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NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 10-99

Subj: INTERPRETATIONS OF SOLAS CHAPTER II-2

1. PURPOSE. This Circular calls attention to "Interpretations of Vague Expressions and Other Vague Wording in SOLAS Chapter II-2", as approved by the International Maritime Organization (IMO), Maritime Safety Committee, as MSC/Circ.847. The interpretations contained in MSC/Circ.847 should be used as guidance when applying relevant provisions of SOLAS Chapter II-2 to fire protection construction, arrangements, and equipment to be installed on board ships on or after 14 May 1998, in order to fulfill the requirements of the 1974 SOLAS Convention.

2. DIRECTIVES AFFECTED. None.

3. BACKGROUND.

   a. The IMO's Subcommittee on Fire Protection, at its 42nd session (8-12 December 1997), completed a multi-year effort to develop a set of unified interpretations, with a view to ensuring uniform application of the requirements of SOLAS Chapter II-2 containing vague expressions such as "to the satisfaction of the Administration" or other vague wording which is open to diverging interpretations. The United States delegation to the Subcommittee on Fire Protection was very active in the development of these interpretations.

   b. The IMO's Maritime Safety Committee, at its 69th session (11-20 May 1998), approved the set of interpretations to SOLAS Chapter II-2 as MSC/Circ.847, "Interpretations of Vague Expressions and Other Vague Wording in SOLAS Chapter II-2."

   c. The IMO's Subcommittee on Fire Protection, at its 43rd session (11-15 January 1999), agreed to various minor editorial corrections to MSC/Circ.847 (as listed in IMO documents FP 43/9 and FP 43/9/1). Although the IMO Secretariat will issue these corrections in due course, Commandant (G-MSE-4) has included them in the MSC/Circ.847 attached to this Circular.

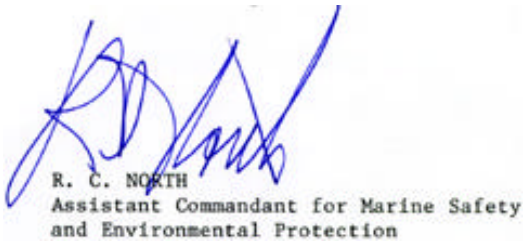
4. DISCUSSION. The interpretations in MSC/Circ.847 should be used as guidance when applying the relevant provisions of SOLAS Chapter II-2 to U.S. flag or foreign flag vessels. These interpretations are clarifications only and are not intended to amend SOLAS

regulations. They are intended to serve as uniform explanations of practices used by Administrations to comply with the intent of the regulations. These interpretations are not retroactive, but apply to construction, arrangements, and equipment to be installed on board ships on or after 14 May 1998.

5. ACTION.

   a. The Commanding Officer, Marine Safety Center and Officers in Charge, Marine Inspection, should use the interpretations contained in MSC/Circ.847 when applying the relevant provisions of SOLAS in plan review and vessel inspection functions.

   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.



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Encl: (1) MSC/Circ.847, "INTERPRETATIONS OF VAGUE EXPRESSIONS AND OTHER VAGUE WORDING IN SOLAS CHAPTER II-2", as corrected

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MSC/Circ.847
12 June 1998

INTERPRETATIONS OF VAGUE EXPRESSIONS AND OTHER VAGUE WORDING IN SOLAS CHAPTER II-2

1 The Maritime Safety Committee, at its sixty-ninth session (11 to 20 May 1998), approved, with a view to ensuring uniform application of the requirements of SOLAS chapter II-2 containing vague expressions such as "to the satisfaction of the Administration" or other vague wording which is open to diverging interpretations, interpretations of vague expressions and other vague wording in SOLAS chapter II-2, prepared by the Sub-Committee on Fire Protection, as set out in the annex.

2 Member Governments are invited to use the annexed interpretations as guidance when applying relevant provisions of SOLAS chapter II-2 to fire protection construction, installation, arrangements and equipment to be installed on board ships on or after 14 May 1998, in order to fulfill the requirements of the 1974 SOLAS Convention, and to bring the interpretations to the attention of all parties concerned.

3 Member Governments are also advised to take into account earlier interpretations to SOLAS chapter II-2 approved by MSC 64, as given in MSC/Circ.669.

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Note: *MSC/Circ.847, as shown in this enclosure, has been updated with minor corrections as listed in IMO documents FP 43/9 and FP 43/9/1. Changes are denoted by a vertical bar in the margin.*

ANNEX

INTERPRETATIONS OF VAGUE EXPRESSIONS AND OTHER VAGUE WORDING IN SOLAS CHAPTER II-2

PART A - GENERAL

Regulation 1 - Application

1.3.1* ***Interpretation of "major character"***

The following repairs, alterations and modifications should be recognized as being of a "major character":

.1 any change that substantially alters the dimensions of a ship

Example:
Lengthening by adding new midbody; new midbody should comply with chapter II-2 of SOLAS 1974, as amended;

.2 any change that substantially alters the passenger accommodation

Example:
Vehicle deck converted to passenger accommodation; new accommodation should comply with chapter II-2 of SOLAS 1974, as amended; and

.3 any change that substantially increases a ship's service life

Example:
Renewal of passenger accommodation on one entire deck; renewed accommodation should comply with chapter II-2 of SOLAS 1974, as amended.

Regulation 3 - Definitions

3.10 ***Devices in pantries or isolated pantries containing no cooking appliances***

Pantries or isolated pantries containing no cooking appliances may contain:

- coffee automats, toasters, dish washers, microwave ovens, water boilers and similar appliances each of them with a maximum power of 5 kW;

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* The numbering "1.3.1" means paragraph 3.1 of regulation 1 of SOLAS chapter II-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 covers regulations II-2/26.2.2(9), 27.2.2(3), 44.2.2(3) and 58.2.2(3)).

3.12 ***Devices in main pantries, pantries containing cooking appliances and galleys***

1 Main pantries and pantries containing cooking appliances may contain:

- coffee automats, toasters, dish washers, microwave ovens, water boilers and similar appliances each of them with a power of more than 5 kW,

- electrically heated cooking plates and hot plates for keeping food warm each of them with a maximum power of 5 kW.

(This interpretation covers regulations II-2/26.2.2(13) and 27.2.2(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.

3.13 ***Liquid cargo other than oil***

Cargo spaces also include tanks for other liquid cargo.

3.15 ***Location and size of openings in ro-ro cargo spaces which are open at one end only***

A ro-ro cargo space which is open at one end only should, in order to be considered as an "open ro-ro cargo space" be provided on both sides with openings without closing appliances. The opening should have such size and be so located that a sufficient natural ventilation is achieved in the whole space, which normally means that the total area of the openings should be at least 10% of the total area of the sides of the space.

3.19 ***Spaces containing oil-fired equipment***

Spaces which contain oil-fired equipment other than boilers, such as inert gas generators, incinerators, etc. should be considered as machinery spaces of category "A" in accordance with this regulation.

3.22 ***Explanations to control stations***

1 Main navigational equipment includes, in particular, the steering stand and the compass, radar and direction-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 radiotelegraph 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 regulation II-1/43.

3.22-1.9 ***Explanations to communication systems***

The communication systems here mean only internal communication systems which are required by the regulations.

Regulation 4 - Fire pumps, fire mains, hydrants and hoses

4.2.2 ***Capacity of additional fire pumps***

Each pump for fire extinguishing which is installed in addition to the required number of pumps should have a capacity of at least 25 m^3/h and should be capable of delivering at least the two jets of water required in regulation II-2/4.5.1.

4.3.1.3 ***Number and type of fire pumps***

Cargo ships of less than 1,000 gross tonnage should be provided with not less than two power fire pumps, one of which should be an independently power driven pump.

4.3.3.2 ***Supply and pressure of emergency pumps***

There should be an alternative means consisting of a fixed independently driven emergency pump which should be capable of supplying two jets of water at a minimum pressure of 0.25 N/mm^2.

4.3.3.2.1 ***Capacity of emergency fire pumps***

The capacity of the emergency fire pump should be not less than 40 % of the required total capacity of the fire pumps as per regulation II-2/4.2.1.

4.3.3.2.3 ***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.

4.3.3.2.5 ***Exception in case of ballast condition***

The ballast condition of a ship on entering or leaving a dry dock need not be considered a service condition.

4.3.3.2.7 ***Type of doors in case of an airlock***

In case of an airlock, the door of the machinery space should be of A-60 class standard, the other door should be at least of steel, both reasonably gastight, self-closing and without any hold back arrangements.

4.3.3.3 ***Capacity of alternative means of providing water for fire fighting***

The alternative means of providing water for fire fighting purposes should be a pump with a capacity of at least 25 m^3/h for passenger ships and of at least 15 m^3/h for cargo ships.

4.3.4.1 ***Automatic starting of fire pumps and prevention of freezing in pipes***

1 Only one of the required fire pumps needs to be provided with automatic starting.

2 Special attention should be given to the design of the continuously pressurized pipelines for prevention of freezing in pipes in ships entering areas where low temperatures may exist.

4.3.4.2 ***Availability of water supply***

Immediate availability of water supply can be achieved either by automatic start of at least one fire pump or by remote starting from the navigation bridge of at least one fire pump. If the pump starts automatically or if the bottom valve cannot be opened from where the pump is remotely started, the bottom valve should always be kept open.

4.3.4.3 ***Exception for cargo ships of less than 1,600 gross tonnage***

This requirement may be waived for cargo ships of less than 1,600 gross tonnage if the fire pump starting arrangement in the machinery space is in an easily accessible position.

4.4.2 ***Pressure for ships less than 1,000 gross tonnage***

A pressure of 0.25 N/mm^2 should be maintained for ships less than 1,000 gross tonnage.

4.5.1 ***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.

4.6.1 ***Drainage of fire mains and shutting off fire main branches***

Fire mains should be capable of being drained. Valves should be installed in the main for shutting off from the weather deck fire main branches used for purposes other than fire fighting.

4.6.3 ***Arrangements of emergency pumps, seawater inlet, suction and delivery pipes and sea-chests***

1 Not only emergency pumps, but also seawater inlet, suction and delivery pipes with valves, etc. should be outside the compartment containing the other fire pumps. Only short lengths of suction and discharge piping may, however, under certain circumstances, penetrate the machinery spaces if enclosed in substantial steel casing. In lieu of the steel casing the pipe may be insulated to A-60 class standard.

The pipe should have substantial wall thickness, in no case less than 11 mm, and should be all welded except for the flanged connection to the sea inlet valve.

The sea-chest with valve and the main part of the suction piping should be, in general, outside the machinery spaces. If this arrangement cannot be made, the sea-chest may be fitted in the machinery spaces on the condition that the valve is remotely controlled from a position near the pump, in the same compartment, and the suction pipe is as short as practicable.

2 The emergency fire pump should be placed so that the main requirements of regulation II-2/4.6.3 can be complied with. The discharge line of the emergency fire pump should be provided with isolating valves placed outside the fire pump space.

4.7.1 ***Length of fire hoses***

Fire hoses should have a length of:

- at least 10 m;

- not more than 15 m in machinery spaces;

- not more than 20 m for other spaces and open decks; and

- not more than 25 m for open decks on ships with a maximum breadth in excess of 30 m.

4.7.4.1 ***Additional hoses and nozzles when carrying dangerous goods***

Ships carrying dangerous goods in accordance with regulation II-2/54 should be provided with 3 additional hoses and 3 additional nozzles (see also interpretations of regulation II-2/54.2.1.2).

4.7.4.2 ***Number of fire hoses in cargo ships of less than 1,000 gross tonnage***

In cargo ships of less than 1,000 gross tonnage, the number of fire hoses should be calculated in accordance with the provisions of regulation II-2/4.7.4.1. However, the number of hoses should in no case be less than three.

4.8.1 ***Diameter of nozzles***

Nozzles larger in diameter may be provided if the requirements relating to the provision of water for fire fighting purposes are met.

Regulation 5 - Fixed gas fire-extinguishing systems

5.1.2 ***Construction of pipelines passing through accommodation***

The pipelines may pass through accommodation providing that they are of substantial thickness and that their tightness is verified with a pressure test, after their installation, at a pressure head not less than 5 N/mm^2. In addition, pipelines passing through accommodation areas should be joined only by welding and should not be fitted with drains or other openings within such spaces. The pipelines should not pass through refrigerated spaces.

5.1.4 ***Location of closing devices***

Openings which may admit air to, or allow gas to escape from, a protected space should be capable of being closed from outside the protected space.

5.1.5 ***Consideration of volume of air receivers when calculating the quantity of extinguishing medium***

The volume of starting air receivers, converted to free air volume, should be added to the gross volume of the machinery space when calculating the necessary quantity of extinguishing medium. Alternatively, a discharge pipe from the safety valves may be fitted and led directly to the open air.

5.1.6 ***Warning of release of extinguishing medium into ro-ro cargo spaces and other spaces where personnel can enter***

1 Ro-ro cargo spaces and other spaces where personnel can be expected to enter and where the access is therefore facilitated by doors or manway hatches should be provided with an automatic warning of release of the extinguishing medium. However, ordinary or conventional cargo spaces and small spaces (such as compressor rooms, paint lockers, lamp stores, etc.) with a local release only need not be provided with such an automatic warning.

2 Advance period of time of alarm sounding: the alarm should sound for the period of time necessary to evacuate the space, but not less than 20 s.

3 The pre-discharge alarm should be automatically activated, e.g. by opening of the release cabinet door.

4 Reference is made to the Code on Alarms and Indicators (AI Code), 1995 (resolution A.830(19)).

5.1.9 ***Separation of spaces***

Two spaces can be considered as separated spaces when fire divisions as required by regulations II-2/26, 27, 44 and 58, as appropriate, or divisions of steel are provided between them.

5.1.11 ***Means for checking the quantity of medium in containers***

1 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.

2 Surface indicators containing radioactive material should be of a type accepted by the Administration.

5.1.13 ***Location, accessibility, use and ventilation of CO_2 - storage spaces***

1 Spaces for storage of cylinders or tanks for extinguishing gas should not be used for other purposes. These spaces should not be located in front of the forward collision bulkhead. Access to these spaces should be possible from the open deck. Spaces situated below the deck should be directly accessible by a stairway or ladder from the open deck. The space should be located no more than one deck below the open deck.

2 Spaces where entrance from the open deck is not provided or which are located below deck are to be fitted with mechanical ventilation. The exhaust duct (suction) should be lead to the bottom of the space. Such spaces should be ventilated with at least 6 air changes per hour.

