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NAVIGATION AND VESSEL INSPECTION CIRCULAR 06-05

Subj: UNIFIED INTERPRETATIONS OF SOLAS CHAPTER II-2, THE FSS CODE, THE FTP CODE AND RELATED FIRE TEST PROCEDURES

Ref: (a) MSC/Circ. 1120, *Unified Interpretations of SOLAS Chapter II-2, the FSS Code, the FTP Code and Related Fire Test Procedures*
(b) SOLAS 2000 amendments

1. PURPOSE. The unified interpretations in reference (a) were approved by the International Maritime Organization's (IMO) Maritime Safety Committee (MSC) at its 78th session (MSC 78, 12-21 May 2004). The interpretations are included as enclosure (1) to this document and should be used as guidance when applying the provisions of SOLAS, the International Code for Fire Safety Systems (FSS Code) and the International Code for Application of Fire Test Procedures (FTP Code) to ships constructed on or after 1 July 2004. These interpretations apply to the 2000 SOLAS amendments (reference (b)). These interpretations are clarifications only and are not intended to amend SOLAS or the FSS Code or the FTP Code. These interpretations are not retroactive. Interpretations of earlier editions of SOLAS are contained in NVIC 10-99.

2. ACTION.

a. The Commanding Officer, Marine Safety Center and Officers in Charge, Marine Inspection should use the interpretations contained in MSC/Circ. 1120 when applying the relevant provisions of SOLAS, the FTP Code and the FSS Code in plan review and vessel inspection functions.

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b. Officers in Charge, Marine Inspection are encouraged to bring this NVIC to the attention of appropriate individuals in the marine industry within their zones.

c. This NVIC is available on the World Wide Web at www.uscg.mil/hq/g-m/nvic/. Within the Coast Guard, it will be distributed by electronic means only.

3. DIRECTIVES AFFECTED. None.

4. BACKGROUND.

a. The IMO's Maritime Safety Committee, at its 69th session approved MSC/Circ. 847, with a view to ensuring uniform application of the requirements of SOLAS chapter II-2 containing vague expressions that could be open to diverging interpretations. These interpretations applied to ships constructed on or after 14 May 1998. The interpretations contained in MSC/Circ. 847 were subsequently issued as NVIC 10-99.

b. On 5 December 2000, the IMO Maritime Safety Committee totally revised and reorganized SOLAS chapter II-2, and made the FSS Code mandatory through adoption of Resolution MSC. 92 (73). The FTP Code was previously made a mandatory document by the adoption of Resolution MSC.61(67), effective 1 July, 1998. The 2000 amendments to chapter II-2 apply to ships built on or after 1 July 2002. The interpretations in MSC/Circ. 847 are not applicable to the 2000 amendments, because of the changes made to chapter II-2.

c. The IMO Sub-Committee on Fire Protection, at its 48th session, developed a revised set of unified interpretations to the 2000 amendments to chapter II-2, the FTP Code, the FSS Code and related fire test procedures. These interpretations were adopted by the Maritime Safety Committee at its 78th session as MSC/Circ.1120 and became effective on 1 July 2004.

5. DISCLAIMER. While the guidance contained in this document may assist the industry, the public, the Coast Guard, and other federal and state regulators in applying statutory and regulatory requirements, this guidance is not a substitute for applicable legal requirements, nor is it in itself a rule. Thus, it is not intended to nor does it impose legally binding requirements on any party, including the Coast Guard, other federal agencies, the states, or the regulated community.

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MSC/Circ.1120
2 June 2004

UNIFIED INTERPRETATIONS OF SOLAS CHAPTER II-2, THE FSS CODE, THE FTP CODE AND RELATED FIRE TEST PROCEDURES

1 The Maritime Safety Committee, at its seventy-eighth session (12 to 21 May 2004), with a view to providing more specific guidance for vague expressions such as "to the discretion of the Administration", which are open to different interpretations contained in IMO instruments, approved the unified interpretations of SOLAS chapter II-2, the FSS Code, the FTP Code and related fire test procedures prepared by the Sub-Committee on Fire Protection, as set out in the annex.

2 Member Governments are invited to use the annexed unified interpretations as guidance when applying relevant provisions of SOLAS chapter II-2, the FSS Code, the FTP Code and related fire test procedures to fire protection construction, installation, arrangements and equipment to be installed on board ships on or after 1 July 2004 and to bring the unified interpretations to the attention of all parties concerned.

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ANNEX

UNIFIED INTERPRETATIONS OF SOLAS CHAPTER II-2, THE FSS CODE, THE FTP CODE AND RELATED FIRE TEST PROCEDURES

INTERPRETATIONS OF VAGUE EXPRESSIONS AND OTHER VAGUE WORDING WITH REFERENCES TO SOLAS CHAPTER II-2, AS AMENDED BY RESOLUTION MSC.99(73)

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
A	1.3.2	**Examples of repairs, alterations and modifications** 1 Example of substantial alteration of the dimensions of a ship: *Lengthening by adding a new midbody; the new midbody should comply with chapter II-2 of SOLAS 1974, as amended.* 2 Example of substantial alteration of the passenger accommodation spaces: *A vehicle deck converted to passenger accommodation spaces; new accommodation spaces should comply with chapter II-2 of SOLAS 1974, as amended.* 3 Example of substantial increase of a ship's service life: *Renewal of passenger accommodation spaces on one entire deck; renewed accommodation spaces should comply with chapter II-2 of SOLAS 1974, as amended. However, in this case, means of escapes in the areas not subject to renewal are not required to be reviewed in the light of new requirements.*
A	3.1	**Devices in pantries or isolated pantries containing no cooking appliances** Pantries or isolated pantries containing no cooking appliances may contain: .1 coffee automats, toasters, dish washers, microwave ovens, water boilers, induction heaters and similar appliances each of them with a maximum power of 5 kW; and .2 electrically heated cooking plates and hot plates for keeping food warm each of them with a maximum power of 2 kW and a surface temperature not above 150°C. A dining room containing such appliances should not be regarded as a pantry. This interpretation also covers regulations 9.2.2.3.2.2(9), 9.2.2.4.2.2(3), 9.2.3.3.2.2(3) and 9.2.4.2.2.2(3).
A	3.2.1 3.2.2	**Application of "light-weight constructions"** "Light-weight constructions" (honeycomb type, etc.) of steel or equivalent material may be used as non load-bearing internal "A" class division in accommodation and service spaces provided they have successfully passed the relevant standard fire test according to the FTP Code. These "light-weight constructions" should not be used as an integral part of main fire zone bulkheads and stairway enclosures on passenger ships.
A	3.9.9	**Explanations to communication systems** The communication systems here mean only internal communication systems, which are required by the regulations.

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
A	3.10	**Adhesives in "C" class construction** Adhesives used in the construction of the "C" class divisions are not required to be non-combustible; however, they are to have low flame-spread characteristics.
A	3.18	**Explanation for control stations** 1 Main navigational equipment includes, in particular, the steering stand and the compass, radar and position-finding equipment. 2 Steering gear rooms containing an emergency steering position are not considered to be control stations. 3 Where in the regulations of chapter II-2 relevant to fixed fire-extinguishing systems there are no specific requirements for the centralization within a control station of major components of a system, such major components may be placed in spaces which are not considered to be a control station. 4 Spaces containing, for instance, the following battery sources should be regarded as control stations regardless of the battery capacity: .1 emergency batteries in separate battery room for power supply from black-out till start of the emergency generator; .2 emergency batteries in separate battery room as reserve source of energy to radio installation; .3 batteries for start of the emergency generator; and .4 in general, all emergency batteries required in pursuance of regulation II-1/42 or II-1/43.
A	3.45	**Devices in main pantries, pantries containing cooking appliances and galleys** 1 Main pantries and pantries containing cooking appliances may contain: .1 coffee automats, toasters, dish washers, microwave ovens, water boilers, induction heaters and similar appliances each of them with a power of more than 5 kW; and .2 electrically heated cooking plates and hot plates for keeping food warm each of them with a maximum power of 5 kW. This interpretation also covers regulations 9.2.2.3.2.2(13) and 9.2.2.4.2.2(9). 2 Spaces containing any electrically heated cooking plate or hot plate for keeping food warm with a power of more than 5 kW should be regarded as galleys.
B	4.2.1.4	**Use of fuel oil having a flashpoint of 43°C or less and crude oil or slop for tanker boilers** 1 Machineries and piping systems for the usage of fuel oil having a flashpoint of 43°C or less should comply with the following: .1 provisions for the measurement of oil temperature should be provided on the suction pipe of oil fuel pump; .2 stop valves and/or cocks should be provided to the inlet side and outlet side of the oil fuel strainers; and .3 pipe joints of welded construction or of circular cone type or spherical type union joint should be applied as much as possible.

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
		2 Reference is made to IACS requirement M 24 – "Requirements concerning use of crude oil or slop as fuel for tanker boilers".
B	4.2.2.3.4	**Controls for remote operation of the valve for emergency generator fuel tank** The wording "separate location" does not mean separate spaces.
B	4.2.2.4 4.2.3.1	**Position of air pipe outlets** Air pipes from oil fuel tanks or heated lubricating oil tanks should be led to a safe position on the open deck. They should not terminate in any place where a risk of ignition is present. Air pipes from unheated lubricating oil (including hydraulic oil) tanks may terminate in the machinery space, provided that the open ends are so situated that issuing oil cannot come into contact with electrical equipment or heated surfaces.
B	4.2.4	**Arrangements for other flammable oils** The second sentence of regulation 4.2.4 is not applicable to hydraulic valves and cylinders located on weather decks, in tanks, cofferdams, or void spaces.
B	4.4.1	**Electric Radiators** Reference is made to IEC Publication 60092 - Electrical installations in ships.
B	4.4.2	**Waste receptacles** This regulation is not intended to preclude the use of containers constructed of combustible materials in galleys, pantries, bars, garbage handling or storage spaces and incinerator rooms provided they are intended purely for the carriage of wet waste, glass bottles and metal cans and are suitably marked.
B	4.4.3	**Surface protection of insulation** The fire insulation in such spaces can be covered by metal sheets (not perforated) or by vapour barrier glass cloth accurately sealed at the joint.
B	4.5.1	**Construction of "cofferdams" and prohibition of containment of cargo, wastes and goods** The expression "cofferdam" means, for the purpose of this regulation, an isolating space between two adjacent steel bulkhead or decks. The minimum distance between the two bulkheads or decks should be sufficient for safe access and inspection. In order to meet the single failure principle, in the particular case when a corner-to-corner situation occurs, this principle may be met by welding a diagonal plate across the corner (see figure of regulation 4.5.1 in the appendix). No cargo, wastes or other goods should be contained in cofferdams.
B	4.5.1.1	**Separation of cargo oil tanks** Pump-rooms intended solely for ballast transfer need not comply with the requirements of regulation 4.5.10. The requirements of regulation 4.5.10 are only applicable to the pump-rooms where pumps for cargo, such as cargo pumps, stripping pumps, pumps for slop tanks, pumps for COW or similar pumps are provided.

