free-standing furniture such as chairs, sofas, tables, is constructed with frames of non-combustible materials;

.3 all draperies, curtains and other suspended textile materials have qualities of resistance to the propagation of flame not inferior to those of wool of mass 0,8 kg/m^2, in accordance with IMO Resolution A.471(XII), as amended.

For class B, C and D ships constructed on or after 1 January 2003, 'IMO Resolution A.471(XII)', as amended, shall read 'Fire Test Procedures Code';

.4 all floor coverings have qualities of resistance to the propagation of flame not inferior to those of an equivalent woollen material used for the same purpose.

For class B, C and D ships constructed on or after 1 January 2003, this subparagraph shall read:

all floor coverings have low flame spread characteristics;

.5 all exposed surfaces of bulkheads, linings and ceilings have low flame-spread characteristics; and

.6 all upholstered furniture has qualities of resistance to the ignition and propagation of flame in accordance with the Fire Test Procedures of Upholstered Furniture of IMO Resolution A.652(16)

For class B, C and D ships constructed on or after 1 January 2003, 'IMO Resolution A.652(16)' shall read 'Fire Test Procedures Code'.

FOR CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003

.7 all bedding components have qualities of resistance to the ignition and propagation of flame, this being determined in accordance with the Fire Test Procedures Code.

.23 *Ro-ro passenger ship* means a passenger ship with ro-ro cargo spaces or special category spaces as defined in this Regulation.

.24 *Fire Test Procedures Code* means the International Code for Application of Fire Test Procedures, as adopted by Resolution MSC.61(67), as amended.

.25 *Fire Safety Systems Code* means the International Code for Fire Safety Systems adopted by Resolution MSC.98(73), as amended.

.26 *Flashpoint* is the temperature in degrees Celsius (closed cup test) at which a product will give off enough flammable vapour to be ignited, as determined by an approved flashpoint apparatus.

.27 *Prescriptive requirements* mean the constructive characteristics, limiting dimensions or fire safety systems specified in this chapter.

[F2.28 *Fire damper* means, for the purpose of implementing Regulation II-2/B/9a, a device installed in a ventilation duct which under normal conditions remains open allowing flow in the duct and is closed during a fire, preventing the flow in the duct to restrict the passage of fire. In using the above definition, the following terms may be associated:

.1 *automatic fire damper* means a fire damper that closes independently in response to exposure to fire products;

.2 *manual fire damper* means a fire damper that is intended to be opened or closed by the crew by hand at the damper itself; and

.3 *remotely operated fire damper* means a fire damper that is closed by the crew through a control located at a distance away from the controlled damper.

Textual Amendments

F2 Inserted by Commission Directive (EU) 2016/844 of 27 May 2016 amending Directive 2009/45/EC of the European Parliament and of the Council on safety rules and standards for passenger ships (Text with EEA relevance).

.29 *Smoke damper* means, for the purpose of implementing Regulation II-2/B/9a, a device installed in a ventilation duct which under normal conditions remains open allowing flow in the duct and is closed during a fire, preventing the flow in the duct to restrict the passage of smoke and hot gases. A smoke damper is not expected to contribute to the integrity of a fire rated division penetrated by a ventilation duct. In using the above definition the following terms may be associated:

.1 *automatic smoke damper* means a smoke damper that closes independently in response to exposure to smoke or hot gases;

.2 *manual smoke damper* means a smoke damper intended to be opened or closed by the crew by hand at the damper itself; and

.3 *remotely operated smoke damper* means a smoke damper that is closed by the crew through a control located at a distance away from the controlled damper.**]**

3 **Fire pumps, fire mains, hydrants, hoses and nozzles (R 4)**

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.1.1 Every ship shall be provided with fire pumps, fire mains, hydrants, hoses and nozzles complying as applicable with the requirements of this Regulation.

NEW CLASS B, C AND D SHIPS CONSTRUCTED BEFORE 1 JANUARY 2003:

.1.2 Where more than one independent fire pump is required, isolating valves to separate the section of the fire main within the machinery space containing the main fire pump or pumps from the rest of the fire main shall be fitted in an easily accessible and tenable position outside this machinery space. The fire main shall be so arranged that when the isolating valves are shut all the hydrants on the ship, except those in the machinery space referred above, can be supplied with water by a fire pump not located in this machinery space through pipes which do not enter this space. Exceptionally, short lengths of the emergency fire pump suction and discharge piping may penetrate the machinery space if it is impracticable to route it externally provided that the integrity of the fire main is maintained by the enclosure of the piping in a substantial steel casing.

NEW CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

.1.3 Isolating valves to separate the section of the fire main within the machinery space containing the main fire pump or pumps from the rest of the fire main shall be fitted in an easily accessible and tenable position outside the machinery spaces. The fire main shall be so arranged that when the isolating valves are shut all the hydrants on the ship, except those in the machinery space referred to above, can be supplied with water by another pump or an emergency fire pump. The emergency pump, its seawater inlet and suction and delivery pipes and isolating valves shall be located outside the machinery space. If this arrangement cannot be made, the sea-chest may be fitted in the machinery space if the valve is remotely controlled from a position in the same compartment as the emergency pump and the suction pipe is as short as practicable. Short lengths of suction or discharge piping may penetrate the machinery space, provided they are

enclosed in a substantial steel casing or are insulated to A-60 standards. The pipes shall have substantial wall thickness, but in no case less than 11 mm and shall be welded except for the flanged connection to the sea inlet valve.

NEW AND EXISTING CLASS B SHIPS AND NEW CLASS C AND D SHIPS OF 24 METRES IN LENGTH AND ABOVE:

.2 *Capacity of fire pumps*

.1 The required fire pumps shall be capable of delivering for fire-fighting purposes a quantity of water, at the pressure specified in paragraph .4.2 not less than two thirds of the quantity required to be dealt with by the bilge pumps when employed for bilge pumping.

.2 In every ship which is required by this Regulation to be provided with more than one power fire pump, each of the required fire pumps shall have a capacity not less than 80 % of the total required capacity divided by the minimum number of required fire pumps but in any case not less than 25 m^3/h and each such pump shall in any event be capable of delivering at least the two required jets of water. These fire pumps shall be capable of supplying the fire main system under the required conditions.

.3 In ships constructed on or after 1 January 2003 where more pumps than the minimum required pumps are installed such additional pumps shall have a capacity of at least 25 m^3/h and shall be capable of delivering at least the two jets of water required in paragraph .5 of this Regulation.

.3 *Arrangements of fire pumps, fire mains and ready availability of water supply*

.1 Ships shall be provided with power driven fire pumps as follows:

.1 ships certified to carry more than 500 passengers: at least three, one of which may be a main engine driven pump;

.2 ships certified to carry up to 500 passengers or less: at least two, one of which may be a main engine driven pump.

.2 Sanitary, ballast, bilge or general service pumps may be accepted as fire pumps, provided that they are not normally used for pumping oil and that if they are subject to occasional duty for the transfer or pumping of oil fuel, suitable changeover arrangements are fitted.

.3 The arrangement of sea connections, fire pumps and their sources of power shall be such as to ensure that in ship certified to carry more than 250 passengers, in the event of a fire in any one compartment all the fire pumps will not be put out of action.

In new class B ships certified to carry up to 250 passengers or less, if a fire in any one compartment could put all the pumps out of action, the alternative means of providing water for fire-fighting purposes shall be an independently driven, power-operated emergency fire pump and with its source of power and sea connection located outside the machinery space. Such an independently driven, power operated emergency fire pump shall comply with the provisions of the Fire Safety Systems Code for ships constructed on or after 1 January 2003.

.4 In new class B ships certified to carry more than 250 passengers, the arrangements for the ready availability of water supply shall be such that at least one effective jet of water is immediately available from any hydrant in an interior location and so as to ensure the continuation of the output of water by the automatic starting of a required fire pump.

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

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

.4 *Diameter of and pressure in the fire mains*

.1 The diameter of the fire main and water service pipes shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously.

.2 With two pumps simultaneously delivering through nozzles specified in paragraph .8 and sufficient hydrants to provide for the quantity of water specified in paragraph .4.1, the following minimum pressures shall be maintained at all hydrants:

Class B ships certified to carry	**New**	**Existing**
more than 500 passengers	0,4 N/mm^2	0,3 N/mm^2
up to 500 passengers	0,3 N/mm^2	0,2 N/mm^2

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

.5 *Number and position of hydrants*

.1 The number and position of hydrants shall be such that at least two jets of water not emanating from the same hydrant, one of which shall be from a single length of hose, may reach any part of the ship normally accessible to the passengers or crew while the ship is being navigated and any part of any cargo space when empty, any ro-ro cargo space or any special category space in which latter case the two jets shall reach any part of such space, each from a single length of hose. Furthermore, such hydrants shall be positioned near the accesses to the protected spaces.

.2 In the accommodation, service and machinery spaces the number and position of the hydrants shall be such that the requirements of paragraph .5.1 may be complied with when all watertight doors and all doors in main vertical zone bulkheads are closed.

.3 Where access is provided to a machinery space at a low level from an adjacent shaft tunnel, two hydrants shall be provided external to, but near the entrance to that machinery space. Where such access is provided from other spaces, in one of those spaces two hydrants shall be provided near the entrance of the machinery space. Such provision need not be made where the tunnel or adjacent spaces are not part of the escape route.

.6 *Pipes and hydrants*

.1 Materials readily rendered ineffective by heat shall not be used for fire mains and hydrants unless adequately protected. The pipes and hydrants shall be so placed that the fire hoses may be easily coupled to them. The arrangement of pipes and hydrants shall be such as to avoid the possibility of freezing. In ships where deck cargo may

be carried, the positions of the hydrants shall be such that they are always readily accessible and the pipes shall be arranged as far as practicable to avoid risk of damage by such cargo.

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

.3 In ships constructed on or after 1 January 2003 isolating valves shall be installed for all open deck fire main branches used for purposes other than fire-fighting.

.7 *Fire hoses*

.1 Fire hoses shall be of non-perishable material, approved by the Administration of the flag State, and shall be sufficient in length to project a jet of water to any of the spaces in which they may be required to be used. Each hose shall be provided with a nozzle and the necessary couplings. There shall be complete interchangeability of hose couplings and nozzles. Hoses specified in this chapter as 'fire hoses' shall together with any necessary fittings and tools, be kept ready for use in conspicuous positions near the water service hydrants or connections. Additionally, in interior locations in ships carrying more than 36 passengers, fire hoses shall be permanently connected to the hydrants.

.2 There shall be at least one fire hose for each of the hydrants required by paragraph .5. The length of a fire hose should be restricted to not more than 20 metres on deck and in superstructures and to 15 metres in machinery spaces and on smaller ships respectively to 15 metres and 10 metres.

.8 *Nozzles*

.1.1 For the purposes of this chapter, standard nozzle sizes shall be 12 mm, 16 mm and 19 mm or as near thereto as possible. In cases where other systems are used — such as fog systems — different diameter nozzles may be permitted.

.1.2 All nozzles shall be of an approved dual-purpose type (i.e., spray/jet type), and shall have a shutoff facility.

.2 For accommodation and service spaces, a nozzle size greater than 12 mm need not be used,

.3 For machinery spaces and exterior locations, the nozzle size shall be such as to obtain the maximum discharge possible from two jets at the pressure mentioned in paragraph .4 from the smallest pump, provided that a nozzle size greater than 19 mm need not be used.

NEW CLASS C AND D SHIPS OF LESS THAN 24 METRES IN LENGTH:

.9 *Fire pumps, fire mains, hydrants, hoses, nozzles and ready availability of water supply*

.1 One independent fire pump is required, which shall be capable of delivering for fire-fighting purposes at least one jet of water from any fire hydrant, at the pressure specified below. The quantity of water so delivered is not to be less than two thirds of the quantity required to be dealt with by the bilge pumps when employed for bilge pumping. Such fire pump shall be capable, when discharging the maximum amount referred to above through fire hydrants with nozzles of 12 or 16 or 19 mm, of maintaining at any hydrant minimum pressures as required in class B ships.

.2 Every ship carrying over 250 passengers shall be provided with an additional fire pump which shall be permanently connected to the fire main. Such pump shall be

operated by power. Such pump and its source of power shall not be situated in the same compartment as the pump required by paragraph .9.1 and shall be provided with a permanent sea connection situated outside the machinery space. Such pump shall be capable of delivering at least one jet of water from any fire hydrants provided in the ship maintaining a pressure of at least 0,3 N/mm^2.

.3 Sanitary, ballast, bilge or general service pumps may be accepted as fire pumps.

.4 Every ship shall be provided with a fire main having a diameter sufficient for the effective distribution of the maximum discharge given above. The number and position of the hydrants shall be such that at least one jet of water may reach any part of the ship using one single max. length of hose as given for class B ships in paragraph .7.2.

.5 Every ship shall be fitted with at least one fire hose for every hydrant fitted.

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

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

4 **Fixed fire-extinguishing systems (R 5 + 8 + 9 + 10)**

.1 *Fixed gas fire-extinguishing systems: General (R 5.1)*
NEW CLASS B, C AND D SHIPS CONSTRUCTED BEFORE 1 JANUARY 2003 AND EXISTING CLASS B SHIPS:

.1 The necessary pipes for conveying fire-extinguishing medium into protected spaces shall be provided with control valves so marked as to indicate clearly the spaces to which the pipes are led. Suitable provision shall be made to prevent inadvertent admission of the medium to any space.

.2 The piping for the distribution of fire-extinguishing medium shall be arranged and discharge nozzles so positioned that a uniform distribution of medium is obtained.

.3 Means shall be provided to close from outside the protected spaces all openings which may admit air to or allow gas to escape from the protected space.

.4 Means shall be provided for automatically giving audible warning of the release of fire-extinguishing medium into any space in which personnel normally work or to which they have access. The alarm shall operate for a suitable period before the medium is released.

.5 The means of control of any fixed gas fire-extinguishing system shall be readily accessible and simple to operate and shall be grouped together in as few locations as possible at positions not likely to be cut off by a fire in a protected space. At each location there shall be clear instructions relating to the operation of the system having regard to the safety of personnel.

.6 Automatic release of fire-extinguishing medium shall not be permitted, except as permitted in respect of local automatically operated units fitted, in addition to and independent of any required fixed fire-extinguishing system, in machinery spaces over equipment having a high fire risk or in enclosed areas of high fire risk within machinery spaces.

.7 Where the quantity of extinguishing medium is required to protect more than one space, the quantity of medium available need not be more than the largest quantity required for any one space so protected.

.8 Except as otherwise permitted, pressure containers required for the storage of fire-extinguishing medium, shall be located outside protected spaces in accordance with paragraph .1.11.

.9 Means shall be provided for the crew or shore personnel to safely check the quantity of medium in the containers.

.10 Containers for the storage of fire extinguishing medium and associated pressure components shall be designed to appropriate codes of practice having regard to their locations and maximum ambient temperatures expected in service.

.11 When the fire-extinguishing medium is stored outside a protected space, it shall be stored in a room which shall be situated in a safe and readily accessible position and shall be effectively ventilated. Any entrance to such a storage room shall preferably be from the open deck and in any case shall be independent of the protected space.

Access doors shall open outwards, and bulkheads and decks including doors and other means of closing any opening therein, which form the boundaries between such rooms and adjoining enclosed spaces shall be gastight. For the purpose of application of the tables for fire integrity of bulkheads and decks in Regulations II-2/B/4 or II-2/B/5, as applicable, such storage rooms shall be treated as control stations.

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

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

.13 Fixed gas fire-extinguishing systems shall comply with the provisions of the Fire Safety Systems Code.

.14 Means shall be provided to close from outside the protected space all openings which may admit air to or allow gas escape from the protected space.

.15 When the fire-extinguishing medium is stored outside a protected space, it shall be stored in a room which is located behind the forward collision bulkhead and is used for no other purposes. Any entrance to such a storage room shall preferably be from the open deck and shall be independent of the protected space. If the storage place is located below deck, it shall be located no more than one deck below the open deck and shall be directly accessible by a stairway or ladder from the open deck.

Spaces which are located below deck or spaces where access from the open deck is not provided shall be fitted with a mechanical ventilation system designed to take exhaust air from the bottom of the space and shall be sized to provide at least 6 air changes per hour. Access doors shall open outwards and bulkheads and decks including doors and other means of closing any opening therein, which form boundaries between such rooms and adjacent enclosed spaces, shall be gastight. For the purpose of the application of tables 4.1, 4.2, 5.1 and 5.2, in Part B of this Chapter, such storage rooms shall be treated as fire control stations.

NEW CLASS A, B, C AND D SHIPS AND EXISTING CLASS B SHIPS:

.16 Where the volume of free air contained in air receivers in any space is such that, if released in such space in the event of fire, such release of air within that space would

seriously affect the efficiency of the fixed fire-extinguishing system, an additional quantity of fire-extinguishing medium shall be provided.

.17 Suppliers of fixed fire-extinguishing installations shall provide a description of the installation, including a checklist for maintenance, in English and in the official language(s) of the flag State.

.18 The quantity of the fire-extinguishing medium shall be checked at least once a year by either an expert authorised by the Administration, the supplier of the installation or a recognised organisation.

.19 The periodic checking which is carried out by the ship's chief engineer or organised by the ship's management shall be entered in the ship's logbook stating the scope and the time of such checking.

.20 Non-prescribed fire extinguishing equipment which is installed e.g. in store rooms shall, in its construction and dimensioning, comply with the provisions of this Regulation for the type of installation in question.

.21 All doors to spaces protected by CO_2 installation shall be marked 'This space is protected by a CO_2 installation and shall be evacuated when the alarm equipment comes into operation'.

.2 *Carbon dioxide systems (R 5.2)*

NEW CLASS B, C AND D SHIPS CONSTRUCTED BEFORE 1 JANUARY 2003 AND EXISTING CLASS B SHIPS:

.1.1 For cargo spaces the quantity of CO_2 available shall, unless otherwise provided, be sufficient to give a minimum volume of free gas equal to 30 % of the gross volume of the largest cargo space so protected in the ship.

If there is a connection through ventilation ducts between two or more cargo spaces, these shall be considered one space. In ships used for the carriage of vehicles, the necessary quantity of CO_2 shall be calculated as 45 % of the gross cubic content of the largest cargo space.

.1.2 For machinery spaces the quantity of carbon dioxide carried shall be sufficient to give a minimum volume of free gas equal to the larger of the following volumes, either:

.1 40 % of the gross volume of the largest machinery space so protected, the volume to exclude that part of the casing above the level at which the horizontal area of the casing is 40 % or less of the horizontal area of the space concerned taken midway between the tank top and the lowest part of the casing; or

.2 35 % of the gross volume of the largest machinery space protected, including the casing; provided that if two or more machinery spaces are not entirely separated they shall be considered as forming one space.

.2 For the purpose of this paragraph the volume of free carbon dioxide shall be calculated at 0,56 m^3/kg.

.3 The fixed piping system shall be such that 85 % of the gas can be discharged into the space within 2 min.

.4 Release mechanism of carbon dioxide:

.1 Two separate controls shall be provided for releasing carbon dioxide into a protected space and to ensure the activities of the alarm. One control shall be used to discharge

the gas from its storage containers. A second control shall be used for opening the valve of the piping which conveys the gas into the protected space.

.2 The two controls shall be located inside a release box clearly identified for the particular space. If the box containing the controls is to be locked, a key to the box shall be in a break-glass type enclosure conspicuously located adjacent to the box.

.5 The Administration of the flag State shall ensure that the spaces in which the CO_2 batteries are located will be properly arranged as regards their access, ventilation and communication equipment. It shall take the necessary safety measures regarding the construction, installation, marking, filling and testing of CO_2 cylinders, pipes and fittings, and for the control and alarm equipment for such installation.

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

.6 Carbon dioxide systems shall comply with the provisions of the Fire Safety Systems Code.

.7 The Administration of the flag State shall ensure that the spaces in which the CO_2 batteries are located will be properly arranged as regards their access, ventilation and communication equipment. It shall take the necessary safety measures regarding the construction, installation, marking, filling and testing of CO_2, cylinders piping and fittings and for control and alarm equipment for such installation.

.3 *Fixed low-expansion foam fire-extinguishing systems in machinery spaces (R 8)*

NEW CLASS B, C AND D SHIPS CONSTRUCTED BEFORE 1 JANUARY 2003 AND EXISTING B CLASS SHIPS:

.1 Where in any machinery space a fixed low-expansion foam fire-extinguishing system is fitted in addition to the requirements of Regulation 6, such system shall be capable of discharging through fixed discharge outlets in not more than five minutes a quantity of foam sufficient to cover to a depth of 150 mm the largest single area over which oil fuel is liable to spread. The system shall be capable of generating foam suitable for extinguishing oil fires. Means shall be provided for effective distribution of the foam through a permanent system of piping and control valves or cocks to suitable discharge outlets and for the foam to be effectively directed by fixed sprayers on other main fire hazards in the protected space. The expansion ratio of the foam shall not exceed 12 to 1.

.2 The means of control of any such systems shall be readily accessible and simple to operate and shall be grouped together in as few locations as possible at positions not likely to be cut off by a fire in the protected space.

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

.3 Fixed low-expansion foam fire-extinguishing systems in machinery spaces shall comply with the provisions of the Fire Safety Systems Code.

.4 *Fixed high-expansion foam fire-extinguishing systems in machinery spaces (R 9)*

NEW CLASS B, C AND D SHIPS CONSTRUCTED BEFORE 1 JANUARY 2003 AND EXISTING CLASS B SHIPS:

.1 Any required fixed high-expansion foam system in machinery spaces shall be capable of rapidly discharging through fixed discharge outlets a quantity of foam sufficient to fill the greatest space to be protected at a rate of at least 1 metre in depth per minute. The quantity of foam-forming liquid available shall be sufficient to produce a volume of foam equal to five times the volume of the largest space to be protected. The expansion ratio of the foam shall not exceed 1 000 to 1.

