CHAPTER 3

SURVEYS AND INSPECTIONS

Key Changes

Major revision which incorporates IACS Unified Interpretations, and provides guidance of where to find additional information for the survey and inspection of fire systems and equipment.

All amendments are highlighted in yellow.

3.1 First Surveys

When conducting a first survey, the surveyor should make such inspections and tests as will ensure the fire extinguishing arrangements and appliances are in accordance with the statutory requirements, approved plans and to his satisfaction. When, in the surveyor's opinion, application of the regulations does not adequately cover any specific fire hazard, full details and proposals to deal with the hazard should be submitted to the officer dealing with plan approval.

3.2 Subsequent Surveys

When conducting any survey or inspection subsequent to the first survey, the surveyor should be satisfied the fire extinguishing arrangements and appliances remain in accordance with the requirements, have been properly maintained and that the equipment is readily available for use.

3.3 Unsatisfactory Condition

When fire fighting installations or equipment are not immediately available for use, or found to be in a defective or unsatisfactory condition, matters should be rectified before the ship sails, for the more serious cases this could lead to the ship being detained.

3.4 Automatic Sprinkler and Fixed Fire Detection Systems

The general requirements for these items are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 4.

3.5 Fire Pumps, Fire Mains, Hydrants and Hoses

The general requirements for these items are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 5.

3.6 Fire Extinguishers – Portable & Non-portable

The general requirements for these items are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 6. In addition the following guidance should be followed.

3.6.1 Portable extinguishers should be subject to periodical inspections in accordance with the manufacturer's instructions and serviced at intervals not exceeding one year. MGN 276 and IMO Resolution A.951(23) provide further guidance on servicing requirements.

3.6.2 Non-portable extinguishers should be subject to periodical inspections in accordance with the manufacturer's instructions and serviced at intervals not exceeding one year. In the case of foam extinguishers of 45 litres capacity and over, the foam forming qualities of the concentrate should also be checked, in accordance with the manufacturer's instructions.

IMO MSC.1/Circ.1432 provides further guidance on servicing requirements.

3.7 Fixed Fire-Extinguishing Systems - Machinery Spaces

The general requirements for fixed fire-extinguishing systems in machinery spaces are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 7. In addition the following guidance should be followed.

3.7.1 Carbon dioxide installations

The general requirements for fixed CO_2 fire-extinguishing systems are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 7, paragraph 7.3 and FSS Code Chapter 5.

3.7.2 Low pressure carbon dioxide installations

The general requirements for low pressure CO_2 fire-extinguishing systems are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 7, paragraph 7.4.

3.7.3 Halon replacement systems (approved under MSC Circular 848)

The general requirements for halon replacement fire extinguishing installations are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 7, paragraph 7.6

3.7.4 Aerosol systems

The general requirements for aerosol fire extinguishing installations are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 7, paragraph 7.7.

3.7.5 Low expansion foam installations

The general requirements for low expansion foam installations are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 7, paragraph 7.9.

3.7.6 High expansion foam installations

The general requirements for high expansion foam systems are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 7, paragraph 7.10.

3.7.7 Fixed pressure water-spraying and water-mist fire-extinguishing systems

The general requirements for fixed pressure water-spraying and water mist systems are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 7, paragraph 7.13.

3.8 Fixed Fire-Extinguishing Systems - Cargo Spaces

The general requirements for fixed fire-extinguishing systems in cargo spaces are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 7. In addition the following guidance should be followed.

3.8.1 Steam smothering installations

Such systems are no longer permitted in ships to which the SI 1998 No. 1012 (Fire Protection: Large Ships) and SI 1998 No. 1011 (Fire Protection: Small Ships) Regulations apply.

3.8.2 Deck foam systems

The general requirements for deck foam systems are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 7, paragraph 7.11.

In such systems the foam expansion ratio should be between 50:1 and 150:1. The system should be tested in accordance with the procedures set out in IforS Chapter 7, paragraph 7.11.

3.8.3 Inert gas systems

The general requirements for inert gas systems in cargo spaces can be found under IforS MSIS 12 Fire Protection Arrangements Chapter 8.

