Maritime & Coastguard Agency

Marine Guidance Note

[DRAFT] MGN 657 (M/F)

[DRAFT] Requirements for Fixed Aerosol Fire Extinguishing Systems for use in Small Vessel Machinery Spaces [DRAFT]

Notice to all Shipowners, Ship Operators, Masters and Officers of Ships, Ship Designers, and Shipbuilders of Fishing Vessels Under 24m, Small Commercial Code Vessels, Surveyors and Providers of Aerosol Fire Suppression Systems.

Summary

This Marine Guidance Note (MGN) draws the attention of interested parties to the publication of the Maritime and Coastguard Agency (MCA) installation and testing requirements required for the approval of new Aerosol Fire Suppression systems for use in small vessel machinery spaces and the UK Approved Bodies permitted to approve such testing on behalf of the MCA.

1. Introduction/Background

1.1 The MCA has previously approved Fixed Aerosol Fire Extinguishing Systems for use in small vessel machinery spaces through approval certificates based on the MCA Certificate of Inspection and Test “MSF 1814” forms issued to suppliers of Fixed Aerosol Fire Extinguishing Systems. These certificates required MCA approval of various fire-extinguishing tests to show the safe and effective operation of the systems. The testing includes demonstration of the system’s ability to extinguish a selection of representative fire types in an enclosure similar to that of a small vessel’s machinery space. This MGN now formalises the process by publishing the test requirements for future approvals and to require that the tests are witnessed and confirmed as successful by a UK Approved Body (see section 3).

1.2 New approval certificates will provide information on the vessel types that the system is accepted for as well as details of the installation requirements for that system. The vessel installation requirements, that are common to all aerosol fixed fire suppression system installations, are described in section 5 of this MGN.

1.3 The test requirements are given in the Appendix. These are based on the International Maritime Organisation (IMO) Maritime Safety Committee (MSC) Circular 1270 “Revised Guidelines for the Approval of Fixed Aerosol Fire-Extinguishing Systems Equivalent to Fixed Gas Fire-Extinguishing Systems, as Referred to in SOLAS 74, for Machinery Spaces - (4 June 2008)”.

2. General

2.1 Aerosol fixed fire extinguishing systems involve the release of an agent to extinguish a fire by interruption of the chemical process of fire. There are two methods considered for applying the aerosol agent to the protected space as defined by the IMO (*see* MSC Circular 1270) as:

2.1.1 Condensed Aerosols - created in pyrotechnic generators through the combustion of the agent charge.

2.1.2 Dispersed Aerosols - these are not pyrotechnically generated but are stored in compressed gas containers with carrier agents (such as inert or approved halocarbon gases) with the aerosol released into and distributed throughout the space through valves, pipes & nozzles.

2.2 These formal definitions are used in this document; however, it may be useful to think of, and refer to, condensed aerosols as pyrotechnically-generated aerosols and dispersed aerosols as stored-pressure aerosols. This gives a more intuitive understanding of the safety considerations that should be addressed during installation, use and maintenance.

3. UK Approved Bodies

3.1 A UK Approved Body, as appointed under the Merchant Shipping (Marine Equipment) Regulations 2016, as amended, (“the Regulations”), in this context, is a body which may undertake approval of an aerosol fire suppression system test that complies with the requirements of the procedures given in Appendix 1 of this MGN on behalf of the MCA.

3.2 Further details on the UK Approved Bodies’ requirements can be found in MGN 554 “Marine Equipment - Procedure for becoming a UK Approved Body following the UK's exit from the EU”, as amended, as well as in MIN 590 as amended “United Kingdom conformity assessment procedures for marine equipment following the transition period”.