.2 Supply ducts for delivering foam, air intakes to the foam generator and the number of foam-producing units shall be such as will provide effective foam production and distribution.

.3 The arrangement of the foam generator delivery ducting shall be such that a fire in the protected space will not affect the foam generating equipment.

.4 The foam generator, its sources of power supply, foam forming liquid and means of controlling the system shall be readily accessible and simple to operate and shall be grouped in as few locations as possible at positions not likely to be cut off by a fire in the protected space.

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

.5 Fixed high expansion foam fire-extinguishing systems in machinery spaces shall comply with the provisions of the Fire Safety Systems Code.

.5 *Fixed pressure water-spraying fire-extinguishing systems in machinery spaces (R 10)*

NEW CLASS B, C AND D SHIPS CONSTRUCTED BEFORE 1 JANUARY 2003 AND EXISTING CLASS B SHIPS:

.1 Any required fixed pressure water-spraying fire-extinguishing system in machinery spaces shall be provided with spraying nozzles of an approved type.

.2 The number and arrangement of the nozzles shall be such as to ensure an effective average distribution of water of at least 5 litres/m^2 per minute in the spaces to be protected. Increased application rates may be considered if necessary for particular hazardous areas. Nozzles shall be fitted above bilges, tank tops and other areas over which oil fuel is liable to spread and also above other specific fire hazards in the machinery spaces.

.3 The system may be divided into sections, the distribution valves of which shall be operated from easily accessible positions outside the spaces to be protected and will not be readily cut off by a fire in the protected space.

.4 The system shall be kept charged at the necessary pressure and the pump supplying the water for the system shall be put automatically into action by a pressure drop in the system.

.5 The pump shall be capable of simultaneously supplying at the necessary pressure all sections of the system in any one compartment to be protected. The pump and its controls shall be installed outside the space or spaces to be protected. It shall not be possible for a fire in the space or spaces protected by the water-spraying system to put the system out of action.

.6 Precautions shall be taken to prevent the nozzles from becoming clogged by impurities in the water or corrosion of piping, nozzles, valves and pump.

NEW CLASS B, C AND D SHIPS CONSTRUCTED BEFORE 1 JANUARY 2003:

.7 The pump may be driven by an independent internal combustion machinery but, if it is dependent upon power being supplied from the emergency generator fitted in compliance with the provisions of Part D of Chapter II-1, that generator shall be so arranged as to start automatically in case of main power failure so that power for the pump required by paragraph .5 is immediately available. When the pump is driven by independent internal combustion machinery it shall be so situated that a fire in the protected space will not affect the air supply to the machinery.

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

.8 Fixed pressure water-spraying fire-extinguishing systems in machinery spaces shall comply with the provisions of the Fire Safety Systems Code.

5 **Portable fire extinguishers (R 6)**

NEW CLASS B, C AND D SHIPS CONSTRUCTED BEFORE 1 JANUARY 2003 AND EXISTING CLASS B SHIPS:

.1 All fire extinguishers shall be of approved types and designs.

.2 The capacity of required portable fluid extinguishers shall be not more than 13,5-litre and not less than 9 litres. Other extinguishers shall be at least as portable as the 13,5-litre fluid extinguisher and shall have a fire-extinguishing capability at least equivalent to that of a 9-litre fluid extinguisher.

.3 Spare charges shall be carried for 50 % of the total of each type of extinguisher on board. Another extinguisher of the same type is a spare charge for an extinguisher which cannot be readily recharged on board.

.4 In general, portable CO_2 fire extinguishers shall not be located in accommodation spaces. Where such extinguishers are provided in radio rooms, at switchboards and other similar positions, the volume of any space containing one or more extinguishers shall be such as to limit the concentration of vapour that can occur due to discharge to not more than 5 % of the net volume of the space for the purpose of this Regulation. The volume of CO_2 shall be calculated at 0,56 m^3/kg.

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

.5 Portable fire extinguishers shall comply with the provisions of the Fire Safety Systems Code.

.6 Carbon dioxide fire extinguishers shall not be placed in accommodation spaces. In control stations and other spaces containing electrical or electronic equipment or appliances necessary for the safety of the ship, fire extinguishers should be provided whose extinguishing media are neither electrically conductive nor harmful to the equipment and appliances.

.7 Fire extinguishers shall be situated ready for use at easily visible places, which can be reached quickly and easily at any time in the event of a fire and in such a way that their serviceability is not impaired by the weather, vibration or other external factors. Portable fire extinguishers shall be provided with devices which indicate whether they have been used.

.8 Spare charges shall be provided for 100 % of the first 10 extinguishers and 50 % of the remaining fire extinguishers capable of being recharged on board.

.9 For the extinguishers which cannot be recharged on board, additional portable fire extinguishers of the same quantity, type, capacity and number as determined in paragraph .13 below shall be provided in lieu of spare charges.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.10 Fire extinguishers containing an extinguishing medium which either by itself or under expected conditions of use gives off toxic gases in such quantities as to endanger persons or gives off gases which are harmful to the environment shall not be permitted.

.11 The fire extinguishers shall be suitable for extinguishing fires which are possible in the vicinity of the fire extinguisher location.

.12 One of the portable fire extinguishers intended for use in any space shall be located near the entrance of that space.

.13 The minimum number of fire extinguishers shall be as follows:

.1 in accommodation and service spaces:

the fire extinguishers shall be so located that no point in the space is more than 10 metres walking distance from an extinguisher;

.2 an extinguisher suitable for use in high voltage areas shall be located in the proximity of any electric panel or subpanel having a power of 20 kW or more;

.3 in galleys the extinguishers shall be so located that no point in the space is more than 10 metres walking distance from an extinguisher;

.4 an extinguisher shall be located in the proximity of paint lockers store rooms containing readily flammable products;

.5 at least one extinguisher shall be located on the navigating bridge and in each control station.

.14 Portable fire extinguishers provided for use in accommodation or service spaces shall so far as practicable have a uniform method of operation.

.15 Periodic inspection of fire extinguishers:

the Administration of the Flag State shall ensure that portable fire extinguishers shall be periodically inspected, function-tested and pressure-tested.

6 **Fire-extinguishing arrangements in machinery spaces (R 7)**

Machinery spaces of category A shall be provided with:
IN NEW CLASS B, C AND D SHIPS OF 24 METRES IN LENGTH AND OVER:

.1 any one of the following fixed fire-extinguishing systems:

.1 a gas system complying with the relevant provisions of paragraphs .1 and .2 of Regulation II-2/A/4, or an equivalent water-based system, complying with the provisions of IMO MSC/Circ.1165 as amended, taking into consideration the date of construction of the ship;

.2 a high-expansion foam system complying with the relevant provisions of paragraph .4 of Regulation II-2/A/4, taking into consideration the date of construction of the ship;

.3 a pressure water-spraying system complying with the relevant provisions of paragraph .5 of Regulation II-2/A/4, taking into consideration the date of construction of the ship.

.2 at least one set of portable air-foam equipment consisting of an air-foam nozzle of an inductor type capable of being connected to the fire main by a fire hose, together with a portable tank containing at least 20 litres of foam-making liquid and one spare tank. The nozzle shall be capable of producing effective foam suitable for extinguishing an oil fire, at a rate of at least 1,5 m^3 per min.

.3 In each such space, approved foam-type fire extinguishers, each of at least 45 litres capacity, or equivalent, sufficient in number to enable foam or its equivalent to be directed on to any part of the fuel and lubricating oil pressure systems, gearing and

other fire hazards. In addition, there shall be provided a sufficient number of portable foam extinguishers or equivalent which shall be so located that no point in the space is more than 10 metres walking distance from an extinguisher and that there are at least two such extinguishers in each such space.

IN NEW CLASS B, C AND D SHIPS OF LESS THAN 24 METRES IN LENGTH AND EXISTING CLASS B SHIPS:

.4 one of the fixed fire-extinguishing systems specified in paragraph .1 above, and in addition in any space containing internal combustion engines, or oil fuel settling tanks or oil-fuel units, one foam fire-extinguisher of at least 45 litres capacity, or equivalents sufficient in number to enable foam or its equivalent to be directed on to any part of the fuel and lubricating oil pressure systems, gearing and other fire hazards, and

.5 one portable fire extinguisher suitable for extinguishing oil fires for each 746 kW or part thereof of such machinery; provided that not less than two nor more than six such extinguishers shall be required in any such space.

The use of low expansion foam fixed system in lieu of some of the six portable fire extinguishers required by this Regulation is permitted.

IN NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS OF 24 METRES IN LENGTH AND OVER:

.6 Each machinery space shall be provided with two suitable water fog applicators which might consist of a metal L-shaped pipe, the long limb being about 2 min length, capable of being fitted to a fire hose, and the short limb being about 250 mm in length, fitted with a fixed water fog nozzle or capable of being fitted with a water spray nozzle.

IN NEW CLASS B, C AND D SHIPS AND EXISTING CLASS B SHIPS:

.7 When heated oil is used as heating medium, it may be additionally required that boiler rooms are equipped with permanently-installed or portable equipment for local systems for jet spraying of water under pressure or the spreading of foam above and below the floor for fire-extinguishing purposes.

IN NEW CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003, WITH A LENGTH OF 24 METRES AND ABOVE; AND NEW CLASS B, C AND D SHIPS CONSTRUCTED BEFORE 1 JANUARY 2003, CERTIFIED TO CARRY MORE THAN 400 PASSENGERS AND EXISTING CLASS B SHIPS, CERTIFIED TO CARRY MORE THAN 400 PASSENGERS:

.8

.1 Machinery spaces of category A above 500 m^3 in volume shall, in addition to the fixed fire-extinguishing system required in this Regulation, be protected by an approved type of fixed water-based or equivalent local application fire-fighting system, based on the guidelines in IMO MSC/Circ.913 ‘Guidelines for the approval of fixed water-based local application fire-fighting systems for use in category A machinery spaces’.

In the cases of periodically unattended machinery spaces, the fire-fighting system shall have both automatic and manual release capabilities. In the case of continuously manned machinery spaces the fire-fighting system is only required to have a manual release capability.

.2 Fixed local application fire-fighting systems are to protect areas such as the following without the necessity of engine shutdown, personnel evacuation or sealing of spaces:

.1 **[**[F3]the fire hazard portions of internal combustion machinery used for the ship's main propulsion and power generation, and for ships built on or after 1 January 2018, the fire hazard portions of all internal combustion machinery,**]**

.2 boiler fronts,

.3 the fire hazard portions of incinerators, and

.4 purifiers for heated fuel oil.

.3 Activation of any local application system shall give a visual and distinct audible alarm in the protected space and at continuously manned stations. The alarm shall indicate the specific system activated. The system alarm requirements described within this paragraph are in addition to and not a substitute for the detection and fire alarm systems required elsewhere in this chapter.

Textual Amendments

F3 Substituted by Commission Directive (EU) 2016/844 of 27 May 2016 amending Directive 2009/45/EC of the European Parliament and of the Council on safety rules and standards for passenger ships (Text with EEA relevance).

7 **Special arrangements in machinery spaces (R 11)**

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.1 The number of skylights, doors, ventilators, openings in funnels to permit exhaust ventilation and other openings to machinery spaces shall be reduced to a minimum consistent with the needs of ventilation and the proper and safe working of the ship.

.2 Skylights shall be of steel and shall not contain glass panels. Suitable arrangements shall be made to permit the release of smoke in the event of fire, from the space to be protected.

NEW CLASS B, C AND D SHIPS:

.3 Doors other than power-operated watertight doors, shall be so arranged that positive closure is assured in case of fire in the space, by power-operated closing arrangements or by the provision of self-closing doors capable of closing against an inclination of 3,5° opposing closure and having a fail-safe hold-back facility, provided with a remotely operated release device.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.4 Windows shall not be fitted in machinery space boundaries. This does not preclude the use of glass in control rooms within the machinery spaces.

.5 Means of control shall be provided for:

.1 opening and closure of skylights, closure of openings in funnels which normally allow exhaust ventilation, and closure of ventilator dampers;

.2 permitting the release of smoke;

.3 closing power-operated doors or actuating release mechanism on doors other than power-operated watertight doors;

.4 stopping ventilating fans; and

.5 stopping forced and induced draught fans, oil fuel transfer pumps, oil fuel unit pumps and other similar fuel pumps. Other similar fuel pumps means for ships constructed on or after 1 January 2003 lubricating oil service pumps, thermal oil circulating pumps and oil separators. However paragraph .6 of this Regulation need not apply to oily water separators.

.6 The controls required in paragraph .5 and Regulation II-2/A/10.2.5 shall be located outside the space concerned, where they will not be cut off in the event of fire in the space they serve. Such controls and the controls for any required fire-extinguishing system shall be situated at one control position or grouped in as few positions as possible. Such positions shall have a safe access from the open deck.

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

8 **Automatic sprinkler, fire detection and fire alarm systems (R 12)**

NEW CLASS B, C AND D SHIPS CONSTRUCTED BEFORE 1 JANUARY 2003 AND EXISTING CLASS B SHIPS:

.1 Any required automatic sprinkler, fire detection and fire alarm system shall be capable of immediate operation at all times and no action by the crew shall be necessary to set it in operation. It shall be of the wet pipe type but small exposed sections may be of the dry pipe type where this is a necessary precaution. Any parts of the system which may be subjected to freezing temperatures in service shall be suitably protected against freezing. It shall be kept charged at the necessary pressure and shall have provision for a continuous supply of water as required in this Regulation.

.2 Each section of sprinklers shall include means for giving a visual and audible alarm signal automatically at one or more indicating units whenever any sprinkler comes into operation. Such units shall indicate in which section served by the system fire has occurred and shall be centralised on the navigation bridge and in addition, visible and audible alarms from the unit shall be placed in a position other than on the navigating bridge so as to ensure that the indication of fire is immediately received by the crew. The alarm system shall be such as to indicate if any fault occurs in the system.

.3 Sprinklers shall be grouped into separate sections, each of which shall contain not more than 200 sprinklers. Any section of sprinklers shall not serve more than two decks and shall not be situated in more than one main vertical zone, unless it can be demonstrated that arrangements with a section of sprinklers serving more than two decks or situated in more than one main vertical zone will not reduce the protection of the ship against fire.

.4 Each section of sprinklers shall be capable of being isolated by one stop valve only. The stop valve in each section shall be readily accessible and its location shall be clearly and permanently indicated. Means shall be provided to prevent the operation of the stop valves by any unauthorised person.

.5 A gauge indicating the pressure in the system shall be provided at each section stop valve and at a central station.

.6 The sprinklers shall be resistant to corrosion by marine atmosphere. In accommodation and service spaces the sprinklers shall come into operation within the temperature range from 68 to 79 °C, except that in locations such as drying rooms, where high ambient temperatures might be expected, the operating temperature may be increased by not more than 30 °C above the maximum deckhead temperature.

.7 A list or plan shall be displayed at each indicating unit showing the spaces covered and the location of the zone in respect of each section. Suitable instructions for testing and maintenance shall be available.

.8 Sprinklers shall be placed in an overhead position and spaced in a suitable pattern to maintain an average application rate of not less than 5 litres/m^2 per minute over the nominal area covered by the sprinklers.

Sprinklers shall be placed as clear as possible of beams or other objects likely to obstruct the projections of water and in such positions that combustible material in the space will be well sprayed.

.9 A pressure tank having a volume equal to at least twice that of the charge of water specified in this paragraph shall be provided. The tank shall contain a standing charge of fresh water, equivalent to the amount of water which would be discharged in one minute by the pump referred to in paragraph .12, and the arrangements shall provide for maintaining an air pressure in the tank such as to ensure that where the standing charge of fresh water in the tank has been used the pressure will be not less than the working pressure of the sprinkler, plus the pressure exerted by a head of water measured from the bottom of the tank to the highest sprinkler in the system. Suitable means of replenishing the air under pressure and of replenishing the fresh water charge in the tank shall be provided. A glass gauge shall be provided to indicate the correct level of the water in the tank.

.10 Means shall be provided to prevent the passage of seawater into the tank. The pressure tank shall be fitted with an efficient relief valve and a pressure gauge. Stop valves or cocks shall be provided at each of the gauge connections.

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

.12 The pump and the piping system shall be capable of maintaining the necessary pressure at the level of the highest sprinkler to ensure a continuous output of water sufficient for the simultaneous coverage of a minimum area of 280 m^2 at the application rate specified in paragraph .8. For new class C and D ships of less than 40 metres in length with a total protected area of less than 280 m^2, the Administration may specify the appropriate area for sizing of pumps and alternative supply components.

.13 The pump shall have fitted on the delivery side a test valve with a short open-ended discharge pipe. The effective area through the valve and the pipe shall be adequate to permit the release of the required pump output while maintaining the pressure in the system specified in paragraph .9.

.14 The sea inlet to the pump shall wherever possible be in the space containing the pump and shall be so arranged that when the ship is afloat it will not be necessary to shut off the supply of seawater to the pump for any purpose other than the inspection or repair of the pump.

.15 The sprinkler pump and tank shall be situated in a position reasonably remote from any machinery space and shall not be situated in any space required to be protected by the sprinkler system.

.16 There shall be not less than two sources of power supply for the seawater pump and automatic alarm and detection system. Where the sources of power for the pump are electrical, these shall be a main generator and an emergency source of power. One supply for the pump shall be taken from the main switchboard, and one from the emergency switchboard by separate feeders reserved solely for that purpose. The feeders shall be so arranged as to avoid galleys, machinery spaces and other enclosed spaces of high fire risk except in so far as it is necessary to reach the appropriate switchboards, and shall be run to an automatic changeover switch situated near the sprinkler pump. This switch shall permit the supply of power from the main switchboard so long as a supply is available therefrom, and to be so designed that upon failure of that supply it will automatically change over to the supply from the emergency switchboard. The switches on the main switchboard and the emergency switchboard shall be clearly labelled and normally kept closed. No other switch shall be permitted in the feeders concerned. One of the sources of power supply for the alarm and detection system shall be an emergency source. Where one of the sources of power for the pump is an internal combustion engine it shall, in addition to complying with the provisions of paragraph .15, be so situated that a fire in any protected space will not affect the air supply to the machinery.

.17 The sprinkler system shall have a connection from the ship's fire main by way of a lockable screw-down non-return valve at the connection which will prevent a backflow from the sprinkler system to the fire main.

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

.19 Means shall be provided for testing the automatic operation of the pump on reduction of pressure in the system.

.20 Switches shall be provided at one of the indicating positions referred to in paragraph .2 which will enable the alarm and the indicators for each section of sprinklers to be tested.

.21 At least 6 spare sprinkler heads shall be provided for each section.

NEW CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

.22 The automatic sprinkler, fire detection and fire alarm systems shall be of an approved type, complying with the provisions of the Fire Safety System Code.

.23 For new C and D class ships of less than 40 metres in length and with a total protected area of less than 280 m^2 the Administration may specify the appropriate area for sizing of pumps and alternative components.

9 **Fixed fire detection and fire alarm systems (R 13)**

NEW CLASS B, C AND D SHIPS CONSTRUCTED BEFORE 1 JANUARY 2003 AND EXISTING CLASS B SHIPS:

.1 *General*

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

.2 Power supplies and electric circuits necessary for the operation of the system shall be monitored for loss of power or fault conditions as appropriate. Occurrence of a fault

condition shall initiate a visual and audible fault signal at the control panel which shall be distinct from a fire signal.

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

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

.5 The control panel shall be located on the navigating bridge or in the main fire control station.

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

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

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

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

.10 A section of fire detectors which covers a control station, a service space or an accommodation space shall not include a machinery space.

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

.12 Suitable instructions and component spares for testing and maintenance shall be provided.

.13 The function of the detection system shall be periodically tested to the satisfaction of the Administration of the flag State by means of equipment producing hot air at the appropriate temperature, or smoke or aerosol particles having the appropriate range of density or particle size, or other phenomena associated with incipient fires to which the detector is designed to respond.

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

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

.15 Fire detection systems with a zone address identification capability shall be so arranged that:

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

— means are provided to ensure that any fault (e.g. power break, short circuit, earth) occurring in the loop will not render the whole loop ineffective,

— all arrangements are made to enable the initial configuration of the system to be restored in the event of failure (electrical, electronic, informatic),

— the first initiated fire alarm will not prevent any other detector to initiate further fire alarms.

.2 *Installation requirements*

.1 Manually operated call points shall be installed throughout the accommodation spaces, service spaces and control stations. One manually operated call point shall be located at each exit. Manually operated call points shall be readily accessible in the corridors of each deck such that no part of the corridor is more than 20 metres from a manually operated call point.

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

.3 Where a fixed fire detection and fire alarm is required for the protection of spaces other than those specified in paragraph .2.2 above, at least one detector complying with paragraph .1.11 shall be installed in each such space.

.4 Detectors shall be located for optimum performance. Positions near beams and ventilation ducts or other positions where patterns of airflow could adversely affect performance and positions where impact or physical damage is likely, shall be avoided. In general, detectors which are located on the overhead shall be a minimum distance of 0,5 metres away from bulkheads.

.5 The maximum spacing of detectors shall be in accordance with the table below:

Type of detector	**Maximum floor area per detector(m^2)**	**Maximum distance apart between centres(m)**	**Maximum distance away from bulkheads(m)**
Heat	37	9	4,5
Smoke	74	11	5,5

The Administration of the flag State may require or permit other spaces based upon test data which demonstrate the characteristics of the detectors.