3.9 Specialised Ships, Tankers, Chemical Carriers, Liquefied Gas Carriers, Dangerous Goods and Offshore Support Vessels

The general requirements for these items are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 8. In addition the following guidance should be followed.

3.9.1 Fire protection arrangements in cargo spaces (SOLAS Reg. II-2/10.7.2)

SOLAS regulation II-2/10.7.2 reads:-

"7.2 Fixed gas fire-extinguishing systems for dangerous goods

A ship engaged in the carriage of dangerous goods in any cargo spaces shall be provided with a fixed carbon dioxide or inert gas fire-

extinguishing system complying with the provisions of the Fire Safety Systems Code or with a fire-extinguishing system which, in the opinion of the Administration, gives equivalent protection for the cargoes carried."

Interpretation

1. Fixed fire-extinguishing systems for cargo spaces specified in Regulation II-2/10.7.2 (Regulation II-2/53.1.3 for ships constructed before 1 July 2002) are required for the following ships engaged in the carriage of dangerous goods:

1.1 Passenger ships constructed on or after 1 September 1984; and

1.2 Cargo ships of 500 gross tonnage and upwards constructed on or after 1 September 1984.

2. Cargo ships of less than 500 gross tonnage are not subject to Regulation II-2/10.7.2 (ex. Regulation II-2/53.1.3) even when such ships are engaged in the carriage of dangerous goods and documents of compliance are issued to such ships according to Regulation II- 2/19.4 (ex. Regulation II-2/54.3).
(IACS Unified Interpretation SC49)

3.10 Firemen's Outfits and Emergency Escape Breathing Devices (EEBD)

The general requirements for these items are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 9.

3.11 Miscellaneous Items and Protection of Vehicle, Special Category and Ro-Ro Spaces

The general requirements for these items are contained in IforS MSIS 12 Fire Protection Arrangements Chapter 10. In addition the following guidance should be followed.

3.11.1 Power ventilation systems in ro-ro cargo spaces – refer to MSC/Circ.729 - Design Guidelines and Operational Recommendations for Ventilation Systems in Ro-Ro Cargo Spaces.

3.11.2 Exhaust fans should be of non-sparking type in accordance with the following IACS Unified Requirement:-

F29.1 Introduction

A fan is considered as non-sparking if in either normal or abnormal conditions it is unlikely to produce sparks.

F29.2 Design criteria

F29.2.1 The air gap between the impeller and the casing shall be not less than 0,1 of the shaft diameter in way of the impeller bearing but not less than 2 mm. It need not be more than 13 mm.

F29.2.2 Protection screens of not more than 13 mm square mesh are to be fitted in the inlet and outlet ventilation openings on the open deck to prevent the entrance of objects into the fan housing.

F29.3 Materials

F29.3.1 The impeller and the housing in way of the impeller are to be made of alloys which are recognised as being spark proof by appropriate test.

F29.3.2 Electrostatic charges both in the rotating body and the casing are to be prevented by the use of antistatic materials. Furthermore, the installation on board of the ventilation units is to be such as to ensure the safe bonding to the hull of the units themselves.

F29.3.3 Tests may not be required for fans having the following combinations:

(i) impellers and/or housings of non-metallic material, due regard being paid to the elimination of static electricity,
(ii) impellers and housings of non-ferrous materials,
(iii) Impellers of aluminium alloys or magnesium alloys and a ferrous (including austenitic stainless steel) housing on which a ring of suitable thickness on non-ferrous materials is fitted in way of the impeller,
(iv) any combination of ferrous (including austenitic stainless steel) impellers and housings with not less than 13 mm tip design clearance.

F29.3.4 The following impellers and housings are considered as sparking and are not permitted:

(i) impellers of an aluminium alloy or magnesium alloy and a ferrous housing, regardless of tip clearance,
(ii) housing made of an aluminium alloy or a magnesium alloy and a ferrous impeller, regardless of tip clearance,
(iii) any combination of ferrous impeller and housing with less than 13 mm design tip clearance.