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
B	4.5.2.2	**Gastightness test for navigation bridge external doors and windows** The navigation bridge external doors and windows which are located within the limits of regulation 4.5.2.1 should be tested for gastightness. If a water hose test is applied, the following may be taken as a guide: - nozzle diameter: minimum 12 mm; - water pressure just before the nozzle: not less than 0.2 N/mm^2; and - distance between the nozzle and the doors or windows: maximum 1.5 m.
B	4.5.3.4.1.3	**Area classification and selection of electrical equipment** 1 Areas on open deck, or semi-enclosed spaces on open deck, within a vertical cylinder of unlimited height and 6m radius centred upon the center of the outlet, and within a hemisphere of 6m radius below the outlet which permit the flow of large volumes of vapour, air or inert gas mixtures during loading/discharging/ballasting are defined as Zone 1. Permitted electrical equipment: - Certified safe type equipment for Zone 1. 2 Areas within 4 m beyond the zone specified in 1 above are defined as Zone 2. Permitted electrical equipment: - Certified safe type equipment for Zone 1; - Equipment of a type, which ensures the absence of sparks, "hot spots" during its normal operation; - Equipment having an enclosure filled with a liquid dielectric, the application, or encapsulated; - Pressurized equipment; and - Equipment specifically designed for Zone 2 (for example type "n" protection in accordance with IEC 60079-15). Note: Zones 1 and 2 are those defined in IEC Publication IEC 60092 Electrical installations in ships - Part 502: Tankers - Special features
B	4.5.3.4.1.4	**Reference to IEC 60092-502** Electrical equipment fitted in compliance with IEC Publication 60092- Electrical installations in ships - Part 502: Tankers - Special features is not considered a source of ignition or ignition hazard.
B	4.5.5.3.3	**Meaning of "closed ullage system"** "Closed ullage system" means a system which allows cargo measurement without breaking the integrity of the tank.
B B	4.5.6.1	**Location of outlets and reference to MSC/Circ.677 and MSC/Circ.731** 1 The outlets mentioned in regulation 4.5.6.1 should be located in compliance with regulation 4.5.3.4.1.3 as far as the horizontal distance is concerned. 2 Refer to MSC/Circ.677, as amended by MSC/Circ.1009 - Revised standards for the design, testing and locating of devices to prevent the passage of flame into cargo tanks in oil tankers, and to MSC/Circ.731 - Revised factors to be taken into consideration when designing cargo tank venting and gas-freeing arrangements.

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
B	4.5.10.1.2	**Emergency lighting** Where the lighting in cargo pump-rooms can be commonly used as the emergency lighting, this lighting should be interlocked with the ventilation systems. However, this interlock should not prevent operation of the emergency lighting in case of the loss of the main source of electrical power.
B	4.5.10.1.3	**Monitoring the concentration of hydrocarbon gases in cargo pump-rooms on oil tankers** 1 Sequential sampling is acceptable as long as it is dedicated for the pump room only, including exhaust ducts, and the sampling time is reasonably short. 2 Detection positions are the zones where air circulation is reduced (e.g. recessed corners).
B	4.5.10.1.4	**Bilge level monitoring devices** Bilge high-level alarms are acceptable as an alternative means for the level monitoring devices.
B	5.2.2.4	**Location of ventilation controls in category A machinery spaces** In machinery spaces of category A, controls to close off ventilation ducts and pipes should be installed with due regard to the hot gases produced by a fire in the space concerned.
B	5.3 6.2	**Materials used on passenger ships for bulkheads of accommodation spaces as defined in regulation 3.1** With respect to materials and components used for bulkheads in accommodation spaces, as defined in regulation 3.1, see tables for regulations 5.3 and 6.2 in the appendix.
B	5.3 6.2	**Fire protection materials for cargo ships** With respect to materials and components used for bulkheads in accommodation spaces, as defined in regulation 3.1, see tables for regulations 5.3 and 6.2 in the appendix.
B	5.3.1.1	**Meaning of "cold service systems"** Cold service is understood to mean refrigeration systems and chilled water piping for air-conditioning systems.
B	5.3.2.2	**Calorific value** Reference is made to the recommendations published by the International Organization for Standardization, in particular, Publication ISO 1716:2002 on ***Determination of the heat of combustion***.
B	5.3.2.4	**Application to materials used on surfaces of bulkheads, ceilings and linings** Surfaces referred to in regulation 5.3.2.4 are those of bulkheads, decks, floor coverings, wall linings and ceilings as appropriate. The requirements described within these regulations are not meant to apply to plastic pipes, electric cables, and furniture.

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
B	6.2	**Application to materials used for bulkheads and on surfaces of bulkheads, ceilings and linings** Surfaces referred to in regulation 6.2 are those of bulkheads, decks, floor coverings, wall linings and ceilings as appropriate. The requirements described within these regulations are not meant to apply to plastic pipes, electric cables, and furniture.
C	7.8.3	**Degree of protection and audibility of two-way portable telephone apparatus used in special cargo spaces** 1 On ships provided with special category spaces, ro-ro spaces or cargo spaces for the carriage of dangerous goods, the two-way portable telephone apparatus should be of certified safe type for use in zone 1 areas as defined in IEC Publication 60079 - Electrical Apparatus for Explosive Gas Atmospheres. 2 Two-way portable telephone apparatus should be audible from most parts of the ship. As a minimum, they should be audible where the fire patrol makes their rounds such as key box locations and the routes specified on fire patrol checklist. If necessary, extra antennas should be fitted to obtain effective communication.
C	8.2	**Equally effective local ventilation closing arrangements for control stations** Equally effective local closing arrangements means that in case of ventilators these should be fitted with fire dampers or smoke dampers which could be closed easily within the control station in order to maintain the absence of smoke in the event of fire.
C	8.3.3	**Location of ventilation controls in category A machinery spaces** In machinery spaces of category A, controls to close off ventilation ducts and pipes should be installed with due regard to the hot gases produced by a fire in the space concerned.
C	8.4	**Construction and location of draught stops** 1 Any of the following methods of construction may be used to construct draught stops: .1 the extension of the "B" Class bulkhead, ceiling or lining; .2 the extension of the "C" Class bulkhead, ceiling or lining; .3 1 mm thick minimum steel sheet, stiffened where necessary, intermittently welded to the ship's structure and the top profile of the bulkhead, or fastened mechanically to the ceilings or linings; .4 non-combustible board type material fastened mechanically to the ship's structure, bulkheads, ceilings or linings; or .5 non-combustible mineral wool insulation, not less than 20 mm in thickness, faced on each side with expanded metal mesh, the mesh on one side being attached to the ship's structure, or expanded metal mesh may be fitted on one side and non-combustible cloth (glass-cloth) on the other side of mineral wool insulation. Other equivalent arrangements may be accepted. 2 Draught stops are not required in public spaces with open ceilings (perforated ceilings) with openings of 40% or more.

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
C	8.5	**Arrangement of exhaust fans for smoke extraction systems** The application of this regulation does not imply the arrangement of additional exhaust fans other than those normally dedicated to the space considered, if these latter fans are of sufficient size to meet the required capacity.
C	9.2.2.1	**Main vertical zones and horizontal zones** If a stairway serves two main vertical zones, the maximum length of one main vertical zone should be measured from the far side of the main vertical zone stairway enclosure. In this case, all boundaries of the stairway enclosure be insulated as main vertical zone bulkheads and access doors leading into the stairway should be provided from the zones (see figures 1 to 4 for regulation 9.2.2.1 in the appendix). However, the stairway should not be included in calculating the size of the main vertical zone if it is treated as its own main vertical zone.
C	9.2.2.2.2.1	**Construction of extended bulkhead behind continuous ceilings or linings** The extension of the bulkhead should be made of non-combustible material and the construction of the extension should correspond to the fire class of extended bulkhead. If the extended bulkhead is of B-0, then the extension may be made of thin steel plates of 1 mm thickness and tightened (e.g. with mineral wool). Alternatively, B-0 class extensions may be constructed of a suitably supported mineral wool (density at least 100 kg/m^3, thickness at least 50 mm).
C	9.2.2.2.3	**Bulkheads within a main vertical zone** Refer to MSC/Circ.917
C	9.2.2.3.2.2 (7)	**Electrical distribution boards** Distribution boards may be located behind panels/linings within accommodation spaces including stairway enclosures, without the need to categorize the space, provided no provision is made for storage. If distribution boards are located in an identifiable space having a deck area of less than 4 m^2, this space may be categorized in (7), according to regulation 9.2.2.3.2.2, or (5), according to regulations 9.2.2.4.2.2, 9.2.3.3.2.2 and 9.2.4.2.2.2
C	9.2.2.3.2.2 (7)	**Devices in diet kitchens** Diet kitchens (containing no open flame) should be in compliance with the interpretation for pantries as stated under regulation 3.1.
C	9.2.2.4.2.2 (5)	**Electrical distribution boards** Distribution boards may be located behind panels/linings within accommodation spaces including stairway enclosures, without the need to categorize the space, provided no provision is made for storage. If distribution boards are located in an identifiable space having a deck area of less than 4 m^2, this space may be categorized in (7), according to regulation 9.2.2.3.2.2, or (5), according to regulations 9.2.2.4.2.2, 9.2.3.3.2.2 and 9.2.4.2.2.2.

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
C	9.2.2.4.5	**Construction and arrangements of saunas** The space categories mentioned in regulation 9.2.2.3.4.1 should be replaced, when applying this regulation, by (5), (7) and (10).
C	table 9.3 table 9.4	**Interpretation of machinery spaces having little or no fire risk** For the definition of machinery spaces having little or no fire risk in footnote "f" see regulation 9.2.2.3.2.2 (10).
C	9.2.3.1.1.3	**Increased area of public spaces** The area of public spaces may be permitted to increase up to 75 m^2.
C	9.2.3.2.4	**Increased area of public spaces** The area of public spaces may be permitted to increase up to 75 m^2.
C	table 9.5 table 9.6	**Interpretation of machinery spaces having little or no fire risk** For the definition of machinery spaces having little or no fire risk in footnote "i" see regulation 9.2.2.3.2.2 (10).
C	9.2.3.3.2.2 (5)	**Electrical distribution boards** Distribution boards may be located behind panels/linings within accommodation spaces including stairway enclosures, without the need to categorize the space, provided no provision is made for storage. If distribution boards are located in an identifiable space having a deck area of less than 4 m^2, this space may be categorized in (7), according to regulation 9.2.2.3.2.2, or (5), according to regulations 9.2.2.4.2.2, 9.2.3.3.2.2 and 9.2.4.2.2.2.
C	9.2.3.3.5	**Construction and arrangements of saunas** The space categories mentioned in regulation 9.2.2.3.4.1 should be replaced, when applying this regulation, to categories (5), (7) and (10).
C	9.2.3.4.1	**Construction of protected stairways** The required protection of stairways penetrating more than a single deck can be achieved by: .1 a stairway enclosure allowing access from one stair to a superimposed stair within such enclosure, the entrances to which should consist self-closing "A" class fire doors at each deck level (see figure 1 of regulation 9.2.3.4.1 in the appendix); or .2 a stairway enclosure enclosing the stairs only, in combination with self-closing "A" class fire doors at each deck-level and at each end of a stair. No requirements apply to the stairs except that they should be of steel frame structure or be made of equivalent material (see figure 2.1 of regulation 9.2.3.4.1 in the appendix); or .3 stairways that penetrate only one single deck should be protected, at a minimum, at one level by at least "B-0" class division and self-closing doors (see figure 2.2 of regulation 9.2.3.4.1 in the appendix).
C	9.2.3.4.1	**Construction of dumb-waiters**

