

RESOLUTION A.213(VII) adopted on 12 October 1971  
RECOMMENDATION ON FIRE SAFETY REQUIREMENTS FOR CONSTRUCTION AND  
EQUIPMENT OF NEW TANKERS

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RECOMMENDATION ON FIRE SAFETY REQUIREMENTS FOR  
CONSTRUCTION AND EQUIPMENT OF NEW TANKERS

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THE ASSEMBLY,

NOTING Article 16(i) of the Convention on the Inter-Governmental Maritime Consultative Organization concerning the functions of the Assembly,

NOTING FURTHER Recommendation 15 of the International Conference on Safety of Life at Sea, 1960, concerning safety measures in tankers,

DESIRING to formulate internationally applicable fire safety standards for the construction and equipment of tankers to supplement the requirements of Chapter II of the International Convention for the Safety of Life at Sea, 1960,

HAVING CONSIDERED the Recommendation on Fire Safety by the Maritime Safety Committee at its twenty-fourth session,

ADOPTS the Recommendation on Fire Safety Requirements for Construction and Equipment of New Tankers, the text of which is set out at Annex to this Resolution,

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INVITES all governments concerned to take appropriate steps to give effect to the Recommendation as soon as possible, and to consider inter-governmental agreements for a common date of its coming into force,

REQUESTS the Maritime Safety Committee to continue its study on this subject with a view to developing the Recommendation further, particularly as regards the provisions in respect of fixed froth and inert gas systems,

AUTHORIZES the Maritime Safety Committee to amend the Recommendation as necessary in the light of such study.

#### ANNEX

#### RECOMMENDATION ON FIRE SAFETY REQUIREMENTS FOR CONSTRUCTION AND EQUIPMENT OF NEW TANKERS

1. The following provisions should be applied to all new tankers carrying crude oil and petroleum products having a closed flashpoint not exceeding 60°C (140°F) and whose Reid vapour pressure is below that of atmospheric pressure and other liquid products having a similar fire hazard. Where other cargoes which introduce additional or alternative fire hazards are to be carried, additional or special safety measures may be required to the satisfaction of the Administration.
2. The provisions of this Recommendation are in addition to the requirements of Chapter II of the International Convention for the Safety of Life at Sea, 1960 (hereinafter referred to as "the Convention").
3. The terms used hereunder are as defined in the proposed Regulation 94, Chapter II of the Convention.



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4. Accommodation, service and machinery spaces should be positioned aft of and not over any cargo tanks, slop tanks, cargo pump rooms and cargo cofferdams. Where fitting of a navigation position above the cargo tank area is necessary it should be for navigation purposes only and it should be separated from the cargo tank deck by means of an open space with a height of at least 2 metres. The fire protection of such navigation position should in addition be as required for control spaces as set forth in paragraph 11(a) and (b) and other sections of this Recommendation as appropriate.

Means should be provided to keep deck spills away from the accommodation and service areas. This may be accomplished by provision of a permanent continuous coaming of a suitable height extending from side to side. Special consideration should be given to the arrangements associated with stern loading.

5. Exterior boundaries of superstructures and deckhouses enclosing accommodation and service spaces and including any overhanging decks which support such accommodation, should be insulated to A-60 standard for the whole of the portions which face cargo oil tanks and for 3 metres aft of the front boundary. In the case of the sides of these superstructures and deckhouses, such insulation should be carried as high as is deemed necessary by the Administration.

6. In boundaries, facing cargo tanks, of superstructures and deckhouses containing accommodation and service spaces the following provisions should be applied:

- (a) No doors should be permitted in the first tier on the main deck, except to those spaces not having access to accommodation and service spaces such as cargo control stations, provision rooms and storerooms.

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Where such doors are fitted, the boundaries of the space should be insulated to A-60 standard. Bolted plates for removal of machinery may be fitted in such boundaries.

- (b) Port lights in such boundaries should be of a fixed (non-opening) type. Pilot house windows may be non-fixed (opening).
- (c) Port lights in the first tier on the main deck should be fitted with inside covers of steel or equivalent material.