Regulation 6 - Fire extinguishers

6 ***Reference to resolution A.602(15)***

Reference is made to IMO resolution A.602(15) - Revised Guidelines for marine portable fire extinguishers.

6.1.1 ***Mass and capacity of fire extinguishers***

1 The mass of portable fire extinguishers should not exceed 23 kg.

2 Each powder or carbon dioxide extinguisher should have a capacity of at least 5 kg, and each foam extinguisher a capacity of at least 9 *l*.

6.1.2 ***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.

6.2 ***Spare charges and additional fire extinguishers and instructions***

1 For fire extinguishers of the same type, capable of being recharged on board, the spare charges should be provided as follows:

- 100% for the first 10 extinguishers and 50% for the remaining extinguishers but not more than 60 (fractions to be rounded off to next number).

2 For fire extinguishers which cannot be recharged by the crew, additional portable fire extinguishers of the same quantity, type, capacity and number as determined in 1 above should be provided in lieu of spare charges.

3 Instructions for recharging should be carried on board. Only refills approved for the fire extinguisher in question may be used for recharging. Partially emptied extinguishers should also be recharged.

6.5 ***Examination and testing of fire extinguishers***

1 The extinguishers should be examined annually by a competent person.

2 Each extinguisher should be provided with a sign indicating that it has been examined.

3 Containers of permanently pressurized fire extinguishers and propellant bottles of non-pressurized fire extinguishers should be hydraulic pressure tested as follows:

- powder extinguishers every 10 years;

- CO_2 - extinguishers every 10 years; and

- other extinguishers every 10 years.

Containers of non-permanently pressurized fire extinguishers should be hydraulic pressure tested every 10 years.

6.7 ***Type and location of fire extinguishers***

1 Carbon dioxide fire extinguishers should 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.

2 Fire extinguishers should 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 should be provided with devices which indicate whether they have been used.

Regulation 7 - Fire-extinguishing arrangements in machinery spaces

7.1.2 ***Location of foam applicator units***

The portable foam applicator unit may also be located at an entrance outside of the boiler room.

7.1.3 ***Fire extinguishers for domestic boilers of less than 175 kW***

In case of domestic boilers of less than 175 kW, the requirements of this paragraph may be relaxed to the provision of two portable fire extinguishers.

7.1.4 ***Dry material at firing spaces***

1 The amount of sand or other approved dry material in the receptacle should be at least 0.1 m^3.

2 A suitable shovel for spreading the material should be provided.

7.2.3 ***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.

7.5 ***Requirements for fixed fire-extinguishing systems not required by chapter II-2***

Where a fixed fire-extinguishing system not required by chapter II-2 is installed, it should meet the requirements of the relevant regulations of this chapter.

7.6 ***Construction of water fog applicators***

A water fog applicator might consist of a metal L-shaped pipe, the long limb being about 2 m in 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.

Regulation 8 - Fixed low-expansion foam fire-extinguishing systems in machinery spaces

8.1 ***Reference to MSC/Circ.582***

Reference is made to MSC/Circ. 582 - Guidelines for the performance and testing criteria and surveys of low-expansion foam concentrates for fixed fire-extinguishing systems.

Regulation 9 - Fixed high-expansion foam fire-extinguishing systems in machinery spaces

9 ***High-expansion foam fire-extinguishing system in spaces other than machinery spaces***

When such a system is to be fitted in any space other than a machinery space, this regulation applies.

9.1.1 ***Reference to MSC/Circ.670***

Reference is made to MSC/Circ.670 - Guidelines for the performance and testing criteria and surveys of high-expansion foam concentrates for fixed fire-extinguishing systems.

9.3 ***Delivery ducts for foam***

Where the space containing the foam generators is close to the protected space, the relevant delivery ducts should meet the following requirements:

.1 they should be made of steel having a thickness of not less than 5 mm;

.2 they should have a length, within the foam generator space, of a least 450 mm; and

.3 their openings at the bulkhead or deck between the foam generator space and the protected space should be provided with a damper (single or multi-bladed) made of stainless steel with a thickness of not less than 3 mm. Those dampers should be automatically operated (electrically, pneumatically or hydraulically) by means of remote control of the foam generator related to them.

Regulation 10 - Fixed pressure water-spraying fire-extinguishing systems in machinery spaces

10 ***Reference to MSC/Circ.668***

Reference is made to MSC/Circ. 668 - Alternative arrangements for halon fire-extinguishing systems in machinery spaces and pump-rooms, and amendments thereto contained in MSC/Circ.728 - Revised test method for equivalent water-based fire extinguishing systems for machinery spaces of category A and cargo pump-rooms contained in MSC/Circ.668.

10.2 ***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
Hot oil fuel pipes near exhausts or similar heated surfaces on main or auxiliary diesel engines	10 *l*/min

Regulation 11 - Special arrangements in machinery spaces

11.2.2 ***Arrangements for release of smoke***

Usual ventilation systems may be acceptable as arrangements for permitting the release of smoke required by regulations II-2/11.2.2 and 11.4.2.

11.4.5 ***Means of control for other oil equipment***

This paragraph should also apply to lubricating oil service pumps, thermal oil circulating pumps and oil separators (purifiers) except oily water separators.

11.5 ***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.

Regulation 12 - Automatic sprinkler, fire detection and fire alarm systems

12 ***Reference to resolution A.800(19)***

Reference is made to IMO resolution A.800(19) - Revised guidelines for approval of sprinkler systems equivalent to that referred to in SOLAS regulation II-2/12.

12.1.1 ***Dry pipe systems in saunas***

1 For the definition of "dry pipe system" see resolution A.800(19), annex, paragraph 2.3. Such a system is used where the possibility of freezing exists during operation of the ship in cold climates.

2 Saunas should be fitted with a dry pipe sprinkler system. The operation temperature may be up to 140°C.

12.2.2 ***Location of section stop valves***

Section stop valves should be located outside of the associated section or in cabinets within stairway enclosures.

12.3 ***Definition of nominal area***

Nominal area is defined as being the gross, horizontal projection of the area to be covered.

12.5.2 ***Pressure calculation and practical test***

This requirement may be considered fulfilled after examination of the hydraulic calculations with satisfactory results, confirmed, where deemed necessary, by a practical test.

12.10 ***Number of spare sprinkler heads***

Spare sprinkler heads should include all types and ratings installed in the ship, and should be provided as follows:

<300 sprinkler heads	6 spare sprinkler heads
300 to 1000 sprinkler heads	12 spare sprinkler heads
>1000 sprinkler heads	24 spare sprinkler heads

The number of spare sprinkler heads of any type need not exceed the number of heads installed of that type.

Regulation 13 - Fixed fire detection and fire alarm systems

13.1.4 ***Definition of "section"***

Group of fire detectors and manually operated call points as reported in the indicating unit(s) required by regulation II-2/13.1.6.

13.1.9 **Extension of detector sections**

The same section of detectors may serve spaces on more than one deck if those spaces are located in fore or aft end of the ship or they are so arranged that they constitute common spaces on different decks (e.g. fan rooms, galleys, public spaces, etc.).

In ships of less than 20 m in breadth, the same section of detectors may serve spaces on both sides of the ship.

13.1.10 ***Restriction of loops***

For fire detection systems with remotely and individually identifiable fire detectors, the requirement set out in this regulation is considered to have been met when a loop covering accommodation, service spaces and control station does not include machinery spaces of category A.

13.1.14 ***Acceptable activating arrangements***

The following arrangement may be acceptable:

.1 to activate a paging system;
.2 to activate the fan stops;
.3 to activate the closure of fire doors;
.4 to activate the closure of fire dampers;
.5 to activate the sprinkler system;
.6 to activate the smoke extraction system; and
.7 to activate the low-location lighting system.

13.1.15 ***Installation of loops and relevant definitions***

1 A loop should be arranged so that it will not pass through a space twice. When this is not practical (e.g. for large public spaces), the part of the loop which by necessity passes through the space for a second time should be installed at the maximum possible distance from the other parts of the loop.

2 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.

13.2.4 ***Location of detectors***

Distances of less than 0.5 m from bulkheads may be accepted in corridors, lockers and stairways.

13.3.1 ***Testing of detectors within cold spaces***

Detectors installed within cold spaces such as refrigerated compartments should be tested according to IEC 68-2-1 (1974) - Section one - Test Aa.

13.3.4 ***Limitation of operation temperature of heat detectors***

The operation temperature of heat detectors in spaces covered by this regulation may be 130° C, in saunas up to 140°C.

Regulation 13-1 - Sample extraction smoke detection systems

13-1.1.2 ***Calculation of intervals***

The interval (I) should depend on the number of scanning points (N) and the response time of the fans (T) (see interpretations of paragraph 13-1.3.3 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).

13-1.3.3 ***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.

Regulation 15 - Arrangements for oil fuel, lubricating oil and other flammable oils

15.1.3 ***Use of oil fuel having a flashpoint of less than 60°C***

The use of oil fuel having a flashpoint of less than 60ºC but not less than 43ºC may be permitted, e.g, for feeding the emergency fire pumps engines and the auxiliary machines which are not located in the machinery spaces of category A, subject to the following:

.1 fuel oil tanks except those arranged in double bottom compartments should be arranged outside of machinery space of category A;

.2 provisions for the measurement of oil temperature should be provided on the suction pipe of the oil fuel pump;

.3 stop valves and/or cocks should be provided to the inlet side and outlet side of the oil fuel strainers; and

.4 pipe joints of welded construction or of circular cone type or spherical type union joint should be applied as much as possible.

15.1.4 ***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.

2 Reference is made to IACS requirement M 24 "Requirements concerning use of crude oil or slop as fuel for tanker boilers."

15.2.5 ***Controls for remote operation of emergency generator fuel tank valves***

1 The provision of this paragraph applies to fuel oil tanks having a capacity of 500 *l* and above.

2 The controls for remote operation of the valve for the emergency generator fuel tank should be in a separate location from other valves for tanks in machinery spaces.

15.2.7 ***Safe positions for discharge of air and overflow pipes and relief valves***

1 Air and overflow pipes and relief valves should discharge to a position where there is no risk of fire or explosion from the emergence of oils and vapour and should not lead into crew spaces, passenger spaces nor into special category spaces, closed ro-ro cargo spaces, machinery spaces or similar spaces.

2 The requirement for overpressure protection should be applied only to filling pipes served by pumps on board.

15.2.8 ***Material of oil fuel pipe valves***

For valves, fitted to oil fuel tanks and which are under static pressure, steel or modular 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 60ºC.

15.3 ***Arrangements of lubricating oil tanks and oil collecting arrangements***

1 The provision of regulation II-2/15.2.5 applies to lubricating oil tanks except those having a capacity less than 500 *l* and storage tanks on which valves are closed at normal operation mode of the ship. Relaxation from this provision may be given, on a case-by-case basis, where it is

determined that an unintended operation of a quick closing valve, on the oil lubricating tank, would endanger the safe operation of the main propulsion and essential auxiliary machinery.

2 Suitable oil collecting arrangements for leaks should be fitted below hydraulic valves and cylinders.

Regulation 16 - Ventilation systems in ships other than passenger ships carrying more than 36 passengers

16.2 ***Definition of "free sectional area" and ventilation ducts with a free sectional area equal to, or less than, 0.02 m² passing through "A" class divisions***

1 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.

2 Where a thin plated duct with a free sectional area equal to, or less than, 0.02 m^2 passes through "A" class bulkheads or decks, the opening should be lined 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 the bulkhead or, in the case of the deck, totally laid on the lower side of the decks pierced.

16.2.2 ***Type of means of closing and accessibility of fire dampers***

1 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.

2 The fire dampers should be easily accessible. Where they are placed behind ceilings or linings, these latter should be provided with an inspection door on which a plate reporting the identification number of the fire damper. Such plate and identification number should be placed also on any remote control required.

16.3 ***Separation of ventilation systems and construction of ducts***

1 Galley ventilation systems should be separated from the ventilation systems serving other spaces. On cargo ships of less than 4,000 gross tonnage and in passenger ships carrying not more than 36 passengers, galley supply ventilation may be achieved by separate ducts from the ventilation unit and an automatic fire damper fitted in the galley ventilation duct near the ventilation unit. When passing through accommodation spaces, service spaces and control stations, galley ventilation ducts should be constructed of "A" class standard having a thickness as per regulation II-2/16.3.1.1 for the entire length passing through such spaces.

2 The ventilation systems for machinery spaces of category A, car deck spaces, ro-ro cargo spaces, special category spaces and cargo spaces, in general, should be separated from each other and from the ventilation systems serving other spaces.

16.6 ***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.

16.8 ***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.

16.9 ***Accessibility, marking and indication of ventilation controls***

The controls should be easily accessible as well as prominently and permanently marked and should indicate whether the shutoff is open or closed.

Regulation 17 - Fireman's outfit

17.1.1.1 ***Reference to ISO standard 6942: 1983***

Reference is made to ISO standard 6942: 1983 - Clothing for protection against heat and fire; evaluation of thermal behaviour of materials and material assemblies when exposed to source of radiant heat.

17.1.1.2 ***Reference to IEC standard 903 - 1988***

Reference is made to IEC standard 903 - 1988 - Specification for gloves and mats of insulating material for live working.

17.1.1.4 ***Reference to IEC Publication 79***

Electric safety lamps on tankers and those intended to be used in hazardous areas should be of an explosion-proof type. Reference is made to IEC Publication 79.

17.1.1.5 ***Handle of axe***

The handle of the axe should be provided with high-voltage insulation.

17.1.2.2 ***Spare charges and recharging of air cylinders for breathing apparatus***

1 Two spare charges suitable for use with the breathing apparatus should be provided for each required apparatus.

2 If passenger ships carrying not more than 36 passengers and cargo ships are equipped with suitably located means for fully recharging the air cylinders free from contamination, only one spare charge is required for each required apparatus.

17.2 ***Fireproof lifeline for breathing apparatus***

Each breathing apparatus should be provided with a flexible fireproof lifeline, about 30 m in length. The lifeline should be subjected to a test by statical load of 3.5 kN for 5 min.

17.4 ***Storage of fireman's outfits and marking of location***

The places for storage of fireman's outfits and personal equipment should be permanently and clearly marked.

Regulation 18 - Miscellaneous items

18.1.1 ***Prevention of heat transmission, details of insulation and cable penetrations***

1 To prevent heat transmission at intersections and terminal points, the insulation of the deck or bulkhead should be carried past the intersection or terminal point for a distance of at least 450 mm in the case of steel and aluminium structures (see also figures 1 and 2 of regulation 26.4 in the appendix).