F29.3.5 Type tests on the finished product are to be carried out in accordance with the requirements of the Classification Society or an equivalent national or international standard.
(IACS Unified Requirement F29)

3.11.3 Fire protection arrangements in cargo spaces (SOLAS Reg. II-2/20.3.1.3):-

The requirements 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.
(MSC/Circ. 1120)
(IACS Unified Interpretation SC52)

3.11.4 Special requirements for ships carrying dangerous goods (SOLAS Reg. II-2/19.3.4.2):-

1 Exhaust fans are to 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 are to have a size of 13 mm x 13 mm.
(MSC/Circ. 1120)
(IACS Unified Interpretation SC52)

3.11.5 Certified safe type electrical equipment for ships carrying dangerous goods (SOLAS Reg. II-2/19.3.2)

SOLAS Reg. II-2/19.3.2 reads:-

"*3.2 Sources of ignition*

*Electrical equipment and wiring shall not be fitted in enclosed cargo spaces or vehicle spaces unless it is essential for operational purposes in the opinion of the Administration. However, if electrical equipment is fitted in such spaces, it shall be of a certified safe type** for use in the dangerous environments to which it may be exposed unless it is possible to completely isolate the electrical system (e.g. by removal of links in the system, other than fuses). Cable penetrations of the decks and bulkheads shall be sealed against the passage of gas or vapour. Through runs of cables and cables within the cargo spaces shall be protected against damage from impact. Any other equipment which may constitute a source of ignition of flammable vapour shall not be permitted."*
** *Refer to the recommendations of International Electrotechnical Commission, in particular, publication IEC 60092 – "Electrical installations in ships".*

Interpretation:

1. Reference is to be made to IEC 60092-506 standard, Special features - Ships carrying specific dangerous goods and materials hazardous only in bulk.

2. For pipes having open ends (e.g., ventilation and bilge pipes, etc.) in a hazardous area, the pipe itself is to be classified as hazardous area. See IEC 60092-506 table B1, item B.

3. Enclosed spaces (e.g., pipe tunnels, bilge pump rooms, etc.) containing such pipes with equipment such as flanges, valves, pumps, etc. are to be regarded as an extended hazardous area, unless provided with overpressure in accordance with IEC 60092-506 clause 7. (MSC.1/Circ.1203)

(IACS Unified Interpretation SC79)

3.11.6 Precaution against ignition of explosive petrol and air mixture in closed vehicle spaces, closed ro-ro spaces and special category spaces (SOLAS Reg. II-2/ 20.3.2.2)

SOLAS Reg. II-2/20.3.2.2 reads:-

" ....electrical equipment of a type so enclosed and protected as to prevent the escape of sparks ..."

Interpretation:

This is realized by requiring an enclosure of at least IP55, or apparatus suitable for use in Zone 2 areas as defined in IEC Publication 60079. Refer to IEC Publication 60079 Part 14 for types of protection suitable for use in Zone 2 areas.

(IACS Unified Interpretation SC42)

3.11.7 Precaution against ignition of explosive petrol and air mixture in closed vehicle spaces, closed ro-ro spaces and special category spaces (SOLAS Reg. II-2/20.3.2.1 and 20.3.3)

SOLAS Reg. II-2/20.3.2.1 and 20.3.3 reads:-

*"... shall be of a type suitable for use in explosive petrol and air mixtures ..."**
"... shall be of a type approved for use in explosive petrol and air mixtures…"

** Refer to the recommendations of the International Electrotechnical Commission, in particular publication 60079.*

Interpretation:

This is realized by requiring certified safe equipment suitable for use in Zone 1 areas as defined in IEC Publication 60079 (Gas Group IIA and Temperature Class T3). Refer to IEC Publication 60079 Part 14 for types of protection suitable for use in Zone 1 areas.

(IACS Unified Interpretation SC43)

3.11.8 Information regarding the carriage of gas cylinders in motor vehicles, boats, caravans and other vehicles where the gas is used solely in connection with its operation or business can be found in MGN 340 (M) - International Maritime Dangerous Goods (IMDG) Code and Cargoes Carried in Cargo Transport Units and MGN 341 (M) - Ro-Ro Ships Vehicle Decks - Accidents to Personnel, Passenger Access and the Carriage of Motor Vehicles.

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