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
		Dumb-waiters are to be regarded as lifts.
C	9.2.4.2.2.2 (5)	**Electrical distribution boards** Distribution boards may be located behind panels/linings within accommodation spaces including stairway enclosures, without the need to categorize the space, provided no provision is made for storage. If distribution boards are located in an identifiable space having a deck area of less than 4 m^2, this space may be categorized in (7), according to regulation 9.2.2.3.2.2, or (5), according to regulations 9.2.2.4.2.2, 9.2.3.3.2.2 and 9.2.4.2.2.2
C	9.2.4.2.7	**Construction and arrangements of saunas** The space categories mentioned in regulation 9.2.2.3.4.1 should be replaced, when applying this regulation, by (5), (7) and (10).
C	table 9.7 table 9.8	**Interpretation of machinery spaces having little or no fire risk** For the definition of machinery spaces having little or no fire risk in footnote "e" see regulation 9.2.2.3.2.2 (10).
C	9.3.1	**Reference to resolution A.753(18)** Reference is made to resolution A.753(18) – Guidelines for the application of plastic pipes on ships.
C	9.3.4	**Prevention of heat transmission by insulation and structural details for drainage** 1 Details of measures to be adopted for avoiding heat transmission at intersections and terminal points of insulation of decks or bulkheads are given in figures 1 and 2 of regulation 9.3.4 in the appendix. Alternative details may be accepted provided that the effectiveness of such design is verified by an appropriate test in the same manner as those specified in the FTP Code. 2 In the case where the lower part of insulation has to be cut for drainage, the construction should be in accordance with the structural details as given in figure 3 for regulation 9.3.4 in the appendix.
C	9.4.1.1	**Reference to MSC/Circ.541** Reference is made to MSC/Circ.541 - Guidance notes on the integrity of flooding boundaries above the bulkhead deck of passenger ships for proper application of regulations II-1/8 and 20, paragraph 1, of the 1974 SOLAS Convention, as amended.
C	9.4.1.1.2	**Doors in divisions of a higher standard and fire testing of watertight doors** 1 Where required divisions are replaced by divisions of a higher standard, the door need only conform to the required division. 2 Watertight doors constructed in accordance with SOLAS regulation II-1/15 and fitted below the bulkhead deck that are required to be watertight need not be tested to the FTP Code provided that the doors meet the requirements for water tightness in SOLAS regulation II-1/18. Doors fitted above the bulkhead deck, which are required to meet both the fire protection and watertight requirements (see MSC/Circ.541), should be tested to the FTP Code.
C	9.4.1.1.4.6	**Lift door indicators located in continuously manned central control station**

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
		Lift door indication signals should meet the following: .1 the signal showing that "A" class lift doors are in the closed position should be activated only when the order to close the main fire doors has been given by the continuously manned central control station; and .2 when there are several lifts giving access to the same stairway, the lift door indicators located in the continuously manned central control station should be capable of indicating that all the lift doors giving access to the same landing are properly closed. This indication should be shown on the panel.
C	9.4.1.1.8	**Type of means of manual closing of fire dampers** Manual closing may be achieved by mechanical means of release or by remote operation of the fire damper by means of a fail-safe electrical switch or pneumatic release (spring-loaded, etc.) on both sides of the division.
C	9.4.1.3	**Reference is made to the following ISO standards:** ISO 614:1989 Shipbuilding and marine structures - Toughened safety glass panes for rectangular windows and side scuttles - Punch method of non-destructive strength testing ISO 1095:1989 Shipbuilding and marine structures - Toughened safety glass panes for side scuttles ISO 1751:1993 Shipbuilding and marine structures - Ship's side scuttles ISO 3254:1989 Shipbuilding and marine structures - Toughened safety glass panes for rectangular windows ISO 3903:1993 Shipbuilding and marine structures - Ships' ordinary rectangular windows ISO 3904:1990 Shipbuilding and marine structures - Clear view screens
C	9.4.2.1	**Doors in divisions of a higher standard** Where required divisions are replaced by divisions of a higher standard, the door need only conform to the required division. **Doors in fire-resisting divisions of cargo ships** Steel or equivalent material is acceptable for the construction of doors and door frames in "A" class divisions.
C	9.7	**Definition of "free sectional area"** The term "free sectional area" means, even in the case of a pre-insulated duct, the area calculated on the basis of the inner diameter of the duct.
C	9.7.3.1.2	**Type of means of closing** Manual closing may be achieved by mechanical means of release or by remote operation of the fire damper by means of a fail-safe electrical switch or pneumatic release (spring-loaded, etc.) on both sides of the division.

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
C	9.7.4.3	**Ventilation system penetrating decks** A duct, irrespective of its cross section, serving more than one tweendeck should be fitted, near the penetration of each deck served, with a fire or smoke damper. Such dampers should close automatically by means of a fusible link or other suitable device, and manually from the deck in which the passage of smoke, due to a fire in the deck immediately below which is served by the same duct, will be avoided. Where, within a main vertical zone, a fan serves more than one tweendeck through separate ducts, each of these dedicated to a single tweendeck, each duct should be provided with a manually operated smoke damper fitted close to the fan.
C	9.7.5.1.2	**Meaning of "lower end of the duct" and "upper end of the duct" in galley range ducts** 1 "Lower end of the duct" means a position at the junction between the duct and the galley range hood. (See also interpretation of regulation 41-2.4.3.2.) 2 "Upper end of the duct" means a position close to the outlet of the duct.
C	9.7.5.1.5	**Location of hatches for inspection and cleaning in galley range ducts** 1 One hatch should be provided close to the exhaust fan. 2 In the galley exhaust duct, the grease will accumulate more in the lower end. Therefore, hatches should be fitted also in this part of the duct.
C	10.2.1.1	**Prevention of freezing in pipes** Special attention should be given to the design of the continuously pressurized pipelines for prevention of freezing in pipes where low temperatures may exist.
C	10.2.1.5.1	**Location of hydrant in machinery spaces** At least one hydrant with hose, nozzle and coupling wrench should be provided in machinery spaces of category A.
C	10.2.2.3.2.2	**Electrical cables for the emergency fire pump** The electrical cables to the emergency fire pump are not to pass through the machinery spaces containing the main fire pumps and their source(s) of power and prime mover(s). They are to be of a fire resistant type, in accordance with IACS unified Requirement E 15 Electrical Services Required to be Operable Under Fire Conditions and Fire Resistant Cables, paragraph 1, where they pass through other high fire risk areas.
C	10.2.2.3.3	**Connection of a pump to fire main** This paragraph does not force designers to choose pumps with capacity and pressure characteristics other than that being optimal for the service intended, just to make their connection to the fire main possible, provided the required number and capacity of fire pumps are already fitted.

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
C	10.4.3	**Storage rooms for fire-extinguishing medium** The following requirements are applicable only for the storage rooms for fire-extinguishing media of fixed gas fire-extinguishing systems: .1 the storage room should be used for no other purposes (last part of the first sentence*); .2 if the storage space is located below deck, it should be located no more than one deck below the open deck and should be directly accessible by a stairway or ladder from the open deck (3rd sentence); .3 spaces which are located below deck or spaces where access from the open deck is not provided, should be fitted with a mechanical ventilation system designed to take exhaust air from the bottom of the space and should be sized to provide at least 6 air changes per hour (4th sentence); and .4 access doors should open outwards, and bulkheads and decks including doors and other means of closing any opening therein, which form the boundaries between such rooms and adjacent enclosed spaces should be gas tight (5th sentence). * Refers to the sentences in regulation 10.4.3.
C	10.5	**Fire extinguishing arrangements in machinery spaces** The number of systems, appliance and extinguisher required by regulation 10.5 are summarized in the table for regulation 10.5 in the appendix.
C	10.5.2.2.2	**Relaxation of fire-extinguishing equipment for cargo ships** A relaxation for cargo ships should be accepted as follows: - The 45 *l* foam type extinguisher or its equivalent may be arranged outside of the space concerned.
C	10.5.6.3.1	**Definition of areas to be protected by local application systems (internal combustion machinery)** Hot surfaces such as exhaust pipes without insulation or with insulation likely to be removed frequently for maintenance and high-pressure fuel oil systems installed nearby the hot surfaces should be protected. The term "insulation likely to be removed frequently" means insulation fitted in accordance with the requirements of regulation 4.2.2.6.1, but which might not be secured firmly because it may be removed frequently for periodic maintenance, such as pipes between cylinders and exhaust manifold. For typical diesel engines, the area on top of the engine, fuel oil injection pumps and turbo chargers should be protected. Where the fuel oil injection pumps are located in sheltered position such as under the steel platform, the pump need not be protected by the system.

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
C	10.5.6.3.2	**Definition of areas to be protected by local application systems (boiler fronts)** The area around the burners without insulation or with insulation likely to be removed frequently for maintenance should be protected. The term "insulation likely to be removed frequently" means insulation fitted in accordance with the requirements of regulation 4.2.2.6.1, but which might not be secured firmly because it may be removed frequently for periodic maintenance. Oil-fired inert gas generators should be also protected in the same manner.
C	10.5.6.3.3	**Definition of areas to be protected by local application systems (incinerators)** The area around the burner(s) without insulation or with insulation likely to be removed frequently for maintenance should be protected. The term "insulation likely to be removed frequently" means insulation fitted in accordance with the requirements of regulation 4.2.2.6.1, but which might not be secured firmly because it may be removed frequently for periodic maintenance.
C	10.7.1.3	**Cargo spaces for which a fixed fire-extinguishing system is ineffective and reference to MSC/Circ.671** For cargoes for which a fixed gas fire-extinguishing system is ineffective and for which a fire-extinguishing system giving equivalent protection should be available, reference is made to MSC/Circ.671, annex, and table 2.
C	10.7.2	**Equivalent protection** Water supplies defined in regulation 19.3.1.2 are considered as an acceptable protection for cargoes listed in table 2 of MSC/Circ. 671. **Ships carrying dangerous goods on deck only** Any cargo space in a ship engaged in the carriage of dangerous goods on deck or in cargo spaces should be provided with a fixed gas fire-extinguishing system complying with the provisions of the FSS Code or with a fire-extinguishing system which, in the opinion of the Administration, gives equivalent protection for the cargoes carried.
C	11.3.1	**Insulation of aluminium decks and interpretation of "load-bearing divisions"** 1 If an aluminium deck is tested with insulation installed below the deck, then the result will apply to decks, which are bare on the top. Aluminium decks may not be provided with deck coverings on the top unless tested with the deck covering, to verify that the 200°C temperature of the aluminium is not exceeded. However, when needed, any approved primary deck covering (not specifically the one used during the standard fire test of the deck) may be used for meeting this requirement. 2 When spaces of categories (1) to (10) in regulation 9.2.2.3 or of categories (1) to (5) and (10) in regulation 9.2.2.4 are located on top of aluminium decks, the deck does not need to be insulated from the upper side, provided the deck is protected by an approved deck covering. 3 "Load-bearing division" is a deck or bulkhead including stiffeners, pillars, stanchions and other structural members which, if eliminated, would adversely affect the designated structural strength of the ship.