2 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 should continue on the deck or bulkhead with the insulation of the lesser value for a distance of at least 450 mm (see also interpretation 2~~s~~ of regulation II-2/26.4).

3 In cases where the lower part of the insulation has to be cut for drainage, the construction should be in accordance with the structural details in the appendix (see figure 3 of regulation 26.4 in the appendix).

4 Cable penetrations in "A" class divisions should be tested and approved in accordance with resolution A.754(18), appendix, A.IV.
For pipe penetrations, see interpretations of regulation II-2/18.2.1 and for duct penetrations, see interpretations of regulation II-2/16.

18.2.1 ***Materials other than steel or copper for pipe penetrations and melting point of materials***

1 Where pipes made of materials other than steel or copper are used on board, the following precautions should be taken:

.1 penetrations in "A" class divisions should be carried out in accordance with one of the following arrangements:

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

.2 a steel sleeve, having a thickness of not less than 4.5 mm and a length of not less than 900 mm (450 mm on each side of the division) should be provided at the penetration. The pipe should be connected to the ends of the sleeve by flanges or couplings; or the clearance between the sleeve and the pipe should not exceed 2.5 mm; or any clearance between pipe and sleeve should be made tight by means of non-combustible or other suitable material;

.3 reference is made to resolution A.753(18) and the Fire Test Procedures Code.

.2 penetrations in "B" class divisions should be carried out in accordance with one of the following arrangements:

.1 a fire tested penetration device, suitable for the fire resistance of the division pierced and the type of pipe used, should be provided at the penetration; 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 (equally divided to each side of the bulkhead). The pipe should be connected to the ends of the sleeve by flanges or couplings; or the clearance between the sleeve and the pipe should not exceed 2.5 mm; or any clearance between pipe and sleeve should be made tight by means of non-combustible or other suitable material.

2 Uninsulated metallic pipes penetrating A-0 or B-0 class divisions should be of suitable material, the melting temperature of which exceeds 950°C for A-0 and 850°C for B-0 class divisions.

18.3 ***Reference to IEC Publication 92***

Reference is made to Publication 92 - Electrical Installations in Ships, published by the International Electrotechnical Commission.

18.6 ***Surface protection of insulation***

The fire insulation in such spaces can be covered by metal sheets (not perforated) or by vapour proof glass cloth accurately sealed at the joint.

18.7 ***Fire-extinguishing arrangement in lockers***

1 Paint lockers and flammable liquid lockers should be provided with a fire-extinguishing arrangement enabling the crew to extinguish a fire without entering the space.

2 For lockers of deck areas of 4 m^2 or more and for those lockers with access to accommodation spaces, one of the fixed arrangements specified below should be provided:

- CO_2 system, designed for 40 % of the gross volume of the space; or
- dry powder system, designed for at least 0.5 kg powder/m^3; or
- water spraying or sprinkler system, designed for 5 *l*/m^2 min.

3 Water spraying systems may be connected to the fire main of the ship.

4 Systems or arrangements other than those mentioned above may be accepted.

5 For lockers of a deck area of less than 4 m^2, which do not give access to accommodation spaces, CO_2 portable fire extinguisher(s) sized in accordance with 2 above, which can be discharged through a port in the boundary of the lockers may be accepted. The required portable fire extinguishers should be stowed adjacent to the port. Alternatively, a port or hose connection may be provided for this purpose to facilitate the use of fire main water.

Regulation 19 - International shore connection

19 ***Reference to resolution A.470(XII)***

Reference is made to resolution A.470 (XII) - International shore connection (shore side).

Regulation 20 - Fire control plans and fire drills

20 ***Reference to resolution A.654(16)***

Reference is made to resolution A.654 (16) - Graphical symbols for fire control plans and resolution A.756(18) - Guidelines on the information to be provided with fire control plans and booklets required by SOLAS regulations II-2/20 and 41-2.

20.2 ***Reference to MSC/Circ.451***

Reference is made to MSC/Circ.451 - Guidance concerning the location of fire control plans for assistance of shoreside fire fighting personnel.

PART B - FIRE SAFETY MEASURES FOR PASSENGER SHIPS

Regulation 23 - Structure

23.2.1 ***Insulation of aluminium decks and interpretation of "load-bearing divisions"***

1 When spaces of category (1) to (10) in regulation II-2/26 or of category (1) to (5) and (10) in regulation II-2/27 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 a not readily ignitable deck covering.

2 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.

23.3 ***Insulation of crowns and casings of machinery spaces of category A***

Crowns and casings of machinery spaces of category A should be insulated in compliance with the tables in regulations II-2/26 and II-2/27. Accordingly, crowns and casings exposed to air need not be insulated, except those facing category (4) deck areas of regulation II-2/26.

Regulation 24 - Main vertical zones and horizontal zones

24 ***Definitions of "main vertical zone"***

Definitions of "main vertical zone" are given in regulations II-2/3.9 and II-2/3.33.

24.5.1 ***Reference to other requirements and protection of service spaces and ship stores on ro-ro decks***

1 Special requirements for the spaces concerned are given in regulations II-2/37, 38 and 38-1.

2 Service spaces and ship stores should not be located on ro-ro decks unless protected in accordance with the applicable regulations.

Regulation 25 - Bulkheads within a main vertical zone

25.2.1 ***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 class standard, 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).

25.2.2 ***Fire integrity of bulkheads, ceilings, doors and door frames***

1 Such bulkheads and ceilings should be of "B" class standard in compliance with regulation II-2/27.

2 Doors and door frames should have the fire integrity of the bulkhead in which they are fitted.

25.3 ***Reference to MSC/Circ. 669***

Reference is made to MSC/Circ. 669 - Interpretations of SOLAS chapter II-2 as amended by resolution MSC.27(61).

Regulation 26 - Fire integrity of bulkheads and decks in ships carrying more than 36 passengers

26.2 ***Separating partial bulkheads of spaces and enclosed promenades***

1 If a space is divided into two (or more) smaller spaces so that these new spaces form enclosed spaces (e.g. a cabinet built in a restaurant, a store room built in a restaurant), then these new enclosed spaces should be surrounded by fire-resistant bulkheads and decks in accordance with regulations II-2/26 or 27, as applicable. However, if the separating bulkheads of such spaces have at least 30% openings, then these spaces are not considered as being separate spaces.

2 Enclosed promenades should have no significant fire risk, meaning that furnishing should be restricted to deck furniture. In addition, such spaces should be naturally ventilated by permanent openings.

26.2.2 ***Insulation values of spaces with special characters of two or more space categories and separating by wire mesh***

1 In case a space has the special characters of two or more space categories of regulation II-2/26.2.2 or 27.2.2, the insulation values of the divisions of such a space should be the highest for the space categories concerned.

For example:

.1 *The fire insulation values of the divisions of emergency generator rooms in passenger ships carrying more than 36 passengers should be the highest value for the space when the space is considered being a control station (category (1)) and a machinery space (category (11) or (12)).*

.2 *The fire insulation of the division of a public space which is also used as an internal muster station in passenger ships carrying more than 36 passengers should be taken as the highest value for the space when considered as an*

accommodation space (categories (6), (7) or (8)) and a muster station (category (4)).

2 A separation made by wire mesh between two portions of a space is not considered a division in applying this regulation.

(See also interpretations of regulation II-2/44.2.2).

26.2.2 (2) ***Category of enclosed emergency escape trunks***

A totally enclosed emergency escape trunk belongs to the space category (2). (See also interpretations of regulations II-2/27.2.2 (4), 44.2.2 (4) and 58.2.2 (4)).

26.2.2 (7) ***Devices in diet kitchens***

Diet kitchens (containing no open flame) should be in compliance with the interpretations for pantries as stated under regulation II-2/3.10.

26.2.2 (8) ***Construction and arrangements of saunas***

1 A sauna is a hot room where the heat of that space is provided with a hot surface (e.g. electrically heated oven). The term "sauna" means here the space where the oven is located, and it may also include the bath room. The temperature in the sauna is normally between 80-120ºC.

2 The perimeter of the sauna should be of "A" class boundaries and may include changing rooms, showers and toilets. The hot room should be insulated to A-60 standard against other spaces except those inside of the perimeter and spaces of categories (5), (9) and (10).

3 The bath room which has direct access to the sauna (hot room) may be considered as a part of the sauna (hot room). In such a case, there are no fire safety requirements to the door between sauna (hot room) and the bath room.

4 The traditional wooden lining on the bulkheads and ceiling are permitted in the sauna. The ceiling above the oven should be lined with a non-combustible plate with an air gap of at least 30 mm. The distance from the hot surfaces to combustible materials should be at least 500 mm or the combustible materials should be protected (e.g. non-combustible plate with an air gap of at least 30 mm).

5 The traditional wooden benches are permitted to be used in the sauna.

6 The sauna door should open outwards by pushing.

7 An electrically heated oven should be provided with a timer.

26.2.2 (9) ***Devices in isolated pantries containing no cooking appliances***

For isolated pantries containing no cooking appliances, see interpretations to regulation II-2/3.10.

26.2.2 (10) ***Open cofferdams***

If a cofferdam is open to some other space, it is considered to be part of that other space.

26.3 ***Continuous "B" class ceilings and linings as part of insulation***

Continuous "B" class ceilings and linings may be accepted as contributing to the required insulation of a division (combination of steel deck or bulkhead and ceiling or lining) providing that they are fire tested in accordance with the applicable test procedure (e.g. resolution A.754 (18)).

26.4 ***Prevention of heat transmission by insulation and structural details for drainage***

1 To prevent heat transmission at intersections and terminal points, the insulation of the deck or bulkhead should be carried past the intersection or terminal point for a distance of at least 450 mm in the case of steel and aluminium structures (see also figures 1 and 2 of regulation 26.4 in the appendix).

2 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 should continue on the deck or bulkhead with the insulation of the lesser value for a distance of at least 450 mm.

3 In 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 of regulation 26.4 in the appendix.

Regulation 27 - Fire integrity of bulkheads and decks in ships carrying not more than 36 passengers

27.2 ***Separating partial bulkheads of spaces, and enclosed promenades***

See interpretations ~~2~~ of regulation II-2/26.2.

27.2.2 ***Insulation values of spaces with special characters of two or more space categories and separating by wire mesh***

See interpretations of regulation II-2/26.2.2.

27.2.2 (4) ***Category of enclosed emergency escape trunks***

A totally enclosed emergency escape trunk belongs to the space category (4). (See also interpretation of regulation II-2/26.2.2(2)).

27.2.2 (9) ***Construction and arrangements of saunas***

See interpretations of regulation II-2/26.2.2 (8) concerning sauna arrangements, where in interpretation 2 the space categories should be (5), (7) and (10).

Table 27.1 ***Interpretation of machinery spaces having little or no fire risk and construction of steel***
Table 27.2 ***decks***

1 For the definition of machinery spaces having little or no fire risk in footnote "f", see regulation II-2/26.2.2 (10).

2 Where an asterisk appears in table 27.2, the deck is required to be of steel or other equivalent material but is not required to be of "A" class standard. However, where such a deck, except an open deck, is penetrated for the passage of electric cables, pipes and vent ducts, such penetrations should be made tight to prevent the passage of flame and smoke.

27.3 ***Continuous "B" class ceilings and linings as part of insulation***

See interpretations of regulation II-2/26.3.

Regulation 28 - Means of escape

28 ***Opening direction of doors along escape routes***

The doors along escape routes should not, in general, open against the escape flow. The following exceptions should be noted:

.1 the cabin doors may, in general, open into the cabins in order to avoid damage to persons in a corridor when the door is opened; and

.2 the doors in vertical emergency escape trunks should, in general, open out of the trunk in order to permit the trunk to be used both for escape and for access.

28.1.1 ***Spaces with only one means of escape***

Spaces which are entered only occasionally by crew members may have only one means of escape. This sole means of escape should be independent of watertight doors.

28.1.4 ***Dead-end corridors in special areas and recess or enlargement of corridors***

1 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, should be permitted, provided

such dead-end corridors are separated from crew accommodation areas and are inaccessible from passenger accommodation areas.

2 Recess means local extension or enlargement of a corridor. A recess should not have a depth greater than its width. All other arrangements are considered dead-end corridors.

28.1.5.1 ***Reference to resolution A.757(18)***

Reference is made to resolution A.757(18) - Standards for the calculation of the width of stairways forming means of escape on passenger ships.

28.1.5.5 ***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 regulation II-2/28.1.5.5. However, if landings can not be entered by entrance doors, such landings should be considered as intermediate landings which should comply with the capacity requirements as given in regulation II-2/28.1.5.3.

28.1.6 ***Access from stairway enclosures to embarkation areas***

Access from the stairway enclosures to the lifeboat and liferaft embarkation area should be provided either directly or through an internal route which has fire integrity and insulation values for stairway enclosures as determined by the tables in regulations II-2/26 and 27.

28.1.8 ***Size of enclosed means of escape***

In applying resolution A.757(18) such enclosed means of escape are to be sized taking into account the total number of persons at each level of the public space considered.

28.2.1 ***Walkways in special category spaces***

Special category spaces used for stowage of motor vehicles should be provided with walkways to the means of escape with a breadth of at least 600 mm.

28.3.1.1.1 ***Arrangement and protection of means of escape***

1 One of the means of escape required by regulation II-2/28.3.1.1.1 should be arranged as follows:

.1 it should be enclosed and insulated as required for spaces of regulation II-2/26.2.2 category (2) or 27.2.2 category (4) against the space it serves. Ladders should be fixed in such a way that heat cannot, in case of a fire in the machinery space, be transferred to the ladder through non-insulated fixing points;

.2 it should have a self-closing door at its lowest point having the fire integrity of the bulkhead in which it is fitted. If there are other exits to this trunk, they should also be provided with such doors;

.3 it should be provided with emergency lighting; and

.4 it should have a free opening of at least 800 mm x 800 mm. The ladder may be included in that area.

2 Ladders having strings of flexible steel wire ropes are not acceptable in such escape routes.

28.3.2 ***Number of means of escape in auxiliary machinery spaces and steering gear spaces***

1 For ships of 1,000 gross tonnage and above, auxiliary machinery spaces where persons are not normally employed may be dispensed with one means of escape.

2 In the steering gear space, a second means of escape should be provided when the emergency steering position is located in that space unless there is direct access to the open deck.

Regulation 29 - Protection of stairways and lifts in accommodation and service spaces

29.1.1 ***Self-closing type doors***

The door provided at this stairway enclosure should be of self-closing type.