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

.3 *Design requirements*

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

.2 Smoke detectors to be installed in stairways, corridors and escape routes within accommodation spaces as required by paragraph .2.2 shall be certified to operate before the smoke density exceeds 12,5 % obscuration per metre, but not until the smoke density exceeds 2 % obscuration per metre.

Smoke detectors to be installed in other spaces shall operate within sensitivity limits to the satisfaction of the Administration of the flag State having regard to the avoidance of detector insensitivity or oversensitivity.

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

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

NEW CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

.4.1 The fixed fire detection and fire alarm systems shall be of an approved type, complying with the provisions of the Fire Safety Systems Code.

.4.2 Manually operated call points complying with the Fire Safety Systems Code shall be installed throughout the accommodation spaces, service spaces and control stations. One manually operated call point shall be located at each exit. Manually operated call points shall be readily accessible in the corridors of each deck such that no part of the corridor is more than 20 metres from a manually operated call point.

NEW CLASS A, B, C AND D SHIPS:

.5 In addition to the above provisions, the Administration of the flag State shall ensure that safety provisions on the installations regarding their independence from other installations or systems, the corrosion resistance of their components, the electrical power supply to their control system, and the availability of instructions for their operation and maintenance shall be complied with.

10 **Arrangements for oil fuel, lubricating oil and other flammable oils (R 15)**

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.1 *Limitations in the use of oil as fuel*

The following limitations shall apply to the use of oil as fuel:

.1 Except as otherwise permitted by this paragraph, no oil fuel with a flashpoint of less than 60 °C shall be used.

.2 In emergency generators, oil fuel with a flashpoint of not less than 43 °C may be used.

.3 Subject to such additional precautions as it may consider necessary and on condition that the ambient temperature of the space in which such oil fuel is stored or used shall not be allowed to rise to within 10 °C below the flashpoint of the oil fuel, the Administration of the flag State may permit the general use of oil fuel having a flashpoint of less than 60 °C but not less than 43 °C.

For ships constructed on or after 1 January 2003 oil fuel having a flashpoint of less than 60 °C but not less than 43 °C may be permitted subject to the following:

.3.1 fuel oil tanks except those arranged in double bottom compartments shall be located outside of machinery spaces of category A;

.3.2 provisions for the measurement of oil temperature are provided on the suction pipe of the fuel pump;

.3.3 stop valves and/or cocks are provided on the inlet side and outlet side of the oil fuel strainers and;

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

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

.2 *Oil fuel arrangements*

In a ship in which oil fuel is used, the arrangements for the storage, distribution and utilisation of the oil fuel shall be such as to ensure the safety of the ship and persons on board and shall at least comply with the following provisions:

.1.1 As far as practicable, parts of the oil fuel system containing heated oil under pressure exceeding 0,18 N/mm^2 shall not be placed in a concealed position such that defects and leakage cannot readily be observed. The machinery spaces in way of such parts of the oil fuel system shall be adequately illuminated.

.1.2 By heated oil is meant oil the temperature of which after heating is higher than 60 °C or higher than the current flashpoint of the oil, if this is lower than 60 °C.

.2 The ventilation of machinery spaces shall be sufficient under all normal conditions to prevent accumulation of oil vapour.

.3 As far as practicable, oil fuel tanks shall be part of the ship's structure and shall be located outside machinery spaces. Where oil fuel tanks, other than double bottom tanks, are necessarily located adjacent to or within machinery spaces, at least one of their vertical sides shall be contiguous to the machinery space boundaries, and shall preferably have a common boundary with the double bottom tanks, and the area of the tank boundary common with the machinery spaces shall be kept to a minimum. Where such tanks are situated within the boundaries of machinery spaces they shall not contain oil fuel having a flashpoint of less than 60 °C. The use of freestanding oil fuel tanks shall be avoided and shall be prohibited in machinery spaces.

.4 No oil fuel tank shall be situated where spillage or leakage therefrom can constitute a hazard by falling on heated surfaces. Precautions shall be taken to prevent any oil that

may escape under pressure from any pump, filter or heater from coming into contact with heated surfaces.

.5 Every oil fuel pipe, which, if damaged, would allow oil to escape from a storage, settling or daily service tank, having a capacity of 500 litres or above, situated above the double bottom, shall be fitted with a cock or valve directly on the tank capable of being closed from a safe position outside the space concerned in the event of a fire occurring in the space in which such tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel or similar space, valves on the tank shall be fitted but control in the event of fire may be effected by means of an additional valve on the pipe or pipes outside the tunnel or similar space. If such additional valve is fitted in the machinery space it shall be operated from a position outside this space.

.1 In ships constructed on or after 1 January 2003 the controls for remote operation of the valve for the emergency generator fuel tank shall be in a separate location from the controls for remote operation of other valves located in machinery spaces.

.2 *In ships constructed on or after 1 January 2012 having a gross tonnage of less than 500*, fuel tanks above the double bottom shall be fitted with a cock or valve.

.3 *In ships constructed before 1 January 2012 having a gross tonnage of less than 500* the cock or the valve mentioned in the first paragraph shall also be fitted in fuel tanks having a capacity of less than 500 litres and situated above the double bottom, not later than the first periodical survey on or after 1 January 2012.

.6 Safe and efficient means of ascertaining the amount of oil fuel contained in any oil fuel tank shall be provided.

NEW CLASS B, C AND D SHIPS:

.1 Sounding pipes shall not terminate in any space where the risk of ignition of spillage from the sounding pipe might arise. In particular, they shall not terminate in passenger or crew spaces. As a general rule, sounding pipes shall not terminate in machinery spaces. However, where the Administration of the flag State considers that these latter requirements are impracticable, it may permit termination of sounding pipes in machinery spaces on condition that all the following requirements are met:

.1.1 in addition, an oil-level gauge is provided meeting the requirements of subparagraph .2.6.2;

.1.2 the sounding pipes terminate in locations remote from ignition hazards unless precautions are taken, such as the fitting of effective screens, to prevent the oil fuel in the case of spillage through the terminations of the sounding pipes from coming into contact with a source of ignition;

.1.3 the termination of sounding pipes are fitted with self-closing blanking devices and with a small-diameter self-closing control cock located below the blanking device for the purpose of ascertaining before the blanking device is opened that oil fuel is not present. Provision shall be made as to ensure that any spillage of oil fuel through the control cock involves no ignition hazard.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.2 Other means of ascertaining the amount of oil fuel contained in any oil fuel tank may be permitted if such means, like the means provided in subparagraph .2.6.1.1, do not require penetration below the top of the tank, and providing their failure or overfilling of the tanks will not permit release of fuel.

.3 Means prescribed in subparagraph .2.6.2 shall be maintained in the proper condition to ensure their continued accurate functioning in service.

.7 Provisions shall be made to prevent overpressure in any oil tank or in any part of the oil fuel system, including the filling pipes served by pumps on board. Any relief valves and air or overflow pipes shall discharge to a position where there is no risk of fire or explosion from the emergence of oils and vapour and shall not lead into crew spaces, passenger spaces nor into special category spaces, closed ro-ro spaces, machinery spaces or similar spaces, situated in ships constructed on or after 1 January 2003.

.8 Oil fuel pipes and their valves and fittings shall be of steel or other approved material, except that restricted use of flexible pipes may be permitted. Such flexible pipes and end attachments shall be of approved fire-resisting materials of adequate strength.

For valves, fitted to oil fuel tanks and which are under static pressure, steel or spheroidal-graphite cast iron may be accepted. However, ordinary cast iron valves may be used in piping systems, where the design pressure is lower than 7 bar and the design temperature is below 60 °C.

NEW CLASS B, C AND D SHIPS:

.9 All external high pressure fuel delivery lines between the high pressure fuel pumps and fuel injectors shall be protected with a jacketed piping system capable of containing fuel from a high pressure line failure. A jacketed pipe incorporates an outer pipe into which the high-pressure fuel pipe is placed forming a permanent assembly. The jacketed piping system shall include a means for collection of leakages and arrangements shall be provided for an alarm to be given of a fuel line failure.

.10 All surfaces with temperatures above 220 °C which may be impinged as a result of a fuel system failure shall be properly insulated.

.11 Oil fuel lines shall be screened or otherwise suitably protected to avoid as far as practicable oil spray or oil leakages onto hot surfaces, into machinery air intakes, or other sources of ignition. The number of joints in such piping systems shall be kept to a minimum.

NEW CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

.12 Oil fuel lines shall not be located immediately above or near units of high temperature including boilers, steam pipelines, exhaust manifolds, silencers or other equipment required to be insulated. As far as practicable, oil fuel lines shall be arranged far apart from hot surfaces, electrical installations or other sources of ignition and shall be screened or otherwise suitably protected to avoid oil spray or oil leakage onto the sources of ignition. The number of joints in such piping systems shall be kept to a minimum.

.13 Components of a diesel engine fuel system shall be designed considering the maximum peak pressure which will be experienced in service, including any high pressure pulses which are generated and transmitted back into fuel supply and spill lines by the action of fuel injection pumps. Connections within the fuel supply and spill lines shall be constructed having regard to their ability to prevent pressurised oil fuel leaks while in service and after maintenance.

.14 In multi-engine installations which are supplied from the same fuel source, means of isolating the fuel supply and spill piping to individual engines, shall be provided.

The means of isolation shall not affect the operation of the other engines and shall be operable from a position not rendered inaccessible by a fire on any of the engines.

.15 Where the Administration of the flag State may permit the conveying of oil and combustible liquids through accommodation and service spaces, the pipes conveying oil or combustible liquids shall be of a material approved by the Administration having regarded of the fire risk.

.16 Existing class B ships shall comply with the requirements of paragraphs .2.9 to .2.11, except that a suitable enclosure of engines having an output of 375 kW or less having fuel injection pumps serving more than one injector may be used as an alternative to the jacketed piping system in paragraph .2.9.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.3 *Lubricating oil arrangements*

The arrangements for the storage, distribution and utilisation of oil used in pressure lubrication systems shall be such as to ensure the safety of the ship and persons on board, and such arrangements in machinery spaces shall at least comply with the provisions of paragraphs .2.1, .2.4, .2.5, .2.6, .2.7, .2.8, .2.10 and .2.11, except that:

.1 this does not preclude the use of sight-flow glasses in lubricating systems provided that they are shown by test to have a suitable degree of fire resistance. If sight-flow glasses are used, the pipe shall be provided with valves in both ends. The valve at the lower end of the pipe shall be of a self-closing type;

.2 sounding pipes may be authorised in machinery spaces; the requirements of paragraphs .2.6.1.1 and .2.6.1.3 need not be applied on condition that the sounding pipes are fitted with appropriate means of closure.

For ships constructed on or after 1 January 2003 the provisions of paragraph 10.2.5 shall also apply to lubricating oil tanks except those of having a capacity less than 500 litres, storage tanks on which valves are closed during the normal operation of the ship or where it is determined that the unintended operation of a quick closing valve on the lubricating oil tank would endanger the safe operation of the main propulsion and essential auxiliary machinery.

.4 *Arrangements for other flammable oils*

The arrangements for the storage, distribution and utilisation of other flammable oils employed under pressure in power transmission systems, control and activating systems and heating systems shall be such as to ensure the safety of the ship and persons on board. In locations where means of ignition are present, such arrangements shall at least comply with the provisions of paragraphs .2.4, .2.6, .2.10 and .2.11 and with the provisions of paragraphs .2.7 and .2.8 in respect of strength and construction.

.5 *Periodically unattended machinery spaces*

In addition to the requirements of provisions 1 to 4, the oil fuel and lubricating oil systems shall comply with the following:

.1 where daily service oil fuel tanks are filled automatically, or by remote control, means shall be provided to prevent overflow spillages. Other equipment which treats flammable liquids automatically, e.g. oil fuel purifiers, which, whenever practicable, shall be installed in a special space reserved for purifiers and their heaters, shall have arrangements to prevent overflow spillages;

.2 where daily service oil fuel tanks or settling tanks are fitted with heating arrangements, a high temperature alarm shall be provided if the flashpoint of the oil fuel can be exceeded.

.6 *Prohibition of carriage of flammable oils in forepeak tanks*

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

11 **Firefighter's outfit (R 17)**
NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

[[F3].1 For ships constructed before 1 July 2019, a firefighter's outfit shall consist of:**]**

.1.1 Personal equipment comprising:

.1 protective clothing of material to protect the skin from the heat radiating from the fire and from burns and scalding by steam. The outer surface shall be water-resistant;

.2 boots and gloves of rubber or other electrically non-conducting material;

.3 a rigid helmet providing effective protection against impact;

.4 an electric safety lamp (hand lantern) of an approved type with a minimum burning period of three hours;

.5 a firefighter's axe.

.1.2 A breathing apparatus of an approved type consisting of a self-contained compressed-air-operated breathing apparatus (SCBA), the volume of air contained in the cylinders of which shall be at least 1 200 litres, or other self-contained breathing apparatus which shall be capable of functioning for at least 30 minutes. Every SCBA shall be provided with fully charged spare cylinders having a spare storage capacity of at least 2 400 litres of free air except that:

(i) if the ship is carrying five or more SCBA, the total spare storage capacity of free air need not to exceed 9 600 litres; or

(ii) if the ship is equipped with means for recharging the air cylinders with full pressure with air, free from contamination, the spare storage capacity of the fully charged spare cylinders of each SCBA shall be at least 1 200 litres of free air, and the total spare storage capacity of free air provided in the ship shall not be required to exceed 4 800 litres of free air.

All air cylinders for SCBA's shall be interchangeable.

.1.3 **[**[F2]Self-contained compressed air breathing apparatus of fire-fighter's outfits shall by 1 July 2019 comply with paragraph 2.1.2.2 of chapter 3 of the Fire Safety Systems Code.

.1a For ships constructed on or after 1 July 2019, the fire-fighter's outfits shall comply with the Fire Safety Systems Code.**]**

.2 For each breathing apparatus a fireproof lifeline of sufficient length and strength shall be provided capable of being attached by means of a snaphook to the harness of the apparatus or to a separate belt in order to prevent the breathing apparatus becoming detached when the lifeline is operated.

.3 New class B and existing class B ships of 24 metres in length and above and new class C and D ships of 40 metres in length and above shall carry at least two firefighter's outfits.

.1 In ships of 60 metres in length and above, in addition there shall be provided, if the aggregate of the lengths of all passenger spaces and service spaces on the deck which carries such spaces is more than 80 metres, or, if there is more than one such deck, on the deck which has the largest aggregate of such lengths, two firefighter's outfits and two sets of personal equipment for every 80 metres, or part thereof, of such aggregate of lengths.

In ships carrying more than 36 passengers, two additional firefighter's outfits shall be provided for each main vertical zone, except for stairway enclosures which constitute individual main vertical zones and for main vertical zones of limited length in the fore and aft end of a ship which do not include, machinery spaces or main galleys.

.2 In ships of 40 metres in length and above but less than 60 metres two firefighter's outfits have to be provided.

.3 In new class B and existing class B ships of 24 metres in length and above but less than 40 metres, also two firefighter's outfits have to be provided, but with only one spare aircharge for self-contained breathing apparatus.

.4 In new and existing class B ships of less than 24 metres length and in new class C and D ships of less than 40 metres in length no firefighter's outfit has to be provided.

[[F2].4a Fire-fighter's communication:

For ships required to carry on board at least one fire-fighter outfit and constructed on or after 1 January 2018, a minimum of two two-way portable radiotelephone apparatus for each fire party for fire-fighter's communication shall be carried on board. For LNG fuelled ships or Ro-Ro passenger ships with closed Ro-Ro spaces or special category spaces, those two-way portable radiotelephone apparatus shall be of an explosion-proof type or intrinsically safe. Ships constructed before 1 January 2018 shall comply with the requirements of this Regulation not later than the first survey after 1 July 2019.**]**

.5 The firefighter's outfits or sets of personal equipment shall be so stored as to be easily accessible and ready for use and, where more than one fire-fighter's outfit or more than one set of personal equipment is carried, they shall be stored in widely separated positions. At least one firefighter's outfit and one set of personal equipment shall be available at any one such position.

.6 When the Administration of a flag State considers that the carriage provisions in this Regulation are unreasonable and/or technically unsuitable on board a ship, such ship may, in compliance with the provisions in Article 9 point 3 in this Directive, be exempted from one ore more of the requirements in this Regulation.

12 **Miscellaneous items (R 18)**

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.1 Where class 'A' divisions are penetrated for the passage of electric cables, pipes, trunks, ducts etc., or for girders, beams or other structural members, arrangements shall be made to ensure that the fire resistance is not impaired in so far as is reasonable and practicable.

For ships which are constructed on or after 1 January 2003, where 'A' class divisions are penetrated, such penetrations shall be tested in accordance with the Fire Test Procedures Code, to ensure that the fire resistance of the divisions is not impaired.

In the case of ventilation ducts Regulations II-2/B/9.2.2b and II-2/B/9.3 apply.

However, where a pipe penetration is made of steel or equivalent material having a thickness of 3 mm or greater and a length of not less than 900 mm (preferably 450 mm on each side of the division) and no openings, testing is not required.

Such penetrations shall be suitably insulated by extension of the insulation at the same level of the division.

.2 Where class 'B' divisions are penetrated for the passage of electric cables, pipes, trunks, ducts etc., or for the fitting of ventilation terminals, lighting fixtures and similar devises, arrangements shall be made to ensure that the fire resistance is not impaired in so far as is reasonable and practicable. In ships which are constructed on or after 1 January 2003 for such penetrations arrangements shall be made to ensure that the fire resistance of the divisions is not impaired.

Pipes other than steel or copper that penetrate 'B' class divisions shall be protected by either:

.1 a fire tested penetration device, suitable for the fire resistance of the division pierced and the type of the pipe used; or

.2 a steel sleeve, having a thickness of not less than 1,8 mm and a length of not less than 900 mm for pipe diameters of 150 mm or more and not less than 600 mm for pipe diameters of less than 150 mm (preferably equally divided to each side of the division).

The pipe shall be connected to the ends of the sleeve by flanges or couplings or the clearance between the sleeve and the pipe shall not exceed 2,5 mm or any clearance between pipe and sleeve shall be made tight by means of non-combustible or other suitable material.

.3 Pipes penetrating 'A' or 'B' class divisions shall be of approved materials having regard to the temperature such divisions are required to withstand.

In ships constructed on or after 1 January 2003, no-insulated metallic pipes penetrating 'A' or 'B' class divisions shall be of materials having a melting temperature which exceeds 950 °C for 'A-0' and 850 °C for 'B-0' class divisions.

.4 In accommodation spaces, service spaces or control stations, pipes intended to convey oil or other flammable liquids shall be of a suitable material and construction having regard to the fire risk.

.5 Materials readily rendered ineffective by heat shall not be used for over board scuppers, sanitary discharges, and other outlets which are close to the waterline and where the failure of the material in the event of fire would give rise to danger of flooding.

.6 Electric radiators, if used, shall be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiators shall be fitted with an element so exposed that clothing, curtains, or other similar materials can be scorched or set on fire by heat from the element.

.7 All waste receptacles shall be constructed of non-combustible materials with no openings in the sides or bottom.

.8 In spaces where penetration of oil products is possible, the surface of insulation shall be impervious to oil or oil vapours.

NEW CLASS A, B, C AND D SHIPS: In spaces in which there is a risk of oils splashing or oil vapour, e.g. in machinery spaces of category A, the surface of the insulating material shall be impermeable by oil and oil vapour. Where there is covering by non-perforated steel plate or other non-combustible materials (not aluminium) which is the ultimate physical surface, this covering may be joined by seaming, riveting, etc.

.9 Paint lockers and flammable liquid lockers shall be protected by an approved fire-extinguishing arrangement, enabling the crew to extinguish a fire without entering the space.

In ships which are constructed on or after 1 January 2003:

.1 Paint lockers shall be protected by one of the following systems:

.1.1 a carbon dioxide system, designed to give a minimum volume of free gas equal to 40 % of the gross volume of the protected space;

.1.2 a dry powder system, designed for at least 0,5 kg powder/m^3;

.1.3 a waterspraying or sprinkler system, designed for 5 litres/m^2 min. Water spraying systems may be connected to the fire main of the ship; or

.1.4 a system providing equivalent protection, as determined by the Administration of the flag State.

In any case the system shall be operable from outside the protected space.

.2 Flammable liquid lockers shall be protected by an appropriate fire extinguishing arrangement approved by the Administration of the flag State.

.3 For lockers of a deck area of less than 4 m^2, which do not give access to accommodation spaces, a carbon dioxide portable extinguisher sized to provide a minimum volume of free gas equal to 40 % of the gross volume of the space may be accepted in lieu of a fixed system.

A discharge port shall be arranged in the locker to allow the discharge of the extinguisher without having to enter into the protected space. The required portable fire extinguisher shall be stowed adjacent to the port. Alternatively a port or hose connection may be provided to facilitate the use of fire main water.

NEW CLASS A, B, C AND D SHIPS AND EXISTING CLASS B SHIPS:

.10 Deep-fat friers, boiling and roasting apparatus:

When deep-fat friers, boiling and roasting apparatus are installed and used in spaces outside the main galley, the Administration of the flag State shall impose additional safety measures with regard to the specific fire hazards associated with the use of this type of equipment.