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
C	11.6.2.2	**Area classification and selection of electrical equipment** 1 Areas on open deck, or semi-enclosed spaces on open deck, within 3 m of cargo tank ventilation outlets which permit the flow of small volumes of vapor, air or inert gas mixtures caused by thermal variation are defined as Zone 1. Permitted electrical equipment: - Certified safe type equipment for Zone 1. 2 Areas within 2 m beyond the zone specified in 1 above are defined as Zone 2. Permitted electrical equipment: - Certified safe type equipment for Zone 1, - Equipment of a type, which ensures the absence of sparks, "hot spots" during its normal operation, - Equipment having an enclosure filled with a liquid dielectric, the application, or encapsulated, - Pressurised equipment, - Equipment specifically designed for Zone 2 (for example type "n" protection in accordance with IEC Publication 60079-15). Note: Zones 1 and 2 are those defined in IEC Publication IEC 60092 Electrical installations in ships - Part 502: Tankers - Special features.
C	11.6.2.2	**Electrical equipment in areas next to cargo tank ventilation outlets which permit flow of small volumes of vapour** Permitted electrical equipment: .1 Areas on open deck within 3 m of cargo tank ventilation outlets which permit the flow of small volumes of vapour caused by thermal variation: - certified safe type equipment. .2 Areas 2 m beyond the zone specified in .1 above: - certified safe type equipment; or - equipment of a type which ensures absence of sparks or arcs and absence of ignition capable surface during normal operation; or - equipment specifically designed for Zone 2 as defined in IEC Publication 60092 Electrical installations in ships - Part 502: Tankers - Special features.
D	13.3.2.3	**Direct access to stairway enclosures** Direct access to escape stairway enclosures is only intended for those areas of an accommodation space as defined in regulation 3.39 for public spaces. Portions of an accommodation space that serve a purpose different than that of a public space such as theatre backstage areas, should not have direct access to escape stairway enclosures.
D	13.3.2.4.1	**Means of escape** The stairway arrangement required by regulation 13.3.2.4.1 for below bulkhead deck compartments of one main vertical zone can be arranged by: - one enclosed stairway which provides a continuous fire shelter from the level of its origin to the embarkation deck in one watertight compartment; - each of the other compartments have an enclosed stairway which provides a continuous fire shelter from the level of its origin to the bulkhead deck; and

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
		- the continuous fire shelter is also provided on the bulkhead deck through a route protected as a category 2 space (horizontal stairway). See figure of regulation 13.3.2.4.1 in the appendix. In applying this interpretation, the content of regulation 13.3.2.1.1 should also be taken into account.
D	13.3.2.4.4	**Size of enclosed means of escape in atriums** Such enclosed means of escape should be sized taking into account the total number of persons at each level of the atrium considered.
D	13.3.3	**Locking arrangements and accessibility to embarkation decks** 1 The escape routes are routes for escape and also for access. Accordingly, the locking arrangement should be such that it does not obstruct these two objectives (escape and access). Doors along any designated escape routes which require keys to unlock them when moving in the direction of escape should not be permitted. 2 The embarkation deck should be accessible from the open decks to which escapes routes lead.
D	13.4.1.1.1	**Arrangement of means of escape (passenger ships)** Ladders having strings of flexible steel wire ropes are not acceptable in such escape routes.
D	13.4.2.1.1	**Arrangement of means of escape (cargo ships)** Ladders having strings of flexible steel wire ropes are not acceptable in such escape routes.
D	13.6	**Arrangement of escape routes in ro-ro cargo spaces** The escape (and access) routes should be so arranged to ensure safe escape also during loading and unloading such as indication of escape lane on deck with minimum clearance of 600 mm in width.
D	13.7.4	**Evacuation Analysis** Reference is made to MSC/Circ.1033 - Interim Guidelines for evacuation analysis for new and existing passenger ships.
	15.2.4	**Fire control plans** Reference is made to Assembly resolution A.952(23) – Graphical symbols for shipboard fire control plans and ISO 17631:2002.
G	19.2.2.2	**Meaning of "purpose-built container spaces"** A purpose-built container space is a cargo space fitted with cell guides for stowage securing of containers.
G	19.2.2.3	**Extended meaning of "ro-ro spaces"** Ro-ro spaces include special category spaces (see regulation 20).

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
G	19.3.1	**Water supplies for open-top container spaces in ships** 1 The water spray system required in paragraphs 9.2, 9.3 and 9.4 of MSC/Circ.608/Rev.1 - Interim guidelines for open-top container ships - will also satisfy the requirement for dangerous goods. 2 The amount of water required for fire-fighting purposes in the largest hold should allow simultaneous use of the water spray system plus four jets of water from hose nozzles.
G	19.3.1.2	**Hydrants for dangerous goods** The number and position of hydrants should be such that at least two of the required four jets of water, when supplied by single lengths of hose, may reach any part of the cargo space when empty; and all four jets of water, each supplied by single lengths of hose may reach any part of ro-ro cargo spaces.
G	19.3.1.4	**Acceptance of high expansion foam systems in case of dangerous goods** A fixed high expansion foam system, complying with the FSS Code, chapter 6, section 2.2, is acceptable, except if cargoes dangerously react with water (see IMDG Code).
G	19.3.2	**Sources of Ignition** Reference is made to the recommendations of the International Electrotechnical Commission, in particular, IEC Publication 60092 Electrical installations in ships – Part 506: Special feature-Ships carrying specific dangerous goods and materials hazardous only in bulk.
G	19.3.4	**Ventilation requirements for individual cargoes and open-top container cargo holds** 1 General If adjacent spaces are not separated from cargo spaces by gastight bulkheads or decks, ventilation requirements should apply as for the cargo space itself, required under regulation 19.3.4.2 and its interpretations. 2 Requirements for individual cargoes: .1 Cargoes liable to give off vapours or gases which can form an explosive mixture with air (See the BC Code, Appendix B, e.g. IMO Class 4.3 materials): Two separate fans should be permanently fitted or being of a portable type adapted for being permanently fitted prior to loading and during voyage. The fans should be either explosion proof or arranged such that the escaping gas flow is separated from electrical cables and components. The total ventilation should be at least six air changes per hour, based upon the empty space. Ventilation should be such that any escaping gases cannot reach living spaces on or under deck. .2 Cargoes liable to spontaneous combustion (only applicable to seed cake (b) and (c)): Two separate fans should be permanently fitted or being of a portable type adapted for being permanently fitted prior to loading and during voyage. The fans should be either explosion proof or arranged such that the escaping gas flow is separated from electrical cables and components. The total ventilation should be at least six air changes per hour, based upon the empty space. Ventilation should be such that any escaping gases cannot reach living spaces on or under deck.

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
		3 For open-top containerships Power ventilation should be required only for the lower part of the cargo hold for which purpose ducting is required. The ventilation capacity should be at least two air changes per hour, based on the empty hold volume below weather deck.
G	19.3.4.2	**Degree of protection of exhaust fans and use of wire mesh guards** 1 Exhaust fans should be of non-sparking type in accordance with IACS Requirement F 29, as revised. 2 The purpose of "suitable wire mesh guards" is to prevent foreign objects from entering into the fan casing. The standard wire mesh guards should have a size of 13 mm x 13 mm.
G	19.3.5.4	**Arrangements of bilge drainage systems for cargo spaces** Electrical equipment in the space should comply with IEC Publication 60092.- Electrical installations in ships.
G	19.3.6.1	**Type and suitability of protective clothing** 1 When selecting the protective clothing the danger of the chemicals according to the class and liquid or gaseous state should be taken into account. 2 The required protective clothing is for emergency purposes. 3 For solid bulk cargoes the protective clothing should satisfy the equipment requirements specified in Appendix E of the BC Code for the individual substances. For packaged goods the protective clothing should satisfy the equipment requirements specified in emergency procedures (EmS) of the Supplement to IMDG Code for the individual substances.
G	19.4	**Certification of special dangerous goods** Certification for carriage of solid dangerous bulk cargoes covers only those cargoes listed in Appendix B of the BC Code except cargoes of MHB. Other solid dangerous bulk cargoes may only be permitted subject to acceptance by the Administrations involved.
G	20.2.2.1	**Horizontal fire zone concept** The "total overall clear height" is the sum of distances between deck and web frames of the decks forming one horizontal zone.
G	20.3.1.1	**Capacity of ventilation systems** Reference is made to MSC/Circ.729 - Design guidelines and operational recommendations for ventilation systems in ro-ro cargo spaces.
G	20.3.1.3	**Alarm in case of loss of ventilation capacity** The requirement to indicate any loss of ventilating capacity is considered complied with by an alarm on the bridge, initiated by fall-out of starter relay of fan motor.

SOLAS Chapter II-2		Interpretation or reference
Part	**Regulation**	**Application**
G	20.3.1.4.2	**Arrangement and construction of ventilation ducts on cargo ships** Ventilation ducts should not pass through machinery spaces of category A unless fire insulated to A-60 standard.
G	20.3.2.2	**Degree of protection of electrical equipment 450 mm above deck** For equipment above a height of 450 mm above deck the degree of protection of electrical equipment required by this regulation will be realized: .1 by an enclosure of at least IP 55 as defined in IEC Publication 600529 - Classification of Degree of Protection Provided by Enclosures; or .2 by apparatus for use in zone 2 areas as defined in Publication 60079 - Electrical Apparatus for Explosive Gas Atmospheres (Temperature class T3).
G	20.3.3	**Degree of protection of electrical equipment in exhaust ventilation ducts and of exhaust fans** 1 The electrical equipment referred to in these regulations should be of certified safe type and wiring, if fitted, and should be suitable for use in zone 1 areas as defined in IEC Publication 60079 - Electrical Apparatus for Explosive Gas Atmospheres (Gas group II A and temperature class T3). 2 Exhaust fans should be of non-sparking type in accordance with IACS Requirement F 29, as revised.
G	20.4.1	**Arrangements for disconnecting detector sections during loading and unloading** The smoke detector sections in vehicle, special category, and ro-ro spaces may be provided with an arrangement, (e.g. a timer) for disconnecting detector sections during loading and unloading of vehicles to avoid "false" alarms. The time of disconnection should be adapted to the time of loading/unloading. The central unit should indicate whether the detector sections are disconnected or not. However, manual call points should not be capable of being disconnected by the arrangements referred to above.
G	20.6.1.4.1.1	**Sizing of scuppers and drainage pumps** For the sizing of scuppers and drainage pumps the capacity of both the water spraying system pumps and the water discharge from the required number of fire hose nozzles specified in regulations 10.2.1.5.1 and 19.3.1, as applicable, should be taken into account.
G	20.6.2.1	**Portable fire extinguishers on weather decks used as ro-ro cargo space** The requirements set out in this regulation need not to be applied to weather decks used as ro-ro cargo spaces.

INTERPRETATIONS OF VAGUE EXPRESSIONS, OTHER VAGUE WORDING AND REFERENCES IN THE FIRE SAFETY SYSTEMS (FSS) CODE

FFS Code		Interpretation or reference
Chapter	**Paragraph**	
3	2.1.1.4	**Personal Equipment** Reference is made to IEC Publication 60079- Electrical Apparatus for Explosive Gas Atmospheres.
4	--	**Fire Extinguishers** Reference is made to resolution A.951(23) - improved Guidelines for marine portable fire extinguishers, as amended by resolution A.951(23).
4	2.1.1.2	**Equivalents of fire extinguishers** Reference is made to the international standard on fire protection equipment - portable fire extinguisher - performance and construction, to be developed by ISO *(ISO/DIS 7156E).*
4	3.1.2	**Recharging of spare charges** Partially emptied extinguishers should also be recharged.
5	2.1.1.1	**Separation of spaces** Two spaces can be considered as separated spaces where fire divisions as required by regulations 9.2.2, 9.2.3 and 9.2.4, as appropriate, or divisions of steel are provided between them.
5	2.1.1.3	**Means for checking the quantity of medium in containers** Means for checking the quantity of medium in containers should be so arranged that it is not necessary to move the containers completely from their fixing position. This is achieved, for instance, by providing hanging bars above each bottle row for a weighing device or by using suitable surface indicators.
5	2.1.3.2	**Certain spaces for which the automatic warning of release of the extinguishing medium is required** Ordinary cargo holds need not comply with regulation 2.1.3.2. However, ro-ro cargo spaces, holds in container ships equipped for integrated reefer containers and other spaces where personnel can be expected to enter and where the access is therefore facilitated by doors or manway hatches should comply with the above regulation. .