29.2 ***Location of hazardous safety equipment, accessibility and size of corridors or lobbies for mustering of fire parties and application of regulation II-2/29.2 to lifts***

1 Safety equipment which may be hazardous (such as rockets) should not be accepted to be located in stairway enclosures. (See also interpretation 1~~s~~ of regulations II-2/34.6 and 41-2.4.10).

2 Small corridors or "lobbies" used to separate an enclosed stairway from galleys or main laundries may have direct access to the stairway and should be adequately sized to support the mustering of a fire party. In general, adequate size should be a minimum deck area of 4.5 m^2 and a width of no less than 0.9 m. Such small corridors should be treated as category (3) spaces of regulation II-2/26.2.2 or category (2) spaces of regulation II-2/27.2.2 and contain a fire hose station. The spaces which open to these small corridors should have means of escape in accordance with regulation II-2/28.

3 Regulation II-2/29.2 does not need to be applied to lifts.

29.3 ***Arrangements for lift machinery rooms and lifts serving different categories of spaces***

1 For lifts totally within stairway enclosures, the relevant machinery should be arranged in a separate room, surrounded by steel boundaries, except that small passages for lift cables are permitted.

2 Lifts which open on some decks into spaces other than corridors, public spaces, special category spaces, stairways and external areas (e.g. provision rooms, galleys, laundries, machinery spaces, etc.) can not open on other decks into stairways included in the means of escape.

Regulation 30 - Openings in "A" class divisions

30.2 ***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.

30.7 ***Doors where a hose port is not required***

The requirement to fit a hose port should not apply to watertight doors, below or above bulkhead deck, weathertight doors (semiwater tight doors), doors leading to the open deck and to doors which need to be reasonably gastight (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).

Regulation 31 - Openings in "B" class divisions

31.1 ***Air balance ducts below sanitary units leading through corridor bulkheads***

Alternatively, a non-combustible air balance duct arrangement between a cabin and a corridor which is located below the sanitary unit leading through the corridor bulkhead is permitted in order to achieve air balance of supply and exhaust air for the cabin under the condition that the cross-sectional area of the duct does not exceed 0.05 m^2.

Regulation 32 - Ventilation systems

32.1.7 ***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.

32.1.8 ***Location of hatches for inspection and cleaning in ventilation ducts***

These hatches need to be provided only in exhaust ducts and should be located in the vicinity of the fire dampers.

32.1.9 ***Application to all galley range ducts***

The requirements for exhaust ducts from galley ranges in which grease or fat is likely to accumulate, should apply to all exhaust ducts from galley ranges.

32.1.9.2 ***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 interpretations of regulation II-2/41-2.4.3.2).

2 "Upper end of the duct" means a position close to the outlet of the duct.

32.1.9.4 ***Means of closing for multibranch systems in galley range ducts***

The means for closing the ends of multibranch systems should be remote controlled from a position close to the remote controls listed in this regulation.

32.1.9.5 ***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.

(See also interpretations of regulation II-2/41-2.4.3.5).

Regulation 33 - Windows and side scuttles

33.2 ***Reference to ISO standards on windows and side scuttles***

Reference is made to the following ISO standards:

ISO 614	Shipbuilding and marine structures: Toughened safety glass panes for rectangular windows and side scuttles: Punch method of non-destructive strength testing (Identical with ISO 614: 1989).
ISO 1095	Shipbuilding - Toughened safety glass panes for ship's side scuttles
ISO 1751	Shipbuilding - Ship's side scuttles
ISO 3254	Shipbuilding - Toughened safety glass panes for ships' rectangular windows
ISO 3903	Shipbuilding - Ships' ordinary rectangular windows
~~ISO 81660~~	~~Clear view screens (Part 1) - ISO Type A: dimensions, construction~~

~~(Part 2) - ISO-Type A: glass disk~~

Other equivalent standards may be used.

33.3 **Alternative dedicated sprinkler heads**

In case of a conventional sprinkler system complying with regulation II-2/12, a sprinkler head contributing to the required spraying density of 5 l/m^2 min should be accepted as dedicated sprinkler head if arranged such that the window (pane) is covered with the same spraying density and if the window area is considered in the calculation as per paragraph 3.

Regulation 34 - Restricted use of combustible materials

34 ***Reference to MSC/Circ. 602***

Reference is made to MSC/Circ. 602 - Materials used for bulkheads in accommodation spaces defined in regulation II-2/3.10 of the 1974 SOLAS Convention.

34.1 ***Material of floor platings in machinery spaces of category A and separating "partial bulkheads" of spaces***

1 The floor plating of normal passageways in machinery spaces of category A should be made of steel.

2 With respect to "partial bulkheads" see interpretation 1~~s~~ of regulation II-2/26.2.

34.2 ***Meaning of "cold service systems"***

Cold service is understood to mean refrigeration systems and chilled water piping for air-conditioning systems. (See also interpretations of regulation II-2/50.3.1).

34.4 ***Application to furniture***

Furniture fixed to linings, walls or decks need not be included in the calculation of the maximum values for combustible material and calorific values.

34.5 ***Application to surfaces of furniture***

The requirements of this paragraph are not applicable to the surfaces of furniture fixed to the wall.

34.6 ***Location of hazardous safety equipment and arrangements of drinking water dispensers, ice cube machines and decorative***

1 Safety equipment which may be hazardous (such as rockets) should not be accepted to be located in stairway enclosures. (See also interpretations 1 of regulations II-2/29.2 and 41-2.4.10).

2 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 d'art such as paintings and tapestries in corridors and staircasings. (See also interpretation 2 of regulation II-2/41-2.4.10).

Regulation 35 - Details of construction

35.1.1 ***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 "A" class 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 In general, the draught stops should coincide with the bulkheads where continuous ceilings are used.

3 Draught stops are not required in public spaces with open ceilings (perforated ceilings) with openings of 40% or more and arranged in such a way that a fire behind the ceiling can be seen and extinguished.

Regulation 36 - Fixed fire detection and fire alarm systems and automatic sprinkler, fire detection and fire alarm systems

36.1.2 ***Reference to resolution A.800(19)***

Reference is made to resolution A.800(19) - Revised guidelines for approval of sprinkler systems equivalent to that referred to in SOLAS regulation II-2/12.

36.2 ***Smoke detection systems or sprinkler systems in CO_2 rooms and reference to resolution A.800(19)***

1 Reference is made to resolution A. 800(19) - Revised guidelines for approval of sprinkler systems equivalent to that referred to in SOLAS regulation II-2/12.

2 CO_2 rooms need not be protected by a smoke detection system or a sprinkler system.

Regulation 37 - Protection of special category spaces

37.1.3 ***Reference to resolution A.123(V) and complementary devices for fire-extinguishing systems including instructions for maintenance and operation***

1 Reference is made to resolution A.123(V) - Recommendation on fixed fire-extinguishing systems for special category spaces.

2 Such systems should fulfill the following requirements:

.1 the valve manifold should be provided with a pressure gauge and each of the valves should be marked;

.2 instructions for maintenance and operation of the installation should be set up in the room where the valves are located; and

.3 the piping system should be provided with a sufficient number of drainage valves.

37.1.4.1 ***Fixed fire detection systems, if fitted, in special category spaces***

1 If a fixed fire detection system is fitted in special category spaces, a smoke detection and alarm system or systems equally effective which are approved by the Administration should be provided.

2 The fire detection system, excluding manual call points, may be switched off with a timer during loading/unloading of vehicles to avoid "false" alarms.

37.1.4.2 ***Spacing of manually operated call points***

Manually operated call points should be spaced so that no part of the space is more than 20 m from a manually operated call point.

37.1.5.1 ***Construction of water fog applicators***

See interpretations of regulation II-2/7.6.

37.1.5.3 ***Location of portable fire extinguishers including suitability and capacity***

1 Portable extinguishers should be provided at each car and platform deck level in each hold or compartment where vehicles are carried, spaced not more than 20 m apart on both sides of the special category space.

2 The fire extinguishers in special category spaces should be suitable for "A" and "B" class fires. The extinguishers should have a capacity of 12 kg dry powder or equivalent. (See also interpretations of regulation II-2/38.2.3).

37.1.6.1 ***Reference to MSC/Circ.729***

Reference is made to MSC/Circ.729 - Design guidelines and operational recommendations for ventilation systems in ro-ro cargo spaces.

37.1.6.3 ***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. (See also interpretations of regulation II-2/38.3.3).

37.1.6.4 ***Location of shutdown arrangements***

These operations should be possible without entering the special category space. (See also interpretations of regulation II-2/38.3.4).

37.1.6.5 ***Construction of ventilation ducts of special category spaces***

1 Ventilation ducts of a special category space passing through another special category space:

.1 which is not part of the same horizontal zone should be constructed of steel in accordance with regulations II-2/16.3.1.1. and 16.3.1.2 and should be fire insulated to A-60 class standard; and

.2 which is part of the same horizontal zone should be constructed of steel.

2 Ventilation ducts should not pass through machinery spaces unless fire insulated to A-60 class standard.

(See also interpretations of regulation II-2/38.3.5).

37.2.1 ***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 II-2/4.5.1 and 54.1.2, as applicable, should be taken into account.

37.2.2.1 ***Degree of protection of electrical equipment***

1 For equipment above a height of 450 mm above deck:

The degree of protection of electrical equipment required by this regulation will be realised:

.1 by an enclosure of at least IP 55 as defined in IEC Publication 529 - Classification of Degree of Protection Provided by Enclosures; or

.2 by apparatus for use in zone 2 areas as defined in IEC Publication 79 - Electrical Apparatus for Explosive Gas Atmospheres (Temperature Class T3).

2 For equipment at or below a height of 450 mm above deck:

The electrical equipment referred to in this regulation 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 79 - Electrical Apparatus for Explosive Gas Atmospheres - (Gas Group II A and Temperature Class T 3). (See also interpretations of regulations II-2/37.3.2.1 and 38.4.1).

37.2.2.2 ***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 79 - Electrical Apparatus for Explosive Gas Atmospheres (Gas Group II A and Temperature Class T 3).

2 Exhaust fans should be of non-sparking type in accordance with IACS Requirement F 29, as revised.

(See also interpretations 1 and 2 of regulations II-2/37.3.2.2 and 38.4.2).

37.3.1 ***Size of pumping and drainage arrangements***

1 Pumping and drainage arrangements should be such as to prevent the accumulation of water on any such decks (Reference is made to regulation 22 of the 1988 LL Protocol).

2 In respect of scuppers and drainage pumps, the following should be complied with:

.1 When calculating the amount of water the capacity of both the water spraying system pumps and required number of fire hose nozzles should be taken into account.

.2 The drainage system should have a capacity of not less than 125 % of the capacity specified in .1 above.

.3 The valves of the drainage arrangement should be operable from outside the protected space at a position in the vicinity of the drencher system controls. Bilge wells should be of sufficient holding capacity and should be arranged at the side shell of the ship at a distance from each other of not more than 40 m in each watertight compartment.

37.3.2.1 ***Degree of protection of electrical equipment***

The electrical equipment referred to in this regulation 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 79 - Electrical Apparatus for Explosive Gas Atmospheres - (Gas Group II A and Temperature Class T 3). (See also interpretation 2 of regulation II-2/37.2.2.1 and interpretation of regulation II-2/38.4.1).

37.3.2.2 ***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 79 - Electrical apparatus for explosive gas atmospheres (Gas group II A and Temperature class T 3).

2 Exhaust fans should be of non-sparking type in accordance with IACS Requirement F 29, as revised. (See also interpretations 1 and 2 of regulations II-2/37.2.2.2 and 38.4.2).

Regulation 38 - Protection of cargo spaces, other than special category spaces, intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion

38.2.3 ***Location, suitability and capacity of portable fire extinguishers***

1 Portable extinguishers should be provided at each car and platform deck level in each hold or compartment where vehicles are carried, spaced not more than 20 m apart on both sides of the cargo space.

2 The fire extinguishers in such cargo spaces should be suitable for "A" and "B" class fires. The extinguishers should have a capacity of 12 kg dry powder or equivalent.

(See also interpretations of regulation II-2/37.1.5.3.)

38.3.3 ***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. (See also interpretations of regulation II-2/37.1.6.3).

38.3.4 ***Location of shutdown arrangements***

These operations should be possible without entering the cargo space. (See also interpretations of regulation II-2/37.1.6.4).

38.3.5 ***Construction of ventilation ducts of motor vehicle cargo spaces***

1 Ventilation ducts of such a cargo space passing through another cargo space:

.1 which is not part of the same horizontal zone should be constructed of steel in accordance with regulations II-2/16.3.1.1. and 16.3.1.2 and should be fire insulated to A-60 standard; and

.2 which is part of the same horizontal zone should be constructed of steel.

2 Ventilation ducts should not pass through machinery spaces unless fire insulated to A-60 standard.

(See also interpretations of regulation II-2/37.1.6.5).

38.4.1 ***Degree of protection of electrical equipment***

The electrical equipment referred to in this regulation 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 79 - Electrical apparatus for explosive gas atmospheres (Gas group II A and Temperature class T 3). (See also interpretation 2 of regulation II-2/37.2.2.1 and interpretations of regulation II-2/37.3.2.1).

38.4.2 ***Degree of protection of electrical equipment in exhaust ventilation duct 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 79 - Electrical apparatus for explosive gas atmospheres (Gas group II A and Temperature class T 3).

2 Exhaust fans should be of non-sparking type in accordance with IACS Requirement F 29, as revised.

(See also interpretations 1 and 2 of regulations II-2/37.2.2.2 and 37.3.2.2).

Regulation 39 - Fixed fire-extinguishing arrangements in cargo spaces

39.2 ***Alternative arrangements in case of exemptions***

Such exemptions may be granted only if the ship is fitted with steel hatch covers and effective means of closing all ventilators and other openings leading to the cargo spaces.

Regulation 40 - Fire patrols, detection, alarms and public address systems

40.5 ***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 cargo 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 79 - 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 check list. If necessary, extra antennas should be fitted to obtain effective communication.

(See also interpretations 1 and 2 of regulation II-2/41-2.1.2).

Regulation 41-2 - Requirements for passenger ships carrying more than 36 passengers constructed before 1 October 1994

41-2.1.1 ***Reference to resolution A.654(16) and resolution A.756(18)***

Reference is made to resolution A.654 (16) - Graphical symbols for fire control plans and resolution A.756(18) - Guidelines on the information to be provided with fire control plans and booklets required by SOLAS regulations II-2/20 and 41-2.