The requirements of this paragraph, where applicable, should also be applied to the boundaries of the superstructures and deckhouses for a distance of 5 metres measured longitudinally from the forward end of such structures.

7. The requirements of Regulation 68(b)(i) of Chapter II of the Convention in respect of means of escape should be applied and, in addition, consideration should be given to the availability of emergency means of escape for personnel from each cabin.

8. The arrangement and positioning of openings in the cargo tank deck from which gas emission can occur should be such as to minimize the possibility of gas being admitted to enclosed spaces containing a source of ignition, or collecting in the vicinity of deck machinery and equipment which may constitute an ignition hazard. In every case the height of the outlet above the deck and the discharge velocity of the gas should be considered in conjunction with the distance of any outlet from any deckhouse opening or source of ignition.

Guidance in respect of arrangements for the venting of flammable vapours, the height of such vents, and their siting relative to accommodation spaces and sources of ignition, is contained in Chapter II of the International Oil Tanker and Terminal Safety Guide.



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9. The arrangement of ventilation inlets and outlets and other deckhouse and superstructure boundary space openings should be such as to complement the guidance in paragraph 8 above. Such vents especially for machinery spaces should be situated as far aft as is practicable. Due consideration in this regard should be given when the ship is equipped to load or discharge at the stern. Sources of ignition such as electrical equipment should be so arranged as to avoid introducing an explosion hazard.

10. Cargo pump rooms should be mechanically ventilated and discharges from the exhaust fans should be led to a safe place on the open deck. The ventilation of these rooms should have sufficient capacity to minimize the possibility of accumulation of flammable vapours. The number of changes of air should be at least 20 times per hour, based upon the gross volume of the space. The air ducts should be arranged so that all of the space is efficiently ventilated. The ventilation should be of the suction type.

11. The requirements of Regulation 54 of Chapter II of the Convention should apply to all tankers of 500 tons gross tonnage and over. In addition all tankers should comply with the following requirements:

- (a) Bulkheads between cargo pump rooms and main engine or boiler rooms should be "A" class and should have no penetrations which are less than "A-0" or equivalent in all respects, other than the cargo pump shaft glands and similar glanded penetrations. Bulkheads and deck forming divisions between engine-, boiler- and cargo pump rooms, including their trunks, respectively, and the accommodations and service spaces should be of class "A-60" type. Consideration should be given to the surface of the insulation on

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interior boundaries of the engine room; these surfaces should be impervious to oil and oil vapours. No windows should be fitted in such bulkheads, but permanent approved gastight lighting enclosures for illuminating the pump rooms may be inserted in the bulkhead provided that these are of adequate strength and maintain the integrity and gastightness of the bulkhead as an "A" class division. Control stations should be separated from adjacent enclosed spaces by means of "A" class bulkheads and decks. The insulation of these control station boundaries should be to the satisfaction of the Administration having in mind the risk of fire of adjacent spaces. Engine rooms and boiler casing doors should be self-closing and comply with sub-paragraph (b)(vii) of this paragraph;

- (b) Within the accommodation, service and control spaces the following conditions should apply:
  - (i) Corridor bulkheads including doors should be of "A" or "B" class divisions extending from deck to deck. Where continuous "B" class ceilings and/or linings are fitted on both sides of the bulkhead, the bulkhead may terminate at the continuous ceiling or lining. Consideration should be given to the fitting of draught stops where a continuous ceiling is fitted. Doors of cabins and public spaces in such bulkheads may have a louver in the lower half.
  - (ii) Ceilings, linings, bulkheads and insulation except for insulation in refrigerated compartments should be of incombustible material. Vapour barriers and adhesives used in conjunction



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with insulation as well as insulation of pipe fittings for cold service systems need not be incombustible, but they should be kept to the minimum quantity practicable and their exposed surfaces should have qualities of resistance to propagation of flame to the satisfaction of the Administration.