FFS Code		Interpretation or reference
Chapter	**Paragraph**	
5	2.2	**Low pressure CO_2 systems** Where a low pressure CO_2 system is fitted to comply with this regulation, the following applies: 1 The system control devices and the refrigerating plants should be located within the same room where the pressure vessels are stored. 2 The rated amount of liquid carbon dioxide should be stored in vessel(s) under the working pressure in the range of 1.8 to 2.2 N/mm^2. The normal liquid charge in the container should be limited to provide sufficient vapour space to allow for expansion of the liquid under the maximum storage temperatures than can be obtained corresponding to the setting of the pressure relief valves but should not exceed 95% of the volumetric capacity of the container. 3 Provision should be made for: - pressure gauge; - high pressure alarm: not more than setting of the relief valve; - low pressure alarm: not less than 1.8 N/mm^2; - branch pipes with stop valves for filling the vessel; - discharge pipes; - liquid CO_2 level indicator, fitted on the vessel(s); - two safety valves. 4 The two safety relief valves should be arranged so that either valve can be shut off while the other is connected to the vessel. The setting of the relief valves should not be less than 1.1 times working pressure. The capacity of each valve should be such that the vapours generated under fire condition can be discharged with a pressure rise not more than 20% above the setting pressure. The discharge from the safety valves should be led to the open. 5 The vessel(s) and outgoing pipes permanently filled with carbon dioxide should have thermal insulation preventing the operation of the safety valve in 24 hours after de-energizing the plant, at ambient temperature of 45°C and an initial pressure equal to the starting pressure of the refrigeration unit. 6 The vessel(s) should be serviced by two automated completely independent refrigerating units solely intended for this purpose, each comprising a compressor and the relevant prime mover, evaporator and condenser. 7 The refrigerating capacity and the automatic control of each unit should be so as to maintain the required temperature under conditions of continuous operation during 24 hours at sea temperatures up to 32°C and ambient air temperatures up to 45°C. 8 Each electric refrigerating unit should be supplied from the main switchboard busbars by a separate feeder. 9 Cooling water supply to the refrigerating plant (where required) should be provided from at least two circulating pumps one of which being used as a stand-by. The stand-by pump may be a pump used for other services so long as its use for cooling would not interfere with any other essential service of the ship. Cooling water should be taken from not less than two sea connections, preferably one port and one starboard. 10 Safety relief devices should be provided in each section of pipe that may be isolated by block valves and in which there could be a build-up of pressure in excess of the design pressure of any of the components. 11 The piping system should be designed in such a way that the CO_2 pressure at the nozzles should not be less than 1 N/mm^2. 12 Audible and visual alarms should be given in a central control station when:

FFS Code		Interpretation or reference
Chapter	**Paragraph**	
		- the pressure in the vessel(s) reaches the low and high values according to 2; - any one of the refrigerating units fails to operate; - the lowest permissible level of the liquid in the vessels is reached. 13 If the system serves more than one space, means for control of discharge quantities of CO_2 should be provided, e.g. automatic timer or accurate level indicators located at the control position(s). 14 If a device is provided which automatically regulates the discharge of the rated quantity of carbon dioxide into the protected spaces, it should be also possible to regulate the discharge manually.
7	2.1.1.2	**Areas for increased application rates** An indication of areas for which increased application rates may be required is given below: ***Protected Area*** — ***Application rate*** Boiler fronts or roof, firing areas, oil fuel units, centrifugal separators (not oily water separators), oil purifiers, and clarifiers. — 20 *l*/min/m^2 Hot oil fuel pipes near exhausts or similar heated surfaces on main or auxiliary diesel engines — 10 *l*/min/m^2
8	2.1.1	**Dry pipe systems in saunas** For the definition of "dry pipe system" see resolution A.800(19), Annex, paragraph 2.3.
8	2.5.2.3	**Definition of nominal area** Nominal area is defined as being the gross, horizontal projection of the area to be covered.
9	2.4.1.1	**Acceptable activating arrangements** The following arrangement may be acceptable to: .1 activate a paging system; .2 activate the fan stops; .3 activate the closure of fire doors; .4 activate the closure of fire dampers; .5 activate the sprinkler system; .6 activate the smoke extraction system; and .7 activate the low-location lighting system.
9	2.1.4	**Relevant definitions** *Loop* means electrical circuit linking detectors of various sections in a sequence and connected (input and output) to the indicating unit(s). *Zone address identification capability* means a system with individually identifiable fire detectors.
9	2.1.3	**Testing of detectors within cold spaces** Detectors installed within cold spaces such as refrigerated compartments should be tested

FFS Code		Interpretation or reference
Chapter	Paragraph	
		according to IEC Publication 60068-2-1 - Section one - Test Aa.
10	2.1.2	**Calculation of intervals** The interval (I) should depend on the number of scanning points (N) and the response time of the fans (T). (See interpretation of paragraph 2.2.2 chapter 10 below.) With a 20 % allowance: $I = 1.2 \times T \times N$ However, the maximum allowable interval should not exceed 120 s (I_{max} = 120 s).
10	2.2.2	**Response time for fans** Depending on the capacity of the fans and the length of system piping the maximum response time of the fans in combination with the system piping should be around 15 s.
12	2.2.2.1	**Heating of diesel driven power sources and other means of starting** 1 If the room for the diesel driven power source is not heated, the diesel driven power source for the pump should be fitted with electric heating of cooling water or lubricating oil. 2 The other means of starting include those by compressed air, electricity, or other sources of stored energy, hydraulic power or starting cartridges.
13	2.2.4	**Size of landings and intermediate landings** If landings can be entered directly via entrance doors, situated in stairway enclosures, the area of such landings should comply with the requirements of paragraph 2.2.4 of chapter 13. However, if landings cannot be entered by entrance doors, such landings should be considered as intermediate landings which should comply with the capacity requirements as given in paragraph 2.3.1 of chapter 13.
14	2.1.3	**Capacity, use and handling of deck foam systems** A common line for fire main and deck foam line can only be accepted provided it can be demonstrated that the hose nozzles can be effectively controlled by one person when supplied from the common line at a pressure needed for operation of the monitors. Additional foam concentrate should be provided for operation of 2 nozzles for the same period of time required for the foam system. The simultaneous use of the minimum required jets of water should be possible on deck over the full length of the ship, in the accommodation, service spaces, control stations and machinery spaces.
14	2.3.2.3	**Foam systems positions of aft monitors** Port and starboard monitors required by this regulation may be located in the cargo area as defined in regulation 3.6, provided they are aft of cargo tanks and that they protect below and aft of each other.
14	2.3.3	**Application to tankers** This paragraph applies to all tankers regardless of their size.
15	2.3.2.7	**Arrangements for isolation of inert gas supply mains and cargo piping systems** As a guide, the effective isolation required by this paragraph may be achieved by the two arrangements shown in figures 1 and 2 of chapter 15 and paragraph 2.3.2.7 in the Appendix

FFS Code		Interpretation or reference
Chapter	**Paragraph**	
		of this circular.

INTERPRETATIONS OF VAGUE EXPRESSIONS, OTHER VAGUE WORDING AND REFERENCES IN THE FIRE TEST PROCEDURE (FTP) CODE AND FIRE TEST PROCEDURES REFERRED TO IN THE CODE

Relevant document	Paragraph	Interpretation or reference
Fire Test Procedure Code		
FTP Code, Approval	5.1.6.5	For cases where an unsuccessful test had been conducted prior to the final approval test, the fire test report should include a description of the modifications made to the test specimen that resulted in the successful test.
FTP Code, Approval	5.2.4	Type approval certificates for windows should state which side of the window was exposed to the heating condition during the test. The certificate should include a reference to optional test(s) such as hose stream test and/or thermo radiation test.
Non-combustibility test		
FTP Code, Annex 1 Part 1	2.1	The test exposure need not exceed a 30 min duration. For the purposes of this Part, ISO 1182:2002 may be used in lieu of ISO 1182:1990.
Smoke and toxicity test		
FTP Code, Annex 1 Part 2	2.6.2	Not only the FTIR (Fourier Transform Infrared Spectrometer) method but also other methods such as GC/MS (Gas Chromatography/Mass Spectrometer) which can produce traceable results can be used for the gas analysis.
Test for "A", "B", and "F" class divisions including windows, fire dampers, pipe penetrations and cable transits		
FTP Code, Annex 1 Part 3 Resolution A.754(18),	2.1 2.6.2.2	"B" class doors should be fire tested in B class steel bulkheads of dimensions as stated in paragraph 2.4.1 of resolution A.754(18), otherwise approval should be limited to the type of construction in which the door was tested.
FTP Code, Annex 1 Part 3	2.2.1	The minimum bulkhead panel height should be a standard height of the manufactured panel with a dimension of 2.4 mm.
FTP Code, Annex 1 Part 3	3.1	The calcium silicate board described as a dummy specimen specified in paragraph 3.3 of resolution A.653(16) should be used as a standard substrate for adhesives.
FTP Code, Annex 1 Part 3	4.1	Sealing materials used in penetration systems for "A" class divisions are not required to meet non-combustibility criteria provided that all other applicable requirements of FTP Code, part 3, are met.
Resolution A. 754(18)	1.2	The thickness of insulation on the stiffeners need not be same as that of the steel plate.

Relevant document	Paragraph	Interpretation or reference
Resolution A.754(18)	1.6	Doors, windows and other division penetrations intended to be installed in fire divisions made of material other than steel should correspond to prototype(s) tested on a division made of such material, unless the Administration is satisfied that the construction, as approved, does not impair the fire resistance of the division regardless of the division construction.
Resolution A.754(18)	1.7	"B" class constructions should be tested without finishes. For constructions where this is not possible, finishes should be included in the non-combustibility test of the construction.
Resolution A.754(18)	2.8.2	Where testing is conducted on a perforated ceiling system, equally constructed non-perforated ceilings and ceilings with a lesser degree of perforations (in terms of size, shape, and perforations per unit area) may be approved without further testing.
Resolution A.754(18)	9	There exist no expectations that "A" and "B" class fire doors remain functional, in the ability to be opened/closed, during or after the specified test duration.
Resolution A.754(18), Appendix A.I Windows	2.1	The test should be conducted on a window of the maximum size (in terms of both the height and the width) and the type of the glass pane and/or the minimum thickness of the glass pane or panes and gaps, if appropriate, for which approval is sought. Test results obtained on this configuration should, by analogy, allow approval of windows of the same type, with lesser dimensions in terms of height and width and with the same or greater thickness.
Resolution A.754(18), Appendix A.I Windows	5.3	The window should be considered to have failed the hose-stream test if an opening develops that allows an observable projection of water from the stream beyond the unexposed surface during the hose stream test. Gap gauges need not be applied during or after the hose stream test.
Resolution A.754(18), Appendix A.II Fire dampers	2.2.4	The distance between the fire damper and the structural core specified in paragraph 2.2.4 means the distance between the fire damper centre and the structural core.
Resolution A.754(18), Appendix A.II Fire dampers	4	If evaluation of insulation is required, it should prevent a temperature rise at any point on the surface not exceeding 180°C above the initial temperature. The average temperature rise is not relevant.
Resolution A.754(18), Appendix A.III Pipe and duct penetrations	4.1	Penetrations and transits should meet both integrity and insulation criteria.
Resolution A.754(18), Appendix A.IV Cable transits	4.1	Penetrations and transits should meet both integrity and insulation criteria.