In ships which are constructed on or after 1 January 2003, deep-fat cooking equipment shall be fitted with the following:

.1 an automatic or manual extinguishing system tested to an international standard in accordance with Publication ISO 15371:2000 on fire-extinguishing systems for protection of galley deep-fat cooking equipment;

.2 a primary and backup thermostat with an alarm to alert the operator in the event of failure of either thermostat;

.3 arrangements for automatically shutting off the electrical power upon activation of the extinguishing system;

.4 an alarm for indicating operation of the extinguishing system in the galley where the equipment is installed; and

.5 controls for manual operation of the extinguishing system, which are clearly labelled for ready use of the crew.

In ships which are constructed before 1 January 2003, new installations for deep-fat cooking equipment shall comply with the requirements of this paragraph.
NEW CLASS A, B, C AND D SHIPS:

.11 Heat bridges:

In the implementation of fire proofing measures, steps shall be undertaken by the Administration of the flag State to prevent heat transfer through heat bridges, e.g. between decks and bulkheads.

In ships which are constructed on or after 1 January 2003, the insulation of a deck or bulkhead shall be carried past the penetration, intersection or terminal point for a distance of at least 450 mm in the case of steel and aluminium structures. If a space is divided with a deck or a bulkhead of 'A' class standard having insulation of different values, the insulation with the higher value shall continue on the deck or bulkhead with the insulation of the lesser value for a distance of at least 450 mm.
NEW CLASS A, B, C AND D SHIPS AND EXISTING CLASS B SHIPS:

.12 Pressurised gas containers:

All portable containers for gases which are compressed, liquefied or broken down under pressure, which may feed a possible fire, shall immediately after use be put in a suitable place above the bulkhead deck, from which there is direct access to open deck.

13 **Fire control plans (R 20)**
NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.1 **[**[F4]In all ships general arrangement plans shall be permanently exhibited for the guidance of the ship's officers, showing clearly for each deck the control stations, the various fire sections enclosed by 'A' class divisions, the sections enclosed by 'B' class divisions together with particulars of the fire detection and fire alarm systems, the sprinkler installation, the fire-extinguishing appliances, means of access to different compartments, decks, etc. and the ventilating system including particulars of the fan control positions, the position of dampers and identification numbers of the ventilating fans serving each section. Alternatively the aforementioned details may be set out in a booklet, a copy of which shall be supplied to each officer, and one copy shall at all times be available on board in an accessible position. Plans and booklets shall be kept up to date, any alterations being recorded thereon as soon as practicable. Description in such plans and booklets shall be in the official language of the flag State. If the language is neither English nor French, a translation into one of these languages shall be included. In the case that the ship is engaged on domestic voyages in another

Member State, a translation into the official language of that port State shall, if this language is neither English nor French, be included.**]**

For new class B, C and D ships constructed on or after 1 January 2003, the information to be provided with the required fire control plans and booklets and the graphical symbols to be used for the fire control plans shall be in accordance with the IMO Resolutions A.756(18) and A.952(23).

Textual Amendments

F4 Substituted by Directive (EU) 2017/2108 of the European Parliament and of the Council of 15 November 2017 amending Directive 2009/45/EC on safety rules and standards for passenger ships (Text with EEA relevance).

.2 In all ships with a length of 24 metres and over a duplicate set of fire control plans or a booklet containing such plans shall be permanently stored in a prominently marked weather tight enclosure outside the deckhouse for the assistance of shore side fire-fighting personnel.

14 **Operational readiness and maintenance**

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.1 *General requirements*

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

A ship is not in service when:

.1 it is in for repairs or lay-up (either at anchor or at port) or in dry-dock;

.2 it is declared not in service by the owner or the owner’s representative; and

.3 if there are no passengers on board.

The following fire protection systems shall be kept in good order so as to ensure their required performance if a fire occurs:

.1.1 Operational readiness

.1 structural fire protection including fire resisting divisions and protection of openings and penetrations in these divisions;

.2 fire detection and fire alarm systems; and

.3 means of escape systems and appliances.

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

.1.2 Maintenance, testing and inspections

Maintenance, testing and inspections shall be carried out based on the guidelines in IMO MSC/Circ.850 and in a manner having due regard to ensuring the reliability of fire-fighting systems and appliances. A maintenance plan shall be kept on board the ship and shall be available for inspection, whenever required by the Administration of the flag State.

The maintenance plan shall include at least the following fire protection systems and fire-fighting systems and appliances, where installed:

.1 fire mains, fire pumps and hydrants including hoses and nozzles;

.2 fixed fire detection and fire alarm systems;

.3 fixed fire-extinguishing systems and other fire-extinguishing appliances;

.4 automatic sprinkler, fire detection and fire alarm systems;

.5 ventilation systems including fire and smoke dampers, fans and their controls;

.6 emergency shut down of fuel supply;

.7 fire doors including their controls;

.8 general emergency alarm systems;

.9 emergency escape breathing devices;

.10 portable fire extinguishers including spare charges; and

.11 firefighter's outfits.

The maintenance programme may be computer-based.

.2 *Additional requirements*

For new class B, C and D ships constructed on or after 1 January 2003 carrying more than 36 passengers, a maintenance plan for low-location lighting and public address systems shall be developed in addition to the maintenance plan mentioned under paragraph .1.2.

15 **Instructions, on-board training and drills**

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.1 *Instructions, duties and organisation*

.1 Crew members shall receive instructions on fire safety on-board the ship.

.2 Crew members shall receive instructions on their assigned duties.

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

.2 *On-board training and drills*

.1 Crew members shall be trained to be familiar with the arrangements of the ship as well as the location and operation of any fire-fighting systems and appliances that they may be called upon to use.

.2 Training in the use of the emergency escape breathing devices shall be considered as a part of on-board training.

.3 Performance of crew members assigned fire-fighting duties shall be periodically evaluated by conducting on-board training and drills to identify areas in need of improvement, to ensure competency in fire-fighting skills is maintained and to ensure the operational readiness of the fire-fighting organisation.

.4 On-board training in the use of the ship's fire-extinguishing systems and appliances shall be planned and conducted in accordance with provisions of Regulation III/19.4.1 of SOLAS 1974, as amended.

.5 Fire drills shall be conducted and recorded in accordance with the provisions of Regulations III/19.3.4, III/19.5 and III/30 of SOLAS 1974, as amended.

[[F2].6 In ships subject to Regulation II-2/A/11, breathing apparatus cylinders used during drills shall be refilled or replaced before departure.**]**

.3 *Training manuals*

A training manual shall be provided in each crew mess room and recreation room or in each crew cabin. The training manual shall be written in the working language of the ship. The training manual, which may comprise several volumes, shall contain the instructions and the information required in this paragraph in easily understood terms and illustrated wherever possible. Any part of such information may be provided in the form of audio-visual aides in lieu of the manual. The training manual shall explain the following in detail:

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

.2 general instructions on fire-fighting activities and fire-fighting procedures including procedures for notification of a fire and use of manually operated call points;

.3 meanings of ship's alarms;

.4 operation and use of fire-fighting systems and appliances;

.5 operation and use of fire doors;

.6 operation and use of fire and smoke dampers; and

.7 escape systems and appliances.

.4 *Fire control plans*

Fire control plans have to comply with the requirements of Regulation II-2/A/13.

16. **Operations**

NEW CLASS B, C, D AND EXISTING CLASS B SHIPS:

.1 To provide information and instruction for proper ship and cargo handling operations in relation to fire safety, operational booklets shall be provided on board.

.2 The required fire operational booklet shall contain the necessary information and instructions for the safe operation of the ship and cargo handling operations in relation to fire safety. The booklet shall include information concerning the crew's responsibilities for the general fire safety of the ship while loading and discharging cargo and while underway. For ships carrying dangerous goods the fire safety booklet shall provide reference to the pertinent fire-fighting and emergency cargo handling instructions contained in the International Maritime Dangerous Goods Code.

.3 The fire safety operational booklet shall be written in the working language of the ship.

.4 The fire safety operational booklet may be combined with the training manuals required in Regulation II-2/A/15.3.

PART B

FIRE SAFETY MEASURES

1 **Structure (R 23)**

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.1 The hull, superstructures, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material. For the purpose of applying the definition of steel or other equivalent material as given in Regulation II-2/A/2.7, the 'applicable fire exposure' shall be according to the integrity and insulation standards given in the tables of Regulations II-2/B/4 and 5. For example, where divisions such as decks or sides and ends of deckhouses are permitted to have 'B-0' fire integrity, the 'applicable fire exposure' shall be half an hour.

.2 However, in cases where any part of the structure is of aluminium alloy, the following shall apply:

.1 The insulation of aluminium alloy components of 'A' or 'B' class divisions, except structure which is non-load-bearing, shall be such that the temperature of the structural core does not rise more than 200 °C above the ambient temperature at any time during the applicable fire exposure to the standard fire test.

.2 Special attention shall be given to the insulation of aluminium alloy components of columns, stanchions and other structural members required to support lifeboat and life-raft stowage, launching and embarkation areas, and 'A' and 'B' class divisions to ensure:

.1 that for such members supporting lifeboat and life-raft areas and 'A' class divisions, the temperature rise limitation specified in paragraph .2.1 shall apply at the end of one hour; and

.2 that for such members required to support 'B' class divisions, the temperature rise limitation specified in paragraph .2.1 shall apply at the end of half an hour.

.3 Crowns and casings of category A machinery spaces shall be of steel construction adequately insulated and openings therein, if any, shall be suitably arranged and protected to prevent the spread of fire.

2 **Main vertical zones and horizontal zones (R 24)**

NEW CLASS B, C AND D SHIPS:

.1.1 In ships carrying more than 36 passengers, the hull, superstructure and deckhouses shall be subdivided into main vertical zones by A-60 class divisions.

Steps and recesses shall be kept to a minimum but where they are necessary, they shall also be A-60 class divisions.

Where an open deck space, a sanitary or similar space or a tank including a fuel oil tank, void space or auxiliary machinery space having little or no fire risk, is on one side or where fuel oil tanks are on both sides of the division the standard may be reduced to A-0.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.1.2 For new class B, C and D ships carrying not more than 36 passengers and for existing class B ships carrying more than 36 passengers, the hull, superstructure and deckhouses in way of accommodation and service spaces shall be subdivided into main

vertical zones by 'A' class divisions. These divisions shall have insulation values in accordance with the tables in Regulation 5.

NEW CLASS B, C AND D SHIPS:

.2 As far as practicable, the bulkheads forming the boundaries of the main vertical zones above the bulkhead deck shall be in line with watertight subdivision bulkheads situated immediately below the bulkhead deck. 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 subdivision watertight 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 m^2 on any deck. The length or width of a main vertical zone is the maximum distance between the furthermost points of the bulkheads bounding it.

NEW CLASS B, C AND D SHIPS AND EXISTING CLASS B SHIPS CARRYING MORE THAN 36 PASSENGERS:

.3 Such bulkheads shall extend from deck to deck and to the shell or other boundaries.

.4 Where a main vertical zone is subdivided by horizontal 'A' class divisions into horizontal zones for the purpose of providing an appropriate barrier between sprinkled and non-sprinklered zones of the ship, the divisions shall extend between adjacent main vertical zone bulkheads and to the shell or exterior boundaries of the ship and shall be insulated in accordance with the fire insulation and integrity values given in table 4.2 for new ships carrying more than 36 passengers, and existing class B ships carrying more than 36 passengers.

.5

.1 On ships designed for special purposes, such as automobile or railroad car ferries where the provision of main vertical zone bulkheads would defeat the purpose for which the ship is intended, equivalent protection shall be obtained by dividing space in horizontal zones.

.2 However, in a ship with special category spaces, any such space shall comply with the applicable provisions of Regulation II-2/B/14 and in so far as such compliance would be inconsistent with compliance with other requirements of this part, the requirements of Regulation II-2/B/14 shall prevail.

3 **Bulkheads within a main vertical zone (R 25)**

NEW CLASS B, C AND D SHIPS CARRYING MORE THAN 36 PASSENGERS:

.1.1 For new ships carrying more than 36 passengers all bulkheads which are not required to be 'A' class divisions shall be at least 'B' class or 'C' class divisions as prescribed in the tables in Regulation 4. All such divisions may be faced with combustible materials in accordance with the provisions of Regulation II-2/B/11.

NEW CLASS B, C AND D SHIPS CARRYING NOT MORE THAN 36 PASSENGERS AND EXISTING CLASS B SHIPS CARRYING MORE THAN 36 PASSENGERS:

.1.2 For new ships carrying not more than 36 passengers and existing class B ships carrying more than 36 passengers all bulkheads within accommodation and service spaces which are not required to be 'A' class divisions shall be at least 'B' class or 'C' class divisions as prescribed in the tables in Regulation II-2/B/5.

All such divisions may be faced with combustible materials in accordance with the provisions of Regulation 11.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.2 In new class B, C and D ships carrying not more than 36 passengers and in existing class B ships carrying more than 36 passengers all corridor bulkheads where not required to be 'A' class shall be 'B' class divisions which shall extend from deck to deck except:

.1 when continuous 'B' class ceilings or linings are fitted on both sides of the bulkhead, the portion of the bulkhead behind the continuous ceiling or lining shall be of material which, in thickness and composition, is acceptable in the construction of 'B' class divisions but which shall be required to meet 'B' class integrity standards only in so far as is reasonable and practicable;

.2 in the case of a ship protected by an automatic sprinkler system complying with the provisions of Regulation II-2/A/8, the corridor bulkheads of 'B' class materials may terminate at a ceiling in the corridor provided such ceiling is of material which, in thickness and composition, is acceptable in the construction of 'B' class divisions.

Notwithstanding the requirements of Regulations II-2/B/4 and 5, such bulkheads and ceilings shall be required to meet 'B' class integrity standards only in so far as is reasonable and practicable. All doors and frames in such bulkheads shall be of non-combustible materials and shall be so constructed and erected as to provide substantial fire resistance.

.3 All bulkheads required to be 'B' class division, except corridor bulkheads prescribed in paragraph .2, shall extend from deck to deck and to the shell or other boundaries unless the continuous 'B' class ceilings or linings fitted on both sides of the bulkheads are at least of the same fire resistance as the bulkhead, in which case the bulkhead may terminate at the continuous ceiling or lining.

4 **Fire integrity of bulkheads and decks in new ships carrying more than 36 passengers (R 26)**

NEW CLASS B, C AND D SHIPS:

.1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this part, the minimum fire integrity of all bulkheads and decks shall be as prescribed in tables 4.1 and 4.2.

.2 The following requirements shall govern the application of the tables:

.1 Table 4.1 shall apply to bulkheads not bounding either main vertical zones or bounding horizontal zones.

Table 4.2 shall apply to decks not forming steps in main vertical zones nor bounding horizontal zones.

.2 For determining the appropriate fire integrity standards to be applied to boundaries between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (14). Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this Regulation, it shall be treated as a space within the relevant category having the most stringent boundary requirements. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

(1) Control stations:

— spaces containing emergency sources of power and lighting,

— wheelhouse and chartroom,
— spaces containing the ship's radio equipment,
— fire-extinguishing rooms, fire control rooms and fire-recording stations,
— control room for propulsion machinery when located outside the propulsion machinery space,
— spaces containing centralised fire alarm equipment,
— spaces containing centralised emergency public address system stations and equipment.

(2) Stairways:
— interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) for passengers and crew and enclosures thereto;
— in this connection a stairway which is enclosed at only one level shall be regarded as part of the space from which it is not separated by a fire door.

(3) Corridors:
— passenger and crew corridors.

(4) Evacuation stations and external escape routes:
— survival craft stowage area,
— open deck spaces and enclosed promenades forming lifeboat and life-raft embarkation and lowering stations,
— assembly stations, internal and external,
— external stairs and open decks used for escape routes,
— the ship's side to the waterline in the lightest seagoing condition, superstructure and deckhouse sides situated below and adjacent to the life-rafts and evacuation slide's embarkation areas.

(5) Open deck spaces:
— open deck spaces and enclosed promenades clear of lifeboat and life-raft embarkation and lowering stations,
— air spaces (the space outside superstructures and deckhouses).

(6) Accommodation spaces of minor fire risk:
— cabins containing furniture and furnishing of restricted fire risk,
— offices and dispensaries containing furniture and furnishings of restricted fire risk,
— public spaces containing furniture and furnishings of restricted fire risk and having a deck area of less than 50 m^2.

(7) Accommodation spaces of moderate fire risk:
— spaces as in category (6) above but containing furniture and furnishing of other than restricted fire risk,
— public spaces containing furniture and furnishing of restricted fire risk and having a deck area of 50 m^2 or more,
— isolated lockers and small storerooms in accommodation spaces having areas less than 4 m^2 (in which flammable liquids are not stowed),

— sale shops,
— motion picture projection and film stowage rooms,
— diet kitchens (containing no open flame),
— cleaning gear lockers (in which flammable liquids are not stowed),
— laboratories (in which flammable liquids are not stowed),
— pharmacies,
— small drying rooms (having a deck area of 4 m^2 or less),
— specie rooms,
— operating rooms.

(8) Accommodation spaces of greater fire risk:
— public spaces containing furniture and furnishing of other than restricted fire risk and having a deck area of 50 m^2 or more,
— barber shops and beauty parlours.

(9) sanitary and similar spaces:
— communal sanitary facilities, shower, baths, water closets, etc.,
— small laundry rooms,
— indoor swimming pool area,
— isolated pantries containing no cooking appliances in accommodation spaces,
— private sanitary facilities shall be considered a portion of the space in which they are located.

(10) Tanks, voids and auxiliary machinery spaces having little or no fire risk:
— water tanks forming part of the ship's structure;
— voids and cofferdams;
— auxiliary machinery spaces which do not contain machinery having a pressure lubrication system and where storage of combustibles is prohibited, such as;
— ventilation and air-conditioning rooms; windlass room; steering gear room; stabiliser equipment room; electrical propulsion motor room; rooms containing section switchboards and purely electrical equipment other than oil-filled electrical transformers (above 10 kVA); shaft alleys and pipe tunnels; spaces for pumps and refrigeration machinery (not handling or using flammable liquids),
— closed trunks serving the spaces listed above,
— other closed trunks such as pipe and cable trunks.

(11) Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk:
— cargo oil tanks,
— cargo holds, trunkways and hatchways,
— refrigerated chambers,
— oil fuel tanks (where installed in a separate space with no machinery),
— shaft alleys and pipe tunnels allowing storage of combustibles,

— auxiliary machinery spaces as in category (10) which contain machinery having a pressure lubrication system or where storage of combustibles is permitted,
— oil fuel filling stations,
— spaces containing oil-filled electrical transformers (above 10 kVA),
— spaces containing small internal combustion engines of power output up to 110 kW driving generators, sprinkler, drencher or fire pumps, bilge pumps, etc.,
— closed trunks serving the spaces listed above.

(12) Machinery spaces and main galleys:
— main propulsion machinery rooms (other than electric propulsion motor rooms) and boiler rooms,
— auxiliary machinery spaces other than those in categories (10) and (11) which contain internal combustion machinery or other oil burning, heating or pumping units,
— main galleys and annexes,
— trunks and casings to the spaces listed above.

(13) Store-rooms, workshops, pantries, etc.:
— main pantries not annexed to galleys,
— main laundry,
— large drying rooms (having a deck area of more than 4 m^2),
— miscellaneous stores,
— mail and baggage rooms,
— garbage rooms,
— workshops (not part of machinery spaces, galleys, etc.),
— lockers and storerooms having areas greater than 4 m^2, other than those spaces that have provisions for the storage of flammable liquids.

(14) Other spaces in which flammable liquids are stowed:
— paint lockers,
— store-rooms containing flammable liquids (including dyes, medicines, etc.),
— laboratories (in which flammable liquids are stowed).

.3 Where a single value is shown for the fire integrity of a boundary between two spaces, that value shall apply in all cases.

.4 There are no special requirements for material or integrity of boundaries where only a dash appears in the tables.

.5 The Administration of the flag State shall determine in respect of category (5) spaces whether the insulation values in table 4.1 shall apply to ends of deckhouses and superstructures, and whether the insulation values in table 4.2 shall apply to weather decks. In no case shall the requirements of category (5) of table 4.1 or 4.2 necessitate enclosure of spaces which in the opinion of the Administration of the flag State need not be enclosed.

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

.4 In approving structural fire protection details the Administration of the flag State shall have regard to the risk of heat transmission at intersections and terminal points of required thermal barriers.