- (iii) The framing, including grounds and the joint pieces of bulkheads, linings, ceilings and draught stops, if fitted, should be of incombustible material.
- (iv) All exposed surfaces in corridors and stairway enclosures and surfaces in concealed or inaccessible spaces should have low flame-spread characteristics.
- (v) Bulkheads, linings and ceilings may have combustible veneer, provided that such veneer should not exceed 2.0 millimetres within any such space except corridors, stairway enclosures and control stations where it should not exceed 1.5 millimetres.
- (vi) Paints, varnishes and other finishes used on exposed interior surfaces should not be of a nature to offer an undue fire hazard in the judgment of the Administration and should not be capable of producing excessive quantities of smoke or other toxic properties.
- (vii) Stairways which penetrate only a single deck should be protected at least by one level by "A" or "B" class divisions and self-closing doors so as to limit the rapid spread of fire from one deck to another. Stairways and lift trunks which



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penetrate more than a single deck should be surrounded by "A" class divisions and protected by self-closing steel doors at all levels. Self-closing doors should not be fitted with holdback hooks. However, holdback arrangements fitted with remote release fittings of the failsafe type may be utilized.

- (c) Ducts provided for ventilation of machinery spaces should not in general pass through accommodation, service spaces or control stations, except that the Administration may permit relaxation from this requirement, provided that:
  - (i) the ducts are constructed of steel, and are insulated to A-60 standard, or
  - (ii) the ducts are constructed of steel and are fitted with an automatic fire damper close to the boundary penetrated and are insulated to A-60 standard from the machinery space to a point at least 5 metres beyond the fire damper.
- (d) Ducts provided for ventilation of accommodation, service spaces or control stations should not in general pass through machinery spaces, except that the Administration may permit relaxation from this requirement provided that ducts are constructed of steel and automatic fire dampers are fitted close to the boundaries penetrated.
- (e) No glass should be fitted in engine-, boiler-, or cargo pump room skylights.

12. For the protection of the cargo tank deck area and cargo tanks, a fixed deck froth system and a fixed inert gas system should be installed in accordance with the provisions of paragraphs 13 and 14.

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After having given proper consideration to the ship arrangement, equipment, and to the characteristic of cargo to be carried, the Administration may waive the provision of an inert gas system, or where this system is provided, may accept reductions in the quantity of froth liquid, the rate of application, and the capacity of monitors and may give consideration to waiving the provisions of monitors.

In lieu of the above fire-extinguishing installation other types of fixed or combination of fixed installations may be accepted by the Administration if they afford equivalent protection, in accordance with Regulation 5 of Chapter I of the Convention. To be considered equivalent, a system should be capable of:

- (a) extinguishing spill fires which would also preclude ignition of spilled fuel not yet ignited;
- (b) combating fires in ruptured tanks; and
- (c) avoiding dangerous generation of static electricity.

13. The fixed deck froth system should be designed as follows:

- (a) The arrangements for providing froth should be capable of delivering froth to the entire cargo tank deck area as well as into any cargo tank, the deck of which has been ruptured.
- (b) The system should be capable of simple and rapid operation. The main control station for the system should be located aft of the cargo tank area and should be readily accessible and operable in the event of fire in the areas protected.
- (c) Froth should be supplied by means of monitors and mobile froth applicators. The number and position of monitors should be such as to comply with sub-paragraph (a) of this paragraph and their spacing



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should not be greater than 90 per cent of the throw of a monitor when producing froth of the required consistency at the designed pressure in still air conditions. One monitor with a hose connection should be situated port and starboard at the poop front. Mobile applicators should be provided for flexibility of action during fire-fighting operations and to cover areas screened from the monitors. On small tankers monitors need not be installed if the Administration is satisfied that a supply of froth in accordance with (d)(i) and (d)(ii) of this paragraph can be provided to any part of the tank deck area or to any tank by means of mobile applicators.