Relevant document	Paragraph	Interpretation or reference
Test for surface flammability		
FTP Code, Annex 1 Part 5	1	Where a product is approved based on a test of a specimen applied on a non-combustible substrate, that product should be approved for application to any non-combustible substrate with similar or higher density (similar density may be defined as a density ≥ 0.75 x the density used during testing) or with a greater thickness if the density is more than 400 kg/m^3. Where a product is approved on the basis of a test result obtained after application on a metallic substrate (e.g. thin film of paints or plastic films on steel plates), such a product should be approved for application to any metallic base of similar or higher thickness (similar thickness is obtained as a thickness ≥ 0.75 x the thickness of metallic substrate used during testing).
Resolution A.653(16)	7	Where a product is approved based on a test of a specimen applied on a non-combustible substrate, that product should be approved for application to any non-combustible substrate with similar or higher density (similar density may be defined as a density ≥ 0.75 x the density used during testing) or with a greater thickness if the density is more than 400 kg/m^3. Where a product is approved on the basis of a test result obtained after application on a metallic substrate (e.g. thin film of paints or plastic films on steel plates), such a product should be approved for application to any metallic base of similar or higher thickness (similar thickness is obtained as a thickness ≥ 0.75 x the thickness of metallic substrate used during testing).
Resolution A.653(16)	7.3	Vapour barriers used in conjunction with insulation should be tested without any other components of "A" or "B" class constructions that will shield the barrier being tested from the radiant panel.
Resolution A.653(16)	8.3.1	In the first line of the first sentence, the word "or" should read "of".
Resolution A.653(16)	10	The sentence should be understood to mean: "Materials giving average values for all of the surface flammability criteria as listed in the following table ... (etc.)." Q_{sb} means an average of three values of average heat for sustained burning, as defined in paragraph 9.3.
Test for primary deck coverings		
FTP Code, Annex 1 Part 6	2.1	For the purpose of this part, the total heat release value (Q_t) for floor coverings given in section 10 of the annex to resolution A.653(16) is replaced by ≤ 2.0 MJ.
FTP Code, Annex 1 Part 6	2.2	Fire test procedure The test may be terminated after 40 min.

APPENDIX

EXPLANATORY SKETCHES

This appendix contains explanatory sketches to some interpretations of regulations in SOLAS chapter II-2, as amended, and interpretations of paragraphs in the Fire Safety Systems Code as follows:

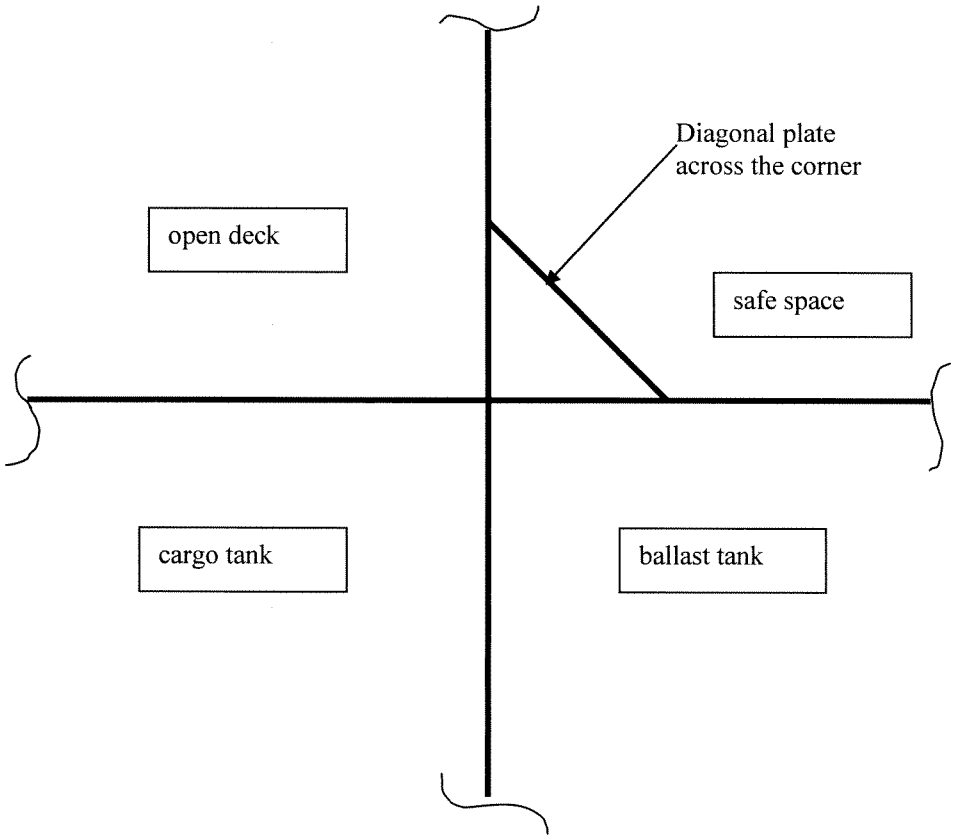
SOLAS Chapter II-2

Regulation 4.5.1:	Corner-to-corner situation in a cofferdam (figure)
Regulation 5.3 and 6.2:	Materials used on passenger ships for bulkheads of accommodation spaces as defined in regulation 3.1 (table)
Regulation 5.3 and 6.2:	Materials used in accommodation spaces, as defined in regulation 3.1, of cargo ships (table)
Regulation 9.2.2.1:	Arrangement of main vertical zones (figures 1 to 4)
Regulation 9.2.3.4.1:	Construction of protected stairway enclosures of cargo ships (figures 1, 2.1 and 2.2)
Regulation 9.3.4:	Prevention of heat transmission by insulation and structural details for drainage (figures 1, 2 and 3)
Regulation 10.5:	Number of systems, appliances and extinguishers in machinery spaces
Regulation 13.3.2.4.1:	Continuous fire shelter of means of escape (figure)

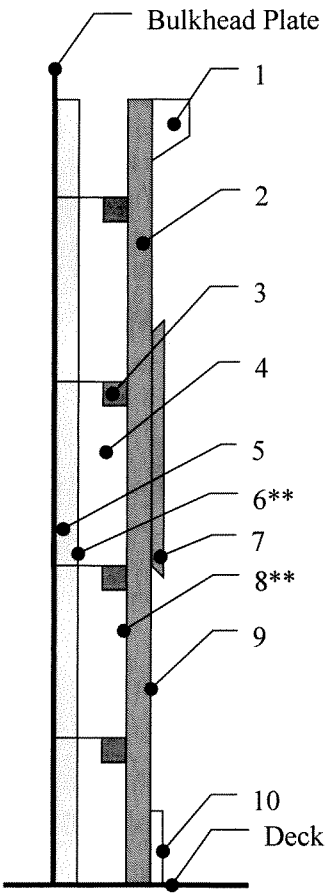
Fire Safety Systems Code

Chapter 15 paragraph 2.3.2.7:	Isolation arrangements in inert gas main (figures 1 and 2)

Regulation 4.5.1: Corner-to-corner situation in a cofferdam



Regulations 5.3 and 6.2: Materials used on passenger ships for bulkheads of accommodation spaces as defined in regulation II-2/3.1



Materials used for bulkheads of accommodation spaces as defined in regulation II-2/3.1					
Bulkhead components	Requirements in SOLAS chapter II-2 for components				
	Non-combustible material (5.3.1.1) (5.3.1.2.1)	Calorific value (5.3.2.2)	Equivalent volume (5.3.2.3)	Low flame spread (5.3.2.4)*	Smoke production, *toxic products* (6.2)
	(A)	(B)	(C)	(D)	(E)
1 moulding			X		
2 wall panel (lining)	X				
3 grounds and supports	X				
4 draft stops	X				
5 insulation	X				
6 insulation surface**				X (5.3.2.4.1.2)	
7 decoration			X		
8 painted surface** or fabric or veneer**		-- X		X (5.3.2.4.1.2) X (5.3.2.4.1.2)	
9 painted surface or fabric or veneer		-- X	X X	X (5.3.2.4.1.1) X (5.3.2.4.1.1)	X X
10 skirting board			X		

NOTES:

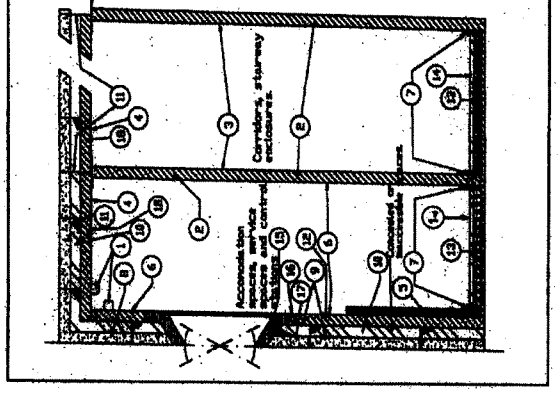
* Exposed surfaces of corridors and stairway enclosures referred to in regulation II-2/5.3.2.4.1.1 includes floor coverings.

** Where the wall panel is an integral part of the fire insulation in accordance with regulation II-2/9.2.2.3.3, these components are to be of non-combustible material.

Regulations 5.3 and 6.2: Materials used in accommodation spaces, as defined in regulation II-2/3.1, of cargo ships

Method IC

	Requirements for components						
	A Non Combustible Material Reg.II-2/5.3.1.2.2.1	B Non Combustible Material Reg.II-2/5.3.1.1	C Low flame spread Reg.II-2/5.3.2.4.2	D Equivalent volume Reg.II-2/5.3.2.2.3.1	E Calorific value Reg.II-2/5.3.2.2.2	F Smoke production Reg.II-2/6.2	G Not readily ignitable Reg.II-2/6.3
1 Moulding							
2 Panel	X			X			
3 Painted surfaces or Veneer or Fabric or Foils			X	X	X	X (2)	
4 Painted surfaces or Veneer or Fabric or Foils			X	X	X	X (2)	
5 Decoration				X		X (2)	
6 Painted surfaces or Veneer or Fabric or Foils				X	X	X (2)	
7 Skirting board				X			
8 Insulation		X (1)					
9 Surfaces and joints in concealed or inaccessible spaces			X				
10 Draught stop	X						
11 Grounds and supports	X		X				
12 Lining	X						
13 Primary deck covering 1st layer						X	X
14 Floor finishing			X (3)			X	X
15 Windows box	X						
16 Windows box surface			X	X	X	X	
17 Windows box surface in concealed or inaccessible spaces			X				
18 Ceiling panel	X						



(1) Vapour barriers used on pipes for cold services (see interpretation to regulationII-2/5.3.1.1) may be of combustible materials providing that their surface has low flame spread characteristics (Reg. II-2/5.3.1.1
(2) Applicable to paints, varnishes and other finishes (Reg. II-2/6.2)
(3) Only in corridors and stairway enclosures

Method IIC - IIIC

		Requirements for components						
		A Non Combustible Material Reg.II-2/5.3.1.2.2.2	B Non Combustible Material Reg.II-2/5.3.1.1	C Low flame spread Reg.II-2/5.3.2.4.2	D Equivalent volume Reg.II-2/5.3.2.3.1	E Calorific value Reg.II-2/5.3.2.2	F Smoke production Reg.II-2/6.2	G Not readily ignite Reg.II-2/6.3
1	Moulding							
2	Panel	X (1)			X (5)			
3	Painted surface or Veneer or Fabric or Foils			X	X	X	X (6)	
4	Painted surface or Veneer or Fabric or Foils			X	X	X (6)	X (6)	
5	Decoration [1]				X (6)	X (6)	X	
6	Painted surface or Veneer or Fabric or Foils				X (6)	X (6)	X (6)	
7	Skirting board				X (6)			
8	Insulation		X (1)					
9	Surfaces and joints in concealed or inaccessible			X				
10	Draught stop	X (4)						
11	Grounds and supports	X (4)		X				
12	Lining	X (4)						
13	Primary deck covering 1st layer						X	X
14	Floor finishing			X (6)			X	X
15	Window box	X (4)						
16	Window box surface			X (2)	X (6)	X (6)	X	
17	Window box surface in concealed or inaccessible			X				
18	Ceiling panel	X (4)						