41-2.1.2 ***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 cargo 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 79 - 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 check list. If necessary, extra antennas should be fitted to obtain effective communication.

(See also interpretations 1 and 2 of regulation II-2/40.5).

41-2.3 ***Spacing of smoke detectors above ceilings***

The spacing of smoke detectors above ceilings should be in accordance with regulation II-2/13.2.5 unless the presence of draught stops requires closer spacing.

41-2.4.2 ***Application to doors***

The requirement set out in this paragraph should be applied to all doors (except doors normally kept locked) of stairway enclosures, main vertical zone bulkheads and galley boundaries.

41-2.4.3.2 ***Meaning of "lower end of the duct"***

"Lower end of the duct" means a position at the junction between the duct and the galley range hood. (See also interpretation 1 of regulation II-2/32.1.9.2).

41-2.4.3.5 ***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.

(See also interpretations of regulation II-2/32.1.9.5).

41-2.4.4 ***Meaning of "within a stairway enclosure"***

A space is considered "within a stairway enclosure" when it is completely located within the fire rated boundaries of the stairway. Such a space is treated, for fire protection purposes, as a stairway.

41-2.4.4.2 ***Supply of sprinkler system and meaning of "directly open into"***

1 On ships referred to in regulation II-2/41-1.3, this sprinkler system may be achieved by a sufficient connection from the ship's fire main or other suitable water line. The valve of this sprinkler system should be located outside of this space. The system may be manually operated.

2 The words "directly open into" have the same meaning as the words "direct access to".

41-2.4.5 ~~***Location of hazardous safety equipment, accessibility and size of corridors or lobbies for***~~

~~***mustering of fire parties and application of regulation II-2/29.2 to lifts***~~***Escape stairway from machinery spaces***

An enclosed escape stairway from machinery spaces may have direct access to a main stairway provided that the stairway from the machinery space is enclosed by "A" class divisions as required for spaces of regulation II-2/26.2.2 category (2) or regulation II-2/27.2.2 category (4~~). (See also interpretation 2 of regulation II-2/29.2).~~.

41-2.4.10 ***Location of hazardous safety equipment and arrangements of drinking water dispensers, ice cube machines and decoratives***

1 Safety equipment which may be hazardous (such as rockets) should not be accepted to be located in stairway enclosures. (See also interpretation 1 of regulations II-2/29.2 and 34.6).

2 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 d'art such as paintings and tapestries in corridors and staircasings. (See also interpretation 2 of regulation II-2/34.6).

41-2.5 ***Reference to resolution A.800(19)***

Reference is made to resolution A.800(19) - Revised guidelines for approval of sprinkler systems equivalent to that referred to in SOLAS regulation II-2/12.

41-2.6.1 ***Application to all penetrations at stairway boundaries and general lay-out of escape routes***

1 The requirement for "A" class integrity applies also to all penetrations at stairway boundaries.

2 The requirements set out in this paragraph do not refer to the general layout of the escape routes as approved by the Administration.

41-2.6.5 ***Clarification on applicable requirements for fire doors***

This paragraph applies mainly to the sliding doors as hinged fire doors are covered by paragraph 4.1 of this regulation. The doors should, in general, satisfy the closing requirements of regulation II-2/30.4

PART C - FIRE SAFETY MEASURES FOR CARGO SHIPS

Regulation 42 - Structure

42.4 ***Insulation of crowns and casings of machinery spaces of category A***

Crowns and casings of machinery spaces of category A should be insulated in compliance with regulation II-2/44 and for tankers with regulation II-2/58. Accordingly, crowns and casings exposed to air need not be insulated.

42.5.3 ***Increased areas of public spaces***

The area of public spaces may be permitted to increase up to 75 m^2.

Regulation 43 - Bulkheads within the accommodation and service spaces

43.4 ***Increased area of public spaces***

The area of public spaces may be permitted to increase up to 75 m^2.

Regulation 44 - Fire integrity of bulkheads and decks

44.2 ***Separating partial bulkheads of spaces, and enclosed promenades***

1 If a space is divided into two (or more) smaller spaces so that these new spaces form enclosed spaces (e.g. a cabinet built in a mess-room, a store room built in a mess-room), these new enclosed spaces should be surrounded by fire-resistant bulkheads and decks in accordance with this regulation. However, if the separating bulkheads of such spaces have at least 30% openings, these spaces are not considered to be separate spaces. (See also interpretation 1 of regulation II-2/26.2).

2 Regarding enclosed promenades, reference is made to interpretation ~~to~~2 of regulations II-2/26.2~~, 27.2~~ and 58.2.

44.2.2 ***Insulation values of spaces with special characters of two or more space categories and separating by wire mesh***

1 In case a space has the special characters of two or more space categories of this regulation, the insulation values of the divisions of such a space should be the highest for the space categories concerned.

2 A separation made by wire mesh between two portions of a space is not considered a division in applying this regulation.

(See also interpretations of regulation II-2/26.2.2).

44.2.2(4) ***Category of enclosed emergency escape trunks***

A totally enclosed emergency escape trunk belongs to the space category (4). (See also interpretations of regulations II-2/26.2.2 (4), 27.2.2 (4) and 58.2.2 (4)).

44.2.2(7) ***Category of electrical equipment rooms***

Electrical equipment rooms (auto-telephone, exchange, air-conditioning duct spaces) are also category (7) spaces. (See also interpretations of regulation II-2/58.2.2(7)).

44.2.2(8) ***Category of weather decks used for cargo stowage***

With respect to the fire integrity, weather decks used for cargo stowage should be considered as category (8) spaces except for cargoes which constitute a low fire risk.

44.2.2(9) ***Construction and arrangements of saunas***

See interpretations to regulation II-2/26.2.2(8) concerning sauna arrangements where in interpretation 2 the space categories should be (5), (7) and (10).

Table 44.1 ***Alternative for means of closure in divisions of steel between control stations (emergency generator) and open decks***

The required division of steel between control stations and open decks may in the case of an emergency generator be provided with openings for intake of combustion air to the diesel engine and for intake of cooling air in the case of an air cooled diesel engine. These openings need not be fitted with means for closure for fire integrity purposes, unless a fixed gas fire-fighting system for the emergency generator space is fitted. (See also interpretations of table 58.1).

Table 44.2 ***Construction of steel decks***

Where an asterisk appears in table 44.2 of regulation II-2/44, the deck is required to be of steel or other equivalent material but is not required to be of "A" class standard. However, where such a deck, except an open deck, is penetrated for the passage of electric cables, pipes and vent ducts, such penetrations should be made tight to prevent the passage of flame and smoke. (See also interpretations of table 58.2).

Table 44.2, note i ***Meaning of "machinery spaces having little or no fire risk"***

For the definition of machinery spaces having little or no fire risk, see regulation II-2/26.2.2 (10).

44.3 ***Continuous "B" class ceilings and linings as part of insulation***

Continuous "B" class ceilings and linings may be accepted as contributing to the required insulation of a division (combination of steel deck or bulkhead and ceiling or lining) provided that they are fire tested in accordance with the applicable fire test procedure (e.g. resolution A.754 (18)).

Regulation 45 - Means of escape

45 ***Arrangements of doors along escape routes and accessibility of 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) and that the doors in the way of escape routes can be opened from both sides.

2 The embarkation deck should be accessible from the open decks to which escapes routes lead.

3 The doors along the escape routes should not, in general, open against the escape flow. Especially, the following exceptions should be noted:

.1 the cabin doors may, in general, open into the cabins in order to avoid damage to persons in a corridor when the door is opened; and

.2 the doors in the vertical emergency escape trunks should, in general, open out of the trunk in order to permit the trunk to be used both for escape and for access.

45.1.2.1 ***Arrangements of escape routes in accommodation areas***
45.1.2.2

Escape routes in the accommodation area may consist of:

.1 two stairways protected according to regulation II-2/46.1 and its interpretation in combination with doors in the outer boundaries on starboard and portside of the deckhouse at least two levels from where the lifeboat or liferaft embarkation area can be easily reached (see figure 1 of regulations 45.1.2.1/1.2.2 in the appendix) or;

.2 one stairway protected according to regulation II-2/46.1 and its interpretation in combination with at least one door in the outer boundary of the deckhouse at each level and a stair or escape hatch directly to the open deck from those parts of the accommodation which are situated below the lowest open deck (see figure 2 of regulations 45.1.2.1/1.2.2 in the appendix).

45.1.3 ***Means of escape from spaces entered occasionally and from steering gear spaces***

1 Spaces which are entered only occasionally by crew members may have only one means of escape. This sole means of escape should be independent of watertight doors.
(See also interpretations of regulation II-2/28.1.1).

2 In the steering gear space a second means of escape should be provided when the emergency steering position is located in that space unless there is direct access to the open deck. (See also interpretation 2 of regulation II-2/28.3.2).

45.1.4 ***Design of dead-end corridors***

Dead-end corridors, where they can not be avoided, should be so designed that persons do not easily enter such corridors in cases of emergency.

45.1.5 ***Width and continuity of means of escape***

1 Stairways and corridors used as means of escape should be not less than 700 mm in clear width and should have a handrail on one side. Stairways and corridors with a clear width of 1800 mm and over should have handrails on both sides. Clear width is the distance between the handrail and the bulkhead on the other side or between the handrails. The angle of inclination of stairways should be, in general, 45° but not greater than 50º, in machinery spaces and small spaces not more than 60º.

2 Doorways which give access to a stairway should be of the same size as the stairway, in accordance with the minimum width as defined in interpretation 1 above.

45.2 ***Number and location of escape routes in ro-ro cargo spaces***

1 The escape (and access) routes should be so arranged that there are adequate escape routes also during loading and unloading.

2 At least one means of escape should be provided near the fore and aft ends of ro-ro cargo spaces.

45.3.1 ***Arrangement and protection of means of escape***

1 If a shelter is provided, it~~One of the means of escape required by regulation II-2/45.3.1~~ should be arranged as follows:

.1 it should be enclosed and insulated as required for spaces of regulation II-2/44.2.2 category (4) against the space it serves. Ladders should be fixed in such a way that heat cannot, in case of a fire in the machinery space, be transferred to the ladder through non-insulated fixing points;

.2 the self-closing door should have the fire integrity of the bulkhead in which it is fitted. If there are other exits to this trunk they should also be provided with such doors;

.3 it should be provided with emergency lighting; and

.4 it should have a free opening of at least 800 mm x 800 mm. The ladder may be included in that area.

2 Ladders having strings of flexible steel wire ropes are not acceptable in such escape routes.

45.4 ***Exception of fire shelters in machinery spaces of category A***

In ships of less than 1,000 gross tonnage, no fire shelter is required as a means of escape for machinery spaces of category A.

45.5 ***Number of escape routes from machinery spaces other than category A***

In general these machinery spaces should be provided with at least two escape routes. However, small spaces (e.g. maximum distance to the door is 5 m) or spaces which are entered only occasionally may be provided with only one escape exit.

Regulation 46 - Protection of stairways and lift trunks in accommodation spaces, service spaces and control stations

46.1 ***Construction of protected stairways***

1 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 46.1 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 46.1 in the appendix); or

.3 a stairway enclosure enclosing the stairs only, in combination with fully closed steel stairs, going from steel wall to steel wall and "A" class fire doors fitted at one end of each stair (see figure 2.2 of regulation 46.1 in the appendix).

2 Dumb-waiters are to be regarded as lifts.

46.2 ***Reduction of division standard***

The "A-0" requirements of paragraph 1 of regulation II-2/46 may be reduced to "B-0".

Regulation 47 - Doors in fire-resisting divisions

47.1 ***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.

47.3 ***Air balance ducts below sanitary units leading through corridor bulkheads and ventilation openings in doors of some special rooms***

1 Alternatively, a non-combustible air balance duct arrangement between a cabin and a corridor which is located below the sanitary unit leading through the corridor bulkhead is permitted in order to achieve air balance of supply and exhaust air for the cabin under the condition that the cross-sectional area of the duct does not exceed 0.05 m^2.

2 Ventilation openings may also be permitted in "B" class doors leading to lavatories, offices, pantries, lockers and store rooms.

Regulation 49 - Restricted use of combustible materials

49 ***Materials used on surfaces of bulkheads, ceilings and linings and of floor platings in machinery spaces of category A***

1 Bulkheads, ceiling and linings should comply with regulations II-2/49.1 and 49.2 regardless of the type of materials used; regulation II-2/49 applies regardless of the type of material. Other finishes used in exposed interior surfaces other than decking should comply with regulation II-2/49.2.

2 The floor plating and gratings of normal passageways at all levels in machinery spaces of category A should be made of steel or equivalent material.

49.2 ***Application to furniture***

This does not apply to furniture.

Regulation 50 - Details of construction

50.3.1 ***Meaning of "cold service systems"***

Cold service is understood to mean refrigeration systems and chilled water piping for air-conditioning systems. (See also interpretations of regulation II-2/34.2).

50.3.2 ***Application to surfaces of furniture***

The requirements of this paragraph are not applicable to the surfaces of furniture fixed to the wall.

50.3.3 ***Application to furniture***

Furniture fixed to linings or walls should not be included in the calculation of the maximum values for combustible material and calorific values.

50.3.4 ***Construction and location of draught stops***

With respect to the construction of draught stops, reference is made to the interpretations of regulations II-2/35.1.1 and 35.1.2.

Regulation 51 - Arrangements for gaseous fuel for domestic purposes

51 ***Location and ventilation of gaseous fuel systems***

Such systems should be approved by the Administration. No part of such systems should be located below the weather deck. The storage bottles should be located in a well ventilated box on open deck or in a well ventilated space which opens only to open deck.

Regulation 53 - Fire protection arrangements in cargo spaces

53.1.1 ***Cargo spaces for which a fixed fire-extinguishing system is ineffective***

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, table 2.

53.1.2 ***Exemptions when carrying cargoes listed in MSC/Circ.671***

For cargoes listed in the annex to MSC/Circ.671 which constitute a low fire risk, exemptions from regulation II-2/53.1.1 may be granted.

53.2.1 ***Arrangements for disconnecting detector sections during loading and unloading***

In case of smoke detectors, the detector sections in these spaces may be provided with an arrangement, e.g. a timer, for disconnecting detector sections during loading and unloading. The central unit should indicate whether the detector sections are disconnected or not. The time of disconnection should be adapted to the time of loading/unloading. Manual call points should not be capable of being disconnected by the arrangements referred to above.