Table 4.1

Bulkheads not bounding either main vertical zones or horizontal zones

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) Control stations	B-0[0]	A-0	A-0	A-0	A-0	A-60	A-60	A-60	A-0	A-0	A-60	A-60	A-60	A-60
(2) Stairways		A-0[0]	A-0	A-0	A-0	A-0	A-15	A-15	A-0[0]	A-0	A-15	A-30	A-15	A-30
(3) Corridors			B-15	A-60	A-0	B-15	B-15	B-15	B-15	A-0	A-15	A-30	A-0	A-30
(4) Evacuation stations and external escape routes					A-0	A[0]-60	A[0]-60	A[0]-60	A-0[0]	A-0	A-60[0]	A-60[0]	A-60[0]	A-60[0]
(5) Open deck spaces					—	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
(6) Accommodation spaces of minor fire risk						B-0	B-0	B-0	C	A-0	A-0	A-30	A-0	A-30
(7) Accommodation spaces of moderate fire risk							B-0	B-0	C	A-0	A-15	A-60	A-15	A-60
(8) Accommodation spaces of greater fire risk								B-0	C	A-0	A-30	A-60	A-15	A-60
(9) Sanitary and similar spaces									C	A-0	A-0	A-0	A-0	A-0

Table 4.1

Bulkheads not bounding either main vertical zones or horizontal zones

Tanks, voids and auxiliary machinery spaces having little or no fire risk	(10)										A-0[0]	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk	(11)											A-0[0]	A-0	A-0	A-15
Machinery spaces and main galleys	(12)												A-0[0]	A-0	A-60
Storerooms, workshops, pantries, etc.	(13)													A-0[0]	A-0
Other spaces in which flammable liquids are stowed	(14)														A-30

Table 4.2

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

Space below ↓ Space above→	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**
Control stations (1)	A-30	A-30	A-15	A-0	A-0	A-0	A-15	A-30	A-0	A-0	A-0	A-60	A-0	A-60
Stairways (2)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-30	A-0	A-30
Corridors (3)	A-15	A-0	A-0[a]	A-60	A-0	A-0	A-15	A-15	A-0	A-0	A-0	A-30	A-0	A-30
Evacuation stations and external escape routes (4)	A-0	A-0	A-0	A-0	—	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Open deck spaces (5)	A-0	A-0	A-0	A-0	—	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of minor fire risk (6)	A-60	A-15	A-0	A-60	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of moderate fire risk (7)	A-60	A-15	A-15	A-60	A-0	A-0	A-15	A-15	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of greater fire risk (8)	A-60	A-15	A-15	A-60	A-0	A-15	A-15	A-30	A-0	A-0	A-0	A-0	A-0	A-0
Sanitary and similar spaces (9)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Tanks voids and auxiliary machinery (10)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0[a]	A-0	A-0	A-0	A-0

Table 4.2

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

spaces having little or no fire risk															
Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk	(11)	A-60	A-60	A-60	A-60	A-0	A-0	A-15	A-30	A-0	A-0	A-0[a]	A-0	A-0	A-30
Machinery spaces and main galleys	(12)	A-60	A-60	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0	A-30	A-30[a]	A-0	A-60
Storerooms, workshops, pantries, etc.	(13)	A-60	A-30	A-15	A-60	A-0	A-15	A-30	A-30	A-0	A-0	A-0	A-0	A-0	A-0
Other spaces in which flammable liquids are stowed	(14)	A-60	A-60	A-60	A-60	A-0	A-30	A-60	A-60	A-0	A-0	A-0	A-0	A-0	A-0

a Where adjacent spaces are in the same numerical category and superscript a appears, a bulkhead or deck between such spaces need not to be fitted if deemed unnecessary by the Administration of the flag State. For example, in category (12) a bulkhead need not be required between a galley and its annexed pantries provided the pantry bulkhead and decks maintain the integrity of the galley boundaries. A bulkhead is, however, required between a galley and a machinery space even though both spaces are in category (12).

b	The ship's side, to the waterline in the lightest seagoing condition, superstructure and deckhouse sides situated below and adjacent to the life-rafts and evacuation slides may be reduced to A-30.
c	Where public toilets are installed completely within the stairway enclosure, the public toilet bulkhead within the stairway enclosure can be of 'B' class integrity.
d	Where spaces of categories 6, 7, 8 and 9 are located completely within the outer perimeter of the assembly station, the bulkheads of these spaces are allowed to be of 'B-0' class integrity. Control positions for audio, video and light installations may be considered as part of the assembly station.

Notes to be applied to tables 4.1 and 4.2

5 **Fire integrity of bulkheads and decks in new ships carrying not more than 36 passengers and existing class B ships carrying more than 36 passengers (R 27)**

NEW CLASS B, C, AND D SHIPS CARRYING NOT MORE THAN 36 PASSENGERS AND EXISTING CLASS B SHIPS CARRYING MORE THAN 36 PASSENGERS:

[[F3].1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this part, the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 5.1 or 5.1(a), and 5.2 or 5.2(a), as appropriate.

When approving structural precautions for fire protection in new ships, account shall be taken of the risk of heat transfer between heat bridges at intersection points and of where the thermal barring devices terminate.**]**

.2 The following requirements shall govern application of the tables:

.1 Tables 5.1 and 5.2 shall apply respectively to the bulkheads and decks separating adjacent spaces.

.2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) below. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

(1) Control stations:
- spaces containing emergency sources of power and lighting,
- wheelhouse and chartroom,
- spaces containing the ship's radio equipment,
- fire-extinguishing rooms, fire control rooms and fire-recording stations,
- control room for propulsion machinery when located outside the propulsion machinery space,
- spaces containing centralised fire alarm equipment.

(2) Corridors:
- passenger and crew corridors and lobbies.

(3) Accommodation spaces:
- spaces as defined in Regulation II-2/A/2.10 excluding corridors.

(4) Stairways:
- interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto,

— in this connection, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(5) Service spaces (low risk):

— lockers and storerooms not having provisions for the storage of flammable liquids and having areas less than 4 m^2 and drying rooms and laundries.

(6) Machinery spaces of category A:

— spaces as defined in Regulation II-2/A/2.19.1.

(7) Other machinery spaces:

— spaces as defined in Regulation II-2/A/2.19.2 excluding machinery spaces of category A.

(8) Cargo spaces:

— all spaces used for cargo (including cargo oil tanks) and trunkways and hatchways to such spaces, other than special category spaces.

(9) Service spaces (high risk):

— galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and storerooms having areas of 4 m^2 or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces.

(10) Open decks:

— open deck spaces and enclosed promenades having no fire risk. Air spaces (the space outside superstructures and deckhouses).

(11) Special category spaces:

— spaces as defined in Regulation II-2/A/2.18.

.3 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is not protected by an automatic sprinkler system complying with the provisions of Regulation II-2/A/8 or between such zones neither of which is so protected, the higher of the two values given in the tables shall apply.

.4 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is protected by an automatic sprinkler system complying with the provisions of Regulation II-2/A/8 or between such zones both of which are so protected, the lesser of the two values given in the tables shall apply. Where a sprinklered zone and a non-sprinklered zone meet within accommodation and service spaces, the higher of the two values given in the tables shall apply to the division between the zones.

.3 Continuous ‘B’ class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

.4 External boundaries which are required in Regulation 1.1 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries to have ‘A’ class integrity elsewhere in this part. Similarly, in such boundaries which are not required to have ‘A’ class

integrity, doors may be of materials to the satisfaction of the Administration of the flag State.

Table 5.1

Fire integrity of bulkheads separating adjacent spaces

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0[0]	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	0	A-60
Corridors (2)		C[0]	B-0[0]	A-0[0]	B-0[0]	A-60	A-0	A-0	A-15	0	A-15
				B-0[0]					A-0[0]		
Accommodation spaces (3)			C[0]	A-0[0]	B-0[0]	A-60	A-0	A-0	A-15	0	A-30
				B-0[0]					A-0[0]		A-0[0]
Stairways (4)				A-0[0]	A-0[0]	A-60	A-0	A-0	A-15	0	A-15
				B-0[0]	B-0[0]				A-0[0]	0	
Service spaces (low risk) undefined (5)					C[0]	A-60	A-0	A-0	A-0	0	A-0
Machinery spaces of category A (6)						0	A-0	A-0	A-60	0	A-60
Other machinery spaces (7)							A-0[0]	A-0	A-0	0	A-0
Cargo spaces (8)								0	A-0	0	A-0
Service spaces (high risk) (9)									A-0[0]	0	A-30
Open decks (10)											A-0
Special category spaces (11)											A-0

[F2The following table shall apply to ALL CLASS B, C and D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2018:

[XI Table 5.1(a)

Fire integrity of bulkheads separating adjacent spaces

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0[0]	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	[0]	A-60
Corridors (2)		C[0]	B-0[0]	A-0[0] B-0[0]	B-0[0]	A-60	A-0	A-0	A-15 A-0[0]	[0]	A-30
Accommodation spaces (3)			C[0]	A-0[0] B-0[0]	B-0[0]	A-60	A-0	A-0	A-15 A-0[0]	[0]	A-30 A-0[0]
Stairways (4)				A-0[0] B-0[0]	A-0[0] B-0[0]	A-60	A-0	A-0	A-15 A-0[0]	[0]	A-30
Service spaces (low risk) (5)					C[0]	A-60	A-0	A-0	A-0	[0]	A-0
Machinery spaces of category A (6)						[0]	A-0	A-0	A-60	[0]	A-60
Other machinery spaces (7)							A-0[0]	A-0	A-0	[0]	A-0
Cargo spaces (8)								[0]	A-0	[0]	A-0
Service spaces (high risk) (9)									A-0[0]	[0]	A-30
Open decks (10)											A-0
Special category spaces (11)											A-30**]]**

Table 5.2

Fire integrity of decks separating adjacent spaces

Space below ↓ Space above→	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
Control stations (1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	[0]	A-30

Table 5.2

Fire integrity of decks separating adjacent spaces

Corridors	(2)	A-0	0	0	A-0	0	A-60	A-0	A-0	A-0	0	A-0
Accommodation spaces	(3)	A-60	A-0	0	A-0	0	A-60	A-0	A-0	A-0	0	A-30
												A-0[0]
Stairways	(4)	A-0	A-0	A-0	0	A-0	A-60	A-0	A-0	A-0	0	A-0
Service spaces (low risk)	(5)	A-15	A-0	A-0	A-0	0	A-60	A-0	A-0	A-0	0	A-0
Machinery spaces of category A	(6)	A-60	A-60	A-60	A-60	A-60	0	A-60[0]	A-30	A-60	0	A-60
Other machinery spaces	(7)	A-15	A-0	A-0	A-0	A-0	A-0	0	A-0	A-0	0	A-0
Cargo spaces	(8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	0	A-0	0	A-0
Service spaces (high risk)	(9)	A-60	A-30	A-30	A-30	A-0	A-60	A-0	A-0	A-0	0	A-30
			A-0[0]	A-0[0]	A-0[0]							
Open decks	(10)	0	0	0	0	0	0	0	0	0	—	A-0
Special category spaces	(11)	A-60	A-15	A-30	A-15	A-0	A-30	A-0	A-0	A-30	A-0	A-0
				A-0[0]								

[F2The following table shall apply to ALL CLASS B, C and D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2018:

[X1Table 5.2(a)

Fire integrity of decks separating adjacent spaces

Space Below↓ Space Above →	***(1)***	***(2)***	***(3)***	***(4)***	***(5)***	***(6)***	***(7)***	***(8)***	***(9)***	***(10)***	***(11)***
Control stations	*(1)*	*A-0*	*A-0*	*A-0*	*A-0*	*A-0*	*A-60*	*A-0*	*A-0*	*A-0*	g	*A-60*
Corridors	*(2)*	*A-0*	g	g	*A-0*	g	*A-60*	*A-0*	*A-0*	*A-0*	g	*A-30*
Accommodation spaces	*(3)*	*A-60*	*A-0*	g	*A-0*	g	*A-60*	*A-0*	*A-0*	*A-0*	g	*A-30*

[X1 Table 5.2(a)

Fire integrity of decks separating adjacent spaces

												A-0[d]
Stairways	*(4)*	*A-0*	*A-0*	*A-0*	g	*A-0*	*A-60*	*A-0*	*A-0*	*A-0*	g	*A-30*
Service spaces (low risk)	*(5)*	*A-15*	*A-0*	*A-0*	*A-0*	g	*A-60*	*A-0*	*A-0*	*A-0*	g	*A-0*
Machinery spaces of category A	*(6)*	*A-60*	*A-60*	*A-60*	*A-60*	*A-60*	g	*A-60[f]*	*A-30*	*A-60*	g	*A-60*
Other machinery spaces	*(7)*	*A-15*	*A-0*	*A-0*	*A-0*	*A-0*	*A-0*	g	*A-0*	*A-0*	g	*A-0*
Cargo spaces	*(8)*	*A-60*	*A-0*	*A-0*	*A-0*	*A-0*	*A-0*	*A-0*	g	*A-0*	g	*A-0*
Service spaces (high risk)	*(9)*	*A-60*	*A-30 A-0[d]*	*A-30 A-0[d]*	*A-30 A-0[d]*	*A-0*	*A-60*	*A-0*	*A-0*	*A-0*	g	*A-30*
Open decks	*(10)*	g	g	g	g	g	g	g	g	g	—	*A-0*
Special category spaces	*(11)*	*A-60*	*A-30*	*A-30 A-0[d]*	*A-30*	*A-0*	*A-60*	*A-0*	*A-0*	*A-30*	*A-0*	*A-30]]*

a [F3 For clarification as to which applies, see Regulations II-2/B/3 and 8.

b Where spaces are of the same numerical category and superscript b appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose, e.g. in category (9). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an 'A-0' bulkhead.

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

d See paragraph .2.3 and .2.4 of this Regulation.

e For the application of Regulation 2.1.2, 'B-0' and 'C', where appearing in table 5.1 and 5.1a, shall be read as 'A-0'.

f Fire insulation need not be fitted if the machinery space in category (7) has little or no fire risk.

g Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material but is not required to be of 'A' class standard.
In ships, which are constructed on or after 1 January 2003, however, where a deck, except in a category (10) space, is penetrated for the passage of electric cables, pipes and ventilation ducts, such penetration shall be made tight to prevent the passage of flame and smoke. Divisions between control stations (emergency generators) and open decks may have air intake openings without means for closure, unless a fixed gas fire-fighting system is fitted.
For the application of Regulation II-2/B/2.1.2. an asterisk, where appearing in table 5.2 and 5.2(a), except for categories (8) and (10), shall be read as 'A-0'.

Notes to be applied to tables 5.1, 5.1(a), 5.2 and 5.2(a), as appropriate:]

6 Means of escape (R 28)

NEW CLASS B, C AND D SHIPS AND EXISTING CLASS B SHIPS:

.1 Stairways and ladders, corridors and doors shall be arranged to provide ready means of escape to the lifeboat and life-raft embarkation deck from all passenger and crew spaces and from spaces in which the crew is normally employed, other than machinery spaces. In particular, the following provisions shall be complied with:

.1 Below the bulkhead deck two means of escape, at least one of which shall be independent of watertight doors, shall be provided from each watertight compartment or similarly restricted space or group of spaces. Exceptionally one of the means of escape may be dispensed with, due regard being paid to the nature and location of spaces and to the number of persons who might be normally employed there.

In such a case the sole means of escape shall provide safe escape.

For ships which are constructed on or after 1 January 2003, the abovementioned dispensation may only be given for crew spaces that are entered only occasionally, in which case the required escape route shall be independent of watertight doors.

.2 Above the bulkhead deck there shall be at least two means of escape from each main vertical zone or similarly restricted space or group of spaces at least one of which shall give access to a stairway forming a vertical escape.

.3 If a radiotelegraph station has no direct access to the open deck, two means of escape from or access to such station shall be provided, one of which may be a porthole or window of sufficient size or another means.

.4 In existing class B ships, a corridor, or part of a corridor from which there is only one route of escape shall not exceed:

.1 5 metres in length for ships constructed on or after 1 October 1994,

.2 13 metres in length for ships constructed before 1 October 1994, carrying more than 36 passengers, and

.3 7 metres in length for ships constructed before 1 October 1994, carrying not more than 36 passengers.

In new class A, B, C and D ships of 24 metres in length and above, a corridor, lobby or part of a corridor from which there is only one route of escape shall be prohibited.

Dead-end corridors used in service areas which are necessary for the practical utility of the ship, such as fuel oil stations and athwartship supply corridors, shall be permitted, provided such dead-end corridors are separated from crew accommodation areas and inaccessible from passenger accommodation areas. A part of a corridor that has a depth not exceeding its width is considered a recess or local extension and is permitted.

NEW CLASS B, C AND D SHIPS OF 24 METRES IN LENGTH AND ABOVE CONSTRUCTED BEFORE 1 JANUARY 2003:

.5 At least one of the means of escape required by paragraphs .1.1 and .1.2 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 life-raft embarkation decks, or to the uppermost 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 III/5.3 and slip-free surfaces underfoot. Boundaries facing external open stairways and passageways forming part of an escape route shall be so protected that a fire in any enclosed space behind such boundaries would not impede escape to the embarkation stations.

The widths, number and continuity of escapes shall be as follows:

.1 Stairways shall not be less than 900 mm in clear width, if reasonable and practicable to the satisfaction of the Member State, but shall in no case be less than 600 mm. Stairways shall be fitted with handrails on each side. The minimum clear width of stairways shall be increased by 10 mm for every one person provided for in excess of 90 persons. The maximum clear width between handrails where stairways are wider than 900 mm shall be 1 800 mm. 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 at least conform to the standard as given in IMO Resolution A.757(18).

.2 All stairways sized for more than 90 persons shall be aligned before and after.

.3 Doorways and corridors and intermediate landings included in means of escape shall be sized in the same manner as stairways.

.4 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°.

.5 Landings at each deck level shall not be less than 2 m^2 in area and shall increase by 1 m^2 for every 10 persons provided for in excess of 20 persons but need not exceed 16 m^2, except for those landings servicing public spaces having direct access onto the stairway enclosure.

CLASS B, C AND D SHIPS OF 24 METRES IN LENGTH AND ABOVE CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

.5a At least one of the means of escape required in the paragraphs .1.1 and .1.2 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 life-raft 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 III/5.3 and slip-free surfaces underfoot. 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 tables 4.1 to 5.2, as appropriate.

The widths, number and continuity of escapes shall be in accordance with the requirements of the Fire Safety Systems Code.

NEW CLASS B, C AND D CONSTRUCTED BEFORE 1 JANUARY 2003 AND EXISTING CLASS B SHIPS:

.6 Satisfactory protection of access from the stairway enclosures to the lifeboat and life-raft embarkation areas shall be provided.

CLASS B, C AND D SHIPS CONSTRCTED ON OR AFTER 1 JANUARY 2003:

.6a Protection of access from the stairway enclosures to the lifeboat and life-raft embarkation areas shall be provided either directly or through protected internal routes

which have fire integrity and insulation values for stairway enclosures as determined by tables 4.1 to 5.2, as appropriate.

NEW CLASS B, C AND D SHIPS:

.7 In addition to the emergency lighting required by Regulations II-1/D/3 and III/5.3, the means of escape including stairways and exits, shall be marked by lighting or photoluminescent strip indicators placed not more than 0,3 metres above the deck at all points of the escape route including angles and intersections. The marking must enable passengers to identify all the routes of escape and readily identify the escape exits. 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. Additionally, all escape route signs and fire equipment location markings shall be of photoluminescent material or marked by lighting. The Administration of the flag State shall ensure that such lighting or photoluminescent equipment have been evaluated, tested and applied in accordance with the guidelines as given in IMO Resolution A.752(18).

However, for new class B, C and D ships constructed on or after 1 January 2003 the Administration of the Flag State shall ensure that such lighting or photoluminescent equipment has been evaluated, tested and applied in accordance with the Fire Safety Systems Code.

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

.8 In ships carrying more than 36 passengers the requirements of paragraph .1.7 of this Regulation shall also apply to the crew accommodations.

.9 Normally locked doors that form part of an escape route.

.1 Cabin and stateroom doors shall not require keys to unlock them from inside the room.

Neither shall there be any doors along any designated escape route which require keys to unlock them when moving in the direction of escape.

.2 Escape doors from public spaces that are normally latched shall be fitted with a means of quick release. Such means shall consist of a door-latching mechanism incorporating a device that releases the latch upon the application of a force in the direction of escape flow. Quick release mechanisms shall be designed and installed to the satisfaction of the Administration of the flag State and in particular:

.2.1 consist of bars or panels, the actuating portion of which extends across at least one half of the width of the door leaf, at least 760 mm and not more than 1 120 mm above the deck;

.2.2 cause the door latch to release when a force not exceeding 67 N is applied; and

.2.3 not be equipped with any locking device, set screw or other arrangement that prevents the release of the latch when pressure is applied to the releasing device.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.2 .1In special category spaces the number and disposition of the means of escape both below and above the bulkhead deck shall be to the satisfaction of the Administration of the flag State and in general the safety of access to the embarkation deck shall be at least equivalent to that provided under paragraphs .1.1, .1.2, .1.5 and .1.6.

In new class B, C and D ships constructed on or after 1 January 2003, such spaces shall be provided with designated walkways to the means of escape with a

breadth of at least 600 mm, and where practicable and reasonable those designated longitudinal walkways shall raise at least 150 mm above the deck surface. The parking arrangements for the vehicles shall maintain the walkways clear at all times.

.2 One of the escape routes from the machinery spaces where the crew is normally employed shall avoid direct access to any special category space.

.3 Hoistable drive-up/down ramps to platform decks must not be capable of blocking the approved escape routes when in lowered position.

.3.1 Two means of escape shall be provided from each machinery space. In particular, the following provisions shall be complied with:

.1 Where the space is below the bulkhead deck the two means of escape shall consist of either:

.1 two sets of steel ladders as widely separated as possible, leading to doors in the upper part of the space similarly separated and from which there is access to the appropriate lifeboat and life-raft embarkation decks. In new ships, one of these ladders shall provide continuous fire shelter from the lower part of the space to a safe position outside the space. In new class B, C and D ships constructed on or after 1 January 2003 that ladder shall be located within a protected enclosure that satisfies Regulation II-2/B/4, category (2) or II-2/B/5, category (4), as appropriate, from the lower part of the space it serves to a safe position outside the space. Self-closing fire doors of the same fire integrity standards shall be fitted in the enclosure. The ladder shall be fixed in such a way that heat is not transferred into the enclosure through non-insulated fixing points. The protected enclosure shall have minimum internal dimensions of at least 800 mm × 800 mm, and shall have emergency lighting provisions; or

.2 one steel ladder leading to a door from which access is provided to the embarkation deck and additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the embarkation deck.

.2 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 a position from which access is provided to the appropriate lifeboat and life-raft embarkation decks. Where such means of escape require the use of ladders, these shall be of steel.