(1) Vapour barriers used on pipes for cold services (see interpretation to regulation II-2/5.3.1.1) may be of combustible materials providing that their surface has low flame spread characteristics (Reg. II-2/5.3.1.1)
(2) Where the material is fitted on non combustible bulkheads, ceiling and lining in accommodation and service spaces (Reg.II-2/5.3.2.2)
(3) To be applied to those accommodation and service spaces bounded by non combustible bulkheads, ceiling and linings (Reg.II-2/5.3.2.3.1)
(4) Only in corridors and stairway enclosures serving accommodation and service spaces and control stations (Reg. II-2/5.3.1.2.2.2)
(5) Applicable to paints, varnishes and other finishes (Reg. II-2/6.2)
(6) Only in corridors and stairway enclosures

Regulation 9.2.2.1: Arrangement of main vertical zones*

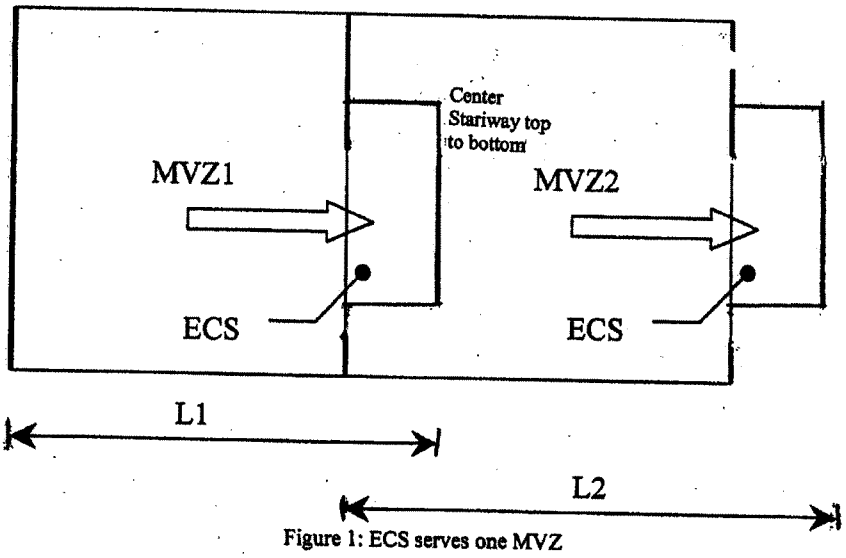
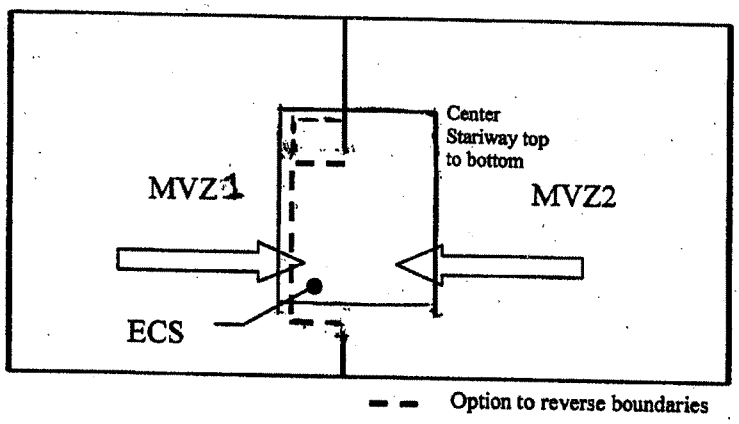
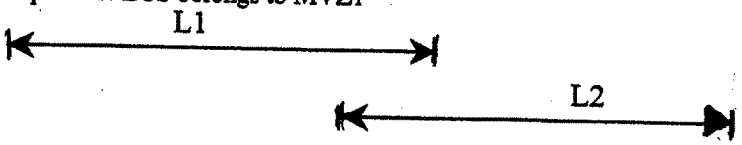


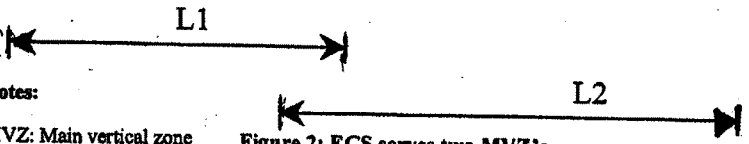
Figure 1: ECS serves one MVZ



Option 1: ECS belongs to MVZ1



Option 2: ECS belongs to MVZ2



Notes:

*MVZ: Main vertical zone
ECS : ESCAPE Stairway
⇨ : Direction of escape

Figure 2: ECS serves two MVZ's

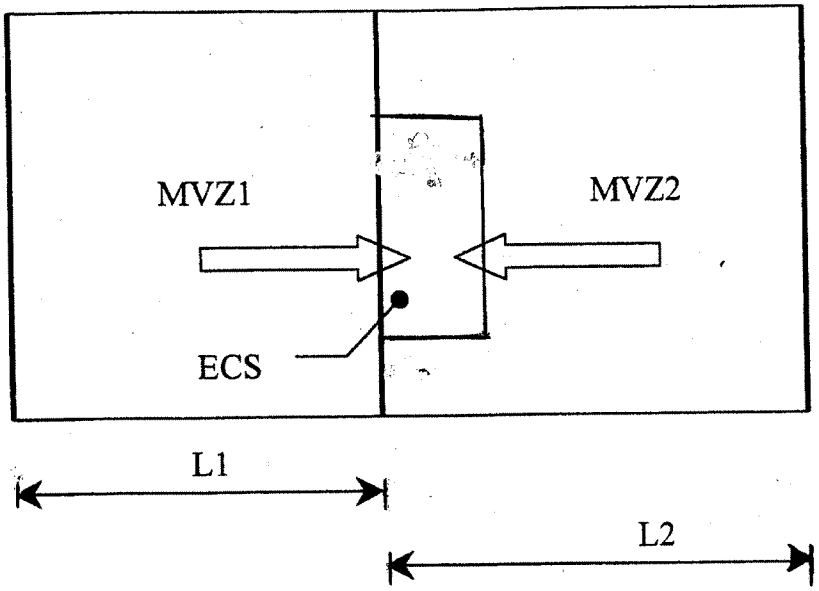
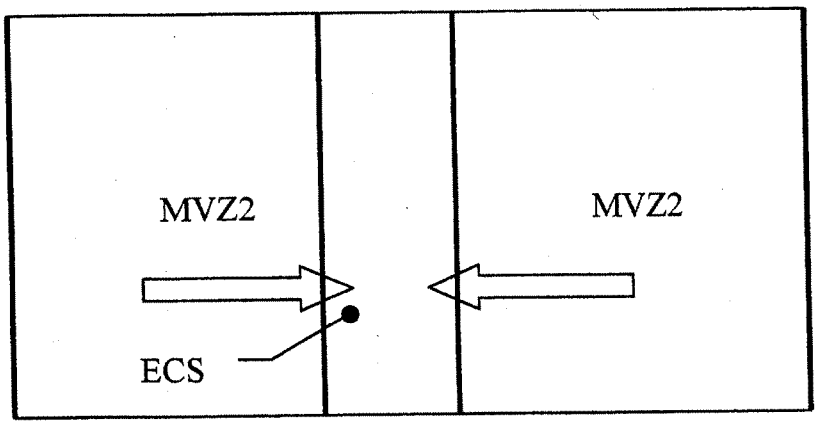
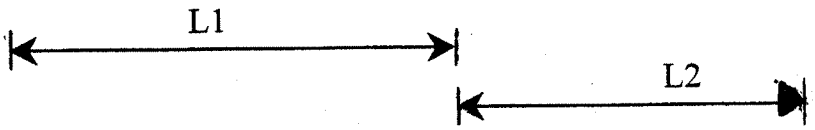


Figure 3: ECS serves two MVZ's (ECS belongs to MVZ2)



Option 1: ECS belongs to MVZ1



Option 2: ECS should be treated as MVZ

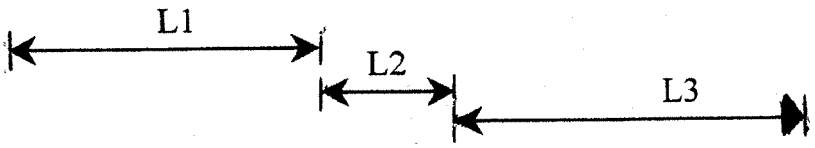


Figure 4: ECS serves two MVZ's

Regulation 9.2.3.4.1: Construction of protected stairways of cargo ships

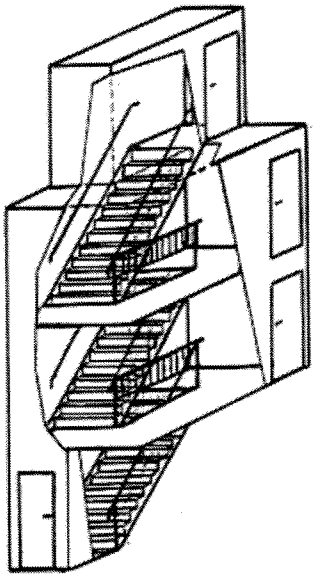


Figure 1

staircase well with going round entrances on each deck level, self-closing doors

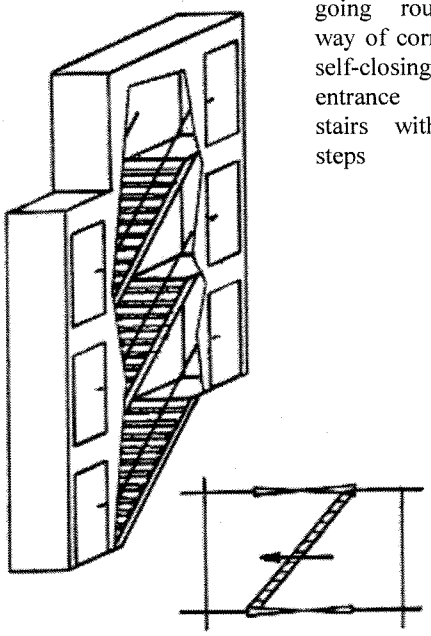


Figure 2.1

staircase well - going round by way of corridor all self-closing entrance doors, stairs with open steps

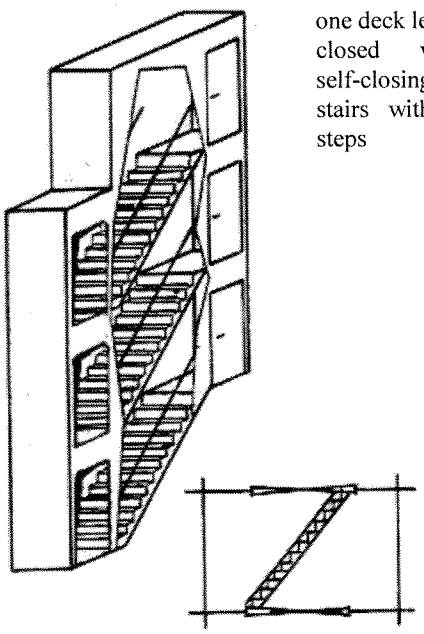


Figure 2.2

each stairway on one deck level to be closed with a self-closing door, stairs with closed steps