53.2.2 ***Fire-extinguishing systems in ro-ro cargo spaces in ships of less than 2,000 gross tonnage***

Ro-ro cargo spaces in cargo ships of less than 2,000 gross tonnage should be fitted with a fixed fire-extinguishing system.

53.2.2.1 ***Location of sealing arrangements for ro-ro cargo spaces***

Ro-ro cargo spaces should be capable of being sealed from a location outside of such cargo spaces, if they are protected with a fixed gas fire-extinguishing system.

53.2.2.1.4 ***Dimension of pumping and drainage arrangements***

With respect to drainage and pumping arrangements, reference is made to the interpretations of regulation II-2/37.3.1.

53.2.2.2 ***Dimension of pumping and drainage arrangements***

With respect to drainage and pumping arrangements, reference is made to the interpretations of regulation II-2/37.3.1.

53.2.2.3 ***Location of portable fire extinguishers including suitability and capacity***

With respect to portable fire extinguishers, reference is made to the interpretations of regulation II-2/37.1.5.3.

53.2.3.1 ***Reference to MSC/Circ.729***

Reference is made to MSC/Circ.729 - Design guidelines and operational recommendations for ventilation systems in ro-ro cargo spaces.

53.2.3.3 ***Alarm in case of loss of ventilating capacity***

The requirement to indicate any loss of ventilation capacity is considered complied with by an alarm on the bridge, initiated by fall-out of starter relay of fan motor. (See also interpretations of regulations II-2/37.1.6.3 and 38.3.3).

53.2.3.5 ***Arrangement and construction of ventilation ducts***

Ventilation ducts should not pass through machinery spaces of category A unless fire insulated to A-60 standard.

53.2.4.1 ***Degree of protection of electrical equipment at or below a height of 450 mm***

The electrical equipment referred to in this regulation 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 79 - Electrical apparatus for explosive gas atmospheres (Gas Group II A and Temperature Class T 3). (See also interpretation 1 of regulation II-2/37.2.2.2).

53.2.4.2 ***Degree of protection of electrical equipment above a height of 450 mm***

The degree of protection of electrical equipment required by this regulation will be realised through an enclosure of at least IP 55 as defined in IEC Publication 529 - Classification of degrees of protection provided by enclosures.

53.2.4.4 ***Degree of protection of electrical equipment in exhaust ventilation ducts***

1 The electrical equipment referred to in this regulation 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 79 - Electrical apparatus for explosive gas atmospheres (Gas group II A and Temperature class T 3).

2 Exhaust fans should be of non-sparking type in accordance with IACS Requirement F 29, as revised.

(See also interpretations to regulation II-2/37.2.2.2).

Regulation 54 - Special requirements for ships carrying dangerous goods

54.1.1 ***Reference to the IMDG Code, General Introduction, sections 17 and 18***

1 Reference is made to section 17 of the General Introduction to the International Maritime Dangerous Goods Code (IMDG Code) for operational measures in association with the requirements of this regulation.

2 Reference is made to section 18 of the General Introduction to the International Maritime Dangerous Goods Code (IMDG Code) for a definition of the term "limited quantities".

54.1.2.2 ***Meaning of "purpose-built container spaces"***

A purpose-built container space is a cargo space fitted with cell guides for stowage securing of containers.

54.1.2.3 ***Extended meaning of "ro-ro cargo spaces"***

Ro-ro cargo spaces include special category spaces (regulation II-2/37) and vehicle deck spaces (regulation II-2/54.2.2).

54.2.1 ***Water supplies for open-top container cargo 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 containerships, 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 (MSC/Circ.608/Rev.1).

54.2.1.2 ***Required capacity of water supply for fire-extinguishing***

The total required capacity of the water supply should satisfy regulations II-2/54.2.1.2 and 54.2.1.3 (if applicable), simultaneously calculated for the largest designated cargo space. The capacity requirement for regulation II-2/54.2.1.2 should be met by the total capacity of the main fire pump(s) not including the capacity of the emergency fire pump, if fitted. If a drencher system is used to satisfy regulation II-2/54.2.1.3, the drencher pump should also be taken into account in this total capacity calculation.

54.2.1.3 ***Reference to resolution A.123(V) and size of pumping and drainage arrangements***

1 Reference is made to resolution A.123(V) - Recommendation on fixed fire-extinguishing systems for special category spaces.

2 With respect to drainage and pumping arrangements, reference is made to the interpretations of regulation II-2/37.3.1.

3 The quantity of water referred to in this regulation should be not less than 5 *l*/min per square metre of the horizontal area of cargo spaces.

54.2.1.4 ***Acceptance of high expansion foam systems in case of dangerous goods***

A high expansion foam system, complying with regulation II-2/9, is acceptable, except if cargoes dangerously react with water (see the IMDG Code).

54.2.2 ***Reference to IEC 92 - 506***

Reference is made to the International Standard IEC Publication 92-506: Electrical installations in ships - Part 506: Special features - Ships carrying specific dangerous goods and materials hazardous only in bulk.

54.2.4 ***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 II-2/54.2.4.2 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.

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.

54.2.4.2 ***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.

54.2.5 ***Arrangements of bilge drainage systems for cargo spaces***

1 If the bilge drainage system for cargo spaces is additional to the system served by pumps in the machinery space, the capacity of the system should be not less than 10 m^3/h per cargo space served. If the additional system is a common system, the capacity need not exceed 25 m^3/h. The additional bilge system need not be arranged with redundancy. Whenever flammable or toxic liquids are carried, the bilge line into the machinery space should be isolated either by fitting a blank flange or by a closed lockable valve.

2 If bilge drainage of cargo spaces is arranged by gravity drainage, the drainage should be either lead directly overboard or to a closed drain tank located outside the machinery spaces. The tank should be provided with vent pipe to a safe location on the open deck.

3 Enclosed spaces outside machinery spaces containing bilge pumps serving cargo spaces intended for carriage of flammable or toxic liquids should be fitted with separate mechanical ventilation giving at least 6 air changes per hour. Electrical equipment in the space should comply with the International Standard IEC Publication 92-506: "Electrical Installations in ships" Part 506: "Special features, Ships carrying specific dangerous goods and materials hazardous only in bulk." ~~IACS Unified interpretation SC 79.~~ If the space has access from another enclosed space, the door should be self-closing.

4 Drainage from a cargo space into bilge wells in a lower space is only permitted if that space satisfies the same requirements as the cargo space above.

54.2.6.1 ***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.

54.2.6.2 ***Spare bottles for breathing apparatuses***

Spare charges for the breathing apparatuses should be provided as required in regulation II-2/17.1.2.2 and its interpretations.

54.2.9 ***Reference to resolution A.123(V), and size of pumping and drainage arrangements***

1 Reference is made to resolution A.123(V) - Recommendation on fixed fire-extinguishing systems for special category spaces.

2 With respect to pumping and drainage arrangement, reference is made to the interpretations of regulations II-2/37.2.1 and 37.3.1.

Table 54.2 ***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. (See also interpretation 2 of regulation II-2/54.3).

54.3 ***Reference to MSC/Circ.642***

1 Reference is made to MSC/Circ.642 - Document of compliance with the special requirements for ships carrying dangerous goods under the provisions of regulation II-2/54 of SOLAS 1974, as amended.

2 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.
(See also interpretations of table 54.2).

3 Certification for dangerous goods except solid dangerous goods in bulk is not required for those cargoes specified as class 6.2 and 7 and dangerous goods in limited quantities.

PART D - FIRE SAFETY MEASURES FOR TANKERS

Regulation 55 - Application

55 ***Reference to ISGOTT***

Reference is made to the International Safety Guide for Oil Tankers and Terminals, as amended.

55.2 ***Liquid cargoes with fire hazards requiring additional measures***

1 A liquid cargo with a flashpoint of less than 60ºC for which a regular foam fire-fighting system complying with regulation II-2/61 is not effective, is considered to be a cargo introducing additional fire hazards in the context of regulation II-2/55.2. The following additional measures are required:

.1 the foam should be of alcohol resistant type; and

.2 the capacity and application rates of the foam extinguishing system should comply with chapter 11 of the IBC Code, except that lower application rates may be accepted based on performance tests. For tankers fitted with inert gas systems, a quantity of foam concentrate sufficient for 20 min of foam generation may be accepted. For determining which cargoes require the use of alcohol resistant foam, MSC/Circ.553 may be used for guidance.

2 Liquid cargoes with a flashpoint above 60ºC other than oil products or liquid cargoes, subject to the requirements of the Bulk Chemical Code are considered to constitute a low fire risk, not requiring the protection of a foam extinguishing system.

3 For the purpose of this regulation, a liquid cargo with a vapour pressure greater than 1.013 bar absolute at 37.8 °C is considered to be a cargo introducing additional fire hazards. Ships carrying such substances should comply with paragraph 15.14 of the International Bulk Chemical Code (IBC Code). When ships operate in restricted areas and at restricted times, the Administration concerned may agree to waive requirements for refrigeration systems in accordance with paragraph 15.14.3 of the IBC Code.

55.3 ***Reference to MSC/Circ.353 and MSC/Circ.387***

Reference is made to MSC/Circ.353 - Guidelines for inert gas systems and MSC/Circ.387 - Revised guidelines for inert gas systems.

55.5.1 ***Reference to resolution A.567(14)***

Reference is made to resolution A.567(14) - Regulation for inert gas systems on chemical tankers.

55.5.2 ***Reference to resolution A.473(XII)***

Reference is made to resolution A.473(XII) - Interim Regulations for inert gas systems on chemical tankers carrying petroleum products.

Regulation 56 - Location and separation of spaces

56 ***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 bulkheads 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 the figure of 56 in the appendix). No cargo, wastes or other goods should be contained in cofferdams.

56.1 ***Pump-rooms for ballast or oil fuel transfer***

Pump-rooms solely for ballast or for oil fuel transfer need not comply with the requirements of regulation II-2/63.

56.3 ***Fire-extinguishing arrangements in spaces forward of cargo areas***

The following interpretation should be applied only to accommodation spaces, main cargo control stations, control station, service spaces and machinery spaces forward of the cargo area.

Fire-extinguishing arrangements in the spaces mentioned below should be in accordance with the following requirements:

.1 one portable fire extinguisher should be arranged in machinery spaces other than those of category A. In case that they contain internal combustion machinery, one approved foam-type extinguisher of at least 45 *l* capacity or equivalent should be arranged in addition to portable fire extinguishers. If operation of a semi-portable fire extinguisher is impracticable, this fire extinguisher may be replaced by two additional portable fire extinguishers; and

.2 the interpretations of regulation II-2/6.7 should be applied in accommodation and service spaces.

56.4.1 ***Cofferdams in combination carriers***

The cofferdams required adjacent to slop tanks should be spaces not used for cargo or ballast and should not be connected to piping systems serving oil cargo or ballast.

56.4.2 ***Systems for transfer of slops***

The system for transfer of slops to the open deck should be permanently installed. When the transfer system is used for slop transfer in the dry cargo mode, it should have no connection to other systems. Separation from other systems by means of removal of spool pieces may be accepted. The slop transfer manifold on deck should be provided with a shut-off valve and a blank flange.

56.6 ***Construction of coamings***

Coamings of a suitable height should have a height of at least 0.3 m.

56.7 ***Insulation of portions which face the cargo area and in the case of sides of superstructures and deckhouses***

For the portions which face the cargo area and in the case of the sides of superstructures and deckhouses referred to in paragraph 7 of the regulation, A-60 standard insulation should be provided up to the underside of the deck of the navigation bridge. The distance of 3 m should be measured horizontally and parallel to the middle line of the ship from the boundary which faces the cargo area at each deck level.

56.8.2 ***Gastightness test for navigation bridge external doors and windows***

The navigation bridge external doors and windows which are located within the limits of regulation II-2/56.8.1 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 2 bar; and

- distance between the nozzle and the doors or windows: maximum 1.5 m.

Regulation 58 - Fire integrity of bulkheads and decks

58.2 ***Separating partial bulkheads of spaces, and enclosed promenades***

1 If a space is divided into two (or more) smaller spaces so that these new spaces form enclosed spaces (e.g. a cabinet built in a mess room, a store room built in a mess room), then these new enclosed spaces should be surrounded by fire-resistant bulkheads and decks in accordance with this regulation. However, if the separating bulkheads of such spaces have at least 30% openings, then these spaces are not considered as separate spaces. (See also interpretation 1 of regulations II-2/26.2 and 44.2).

2 Regarding enclosed promenades, reference is made to interpretation 2 of regulations II-2/26.2 and 44.2.

58.2.2 ***Insulation values of spaces with special characters of two or more space categories and separating by wire mesh***

1 In case a space has the special characters of two or more space categories of this regulation, the insulation values of the divisions of such a space should be the highest for the space categories concerned.

2 A separation made by wire mesh between two portions of a space is not considered a division in applying this regulation.

(See also interpretations of regulations II-2/26.2.2 and 44.2.2).

58.2.2(4) ***Category of enclosed emergency escape trunks***

A totally enclosed emergency escape trunk belongs to the space category (4). (See also interpretations of regulations II-2/26.2.2(2), 27.2.2(4) and 44.2.2(4)).

58.2.2(7) ***Category of electrical equipment rooms***

Electrical equipment rooms (auto-telephone, exchange, air-conditioning duct spaces) are also category (7) spaces. (See also interpretation of regulation II-2/44.2.2(7)).

58.2.2(9) ***Construction and arrangements of saunas***

See interpretation of regulation II-2/26.2.2(8), concerning sauna arrangements, where in interpretation 2 the space categories should be (5), (7) and (10).

Table 58.1 ***Alternative means of closure in divisions of steel between control stations (emergency generator) and open decks***

The required division of steel between control stations and open decks may in the case of an emergency generator be provided with openings for intake of combustion air to the diesel engine and for intake of cooling air in the case of an air cooled diesel engine. These openings need not be fitted with means for closure for fire integrity purposes, unless a fixed gas fire-fighting system for the emergency generator space is fitted. (See also interpretation of table 44.1).

Table 58.2 ***Construction of steel decks***

Where an asterisk appears in table 2 of regulation II-2/58, the deck is required to be of steel or other equivalent material but is not required to be of "A" class standard. However, where such a deck, except an open deck, is penetrated for the passage of electric cables, pipes and vent ducts, such penetrations should be made tight to prevent the passage of flame and smoke. (See also interpretation of table 44.2).