3.3 The list of UK Approved Bodies can be found in MSN 1874, as amended.

3.4 The UK Approved Bodies appointed for the approval of Fixed Aerosol Fire Extinguishing Systems in compliance with this MGN are;

To Be Confirmed (confirmation of approved body will depend on exact content of this MGN which may be revised during consultation)

4. Fixed Aerosol Fire Extinguishing Systems Approval

4.1 Successful completion of the tests described in the Appendix, and subsequent Notified Body approval proves a system's ability to extinguish fires effectively, however, this does not approve the system for use on a vessel. The MCA certification system, which does approve the system for use on vessels, is also further based on assessment of the toxicity of the extinguishing medium, system design and capabilities, documentation provided, installer competence and environmental considerations.

4.2 The MCA first certifies aerosol fire suppression systems for a period of 5 years and requires that successful testing, as described in the Appendix, is completed to the satisfaction of the Approved Body. This testing can then be used as the basis of approval for two further 5-year recertifications. After 15 years retesting in compliance with this MGN is required before a further certificate will be issued.

4.3 Following any major design change the system shall be retested. The Approved Body shall be informed of any changes to the design of the system and will determine if retesting is required.

5. Vessel Installation Requirements

5.1 Systems will be installed to the vessel based on the requirements of their approval certificate and accepted by the witnessing surveyor. Systems are to be installed in accordance with the requirements of each manufacturer's design, operation, and maintenance manuals.

5.2 Installation is only permitted in machinery spaces that are *not normally occupied*. Such spaces are protected spaces that are occupied for limited periods only, in particular for monitoring, or undertaking maintenance, and where the continual presence of persons is not necessary for the effective functioning of the equipment or facility.

5.3 The machinery space housing the aerosol fixed fire extinguishing system is referred to in this document as the protected enclosure or protected space. The protected enclosure volume should be calculated and agreed. The required concentration of the aerosol varies between manufacturer / system types, and agreement of the design concentration required for the space should be sought from the manufacturer or their agent. The methods used for calculating the design concentration shall be included in the vessel's application for certification.

5.3.1 Where the protected enclosure contains multiple spaces where mixing of the aerosol and air may be inhibited, such as a partially enclosed room, the partially enclosed space should be treated as a separate space for design concertation calculation purposes. For example, using an aerosol with a

design concentration of 100 g/m^3, a 30 m^3 enclosure could be protected by ten 300 g generators but if there is a partially enclosed space of 5 m^3 within, where mixing is significantly inhibited, 25 m^3 of the space could be protected by eight 300 g generators plus one 100 g generator for example, and the remaining 5 m^3 space protected by one 300 g generator plus one 200 g generator for example. These would be controlled from the same control unit; the space is only treated as separate for design concentration calculations.

5.4 The space to be protected should be provided with means to close all openings which may admit air to the protected space. All openings should be closed before the system is discharged.

5.5 Class A fire materials such as wood, paper, plastics, rubber, or textiles are to be stored outside the protected space. Regular inspection and control of Class A materials present shall be undertaken in the protected space.

5.6 Where the space being protected has the possibility of being entered, an isolation switch will be provided that should be used to deactivate the system whenever personnel enter the space. The system isolation switch shall be situated outside the protected space and close to the system or control panel or adjacent to the main entrance to the protected space. The isolation switch shall only inhibit the discharge of the system, fire detection and alarm systems shall not be impacted and will continue to work normally during isolation. The isolation switch shall electrically isolate and earth each conductor of the wiring to the generator units / discharge device. When the isolation switch is active a visual indication will be provided at the system control panel.

5.7 Only control panels approved by the manufacturer and included in the system's approval certificate shall be used.

5.8 Control wiring for the system should be shielded or run in separate conduits from power cables or other alternating current (AC) cables.

5.9 Clear instructions for installation, maintenance, testing, and operation applicable to the specific system installed on the vessel should be provided on board.

5.10 Clear safety notices should be placed at the entrance to the protected space, inside the protected space, at the control panel and at the system isolation switch.

5.11 Generator units should be positioned and orientated such that the aerosol discharge stream shall not be across any entrance or exits to the space or over any walkways through the protected space unless set a safe distance from them. The manufacturer shall supply safe distances for positioning of generator units in their manual.