Regulation 9.3.4: Prevention of heat transmission by insulation and structural details for drainage*

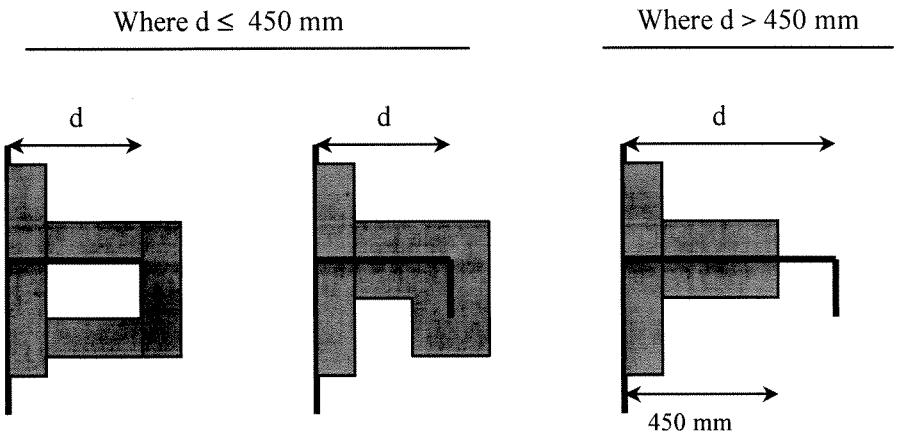


Figure 1

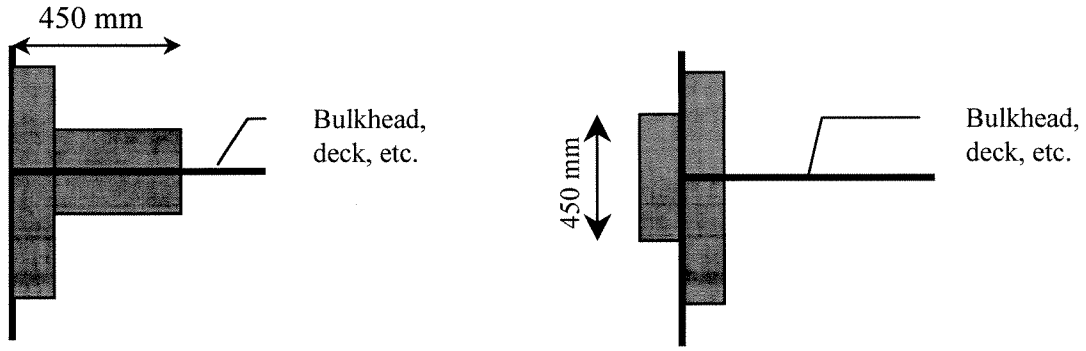


Figure 2

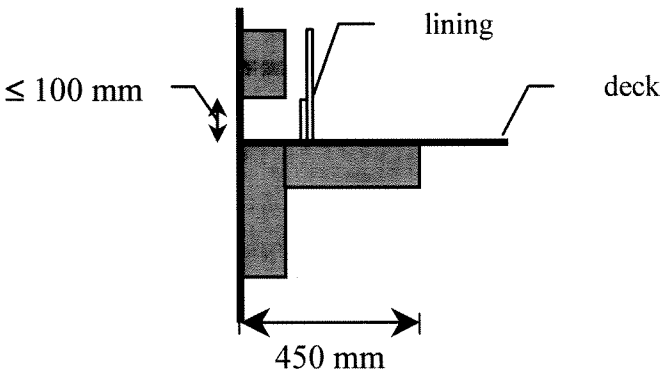


Figure 3

***Note:**
d = Depth of stiffener on girder.

Regulation 10.5: Number of systems, appliances, and extinguishers required in machinery spaces

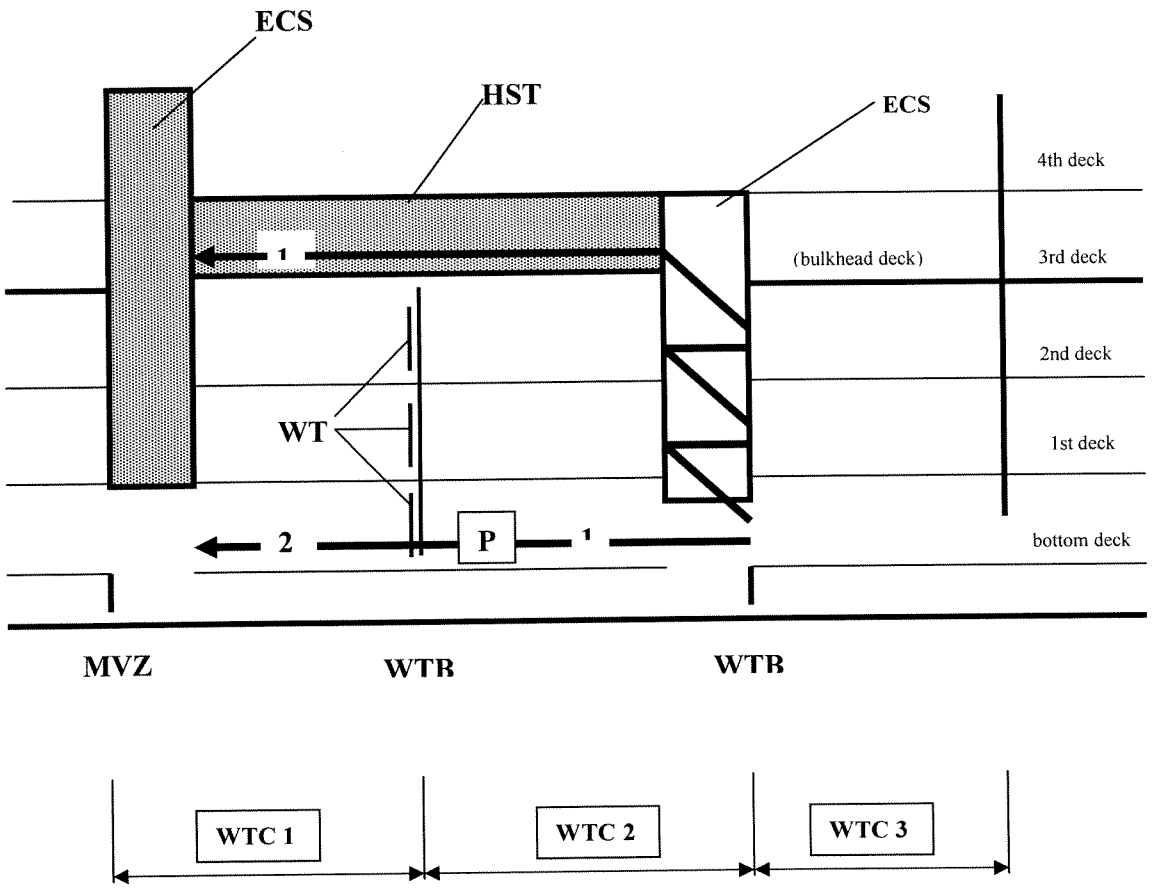
Systems appliances & extinguishers → **Category A Machinery ↓ spaces**	**Fixed fire extinguishing system**	**Portable foam applicator** *1	**Portable foam extinguishers**	**Add'l Portable foam extinguishers**	**135 *l* foam extinguisher**	**45 *l* foam extinguishers** *2	**Sand boxes** *3
SOLAS paragraph →	10.5.1.1, 10.5.2.1	10.5.1.2.1 10.5.2.2.1	10.5.1.2.2	10.5.2.2.2	10.5.1.2.2	10.5.2.2.2	10.5.2.2.2
Oil-fired boilers	1	1	2N	NA	1*4	-	N
Oil-fired boilers and oil fuel units	1	1	2N+2	NA	1*4	-	N
Engine room containing:							
Oil fuel units only	1	-	2	NA	-	-	-
Internal combustion machinery	1	1	x		-	y	-
Internal combustion machinery and oil fuel units	1	1	x		-	y	-
Combined engine/boiler room containing:							
Internal combustion machinery, oil fired boilers and oil fuel units	1	1	(2N+2) or x whichever is greater		1*4	y*5	N

N = number of firing spaces.
"2N" means that two extinguishers are to be located in each firing space.
X = sufficient number, minimum two in each space, so located that there are at least one portable fire extinguisher within 10 m walking distance from any point.
y = sufficient number to enable foam to be directed onto any part of the fuel lubricating oil pressure systems, gearing and other fire hazard.

Notes:

*1. May be located at outside of the entrance to the room.
*2. May be arranged outside of the space concerned for smaller spaces of cargo ships.
*3. The amount of sand is to be at least 0.1 m^3.
*4. Not required for such spaces in cargo ships wherein all boilers contained therein are for domestic services and are less than 175kW.
*5. In case of machinery spaces containing both boilers and internal combustion engines (case not explicitly considered in regulation 10.5) regulation 10.5.1 and 10.5.2 apply, with the exception that one of the foam fire-extinguishers of at least 45 *l* capacity or equivalent (required by regulation 10.5.2.2.2) may be omitted on the condition that the 135 *l* extinguisher (required by regulation 10.5.1.2.2) can protect efficiently and readily the area covered by 45 *l* extinguisher.
*6. Oil fired machinery other than boilers such as fired inert gas generators, incinerators and waste disposal units are to be considered the same as boilers insofar as the required number and type of fire fighting appliances are concerned.

Regulation 13.3.2.4.1: Continuous fire shelter of means of escape



Figure

NOTES:

ECS: stairway enclosed in a continuous fire shelter
HST: "horizontal stairway"; route protected as a category 2 space
MVZ: main vertical zone
WTB: watertight bulkhead
WTC: watertight compartment
WTD: watertight door
P: group of persons

Chapter 15, paragraph 2.3.2.7: Isolation arrangements in inert gas main

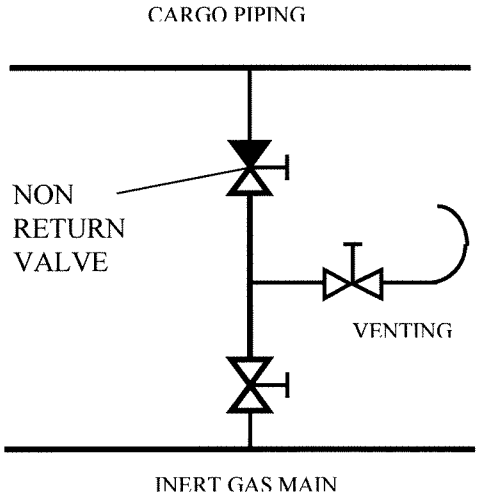


Figure 1

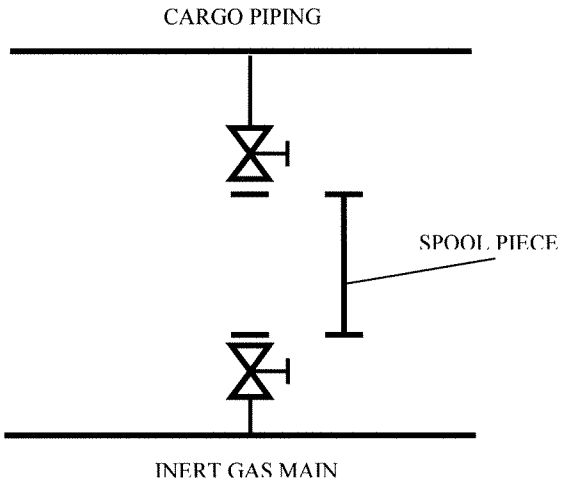


Figure 2