Table 58.2, ***Meaning of "machinery spaces having little or no fire risk"***
note e

For the definition of "machinery spaces having little or no fire risk", see ~~the interpretations of~~ regulation II-2/26.2.2 (10).

58.3 ***Continuous "B" class ceilings and linings as part of insulation***

Continuous "B" class ceilings and linings may be accepted as contributing to the required insulation of a division (combination of steel deck or bulkhead and ceiling or lining), provided that they are fire tested in accordance with the applicable fire test procedure (e.g. resolution A.754 (18)).

Regulation 59 - Venting, purging, gas-freeing and ventilation

59.1.5 ***Reference to MSC/Circ.677 and MSC/Circ.450/Rev.1, and ullage openings***

1 Reference is made to MSC/Circ.677 - Revised standards for the design, testing and locating of devices to prevent the passage of flame into cargo tanks in oil tankers, and MSC/Circ.450/Rev.1 - Revised factors to be taken into consideration when designing cargo tank venting and gas-freeing arrangements.

2 Ullage openings should not be used for pressure equalization. They should be provided with self-closing and tightly sealing covers. Flame arresters and flame screens are not permitted in these openings.

59.1.6 ***Use of spill valves and systems for guarding against liquid rising***

1 Spill valves will normally not be considered equivalent to an overflow system.

2 The system for guarding against liquid rising to a height which would exceed the design head of cargo tanks should be independent of the gauging devices.

59.1.7.2 ***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.

59.1.9.3 ***Electrical equipment in areas next to cargo tank ventilation outlets which permit flow of large volumes of vapour, location of anchor windlass and chain locker openings and reference to IEC 92-502***

1 Permitted electrical equipment:

.1 Areas on open deck within 6 m of cargo tank ventilation outlets which permit the flow of large volumes of vapour during loading/discharging/ballast:

- certified safe type equipment.

.2 Areas 4 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.

2 Anchor windlass and chain locker openings constitute ignition hazards. They should be located at the distance required by regulations II-2/59.1.7.2, 59.1.9.3 and 59.1.9.4.

3 Electrical equipment fitted in compliance with IEC 92-502 is not considered a source of ignition or ignition hazard.

59.1.9.4 ***Location of anchor windless and chain locker openings and reference to IEC 92-502***

1 Anchor windless and chain lockers openings constitute ignition hazards. They should be located at the distance required by regulations II-2/59.1.7.2, 59.1.9.3 and 59.1.9.4.

2 Electrical equipment fitted in compliance with IEC 92-502 is not considered a source of ignition or ignition hazard.

59.2 ***Location of outlets and reference to MSC/Circ.677 and MSC/Circ.450/Rev.1***

1 The outlets mentioned in regulation II-2/59.2 should be located in compliance with regulation II-2/59.1.9.3 as far as the horizontal distance is concerned.

2 Reference is made to MSC/Circ.677 - Revised standards for the design, testing and locating of devices to prevent the passage of flame into cargo tanks in oil tankers, and MSC/Circ.450/Rev.1 - Revised factors to be taken into consideration when designing cargo tank venting and gas-freeing arrangements.

Regulation 60 - Cargo tank protection

60 ***Drip pans under manifolds and electrical continuity and earthing of cargo hoses and tank washing hoses***

1 Drip pans for collecting cargo residues in cargo lines and hoses should be provided in the area of pipe and hose connections under the manifold area.

2 Cargo hoses and tank washing hoses should have electrical continuity over their entire lengths including couplings and flanges (except shore connections) and should be earthed for removal of electrostatic charges.

60.6 ***Meaning of "all tankers"***

All tankers means any tanker, of any deadweight, fitted with a crude oil washing system, irrespective of its age.

60.7 ***Meaning of "closed ullage system"***

Closed ullage system means a system which allows cargo measurement without breaking the integrity of the tank.

Regulation 61 - Fixed deck foam systems

61.8 ***Application to tankers***

This regulation applies to all tankers regardless of their size.

61.10 ***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.

Regulation 62 - Inert gas systems

62 ***Reference to MSC/Circ.387, MSC/Circ.450/Rev.1 and MSC/Circ.485***

Reference is made to MSC/Circ.450/Rev.1- Revised factors to be taken into consideration when designing cargo tank venting and gas-freeing arrangements, MSC/Circ.485 - Clarification of inert gas system requirements under SOLAS 1974, as amended, and MSC/Circ.387 - Revised guidelines for inert gas systems.

62.1 ***Meaning of "cargo tanks"***

Throughout this regulation the term "cargo tanks" includes also slop tanks.

62.9.2 ***Meaning of "gas-safe space"***

A gas-safe space is a space in which the entry of hydrocarbon gases would produce hazards with regard to flammability or toxicity.

62.11.5 ***Arrangement for connection of inert gas main to external supply of inert gas***

The arrangements should consist of a 250 mm nominal pipe size bolted flange, isolated from the inert gas main by a valve and located forward of the non-return valve referred to in regulation II-2/62.10.8. The design of the flange should conform to the appropriate class in the standards adopted for the design of other external connections in the ship's cargo piping system.

62.13.4.1 ***Arrangements for isolation of inert gas supply mains and cargo piping systems***

As a guide, the effective isolation required by this regulation may be achieved by the two arrangements shown in figures 1 and 2 of regulation 62.13.4.1 in the appendix.

62.20 ***Reference to original SOLAS text***

The text as adopted by the International Conference on Safety of Life at Sea, 1974.

62.21 ***Reference to MSC/Circ.353***

Reference is made to MSC/Circ.353 - Guidelines for inert gas systems.

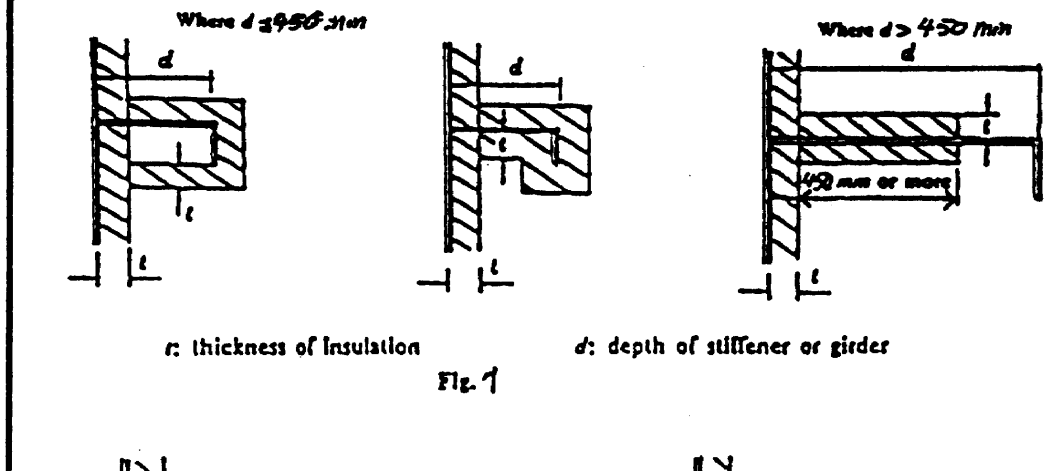
APPENDIX

EXPLANATORY SKETCHES

This appendix contains explanatory sketches to some interpretations of regulations in chapter II-2 of the 1974 SOLAS Convention as follows:

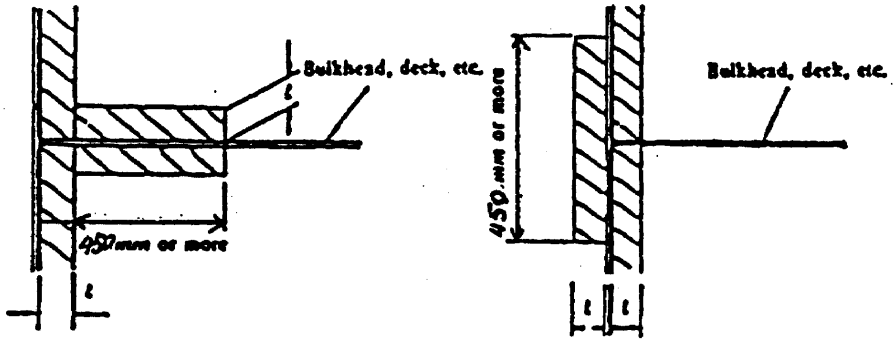
Regulation 26.4:	Heat transmission at intersections
Regulations 45.1.2.1/1.2.2:	Escape routes (figures 1 and 2)
Regulation 46.1:	Staircases (figures 1, 2.1 and 2.2)
Regulation 56:	Corner-to-corner situation in a cofferdam
Regulation 62.13.4.1:	Isolation arrangements in inert gas main

Regulation 26.4: Heat transmission at intersections



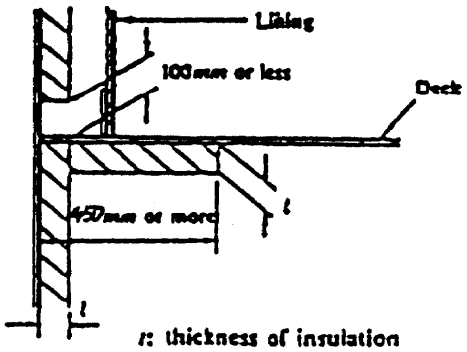
t: thickness of insulation d: depth of stiffener or girder