NEW CLASS A, B, C AND D SHIPS:

.3 From spaces for monitoring of operation of machinery, and from work spaces, there shall be at least two means of escape, of which one shall be independent of the machinery space and give access to the embarkation deck.

.4 The underside of stairs in machinery spaces shall be shielded.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.3.2 In a ship of less than 24 metres in length, the Administration of the flag State may dispense with one of the means of escape in machinery spaces, due regard being paid to the width and disposition of the upper part of the space.

In a ship of 24 metres in length and above, the Administration of the flag State may dispense with one means of escape from any such space so long as either a door or a steel ladder provides a safe escape route to the embarkation deck, due regard being paid to the nature and location of the space and whether persons are normally employed in that space. In new class B, C and D ships constructed on or after 1 January 2003, a second means of escape shall be provided in the steering gear space when the emergency steering position is located in that space unless there is a direct access to the open deck.

.3.3 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.

[[F2]CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2018

.3.4 Two means of escape shall be provided from the main workshop within a machinery space. At least one of those escape routes shall provide a continuous fire shelter to a safe position outside the machinery space.**]**

.4 In no case shall lifts be considered as forming one of the required means of escape.

.5 NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS OF 40 METRES IN LENGTH AND ABOVE:

.1 Emergency escape breathing devices shall be carried, complying with the Fire Safety Systems Code.

.2 At least two emergency escape breathing devices shall be carried in each main vertical zone

.3 In ships carrying more than 36 passengers, two emergency escape breathing devices, in addition to those required in subparagraph .5.2 shall be carried in each main vertical zone.

.4 However, subparagraphs .5.2 and .5.3 do not apply to stairway enclosures which constitute individual main vertical zones and for the main vertical zones in the fore or aft end of a ship, which do not contain spaces of categories (6), (7), (8) or (12) defined in Regulation II-2/B/4.

.5 Within the machinery spaces, emergency escape breathing devices shall be situated ready for use at easily visible places, which can be reached quickly and easily at any time in the event of fire. The location of emergency escape breathing devices shall take into account the layout of the machinery space and the number of persons normally working in the space.

.6 Reference is made to the Guidelines for the performance, location, use and care of emergency escape breathing devices (EEBD) in IMO MSC/Circ.849.

.7 The number and location of these devices shall be indicated in the fire control plan required in Regulation II-2/A/13.

6-1 **Escape routes on ro-ro passenger ships (R 28-1)**

.1 REQUIREMENTS APPLICABLE TO NEW CLASS B, C AND D AND EXISTING CLASS B RO-RO PASSENGER SHIPS

.1.1 This paragraph applies to new class B, C and D and existing class B ro-ro passenger ships.

.1.2 Handrails or other handholds shall be provided in all corridors along the entire escape route, so that a firm handhold is available every step of the way, where possible, to the assembly stations and embarkation stations. Such handrails shall be provided on both sides of longitudinal corridors more than 1,8 metres in width and transverse corridors more than 1 metre in width. Particular attention shall be paid to the need to be able to cross lobbies, atriums and other large open spaces along escape routes. Handrails and other handholds shall be of such strength as to withstand a distributed horizontal load of 750 N/m applied in the direction of the centre of the corridor or space, and a distributed vertical load of 750 N/m applied in the downward direction. The two loads need not be applied simultaneously.

.1.3 Escape routes shall not be obstructed by furniture or other obstructions. With the exception of tables and chairs which may be cleared to provide open space, cabinets and other heavy furnishings in public spaces and along escape routes shall be secured in place to prevent shifting if the ship rolls or lists. Floor coverings shall also be secured in place. When the ship is underway, escape routes shall be kept clear of obstructions such as cleaning carts, bedding, luggage and boxes of goods.

.1.4 Escape routes shall be provided from every normally occupied space on the ship to an assembly station. These escape routes shall be arranged so as to provide the most direct route possible to the assembly station, and shall be marked with symbols related to life-saving appliances and arrangements, adopted by IMO by Resolution A.760(18) as amended.

.1.5 Where enclosed spaces adjoin an open deck, openings from the enclosed space to the open deck shall, where practicable, be capable of being used as an emergency exit.

.1.6 Decks shall be sequentially numbered, starting with '1' at the tank top or lowest deck. These numbers shall be prominently displayed at stair landings and lift lobbies. Decks may also be named, but the deck number shall always be displayed with the name.

.1.7 Simple 'mimic' plans showing the 'you are here' position and escape routes marked by arrows shall be prominently displayed on the inside of each cabin door and in public spaces. The plan shall show the directions of escape, and shall be properly oriented in relation to its position on the ship.

.1.8 Cabin and stateroom doors shall not require keys to unlock them from inside the room. Neither shall there be any doors along any designed escape route which require keys to unlock them when moving in the direction of escape.

.2 REQUIREMENTS APPLICABLE TO NEW CLASS B, C AND D RO-RO PASSENGER SHIPS

.2.1 The lowest 0,5 metres of bulkheads and other partitions forming vertical divisions along escape routes shall be able to sustain a load of 750 N/m^2 to allow them to be used as walking surfaces from the side of the escape route with the ship at large angles of heel.

.2.2 The escape route from cabins to stairway enclosures shall be as direct as possible, with a minimum number of changes in direction. It shall not be necessary to cross from one side of the ship to the other to reach an escape route. It shall not be necessary to climb more than two decks up or down in order to reach an assembly station or open deck from any passenger space.

.2.3 External routes shall be provided from open decks, referred to in paragraph 2.2, to the survival craft embarkation stations.

.3 REQUIREMENTS APPLICABLE TO NEW CLASS B, C AND D RO-RO PASSENGER SHIPS CONSTRUCTED ON OR AFTER 1 JULY 1999

For new class B, C and D ro-ro passenger ships constructed on or after 1 July 1999, escape routes shall be evaluated by an evacuation analysis early in the design process. The analysis shall be used to identify and eliminate, as far as practicable, congestion which may develop during abandonment, due to normal movement of passengers and crew along escape routes, including the possibility that crew may need to move along these routes in a direction opposite the movement of the passengers. In addition, the analysis shall be used to demonstrate that escape arrangements are sufficiently flexible to provide for the possibility that certain escape routes, assembly stations, embarkation stations or survival craft may not be available as a result of a casualty.

7 **Penetrations and openings in 'A' and 'B' class divisions (R 30, 31)**

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.1 All openings in 'A' class divisions shall be provided with permanently attached means of closing which shall be as effective for resisting fires as the divisions in which they are fitted.

.2 The construction of all doors and door frames in 'A' class divisions, with the means of securing them when closed, shall provide resistance to fire as well as to the passage of smoke and flame, as far as practicable, equivalent to that of the bulkheads in which the doors are situated. Such doors and doorframes shall be constructed of steel or other equivalent material. Watertight doors need not be insulated.

.3 It shall be possible for each door to be opened and closed from each side of the bulkhead by one person only.

.4 Fire doors in main vertical zone bulkheads and stairways enclosures other than power-operated sliding watertight doors and doors normally locked, shall satisfy the following requirements:

.1 The doors shall be self-closing and be capable of closing with an angle of up to 3,5° opposing closure. The speed of closure shall, if necessary, be controlled so as to prevent undue danger to persons. In new ships the uniform rate of closure shall be no more than 0,2 m/s and no less than 0,1 m/s with the ship in the upright position.

NEW CLASS B, C AND D SHIPS:

.2 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 continue sounding until the door is completely closed. Doors designed to re-open upon contacting an object in its path shall re-open sufficiently to allow a clear passage of at least 0,75 metres, but no more than one metre.

.3 All doors, except fire doors which are normally kept closed, shall be capable of remote and automatic release from a continuously manned central control station, either simultaneously or in groups, and also individually from a position at both sides of the door. Indication must be provided at the fire control panel in the continuously manned central control station whether each of the remote-controlled doors is closed. The release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system or central power supply. Release switches

shall have an on-off function to prevent automatic resetting of the system. Holdback hooks not subject to central control station release are prohibited.

.4 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.

.5 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.

.6 Doors giving direct access to special category spaces which are power-operated and automatically closed need not be equipped with alarms and remote-release mechanisms required in .4.2 and .4.3.

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

Instead of .4 the following paragraph .4a shall apply

.4a Fire doors in main vertical zone bulkheads, galley boundaries and stairway enclosures other than power-operated watertight doors and those which are normally locked, shall satisfy the following requirements:

.1 the doors shall be self-closing and be capable of closing against an angle of inclination of up to 3,5° opposing closure;

.2 the approximate time of closure for hinged fire doors shall be no more than 40 seconds and no less than 10 seconds from the beginning of their movement with the ship in upright position. The approximate uniform rate of closure for sliding fire doors shall be of no more than 0,2 m/s and no less than 0,1 m/s with the ship in the upright position;

.3 the doors shall be capable of remote release from the continuously manned central control station, either simultaneously or in groups and shall be capable of release also individually from a position at both sides of the door. Release switches shall have an on-off function to prevent automatic resetting of the system;

.4 hold-back hooks not subject to central control station release are prohibited;

.5 a door closed remotely from the central control station shall be capable of being reopened at both sides of the door by local control. After such local opening the door shall automatically close again;

.6 indication shall be provided at the fire door indicator panel in the continuously manned central control station whether each of the remote-released doors are closed;

.7 the release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system or main source of electric power;

.8 local power accumulators for power-operated doors shall be provided in the immediate vicinity of the doors to enable the doors to be operated after disruption of the control system or main source of electric power at least 10 times (fully opened or closed) using the local controls;

.9 disruption of the control system or main source of electric power at one door shall not impair the safe functioning of the other doors;

.10 remote-released sliding or power-operated doors shall be equipped with an alarm that sounds for at least 5 seconds but no more than 10 seconds after the door is released from the central control station and before the door begins to move and continue sounding until the door is completely closed;

.11 a door designed to re-open upon contacting an object in its path shall re-open not more than one metre from the point of contact;

.12 double-leaf doors equipped with latch necessary to their fire integrity shall have a latch that is automatically activated by the operation of the doors when released by the control system;

.13 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 required in paragraph .3 and .10;

.14 the components of the local control system shall be accessible for maintenance and adjusting; and

.15 power-operated doors shall be provided with a control system of an approved type which shall be able to operate in case of fire, this being determined in accordance with the Fire Test Procedure Code. This system shall satisfy the following requirements:

.15.1 the control system shall be able to operate the door at a temperature of at least 200 °C for at least 60 minutes, served by the power supply;

.15.2 the power supply for all other doors not subject to fire shall not be impaired, and;

.15.3 at temperatures exceeding 200 °C the control system shall be automatically isolated from the power supply and shall be capable of keeping the door closed up to at least 945 °C.

NEW CLASS B, C AND D SHIPS:

.5 The requirements for ‘A’ class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles, provided that there is no requirement for such boundaries to have ‘A’ class integrity in Regulation 10. Similarly, the requirements for ‘A’ class integrity shall not apply to exterior doors in superstructures and deckhouses.

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

Instead of .5: the following paragraph .5a shall apply:

.5a The requirements for ‘A’ class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles, provided that there is no requirement for such boundaries to have a ‘A’ class integrity in Regulation 10.

The requirements for ‘A’ class integrity of the outer boundaries of the ship shall not apply to exterior doors, except for those in superstructures and deckhouses facing life-saving appliances, embarkation and external assembly station areas, external stairs

and open decks used for escape routes. Stairway enclosure doors need not meet this requirement.

NEW CLASS B, C AND D SHIPS:

.6 Except for watertight doors, weathertight doors (semi-watertight doors), doors leading to the open deck and doors which need to be reasonably gastight all 'A' class doors located in stairways, public spaces and main vertical zone bulkheads in escape routes shall be equipped with a self-closing hose port of material, construction and fire resistance which is equivalent to the door into which it is fitted, and shall be a 150 mm square clear opening with the door closed and shall be inset into the lower edge of the door, opposite to the door hinges, or in the case of sliding doors, nearest the opening.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.7 Doors and door frames in 'B' class divisions and means of securing them shall provide a method of closure which shall have resistance to fire equivalent to that of the divisions except that ventilation openings may be permitted in the lower portion of such doors. Where such opening is in or under a door the total net area of any such opening or openings shall not exceed 0,05 m^2. Alternatively, a non-combustible air balance duct routed between the cabin and the corridor and located below the sanitary unit is permitted where the cross-sectional area of the duct does not exceed 0,05 m^2. All ventilation openings shall be fitted with a grill made of non-combustible material. Doors shall be non combustible.

.7.1 For reasons of noise reduction, the Administration may approve, as an equivalent, doors with built-in ventilation sound-locks with openings at the bottom on one side of the door and at the top on the other side, on condition that the following provisions have been complied with:

.1 The upper opening shall always face towards the corridor and shall be provided with a grating of non-combustible material and an automatically operating fire damper, which is activated at a temperature of about 70 °C.

.2 The lower opening shall be provided with a grating made of a non-combustible material.

.3 The doors shall be tested in accordance with Resolution A.754(18).

NEW CLASS B, C AND D SHIPS:

.8 Cabin doors in 'B' class divisions shall be of a self-closing type. Hold-backs are not permitted.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.9 The requirements for 'B' class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles. Similarly the requirements for 'B' class integrity shall not apply to exterior doors in superstructures and deckhouses. For ships carrying not more than 36 passengers, the Administration of the flag State may permit the use of combustible materials in doors separating cabins from the individual interior sanitary spaces such as showers.

8 **Protection of stairways and lifts in accommodation and service spaces (R 29)**

NEW CLASS B, C AND D SHIPS:

.1 All stairways shall be of steel frame construction, except where the Administration sanctions the use of other equivalent material, and shall be within enclosures formed of 'A' class divisions, with positive means of closure of all openings except that:

.1 a stairway connecting only two decks need not be enclosed, provided the integrity of the deck is maintained by proper bulkheads or doors in one between-deck space. When a stairway is closed in one between-deck space, the stairway enclosure shall be protected in accordance with the tables for decks in Regulations 4 and 5;

.2 stairways may be fitted in the open in a public space, provided they lie wholly within such public space.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.2 Stairway enclosures shall have direct access with 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.

NEW CLASS B, C AND D SHIPS: Within the perimeter of such stairway enclosures only public toilets, lockers of non-combustible material providing storage for safety equipment and open information counters are permitted.

Only public spaces, corridors, public toilets, special category spaces, other escape stairways required by Regulation II-2/B/6-1.5 and external areas are permitted to have direct access to these stairway enclosures.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

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

[F3 9 Ventilation systems for ships built before the 1 January 2018 (R 32)]

.1 *Ships carrying more than 36 passengers*

NEW CLASS B, C AND D SHIPS:

.1 The ventilation system shall, in addition to paragraph 1 in Regulation II/32 of the 1974 SOLAS Convention, as in force on 17 March 1998, also be in compliance with subparagraphs .2.2 to .2.6, .2.8 and .2.9 of this Regulation.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.2 In general, the ventilation fans shall be so disposed that the ducts reaching the various spaces remain within the main vertical zone.

.3 Where ventilation systems penetrate decks, precautions shall be taken, in addition to those relating to fire integrity of the deck required by Regulation II-2/A/12.1, 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, if necessary, be insulated as required by the appropriate tables in Regulation 4.

NEW CLASS B, C AND D SHIPS:

.4 Ventilation ducts shall be constructed of the following materials:

.1 ducts not less than 0,075 m^2 in sectional area and all vertical ducts serving more than a single between-deck space shall be constructed of steel or other equivalent material;

.2 ducts less than 0,075 m^2 in sectional area other than vertical ducts referred to in subparagraph .1.4.1 shall be constructed of non-combustible materials. Where such ducts penetrate ‘A’ or ‘B’ class divisions due regard shall be given to ensuring the fire integrity of the division;

.3 short lengths of duct, not in general exceeding 0,02 m^2 in sectional area nor two metres in length, need not be non-combustible provided that all of the following conditions are met:

.1 the duct is constructed of a material of low fire risk to the satisfaction of the Administration of the flag State;

.2 the duct is used only at the terminal end of the ventilation system; and

.3 the duct is not located closer than 600 mm measured along its length to a penetration of an 'A' or 'B' class division, including continuous 'B' class ceilings.

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

instead of subparagraph .1 the following subparagraph .1a shall apply:

.1a the duct shall be of a material which has low flame spread characteristics.

.5 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.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.6 All power ventilation, except machinery space and cargo space ventilation and any alternative system which may be required under subparagraph .9.2.6, shall be fitted with controls so grouped that all fans may be stopped from either of two separate positions which shall be situated as far apart as practicable. Controls provided for the power ventilation serving machinery spaces shall also be grouped so as to be operable from two positions, one of which shall be outside such spaces. Fans serving power ventilation systems to cargo spaces shall be capable of being stopped from a safe position outside such spaces.

NEW CLASS B, C AND D SHIPS:

.7 Where public spaces span three or more open decks and contain combustibles such as furniture and enclosed spaces such as shops, offices and restaurants, the space shall be equipped with a smoke extraction system. The smoke extraction system shall be activated by the required smoke detection system and be capable of manual control. The fans shall be sized such that the entire volume within the space can be exhausted in 10 minutes or less.

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

.9 Exhaust ducts from galley ranges in which grease or fat is likely to accumulate shall meet requirements of subparagraphs .9.2.3.2.1 and .9.2.3.2.2 and shall be fitted with:

.1 a grease trap readily removable for cleaning unless an alternative approved grease removal system is fitted;

.2 a fire damper located in the lower end of the duct which is automatically and remotely operated, and in addition a remotely operated fire damper located in the upper end of the duct;

.3 a fixed means for extinguishing a fire within the duct;

.4 remote control arrangements for shutting off the exhaust fans and supply fans, for operating the fire dampers mentioned in .2 and for operating the fire-extinguishing system, which shall be placed in a position close to the entrance to the galley. Where

a multi-branch system is installed, means shall be provided to close all branches exhausting through the same main duct before an extinguishing medium is released into the system; and

.5 suitably located hatches for inspection and cleaning.

.2 *Ships carrying not more than 36 passengers*

NEW CLASS B, C AND D SHIPS:

.1 Ventilation ducts shall be of non-combustible material. Short ducts, however, not generally exceeding two metres in length and with a cross-section not exceeding 0,02 m^2 need not be non-combustible, subject to the following conditions:

.1 these ducts shall be of a material which, in the opinion of the Administration of the flag State, has a low fire risk;

.2 they may only be used at the end of the ventilation device;

.3 they shall not be situated less than 600 mm, measured along the duct, from an opening in an 'A' or 'B' class division, including continuous 'B' class ceilings.

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

instead of subparagraph .1 the following subparagraph .1a shall apply:

.1a these ducts shall be of a material which has low flame spread characteristics.

.2a Where the ventilation ducts with a free-sectional area exceeding 0,02 m^2 pass through class 'A' bulkheads or decks, the openings shall be lined with a steel sheet sleeve unless the ducts passing through the bulkheads or decks are of steel in the vicinity of passage through the deck or bulkhead and the ducts and sleeves shall comply in this part with the following:

.1 The sleeves shall have a thickness of at least 3 mm and a length of at least 900 mm. When passing through bulkheads, this length shall be divided preferably into 450 mm on each side of the bulkhead. These ducts, or sleeves lining such ducts, shall be provided with fire insulation. The insulation shall have at least the same fire integrity as the bulkhead or deck through which the duct passes.

.2 Ducts with a free cross-sectional area exceeding 0,075 m^2 shall be fitted with fire dampers in addition to the requirements of sub-paragraph .9.2.2.1. The fire damper shall operate automatically but shall also be capable of being closed manually from both sides of the bulkhead or deck. The damper shall be provided with an indicator which shows whether the damper is open or closed. Fire dampers are not required, however, where ducts pass through spaces surrounded by 'A' class divisions, without serving those spaces, provided those ducts have the same fire integrity as the divisions which they pierce. Fire dampers shall be easily accessible. In new class B, C and D ships constructed on or after 1 January 2003, where fire dampers are placed behind ceilings or linings, these ceilings or linings shall be provided with an inspection door on which a plate reporting the identification number of the fire damper is provided. The fire damper identification number shall also be placed on any remote controls required.

.2b In new class B, C and D ships constructed on or after 1 January 2003, where a thin plated duct with a free cross-sectional area equal to or less than 0,02 m^2 passes through 'A' class bulkheads or decks, the opening shall be lined with a steel sleeve having a thickness of at least 3 mm and a length of at least 200 mm, divided preferably into

100 mm on each side of the bulkhead or, in the case of the deck, wholly laid on the lower side of the decks pierced.

.3 Ducts provided for the ventilation of machinery spaces, galleys, car deck spaces, ro-ro cargo spaces or special category spaces shall not pass through accommodation spaces, service spaces or control stations unless they comply with the conditions specified in subparagraphs .9.2.3.1.1 to .9.2.3.1.4 or .9.2.3.2.1 and .9.2.3.2.2:

.1.1 the ducts are constructed of steel having a thickness of at least 3 mm and 5 mm for ducts the widths or diameters of which are up to and including 300 mm and 760 mm and over respectively and, in the case of such ducts, the widths or diameters of which are between 300 mm and 760 mm having a thickness to be obtained by interpolation;

.1.2 the ducts are suitably supported and stiffened;

.1.3 the ducts are fitted with automatic fire dampers close to the boundaries penetrated; and

.1.4 the ducts are insulated to 'A-60' standard from the machinery spaces, galleys, car deck spaces, ro-ro cargo spaces or special category spaces to a point at least 5 metres beyond each fire damper;

or

.2.1 the ducts are constructed of steel in accordance with paragraphs .9.2.3.1.1 and .9.2.3.1.2; and

.2.2 the ducts are insulated to 'A-60' standard throughout the accommodation spaces, service spaces or control stations;

except that penetrations of main zone divisions shall also comply with the requirements of subparagraph .9.2.8.