5.12 The system may be activated by an automatic system (where approved by the manufacturer and included in the MCA approval certificate). The automatic discharge must be automatically disabled when the isolation switch is engaged. Where an automatic release system is installed a pre-discharge alarm must sound for a minimum of 20 seconds before release. This is to allow any personnel present evacuation time, and time to close openings prior to activation. Where there is an automatic activation system in place the system shall not activate when isolated. Following an attempted automatic activation impeded by the isolation switch being active, the system shall discharge immediately when the isolation is removed.

6. Installation, Commissioning and Maintenance Requirements

6.1 Systems will be installed and commissioned by an authorised competent person, using approved components, in accordance with the manufacturer's instructions and conditions of the system approval certificate.

6.2 Systems will be serviced and maintained onboard the vessel based on the requirements of the manufacturer's maintenance manuals. As a minimum, systems shall be inspected monthly by the operator and serviced annually by the authorised competent person(s).

6.2.1 Monthly inspections should include checking for obstructions of the discharge nozzles, extension / alteration of the protected enclosure, openings left unclosed that were not catered for during the design, and that the position and orientation of the aerosol generators remain in their original installed position.

6.3 Records of installation, commissioning, servicing, and inspections are to be retained onboard the vessel. It is recommended that aide memoires or checklists are developed and circulated by the manufacturer so that the system is installed, commissioned, and maintained to the manufacturers requirements and conditions of approval.

More Information

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telephone numbers are correct at time of publishing

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APPENDIX 1. MCA Fire Test Approval Procedures - Fixed Aerosol Fire Extinguishing Systems for Small Craft Machinery Spaces

1. Definitions

1.1.1 **Aerosol** is a fire-extinguishing medium consisting of finely divided solid particles of chemicals released into a protected space as either condensed aerosol (pyrotechnic charge) or dispersed aerosol (compressed carrier gas).

1.1.2 **Generator** is a device for creating a condensed aerosol fire extinguishing medium by pyrotechnical means.

1.1.3 **Test Density (g/m^3)** is the mass of an aerosol forming composition per cubic metre of the enclosure volume required to extinguish a specific type of fire as determined by the testing regime described below.

1.1.4 **Design Density (g/m^3)** is the mass of an aerosol forming composition per cubic metre of the machinery space onboard provided to extinguish a specific type of fire, which is equal to the test density with a safety factor of 1.3.

1.1.5 **Agent** - medium for the purpose of these guidelines, these words are interchangeable.

1.1.6 **Casing** – The casing of the condensed aerosol generator, that is the metal outer part of the generator.

2. Test Enclosures

2.1 Figures (1) and (2) are for a small machinery space mock-up, constructed within a 20-foot ISO steel container. The container is one option; other enclosures may also be used for the test subject to approval by the Approved Body. A mock-up of an engine shall be created in the test enclosure to represent the expected fire scenarios more accurately than for an empty container with no obstructions to the seat of the fire. Figure (2) provides details for this mock up.

2.2 IMO MSC.1/Circular 1270 “Revised Guidelines for the Approval of Fixed Aerosol Fire-Extinguishing Systems for Machinery Spaces test methods” is used as the basis for these tests, with a smaller test enclosure volume and fire sizes to more accurately represent the small machinery spaces being approved.

2.3 The test enclosure volume should be at least equal to that of a standard 20-foot ISO container.

2.4 Tray A is placed in the enclosure away from obstructions including the mock engine. A simulated bilge system is created by plating-in close to the sides of the engine mock-up, with a fuel tray (Tray B) placed underneath the mock ‘engine’ to simulate fuel accumulation from a leak. A fuel-spray is situated at the forward end of the engine mock-up, aiming across the engine and hidden by a

plate placed over it. Also, in the four corners of the enclosure, small cans with 0.3 litres of heptane are placed at the four corners of the test enclosure to check the distribution of the extinguishing agent. As well as extinguishing the fire in the four cans the agent deposits in the small cans are required to be checked visually to prove effective distribution over the entire volume (no measurement needs to be taken) If it is clear from inspection that there is an incomplete distribution of the agent, for example the distribution of agent deposits in the four tins is significantly different, then the test should be repeated with a different arrangement of the aerosol generators.