- (d) The rate of application of froth solution, at a froth expansion ratio not to exceed 12 to 1, to any portion of the deck area should not be less than the greater of the following:
  - (i) a rate of application of at least 0.6 l/min per square metre of the cargo deck area (cargo deck area is defined as the maximum breadth of the ship times the total longitudinal extent of the cargo tank spaces) or
  - (ii) a rate of application of at least 6 l/min per square metre of the horizontal sectional area of the single tank having the largest such area;
  - (iii) sufficient froth liquid should be supplied to ensure at least 20 minutes of froth generation when using water capacity stipulated in items (i) or (ii) of this sub-paragraph.



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Where systems essentially produce low expansion froth but at expansion ratio slightly in excess of 12 to 1, the quantity of froth solution available should be calculated as for 12 to 1 expansion ratio systems, but when medium expansion ratio froth (between 50 to 1 and 150 to 1 expansion ratio) is employed the application rate of the froth and the capacity of a monitor installation should be to the satisfaction of the Administration.

- (e) At least 33 per cent of the required froth rate should be delivered from each monitor.
- (f) Valves should be provided in both the froth main and the fire main immediately forward of every monitor position to isolate damaged sections of these mains.
- (g) Operation of the deck froth system should permit the simultaneous use of the fire main at its required capacity.

14. Inert gas systems may use gas provided by an approved inert gas generator or cleaned flue gas from a main or auxiliary boiler fitted with automatic combustion control. Where cleaned boiler flue gases are used the system should comply with the provisions of this paragraph. When any other source of inert gas is used the arrangements should provide a similar level of security.

- (a) The steam demand on the boiler during cargo discharge should be such as to ensure that the volume of gas referred to in (c) is available. At other times sufficient gas to ensure compliance with (d) should be continuously available.

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- (b) The construction of the inert gas system should provide means for purging the tanks with fresh air as well as with inert gas.
- (c) The capacity of the inert gas system should be sufficient to enable the tanks to be replenished with a 10 per cent reserve capacity of inert gas when the ship is being unloaded at the maximum unloading capacity of the cargo pumps.
- (d) Under normal running conditions, when tanks are being filled or have been filled with inert gas, a small positive pressure not in excess of 0.25 kp per square centimetre should be maintained at the tank and the tanks should be fitted with pressure and vacuum relief valves adjusted accordingly.
- (e) Exhaust gas outlets for purging should be suitably located in the open air and should be to the same requirements as prescribed for ventilating outlets of tanks in tankers, referred to in paragraph 9.
- (f) A scrubber should be provided which will effectively cool the gas and remove any solids and sulphur combustion products.
- (g) At least two fans (blowers) should be provided which together should be capable of delivering at least the amount of gas stipulated in sub-paragraph (c) of this paragraph.
- (h) The oxygen content in the inert gas should not normally exceed 5 per cent by volume. An alarm should be given and the system should be so designed that the supply fans (blowers) will stop should the oxygen content reach 8 per cent by volume.



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- (i) Means should be provided to prevent the return of hydrocarbon gases from the tanks to the machinery spaces and uptakes and, in addition, an effective water lock should be installed integrally with a scrubber. Branch piping for inert gas should be fitted with stop valves or equivalent means of control at every tank. The velocity of the gas should not be such as to produce hazardous static electricity generation.
- (j) Portable gas analyzers and tank fittings should be provided for measurement of the oxygen content of the tanks. Instruments should be fitted for continuously recording the oxygen content of the gas in the main inert gas discharge line.
- (k) Means for indicating the temperature and pressure of the inert gas main should be provided.
- (l) Alarms should be provided to indicate, and automatic shut-downs of the system should be arranged on predetermined limits being reached on the following:
  - (i) high oxygen content of gas in the inert gas main;
  - (ii) high temperature of gas in the inert gas main;
  - (iii) low gas pressure in the inert gas main;
  - (iv) the loss of effectiveness of the scrubber e.g. low water pressure and low pressure in the supply to the deck water seal.



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15. Where an inert gas system is fitted, at least two fire hydrants should be provided in the fire main on each side of the poop front and isolating valves should be fitted in the fire main just forward of these and other hydrants at regular positions along the deck with a maximum spacing of 40 metres between such isolating valves.

16. All water nozzles provided for use on board tankers should be of an approved dual purpose type (i.e. spray/jet type).

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