In new class B, C and D ships constructed on or after 1 January 2003, the ventilation systems for machinery spaces of category A, vehicle spaces, ro-ro spaces, galleys, special category spaces and cargo spaces shall, in general, be separated from each other and from the ventilation systems serving other spaces. Except that the galley ventilation systems on passenger ships carrying not more than 36 passengers need not be completely separated, but may be served by separate ducts from a ventilation unit serving other spaces. In any case an automatic fire damper shall be fitted in the galley ventilation duct near the ventilation unit.

.4 Ducts provided for ventilation to accommodation spaces, service spaces or control stations shall not pass through machinery spaces, galleys, car deck spaces, ro-ro cargo spaces or special category spaces unless they comply with the conditions specified in subparagraphs .9.2.4.1.1 to .9.2.4.1.3 or .9.2.4.2.1 and .9.2.4.2.2:

.1.1 the ducts where they pass through a machinery space, galley, car deck space, ro-ro cargo space or special category space are constructed of steel in accordance with subparagraphs .9.2.3.1.1 and .9.2.3.1.2;

.1.2 automatic fire dampers are fitted close to the boundaries penetrated; and

.1.3 the integrity of the machinery space, galley, car deck space, ro-ro cargo space or special category space boundaries is maintained at the penetrations;

or

.2.1 the ducts where they pass through a machinery space, galley, car deck space, ro-ro cargo space or special category space are constructed of steel in accordance with subparagraphs .9.2.3.1.1 and .9.2.3.1.2; and

.2.2 the ducts are insulated to 'A-60' standard throughout the machinery space, galley, car deck space, ro-ro cargo space or special category space;

except that penetrations of main zone divisions shall also comply with the requirements of subparagraph .9.2.8.

.5 Ventilation ducts with a free-sectional area exceeding 0,02 m^2 passing through class 'B' bulkheads shall be lined with steel sheet sleeves of 900 mm in length divided preferably into 450 mm on each side of the bulkheads unless the duct is of steel for this length.

.6 Such measures as are practicable shall be taken in respect of control stations outside machinery spaces in order to ensure that ventilation, visibility and freedom from smoke are maintained, so that in the event of fire the machinery and equipment contained therein may be supervised and continue to function effectively. Alternative and separate means of air supply shall be provided; air inlets of the two sources of supply shall be so disposed that the risk of both inlets drawing in smoke simultaneously is minimised. Such requirements need not apply to control stations situated on, and opening on to, an open deck, or where local closing arrangements would be equally effective.

.7 Where they pass through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be constructed of 'A' class divisions. Each exhaust duct shall be fitted with:

.1 a grease trap readily removable for cleaning;

.2 a fire damper located in the lower end of the duct;

.3 arrangements, operable from within the galley, for shutting off the exhaust fans; and

.4 fixed means for extinguishing a fire within the duct.

.8 Where it is necessary that a ventilation duct passes through a main vertical zone division, a fail-safe automatic closing fire damper shall be fitted adjacent to the division. The damper shall also be capable of being manually closed from each side of the division. The operating position shall be readily accessible and be marked in red light-reflecting colour. The duct between the division and the damper shall be of steel or other equivalent material and, if necessary, insulated to comply with the requirements of Regulation II- 2/A/12.1. The damper shall be fitted on at least one side of the division with a visible indicator showing whether the damper is in the open position.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.9 The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated.

NEW CLASS B, C AND D SHIPS:

.10 Power ventilation of accommodation spaces, service spaces, cargo spaces, control stations and machinery spaces shall be capable of being stopped from an easily accessible position outside the space being served. This position should not be readily cut off in the event of a fire in the spaces served. The means provided for stopping the

power ventilation of the machinery spaces shall be entirely separate from the means provided for stopping ventilation of other spaces.

.3 CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

The following arrangements shall be tested in accordance with the IMO Fire Test Procedures Code:

.1 fire dampers including relevant means of operation; and

.2 duct penetrations through 'A' class divisions. Where steel sleeves are directly joined to ventilation ducts by means of riveted or screwed flanges or by welding, the test is not required.

[F2 9a Ventilation systems in ships

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2018

.1 *General*

.1 Ventilation ducts, including single and double wall ducts, shall be of steel or an equivalent material, except for flexible bellows of short length not exceeding 600 mm used for connecting fans to the ducting in air-conditioning rooms. Unless expressly provided otherwise in paragraph .1.6, any other material used in the construction of ducts, including insulation, shall also be non-combustible. However, short ducts, not exceeding 2 m in length and with a free cross-sectional area (The term free cross-sectional area means, even in the case of a pre-insulated duct, the area calculated on the basis of the inner dimensions of the duct itself and not the insulation) not exceeding 0,02 m^2, need not be of steel or equivalent material, subject to the following conditions:

.1 the ducts shall be made of non-combustible material which may be faced internally and externally with membranes having low flame-spread characteristics and, in each case, a calorific value not exceeding 45 MJ/m^2 of their surface area for the thickness used. The calorific value shall be calculated in accordance with the recommendations published by the International Organization for Standardization, in particular publication ISO 1716:2002, 'Reaction to the fire tests for building products — Determination of the heat of combustion'.;

.2 the ducts are only used at the end of the ventilation device; and

.3 the ducts are not situated less than 600 mm, measured along the duct, from an opening in an 'A' or 'B' class division, including continuous 'B' class ceiling.

.2 The following arrangements shall be tested in accordance with the Fire Test Procedures Code:

.1 fire dampers, including their relevant means of operation, although the testing is not required for dampers located at the lower end of the duct in exhaust ducts for galley ranges, which must be of steel and capable of stopping the draught in the duct; and

.2 duct penetrations through 'A' class divisions, although the testing is not required where steel sleeves are directly joined to ventilation ducts by means of riveted or screwed connections or by welding.

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

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

.5 The main inlets and outlets of ventilation systems shall be capable of being closed from outside the spaces being ventilated. The means of closing shall be easily accessible as well as prominently and permanently marked and shall indicate the operating position of the closing device.

.6 Combustible gaskets in flanged ventilation duct connections are not permitted within 600 mm of openings in 'A' or 'B' class divisions and in ducts required to be of 'A' class construction.

.7 Ventilation openings or air balance ducts between two enclosed spaces shall not be provided except as permitted by Regulation II-2/B/7.7.

.2 *Arrangement of ducts*

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

.2 Ducts provided for the ventilation of machinery spaces of category A, galleys, vehicle spaces, Ro-Ro spaces or special category spaces shall not pass through accommodation spaces, service spaces, or control stations unless they comply with paragraph .2.4.

.3 Ducts provided for the ventilation of accommodation spaces, service spaces or control stations shall not pass through machinery spaces of category A, galleys, vehicle spaces, Ro-Ro spaces or special category spaces unless they comply with paragraph .2.4.

.4 As permitted by paragraphs .2.2 and .2.3 ducts shall be either:

.1.1 constructed of steel having a thickness of at least 3 mm for ducts with a free cross-sectional area of less than 0,075 m^2, at least 4 mm for ducts with a free cross-sectional area of between 0,075 m^2 and 0,45 m^2, and at least 5 mm for ducts with a free cross-sectional area of over 0,45 m^2;

.1.2 suitably supported and stiffened;

.1.3 fitted with automatic fire dampers close to the boundaries penetrated; and

.1.4 insulated to 'A-60' class standard from the boundaries of the spaces they serve to a point at least 5 m beyond each fire damper;

or

.2.1 constructed of steel in accordance with paragraphs .2.4.1.1 and .2.4.1.2; and

.2.2 insulated to 'A-60' class standard throughout the spaces they pass through, except for ducts that pass through spaces of category (9) or (10) as defined in Regulation II-2/B/4.2.2.

.5 For the purposes of paragraphs .2.4.1.4 and .2.4.2.2, ducts shall be insulated over their entire cross-sectional external surface. Ducts that are outside but adjacent to the specified space, and share one or more surfaces with it, shall be considered to pass through the specified space and shall be insulated over the surface they share with the space for a distance of 450 mm past the duct (Sketches of such arrangements are contained in the Unified Interpretations of SOLAS chapter II-2 (MSC.1/Circ.1276)).

.6 Where it is necessary that a ventilation duct passes through a main vertical zone division, an automatic fire damper shall be fitted adjacent to the division. The damper shall also be capable of being manually closed from each side of the division. The control location shall be readily accessible and be clearly and prominently marked. The duct between the division and the damper shall be constructed of steel in accordance with paragraphs .2.4.1.1 and .2.4.1.2 and insulated to at least the same fire integrity as the division penetrated. The damper shall be fitted on at least one side of the division with a visible indicator showing the operating position of the damper.

.3 *Details of fire dampers and duct penetrations*

.1 Ducts passing through 'A' class divisions shall meet the following requirements:

.1 where a thin plated duct with a free cross sectional area equal to, or less than, 0,02 m^2 passes through 'A' class divisions, the opening shall be fitted with a steel sheet sleeve having a thickness of at least 3 mm and a length of at least 200 mm, divided preferably into 100 mm on each side of a bulkhead or, in the case of a deck, wholly laid on the lower side of the decks penetrated;

.2 where ventilation ducts with a free cross-sectional area exceeding 0,02 m^2, but not more than 0,075 m^2, pass through 'A' class divisions, the openings shall be lined with steel sheet sleeves. The ducts and sleeves shall have a thickness of at least 3 mm and a length of at least 900 mm. When passing through bulkheads, this length shall be divided preferably into 450 mm on each side of the bulkhead. These ducts, or sleeves lining such ducts, shall be provided with fire insulation. The insulation shall have at least the same fire integrity as the division through which the duct passes; and

.3 automatic fire dampers shall be fitted in all ducts with a free cross-sectional area exceeding 0,075 m^2 that pass through 'A' class divisions. Each damper shall be fitted close to the division penetrated and the duct between the damper and the division penetrated shall be constructed of steel in accordance with paragraphs .2.4.2.1 and .2.4.2.2. The fire damper shall operate automatically, but shall also be capable of being closed manually from both sides of the division. The damper shall be fitted with a visible indicator which shows the operating position of the damper. Fire dampers are not required, however, where ducts pass through spaces surrounded by 'A' class divisions, without serving those spaces, provided those ducts have the same fire integrity as the divisions which they penetrate. A duct of cross-sectional area exceeding 0,075 m^2 shall not be divided into smaller ducts at the penetration of an 'A' class division and then recombined into the original duct once through the division to avoid installing the damper required by this provision.

.2 Ventilation ducts with a free cross-sectional area exceeding 0,02 m^2 passing through 'B' class bulkheads shall be lined with steel sheet sleeves of 900 mm in length, divided preferably into 450 mm on each side of the bulkheads unless the duct is of steel for this length.

.3 All fire dampers shall be capable of manual operation. The dampers shall have a direct mechanical means of release or, alternatively, be closed by electrical, hydraulic, or pneumatic operation. All dampers shall be manually operable from both sides of the division. Automatic fire dampers, including those capable of remote operation, shall have a failsafe mechanism that will close the damper in a fire even upon loss of electrical power or hydraulic or pneumatic pressure loss. Remotely operated fire dampers shall be capable of being reopened manually at the damper.

.4 *Ventilation systems for passenger ships carrying more than 36 passengers*

.1 In addition to the requirements in sections .1, .2 and .3, the ventilation system of a passenger ship carrying more than 36 passengers shall also meet the following requirements:

.1 In general, the ventilation fans shall be so arranged that the ducts reaching the various spaces remain within a main vertical zone.

.2 Stairway enclosures shall be served by an independent ventilation fan and duct system (exhaust and supply) which shall not serve any other spaces in the ventilation systems.

.3 A duct, irrespective of its cross-section, serving more than one 'tween-deck' accommodation space, service space or control station, shall be fitted, near the penetration of each deck of such spaces, with an automatic smoke damper that shall also be capable of being closed manually from the protected deck above the damper. Where a fan serves more than one 'tween-deck' space through separate ducts within a main vertical zone, whereby each one is dedicated to a single 'tween-deck' space, each duct shall be provided with a manually operated smoke damper fitted close to the fan.

.4 Vertical ducts shall, where necessary, be insulated as required by tables 4.1 and 4.2. Ducts shall be insulated as required for decks between the space they serve and the space being considered, as applicable.

.5 *Exhaust ducts from galley ranges*

.1 Requirements for passenger ships carrying more than 36 passengers

.1 In addition to the requirements in sections .1, .2 and .3, exhaust ducts from galley ranges shall be constructed in accordance with paragraphs .2.4.2.1 and .2.4.2.2 and insulated to 'A-60' class standard throughout accommodation spaces, service spaces, or control stations they pass through. They shall also be fitted with:

.1 a grease trap readily removable for cleaning unless an alternative approved grease removal system is fitted;

.2 a fire damper located in the lower end of the duct at the junction between the duct and the galley range hood which is automatically and remotely operated and, in addition, a remotely operated fire damper located in the upper end of the duct close to the outlet of the duct;

.3 a fixed means for extinguishing a fire within the duct. The fire extinguishing systems shall comply with the recommendations published by the International Organization for Standardization, in particular publication ISO 15371:2009 'Ships and marine technology — Fire-extinguishing systems for protection of galley cooking equipment';

.4 remote-control arrangements for shutting off the exhaust fans and supply fans, for operating the fire dampers mentioned in paragraph .5.1.1.2 and for operating the fire-extinguishing system, which shall be placed in a position outside the galley close to the entrance to the galley. Where a multi-branch system is installed, a remote means located with the above controls shall be provided to close all branches exhausting through the same main duct before an extinguishing medium is released into the system; and

.5 suitably located hatches for inspection and cleaning, including one provided close to the exhaust fan and one fitted in the lower end where grease accumulates.

.2 Exhaust ducts from ranges for cooking equipment installed on open decks shall conform to paragraph .5.1.1, as applicable, when passing through accommodation spaces or spaces containing combustible materials.

.2 Requirements for passenger ships carrying not more than 36 passengers

When passing through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be constructed in accordance with paragraphs .2.4.1.1 and .2.4.1.2. Each exhaust duct shall be fitted with:

.1 a grease trap readily removable for cleaning;

.2 an automatically and remotely operated fire damper located in the lower end of the duct at the junction between the duct and the galley range hood and, in addition, a remotely operated fire damper in the upper end of the duct close to the outlet of the duct;

.3 arrangements, operable from within the galley, for shutting off the exhaust and supply fans; and

.4 fixed means for extinguishing a fire within the duct.

.6 *Ventilation rooms serving machinery spaces of category A containing internal combustion machinery*

.1 Where a ventilation room serves only such an adjacent machinery space and there is no fire division between the ventilation room and the machinery space, the means for closing the ventilation duct or ducts serving the machinery space shall be located outside of the ventilation room and machinery space.

.2 Where a ventilation room serves such a machinery space as well as other spaces and is separated from the machinery space by a ‘A-0’ class division, including penetrations, the means for closing the ventilation duct or ducts for the machinery space can be located in the ventilation room.

[[X1].7 *Ventilation systems for laundries in passenger ships carrying more than 36 passengers*

Exhaust ducts from laundries and drying rooms of category (13) spaces as defined in Regulation II-2/B/4.2.2 shall be fitted with:**]**

.1 filters readily removable for cleaning purposes;

.2 a fire damper located in the lower end of the duct which is automatically and remotely operated;

.3 remote-control arrangements for shutting off the exhaust fans and supply fans from within the space and for operating the fire damper mentioned in paragraph .7.2; and

.4 suitably located hatches for inspection and cleaning.**]**

10 **Windows and sidescuttles (R 33)**

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.1 All windows and sidescuttles in bulkheads within accommodation and service spaces and control stations other than those to which the provisions of Regulation 7.5 apply, shall be so constructed as to preserve the integrity requirements of the type of bulkheads in which they are fitted.

In new class B, C and D ships constructed on or after 1 January 2003 this shall be determined in accordance with the Fire Test Procedures Code.

.2 Notwithstanding the requirements of the tables in Regulations 4 and 5, all windows and sidescuttles in bulkheads separating accommodation and service spaces and control stations from weather shall be constructed with frames of steel or other suitable material. The glass shall be retained by a metal glazing bed or angle.

NEW CLASS B, C AND D SHIPS CARRYING MORE THAN 36 PASSENGERS:

.3 Windows facing life-saving appliances, embarkation and assembly areas, external stairs and open decks used for escape routes, and windows situated below life-raft and escape slide embarkation areas shall have the fire integrity as required in the tables of Regulation 4. Where automatic dedicated sprinkler heads are provided for windows, 'A-0' windows may be accepted as equivalent

In new class B, C and D ships constructed on or after 1 January 2003, the automatic dedicated sprinkler heads must either be:

.1 dedicated heads located above the windows and installed in addition to the conventional ceiling sprinklers; or

.2 conventional ceiling sprinkler heads arranged such that the window is protected by an average application rate of at least 5 litres/m^2 per minute and the additional window area is included in the calculation of the area of coverage.

Windows located in the ship's side below the lifeboat embarkation areas shall have the fire integrity at least equal to 'A-0' class.

NEW CLASS B, C AND D SHIPS CARRYING NOT MORE THAN 36 PASSENGERS AND EXISTING CLASS B SHIPS:

.4 Notwithstanding the requirements of the tables in Regulation II-2/B/5, special attention shall be given to the fire integrity of windows facing open or enclosed lifeboat and life-raft embarkation areas and to the fire integrity of windows situated below such areas in such a position that their failure during a fire would impeded the launching of, or embarkation into, lifeboats or life-rafts.

11 **Restricted use of combustible material (R 34)**

NEW CLASS B, C AND D SHIPS:

.1 Except in cargo spaces, mail rooms, baggage rooms, or refrigerated compartments of service spaces, all linings, grounds, draughtstops, ceilings, and insulations shall be of non-combustible materials. Partial bulkheads or decks used to subdivide a space for utility or artistic treatment shall also be of non-combustible material.

.2 Vapour barriers and adhesives used in conjunction with insulation, as well as insulation of pipe fittings, for cold service systems need not be non-combustible, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have

qualities of resistance to the propagation of flame in accordance with the test procedure of IMO Resolution A.653(16).

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

Instead of .2 the following paragraph .2a shall apply:

.2a Vapour barriers and adhesives used in conjunction with insulation, as well as insulation of pipe fittings for cold service systems need not be non-combustible, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have low flame spread characteristics.

.3 The following surfaces shall have low flame-spread characteristics:

.1 exposed surfaces in corridors and stairway enclosures, and of bulkheads, wall and ceiling linings in all accommodation and service spaces and control stations;

.2 concealed or inaccessible spaces in accommodation, service spaces and control stations.

.4 The total volume of combustible facings, mouldings, decorations and veneers in any accommodation and service space shall not exceed a volume equivalent to 2,5 mm veneer on the combined area of the walls and ceilings. Furniture fixed to linings, bulkheads or decks need not be included in the calculation of the total volume of combustible materials.

In the case of ships fitted with an automatic sprinkler system complying with the provisions of Regulation II 2-A/8, the above volume may include some combustible material used for erection of 'C' class divisions.

.5 Veneers used on surfaces and linings covered by the requirements of paragraph .3 shall have a calorific value not exceeding 45 MJ/m^2 of the area for the thickness used.

.6 Furniture in stairway enclosures shall be limited to seating. It shall be fixed, limited to six seats on each deck in each stairway enclosure, be of restricted fire risk, and shall not restrict the passenger escape route. The Administration of the flag State may permit additional seating in the main reception area within a stairway enclosure if it is fixed, non-combustible and does not restrict the passenger escape route. Furniture shall not be permitted in passenger and crew corridors forming escape routes in cabin areas. In addition to the above, lockers of non-combustible material, providing storage for safety equipment required by Regulations, may be permitted. Drinking water dispensers and ice cube machines may be permitted in corridors provided they are fixed and do not restrict the width of the escape routes. This applies as well to decorative flower or plant arrangements, statues or other objects of art such as paintings and tapestries in corridors and stairways.

.7 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke and toxic products.

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

Instead of .7 the following paragraph .7a. shall apply:

.7a Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke and toxic products, this being determined in accordance with the IMO Fire Test Procedures Code.

.8 Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of approved material which will not readily ignite, in

accordance with the fire test procedures of IMO Resolution A.687(17) or give rise to toxic or explosive hazards at elevated temperatures.

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

Instead of paragraph .8 the following paragraph .8a shall apply:

.8a Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of an approved material which will not readily ignite or give rise to toxic or explosive hazards at elevated temperatures, this being determined in accordance with the IMO Fire Test Procedure Code.

12 **Details of construction (R 35)**

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

In accommodation and service spaces, control stations, corridors and stairways:

.1 air spaces enclosed behind ceilings, panelling or linings shall be suitably divided by close-fitting draught stops not more than 14 metres apart;

.2 in the vertical direction, such enclosed air spaces, including those behind linings of stairways, trunks, etc. shall be closed at each deck.

13 **Fixed fire detection and fire alarm systems and automatic sprinkler, fire detection and fire alarm system (R 14) (R 36)**

NEW CLASS B, C AND D SHIPS:

.1 In ships carrying not more than 36 passengers and in ships with a length of less than 24 metres there shall be installed throughout each separate zone, whether vertical or horizontal, in all accommodation and service spaces and in control stations, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc., either:

.1 a fixed fire detection and fire alarm system of an approved type and complying with the requirements of Regulation II-2/A/9 and so installed and arranged as to detect the presence of fire in such spaces, however in new class B, C and D ships constructed on or after 1 January 2003 providing smoke detection in corridors, stairways and escape routes within accommodation spaces, or,

.2 an automatic sprinkler, fire detection and fire alarm system of an approved type complying with the requirements of Regulation II-2/A/8 or with the IMO guidelines for an approved equivalent sprinkler system as given in IMO Resolution A.800(19) and so installed and arranged as to protect such spaces and, in addition, a fixed fire detection and fire alarm system of an approved type and complying with the requirements of Regulation II-2/A/9 and so installed and arranged as to provide smoke detection in corridors, stairways and escape routes within accommodation spaces.

