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**REVISED GUIDELINES FOR THE APPROVAL OF EQUIVALENT WATER-BASED
FIRE-EXTINGUISHING SYSTEMS FOR MACHINERY SPACES
AND CARGO PUMP-ROOMS**

- 1 The Maritime Safety Committee, at its sixty-fourth session (5 to 9 December 1994), recognizing the urgent necessity of providing guidelines for alternative arrangements for halon fire-extinguishing systems, approved Guidelines for the approval of equivalent water-based fire-extinguishing systems as referred to in SOLAS 74 for machinery spaces and cargo pump-rooms (MSC/Circ.668).
- 2 The Committee, at its sixty-sixth session (28 May to 6 June 1996), having considered a proposal by the fortieth session of the Sub-Committee on Fire Protection to revise the interim test method for equivalent water-based fire-extinguishing systems, contained in MSC/Circ.668, approved a revised test method for equivalent water-based fire-extinguishing systems for category A machinery spaces and cargo pump-rooms contained in MSC/Circ.668 (MSC/Circ.728).
- 3 The Sub-Committee on Fire Protection, at its forty-ninth session (24 to 28 January 2005), reviewed the Guidelines for the approval of equivalent water-based fire-extinguishing systems as referred to in SOLAS 74 for machinery spaces and cargo pump-rooms (annex to MSC/Circ.668, as amended by MSC/Circ.728) and made amendments to the test method for equivalent water-based fire-extinguishing systems for machinery spaces of category A and cargo pump-rooms, taking into account the latest technological progress made in this area.
- 4 The Committee, at its eightieth session (11 to 20 May 2005), after having considered the above proposal by the forty-ninth session of the Sub-Committee on Fire Protection, approved Revised Guidelines for the approval of equivalent water-based fire-extinguishing systems for machinery spaces and cargo pump-rooms, as set out in the annex.
- 5 Member Governments are invited to apply the annexed Guidelines when approving equivalent water-based fire-extinguishing systems for machinery spaces and pump-rooms and bring them to the attention of ship designers, ship owners, equipment manufacturers, test laboratories and other parties concerned.
- 6 Test approvals already conducted in accordance with guidelines contained in MSC/Circ.668, as amended by MSC/Circ.728, should remain valid until 5 years after the date of this circular.

ANNEX

**REVISED GUIDELINES FOR THE APPROVAL OF EQUIVALENT
WATER-BASED FIRE-EXTINGUISHING SYSTEMS
FOR MACHINERY SPACES AND
CARGO PUMP-ROOMS**

General

1 Water-based fire-extinguishing systems for use in machinery spaces of category A and cargo pump-rooms equivalent to fire-extinguishing systems required by SOLAS regulation II-2/10 and chapter 5 of the FSS Code should prove that they have the same reliability which has been identified as significant for the performance of fixed pressure water-spraying systems approved under the requirements of SOLAS regulation II-2/10 and chapter 5 of the FSS Code. In addition, the system should be shown by test to have the capability of extinguishing a variety of fires that can occur in a ship's engine-room.

Definitions

2 *Antifreeze system* is a wet pipe system containing an antifreeze solution and connected to a water supply. The antifreeze solution is discharged, followed by water, immediately upon operation of nozzles.

3 *Bilge area* is the space between the solid engine-room floor plates and the bottom of the engine-room.

4 *Deluge system* is a system employing open nozzles attached to a piping system connected to a water supply through a valve that is opened by the operation of a detection system installed in the same areas as the nozzles or opened manually. When this valve opens, water flows into the piping system and discharges from all nozzles attached thereto.

5 *Dry Pipe system* is a system employing nozzles attached to a piping system containing air or nitrogen under pressure, the release of which (as from the opening of a nozzle) permits the water pressure to open a valve known as a dry pipe valve. The water then flows into the piping system and out of the opened nozzle.

6 *Fire extinction* is a reduction of the heat release from the fire and a total elimination of all flames and glowing parts by means of direct and sufficient application of extinguishing media.

7 *Preaction system* is a system employing automatic nozzles attached to a piping system containing air that may or may not be under pressure, with a supplemental detection system installed in the same area as the nozzles. Actuation of the detection system opens a valve that permits water to flow into the piping system and to be discharged from any nozzles that may be open.

8 *Water-based extinguishing medium* is fresh water or seawater with or without additives mixed to enhance fire-extinguishing capability.

9 *Wet pipe system* is a system employing nozzles attached to a piping system containing water and connected to a water supply so that water discharges immediately from the nozzles upon system activation.

Principal requirements for the system

- 10 The system should be capable of manual release.
- 11 The system should be capable of fire extinction, and tested to the satisfaction of the Administration in accordance with appendix B to these Guidelines.
- 12 The system should be available for immediate use and capable of continuously supplying water for at least 30 min in order to prevent re-ignition or fire spread within that period of time. Systems which operate at a reduced discharge rate after the initial extinguishing period should have a second full fire-extinguishing capability available within a 5-minute period of initial activation.
- 13 The system and its components should be suitably designed to withstand ambient temperature changes, vibration, humidity, shock, impact, clogging and corrosion normally encountered in machinery spaces or cargo pump-rooms in ships. Components within the protected spaces should be designed to withstand the elevated temperatures which could occur during a fire.
- 14 The system and its components should be designed and installed in accordance with international standards acceptable to the Organization¹ and manufactured and tested to the satisfaction of the Administration in accordance with appropriate elements of appendices A and B to these guidelines.
- 15 The nozzle location, type of nozzle and nozzle characteristics should be within the limits tested to provide fire extinction as referred to in paragraph 10.
- 16 The electrical components of the pressure source for the system should have a minimum rating of IP 54. The system should be supplied by both main and emergency sources of power and should be provided with an automatic change-over switch. The emergency power supply should be provided from outside the protected machinery space.
- 17 The system should be provided with a redundant means of pumping. The capacity of the redundant means should be sufficient to compensate for the loss of any single supply pump. The system should be fitted with a permanent sea inlet and be capable of continuous operation using seawater.
- 18 The piping system should be sized in accordance with an hydraulic calculation technique.²
- 19 Systems capable of supplying water at the full discharge rate for 30 min may be grouped into separate sections within a protected space. The sectioning of the system within such spaces should be approved by the Administration in each case.

¹ Pending the development of international standards acceptable to the Organization, national standards as prescribed by the Administration should be applied.

² Where the Hazen-Williams Method is used, the following values of the friction factor "C" for different pipe types which may be considered should apply:

Pipe type	C
Black or galvanized mild steel	100
Copper and copper alloys	150
Stainless steel	150

- 20 In all cases the capacity and design of the system should be based on the complete protection of the space demanding the greatest volume of water.
- 21 The system operation controls should be available at easily accessible positions outside the spaces to be protected and should not be liable to be cut off by a fire in the protected spaces.
- 22 Pressure source components of the system should be located outside the protected spaces.
- 23 A means for testing the operation of the system for assuring the required pressure and flow should be provided.
- 24 Activation of any water distribution valve should give a visual and audible alarm in the protected space and at a continuously manned central control station. An alarm in the central control station should indicate the specific valve activated.
- 25 Operating instructions for the system should be displayed at each operating position. The operating instructions should be in the official language of the flag State. If the language is neither English nor French, a translation into one of these languages should be included.
- 26 Spare parts and operating and maintenance instructions for the system should be provided, as recommended by the manufacturer.
- 27 Additives should not be used for the protection of normally occupied spaces unless they have been approved for fire protection service by an independent authority. The approval should consider possible adverse health effects to exposed personnel, including inhalation toxicity.