Fig. 1



t: thickness of insulation

Fig. 2



t: thickness of insulation

Fig. 3

Regulations 45.1.2.1/1.2.2: Escape routes

Figure 1

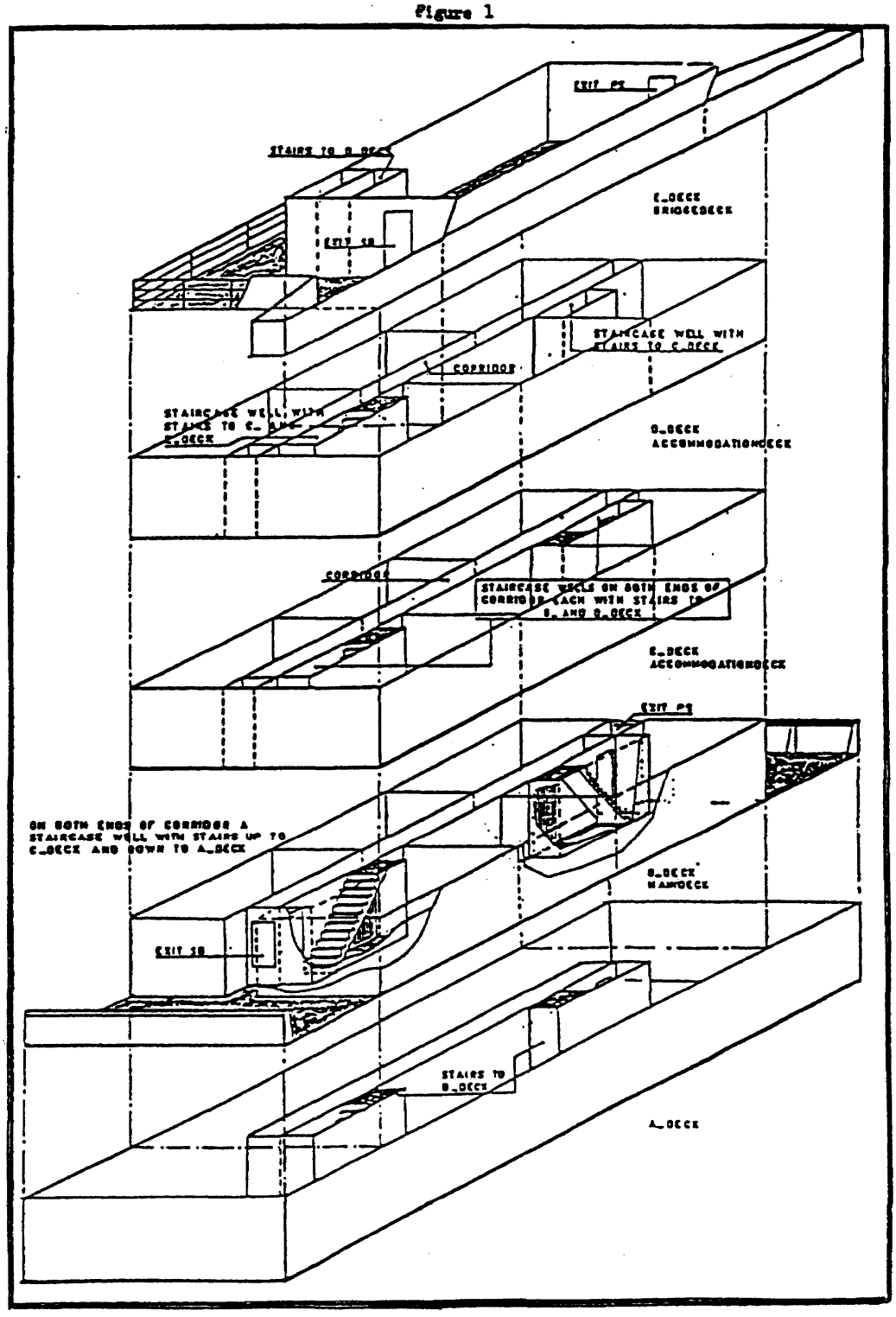
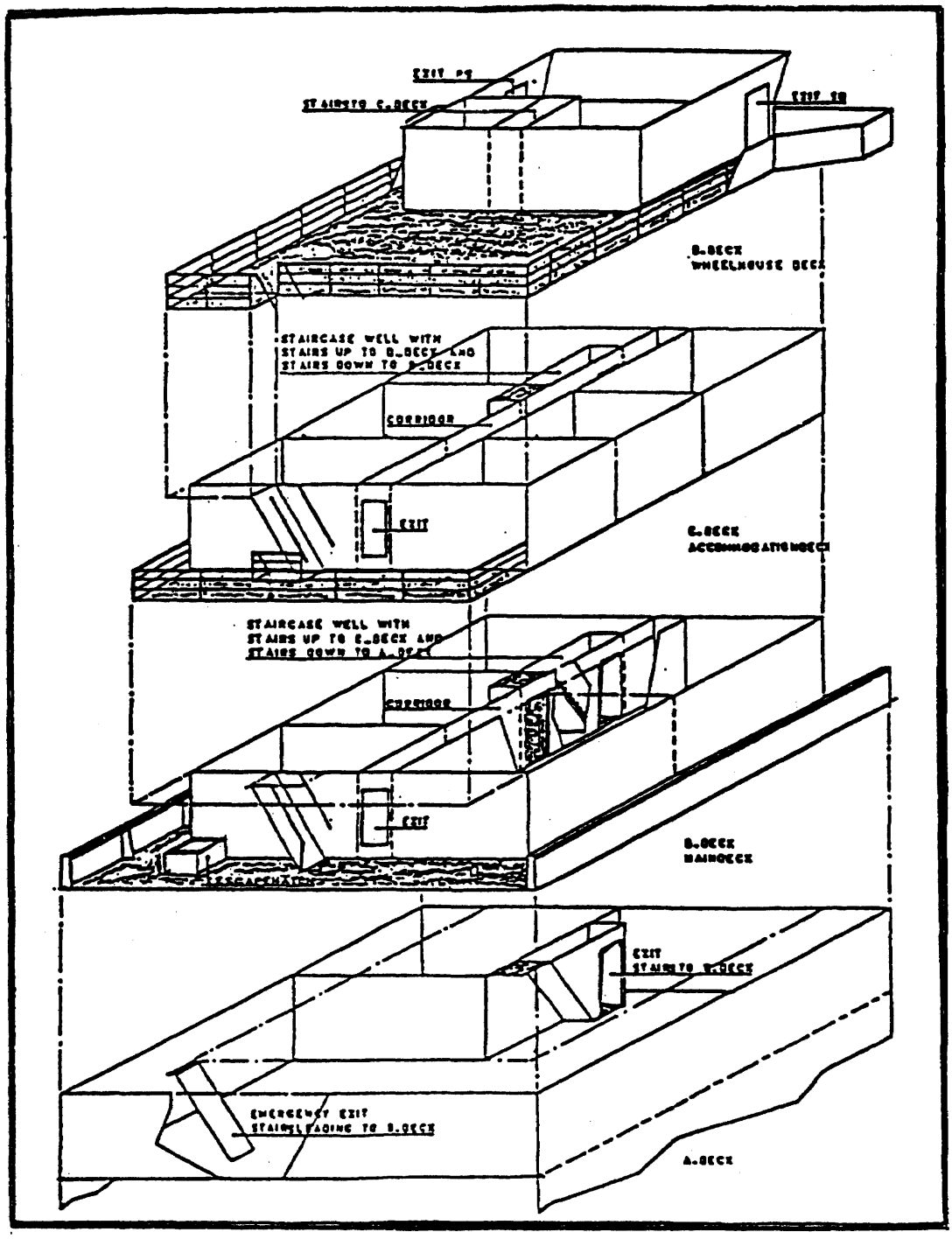
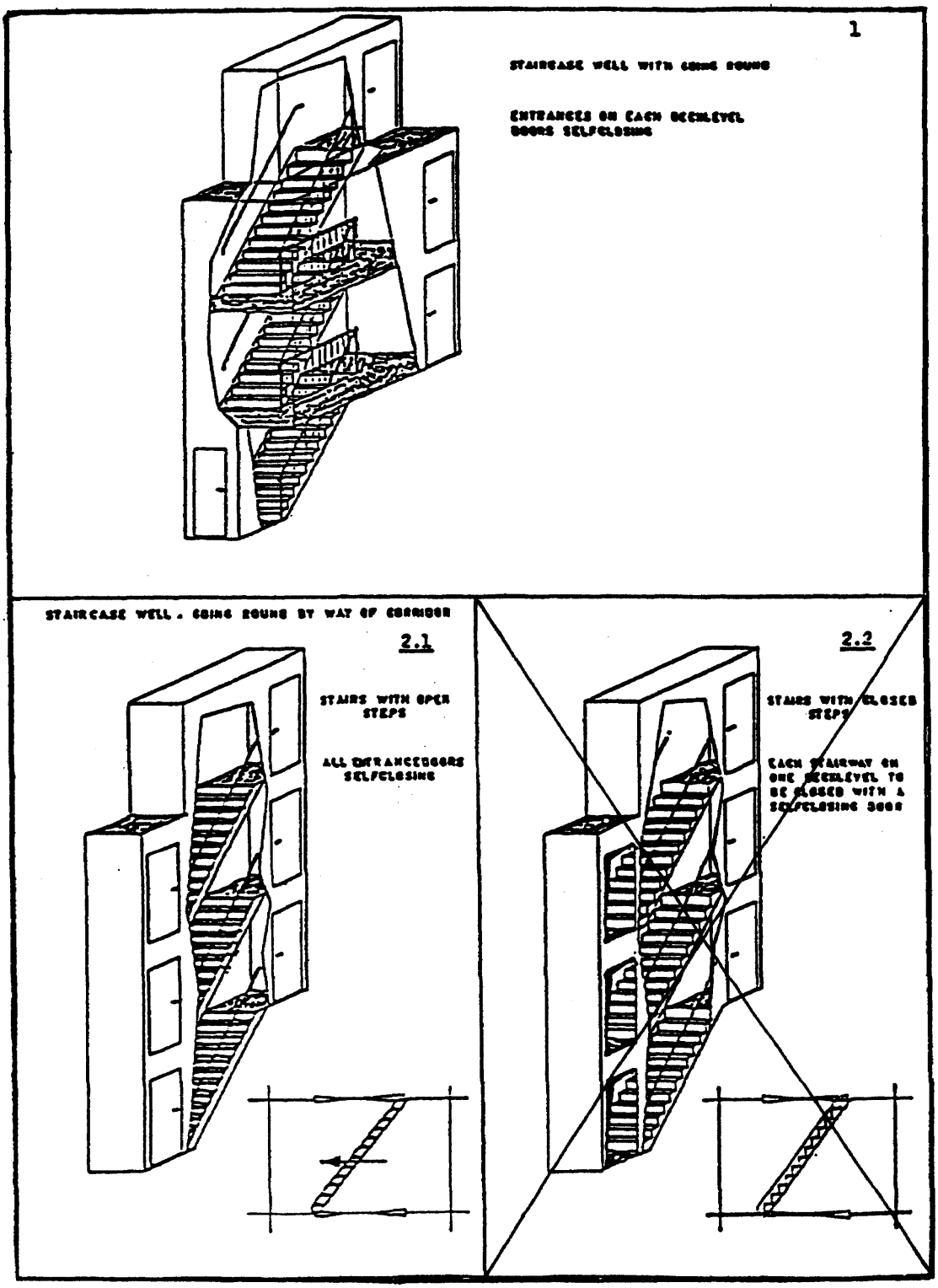


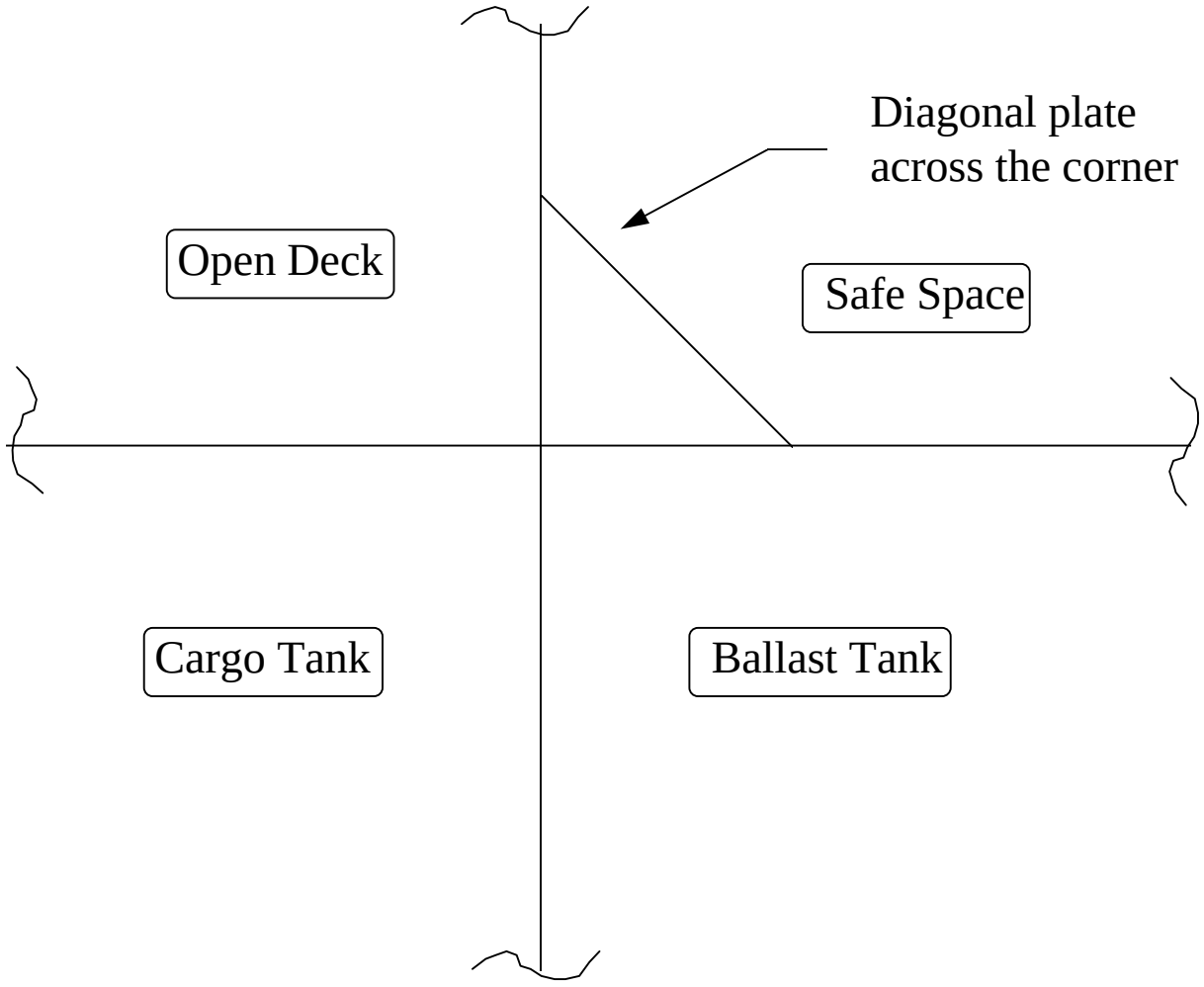
Figure 2


EXIT PS
STAIRS TO C_DECK
EXIT SB
B_DECK
WHEELHOUSE DECK
STAIRCASE WELL WITH
STAIRS UP TO B_DECK AND
STAIRS DOWN TO C_DECK
CORRIDOR
EXIT
C_DECK
ACCOMMODATION DECK
STAIRCASE WELL WITH
STAIRS UP TO C_DECK AND
STAIRS DOWN TO A_DECK
CORRIDOR
EXIT
B_DECK
MAINDECK
EXIT
STAIRS TO M.DECK
EMERGENCY EXIT
STAIRWELL GOING TO B_DECK
A_DECK

Regulation 46.1: Staircases



Regulation 56: Corner-to-corner situation in a cofferdam



Regulation 62.13.4.1: Isolation arrangements in inert gas main

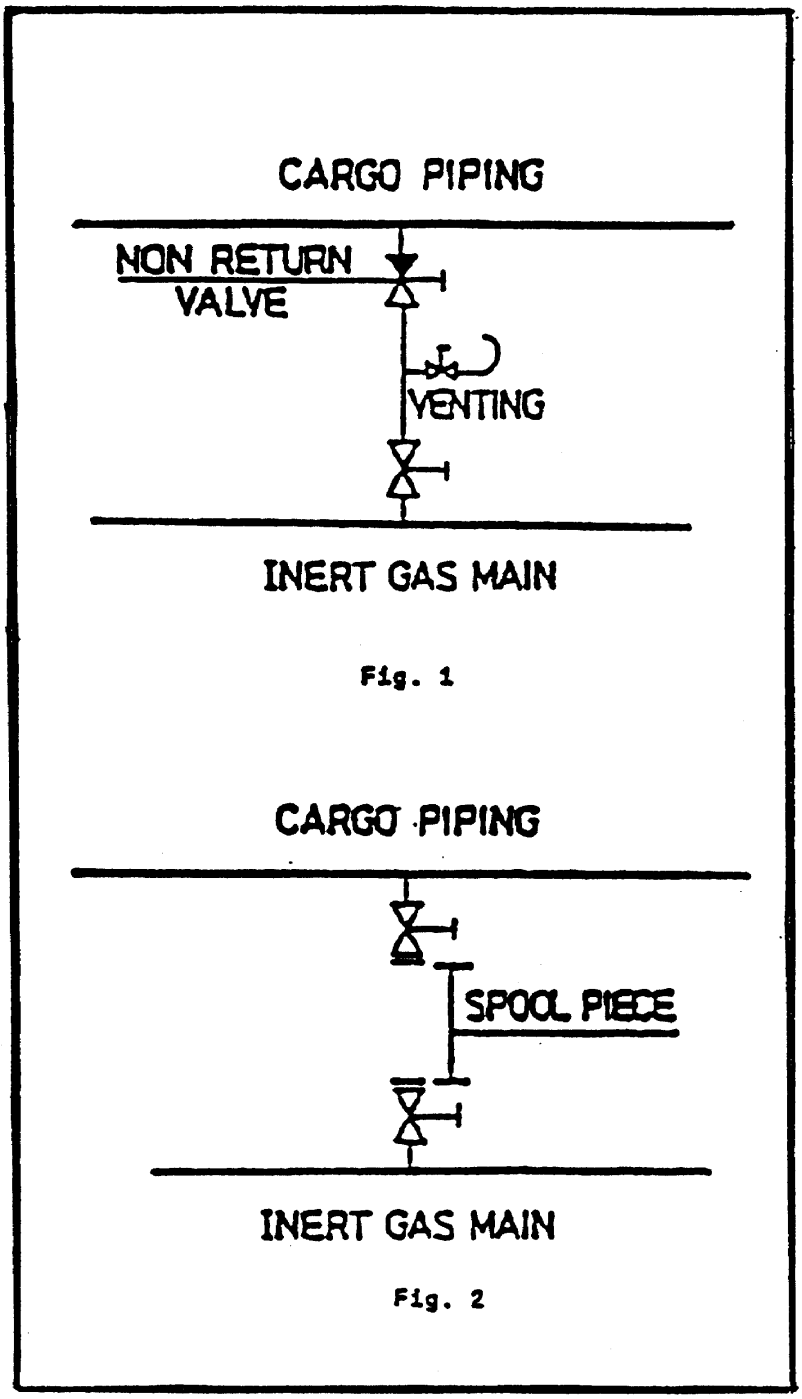


Fig. 1

Fig. 2