.2 Ships carrying more than 36 passengers, except ships with a length of less than 24 metres, shall be equipped with:

An automatic sprinkler, fire detection and fire alarm system of an approved type complying with the requirements of Regulation II-2/A/8 or with the IMO guidelines for an approved equivalent sprinkler system as given in IMO Resolution A.800(19), in all service spaces, control stations and accommodation spaces, including corridors and stairways.

Alternatively control stations where water may cause damage to essential equipment may be fitted with an approved fixed fire-extinguishing system of another type.

A fixed fire detection and fire alarm system of an approved type, complying with the requirements of Regulation II-2/A/9 shall be installed, so installed and arranged as to provide smoke detection in service spaces, control stations and accommodation spaces, including corridors and stairways. Smoke detectors need not be fitted in private bathrooms and galleys.

Spaces having little or no fire risk such as voids, public toilets, carbon dioxide rooms and similar spaces need not be fitted with an automatic sprinkler system or fixed fire detection and alarm system.

.3 In periodically unattended machinery spaces a fixed fire detection and fire alarm system of an approved type, in accordance with the relevant provisions of Regulation II-2/A/9, shall be installed.

This fire detection system shall be so designed and the detectors so positioned as to detect rapidly the onset of fire in any part of those spaces and under any normal conditions of operation of the machinery and variations of ventilation as required by the possible range of ambient temperatures. Except in spaces of restricted height and where their use is specially appropriate, detection systems using only thermal detectors shall not be permitted. The detection system shall initiate audible and visual alarms distinct in both respects from the alarms of any other system not indicating fire, in sufficient places to ensure that the alarms are heard and observed on the navigating bridge and by a responsible engineer officer.

When the navigating bridge is unmanned the alarm shall sound in a place where a responsible member of the crew is on duty.

After installation the system shall be tested under varying conditions of engine operation and ventilation.

[[F2]CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2018

.4 A fixed fire detection and fire alarm system of an approved type, in accordance with the relevant provisions of Regulation II-2/A/9, shall be installed in machinery spaces where:

.4.1 the installation of automatic and remote control systems and equipment has been approved in lieu of continuous manning of the space; and

.4.2 the main propulsion and associated machinery including sources of main source of electrical power are provided with various degrees of automatic or remote control and are under continuous manned supervision from a control room.

.5 A fixed fire detection and fire alarm system of an approved type, in accordance with the relevant provisions of Regulation II-2/A/9, shall be installed in enclosed spaces containing incinerators.

.6 With regard to the fixed fire detection and fire alarm system required by Regulations II-2/B/13.4 and 13.5, the following shall apply:

The fire detection system shall be so designed and the detectors so positioned as to detect rapidly the onset of fire in any part of those spaces and under any normal conditions of operation of the machinery and variations of ventilation as required by the possible range of ambient temperatures. Except in spaces of restricted height and where their use is especially appropriate, detection systems using only thermal detectors shall not be permitted. The detection system shall initiate audible and visual alarms distinct in both respects from the alarms of any other system not indicating fire, in sufficient places to ensure that the alarms are heard and observed on the navigating bridge and by a responsible engineer officer.

When the navigating bridge is unmanned, the alarm shall sound in a place where a responsible member of the crew is on duty.

After installation, the system shall be tested under varying conditions of engine operation and ventilation.**]**

14 **Protection of special category spaces (R 37)**

.1 *Provisions applicable to special category spaces whether above or below the bulkhead deck*

NEW CLASS B, C AND D SHIPS AND EXISTING CLASS B SHIPS CARRYING MORE THAN 36 PASSENGERS:

.1 General

.1 The basic principle underlying the provisions of this Regulation is that as normal main vertical zoning may not be practicable in special category spaces, equivalent protection must be obtained in such spaces on the basis of a horizontal zone concept and by the provision of an efficient fixed fire-extinguishing system. Under this concept a horizontal zone for the purpose of this Regulation may include special category spaces on more than one deck provided that the total overall clear height for vehicles does not exceed 10 metres.

[F3.2 The requirements of Regulations II-2/A/12, II-2/B/7, II-2/B/9 and II-2/B/9a for maintaining the integrity of vertical zones shall be applied equally to decks and bulkheads forming the boundaries separating horizontal zones from each other and from the remainder of the ship.**]**

.2 Structural protection

.1 In new ships carrying more than 36 passengers the boundary bulkheads and decks of special category spaces shall be insulated to 'A-60' class standard. However, where an open deck space (as defined in Regulation II-2/B/4.2.2(5)), a sanitary or similar space (as defined in Regulation II-2/B/4.2.2(9)) or a tank, void or auxiliary machinery space having little or no fire risk (as defined in Regulation II-2/B/4.2.2(10)), is on one side of the division the standard may be reduced to 'A-0'.

Where fuel oil tanks are below a special category space, the integrity of the deck between such spaces may be reduced to 'A-0' standard.

[F3.2 In new ships built before 1 January 2018 carrying not more than 36 passengers and existing class B ships carrying more than 36 passengers, the boundary bulkheads of special category spaces shall be insulated as required for category (11) spaces in table 5.1 of Regulation II-2/B/5 and the horizontal boundaries as required for category (11) in table 5.2 of Regulation II-2/B/5. In ships built on or after 1 January 2018 carrying not more than 36 passengers, the boundary bulkheads of special category spaces shall be insulated as required for category (11) spaces in table 5.1a of Regulation II-2/B/5 and the horizontal boundaries as required for category (11) in table 5.2a of Regulation II-2/B/5.**]**

.3 Indicators shall be provided on the navigating bridge which shall indicate when any fire door leading to or from the special category spaces is closed.

Doors to special category spaces shall be of such a construction that they cannot be kept open permanently and shall be kept closed during the voyage.

.3 Fixed fire-extinguishing system

Each special category space shall be fitted with an approved fixed pressure water-spraying system for manual operation which shall protect all parts of any deck and vehicle platform in such space.

In new class B, C and D ships constructed on or after 1 January 2003, such water spray systems shall have:

.1 a pressure gauge on the valve manifold;

.2 clear marking on each manifold valve indicating the spaces served;

.3 instructions for maintenance and operation located in the valve room; and

.4 a sufficient number of drainage valves.

The Administration of the flag State may permit the use of any other fixed fire-extinguishing system that has been shown by full-scale test in conditions simulating a flowing petrol fire in a special category space to be not less effective in controlling fires likely to occur in such a space. Such fixed pressure water-spraying system or other equivalent fire-extinguishing system shall comply with the provisions of IMO Resolution A.123(V) and the IMO MSC/Circ.1272 ‘Guidelines when approving alternative water-based fire-fighting systems for use in special category spaces’ shall be taken into consideration.

.4 Patrols and detection

.1 An efficient patrol system shall be maintained in special category spaces. In any such space in which the patrol is not maintained by a continuous fire watch at all times during the voyage there shall be provided a fixed fire detection and fire alarm system of an approved type complying with the requirements of Regulation II-2/A/9. The fixed fire detection system shall be capable of rapidly detecting the onset of fire. The type and the spacing and location of detectors shall determined taking into account the effects of ventilation and other relevant factors.

In new class B, C and D ships constructed on or after 1 January 2003, after being installed the system shall be tested under normal ventilation conditions and shall give an overall response time to the satisfaction of the Administration of the flag State.

.2 Manually operated call points shall be provided as necessary throughout the special category spaces and one shall be placed close to each exit from such spaces.

In new class B, C and D ships constructed on or after 1 January 2003, manually operated call points shall be spaced so that no part of the space is more than 20 metres from a manually operated call point.

5 Portable fire-extinguishing equipment

NEW CLASS B, C AND D CONSTRUCTED BEFORE 1 JANUARY 2003 AND EXISTING CLASS B SHIPS:

.5a There shall be provided in each special category space:

.1 at least three water fog applicators;

.2 one portable foam applicator unit complying with the provisions of Regulation II-2/A/6.2, provided that at least two such units are available in the ship for use in such spaces; and

.3 at least one portable extinguisher located at each access to such spaces.

CLASS B, C, AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

.5b Portable extinguishers shall be provided at each deck level in each hold or compartment where vehicles are carried, spaced not more than 20 metres apart on both sides of the space. At least one portable fire extinguisher shall be located at each access to such space.

In addition the following fire extinguishing appliances shall be provided in special category spaces:

.1 at least three water-fog applicators; and

.2 one portable foam applicator unit complying with the provisions of the Fire Safety Systems Code, provided that at least two such units are available in the ship for use in such ro-ro space.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.6 Ventilation system

.1 There shall be provided an effective power ventilation system for the special category spaces sufficient to give at least 10 air changes per hour. The system for such spaces shall be entirely separated from other ventilation systems and shall be operating at all times when vehicles are in such spaces. The number of air changes shall be increased at least to 20 during loading and unloading of vehicles.

Ventilation ducts serving special category spaces capable of being effectively sealed shall be separated for each such space. The system shall be capable of being controlled from a position outside such spaces.

.2 The ventilation shall be such as to prevent air stratification and the formation of air pockets.

.3 Means shall be provided to indicate on the navigating bridge any loss or reduction of the required ventilating capacity.

.4 Arrangements shall be provided to permit a rapid shutdown and effective closure of the ventilation system in case of fire, taking into account the weather and sea conditions.

.5 Ventilation ducts, including dampers, shall be made of steel and their arrangement shall be to the satisfaction of the Administration of the flag State.

In new class B, C and D ships constructed on or after 1 January 2003, ventilation ducts that pass through horizontal zones or machinery spaces shall be ‘A-60’ class steel ducts constructed in accordance with Regulations II-2/B/9.2.3.1.1 and II-2/B/9.2.3.1.2.

.2 *Additional provisions applicable only to special category spaces above the bulkhead deck*

NEW CLASS B, C AND D SHIPS:

.1.1 Scuppers

In view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or decks consequent on the operation of the fixed pressure water-spraying system, scuppers shall be fitted so as to ensure that such water is rapidly discharged directly overboard.

NEW CLASS B, C AND D AND EXISTING CLASS B RO-RO PASSENGER SHIPS:

.1.2 Discharges

.1.2.1 Discharge valves for scuppers, fitted with positive means of closing operable from a position above the bulkhead deck in accordance with the requirements of the International Convention on Load Lines in force, shall be kept open while the ships are at sea.

.1.2.2 Any operation of the valves referred to in subparagraph .1.2.1 shall be recorded in the logbook.

NEW CLASS B, C AND D SHIPS:

.2 Precautions against ignition of flammable vapours

.1 On any deck or platform, if fitted, on which vehicles are carried and on which explosive vapours might be expected to accumulate, except platforms with openings of sufficient size permitting penetration of petrol gases downwards, equipment which may constitute a source of ignition of flammable vapours and, in particular, electrical equipment and wiring, shall be installed at least 450 mm above the deck or platform. Electrical equipment installed at more than 450 mm above the deck or platform shall be of a type so enclosed and protected as to prevent the escape of sparks. However, if the installation of electrical equipment and wiring at less than 450 mm above the deck or platform is necessary for the safe operation of the ship, such electrical equipment and wiring may be installed provided that it is of a certified safe type approved for use in an explosive petrol and air mixture.

.2 Electrical equipment and wiring, if installed in an exhaust ventilation duct, shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

.3 *Additional provisions applicable only to special category spaces below the bulkhead deck*

NEW CLASS B, C AND D SHIPS:

.1 Bilge pumping and drainage

In view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or tank top consequent on the operation of the fixed pressure water-spraying system, the Administration of the flag State may require pumping and drainage facilities to be provided additional to the requirements of Regulation II-1/C/3.

In new class B, C and D ships constructed on or after 1 January 2003 in such case, the drainage system shall be sized to remove not less than 125 % of the combined capacity of both the water spraying system pumps and the required number of fire hose nozzles. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of not more than 40 metres in each watertight compartment.

.2 Precautions against ignition of flammable vapours

.1 Electrical equipment and wiring, if fitted, shall be of a type suitable for use in explosive petrol and air mixtures. Other equipment which may constitute a source of ignition of flammable vapours shall not be permitted.

.2 Electrical equipment and wiring, if installed in an exhaust ventilation duct, shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any

exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

.4 *Permanent openings*

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

Permanent openings in the side plating, the ends or deckhead of special category spaces shall be so situated that a fire in the special category space does not endanger stowage areas and embarkation stations for survival craft and accommodation spaces, service spaces and control stations in superstructures and deckhouses above the special category spaces.

15 **Fire patrols, detection, alarms and public address systems (R 40)**

NEW CLASS B, C AND D SHIPS:

.1 Manually operated call points complying with the requirements of Regulation II-2/A/9 shall be installed.

.2 All ships shall at all times when at sea, or in port (except when out of service), be so manned or equipped as to ensure that any initial fire alarm is immediately received by a responsible member of the crew.

.3 A special alarm, operated from the navigating bridge or fire control station, shall be fitted to summon the crew. This alarm may be part of the ship's general alarm system but it shall be capable of being sounded independently of the alarm to the passenger spaces.

.4 A public address system or other effective means of communication shall be available throughout the accommodation and service spaces and control stations and open decks.

In new class B, C and D ships constructed on or after 1 January 2003, this public address system shall comply with the requirements of SOLAS Regulation III/6.5 as amended.

NEW CLASS B, C AND D AND EXISTING CLASS B SHIPS:

.5 For ships carrying more than 36 passengers an efficient patrol system shall be maintained so that an outbreak of fire may be promptly detected. Each member of the fire patrol shall be trained to be familiar with the arrangements of the ship as well as the location and operation of any equipment he or she may be called upon to use. Each member of the fire patrol shall be provided with a two-way portable radio telephone apparatus.

NEW CLASS B, C AND D SHIPS:

.6 Ships carrying more than 36 passengers shall have the detection alarms for the systems required by Regulation 13.2 centralised in a continuously manned central control station. In addition, controls for remote closing of the fire doors and shutting down the ventilation fans, shall be centralised in the same location. The ventilation fans shall be capable of reactivation by the crew at the continuously manned control station. The control panel in the central control station shall be capable of indicating open or closed positions of fire doors, closed or off status of the detectors, alarms and fans. The control panel shall be continuously powered and should have an automatic changeover to standby power supply in case of loss of normal power supply. The control panel shall be powered from the main source of electrical power and the emergency source of electrical power defined by Regulation II-1/D/3 unless other arrangements are permitted by the Regulations, as applicable.

.7 The control panel shall be designed on the fail-safe principle, e.g. an open detector circuit shall cause an alarm condition.

16 **Upgrading of existing class B ships carrying more than 36 passengers (R 41-1)**

.1 In addition to the requirements for existing class B ships in this Chapter II-2, existing class B ships carrying more than 36 passengers shall comply with the following requirements:

.1 All accommodation and service spaces, stairway enclosures and corridors shall be equipped with a smoke detection and alarm system of an approved type, and complying with the requirements of Regulation II-2/A/9. Such system need not be fitted in private bathrooms, and spaces having little or no fire risk such as voids and similar spaces. Detectors operated by heat instead of smoke shall be installed in galleys.

.2 Smoke detectors connected to the fire detection and alarm system shall also be fitted above ceilings in stairways and corridors in the areas where ceilings are of combustible construction.

.3.1 Hinged fire doors in stairway enclosures, 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.

.3.2 A panel shall be placed in a continuously manned central control station to indicate whether the fire doors in stairway enclosures, main vertical zone bulkheads and galley boundaries are closed.

.3.3 Exhaust ducts from galley ranges in which grease or fat is likely to accumulate and which pass through accommodation spaces or spaces containing combustible materials shall be constructed of ‘A’ class divisions. Each galley range exhaust duct shall be fitted with:

.1 a grease trap readily removable for cleaning unless an alternative grease removal process is fitted;

.2 a fire damper located in the lower end of the duct;

.3 arrangements operable from within the galley for shutting off the exhaust fans;

.4 fixed means for extinguishing a fire within the duct; and

.5 suitably located hatches for inspection and cleaning.

.3.4 Only public toilets, lifts, lockers of non-combustible materials providing storage for safety equipment and open information counters may be located within the stairway enclosure boundaries. Other existing spaces within the stairway enclosure:

.1 shall be emptied, permanently closed and disconnected from the electrical system; or

.2 shall be separated from the stairway enclosure by the provision of ‘A’ class divisions in accordance with Regulation II-2/B/5. Such spaces may have direct access to stairway enclosures by the provision of ‘A’ class doors in accordance with Regulation II-2/B/ 5, and subject to a sprinkler system being

provided in these spaces. However, cabins shall not directly open into the stairway enclosure.

.3.5 Spaces other than public spaces, corridors, public toilets, special category spaces, other stairways required by Regulation II-2/B/6.1.5, open deck spaces and spaces covered by paragraph .3.4.2 are not permitted to have direct access to stairway enclosures.

.3.6 Existing machinery spaces of category (10) described in Regulation II-2/B/4 and back offices for information counters which open directly into the stairway enclosure may be retained, provided that they are protected by smoke detectors and that back offices for information counters contain only furniture of restricted fire risk.

.3.7 In addition to the emergency lighting required by Regulations II-1/D/3 and III/5.3, 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 the routes of escape and readily identify the escape exits. 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. Additionally, all escape route signs and fire equipment location markings shall be of photoluminescent material or marked by lighting. The Administration of the flag State shall ensure that such lighting or photoluminescent equipment have been evaluated, tested and applied in accordance with the guidelines as given in IMO Resolution A.752(18) or in ISO Standard 15370-2001.

.3.8 A general emergency alarm system shall be provided. The alarm shall be audible throughout all the accommodation and normal crew working spaces and open decks, and its sound pressure level shall comply with the standards of the Code on Alarms and Indicators in IMO Resolution A.686(17) as amended.

.3.9 A public address system or other effective means of communication shall be available throughout the accommodation, public and service spaces, control stations and open decks.

.3.10 Furniture in stairway enclosures shall be limited to seating. It shall be fixed, limited to six seats on each deck in each stairway enclosure, be of restricted fire risk, and shall not restrict the passenger escape route. The Administration of the flag State may permit additional seating in the main reception area within a stairway enclosure, if it is fixed, non-combustible, and does not restrict the passenger escape route. Furniture shall not be permitted in passenger and crew corridors forming escape routes in cabin areas. In addition to the above, lockers of non-combustible material, providing storage for safety equipment required by Regulations, may be permitted.

.2 In addition:

.1 All stairways in accommodation and service spaces shall be of steel frame construction except where the Administration of the flag State sanctions the use of other equivalent material, and shall be within enclosures formed of ‘A’ class divisions, with positive means of closure at all openings, except that:

.1 a stairway connecting only two decks need not be enclosed, provided the integrity of the deck is maintained by proper bulkheads or doors in one between-deck space. When a stairway is closed in one between-deck space, the stairway enclosure shall be protected in accordance with the tables for decks in Regulation II-2/B/5;

.2 stairways may be fitted in the open in a public space, provided they lie wholly within such public space.

.2 Machinery spaces shall be fitted with a fixed fire-extinguishing system complying with the requirements of Regulation II-2/A/6.

.3 Ventilation ducts passing through divisions between main vertical zones shall be equipped with a fail-safe automatic closing fire damper which shall also be capable of being manually closed from each side of the division. In addition, fail-safe automatic closing fire dampers with manual operation from within the enclosure shall be fitted to all ventilation ducts serving both accommodation and service spaces and stairway enclosures where they pierce such enclosures. Ventilation ducts passing through a main fire zone division without serving spaces on both sides or passing through a stairway enclosure without serving that enclosure need not be fitted with dampers provided that the ducts are constructed and insulated to 'A-60' standard and have no openings within the stairway enclosure or in the trunk on the side which is not directly served.

.4 Special category spaces shall comply with the requirements of Regulation II-2/B/14.

.5 All fire doors in stairway enclosures, 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.

.6 The requirements of paragraph .1.3.7 of this Regulation shall also apply to the accommodations.

.3 Not later than 1 October 2005 or 15 years after the date of construction of the ship, whichever is the later:

.1 Accommodation and service spaces, stairway enclosures and corridors shall be fitted with an automatic sprinkler, fire detection and fire alarm system complying with the requirements of Regulation II-2/A/8 or with the guidelines for an approved equivalent sprinkler system as given in IMO Resolution A.800(19).

17 **Special requirements for ships carrying dangerous goods (R 41)**

NEW CLASS B, C AND D SHIPS CONSTRUCTED BEFORE 1 JANUARY 2003 AND EXISTING CLASS B SHIPS:

The requirements of SOLAS Regulation II-2/54, as in force on 17 March 1998, shall apply, as appropriate, to passenger ships carrying dangerous goods.

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

The requirements of Regulation 19 of Part G of the SOLAS Chapter II-2, as revised per 1 January 2003, shall apply, as appropriate, to passenger ships carrying dangerous goods.

18 **Special requirements for helicopter facilities**

CLASS B, C AND D SHIPS CONSTRUCTED ON OR AFTER 1 JANUARY 2003:

Ships equipped with helidecks shall comply with the requirements of Regulation 18 of Part G of the SOLAS Chapter II-2, as revised per 1 January 2003.**]**