2.5 The Wood Crib should be made of kiln spruce and consist of four layers, each layer being made up of three members; the size of each member being 38 mm x 38 mm x 260 mm. Ignition of the crib is achieved by burning heptane in a square pan located underneath the crib. The bottom of the crib should be 140 mm above the floor. The members should be placed in 4 alternate layers at right angles to one another. Members should be evenly spaced forming a square structure. The pre-burn time for the wood crib is 4 minutes.

3. Required Fire Tests

3.1 A series of eight tests should be conducted as follows:

3.1.1 Open pool (Tray A) fire - diesel fuel;

3.1.2 Hidden spray fire - diesel fuel;

3.1.3 Hidden pool fire (Tray B) - lubricating oil;

3.1.4 Combined open pool (Tray A) / hidden spray – diesel fuel;

3.1.5 Combined open pool (Tray A) / hidden pool (Tray B) – diesel fuel / lube oil;

3.1.6 Combined hidden pool (Tray B) / hidden spray - lube oil / diesel fuel;

3.1.7 Combined open pool (Tray A) / hidden pool (Tray B) / hidden spray / heptane filled cans– diesel fuel / lube oil / diesel fuel / heptane;

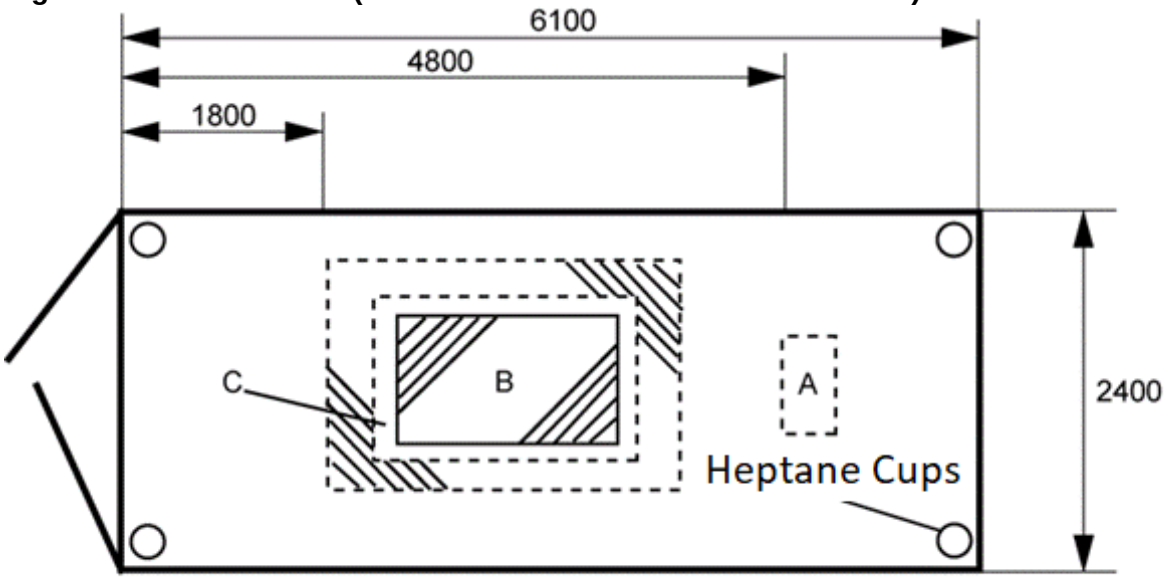
3.1.8 Wood Crib (Class A fire)

Note: 3.1.1 to 3.1.7 are for Class B fires.

3.2 With reference to the Figures 1 and 2, Tray A should contain 10 litres of diesel fuel; Tray B should contain 5 litres of lubricating oil and 5 litres of diesel fuel. When required for the relevant fire test, trays should have a water base and may be started using heptane as an accelerant.

3.3 The hidden spray should provide a flow of 1 L/minute at 3 bar pressure. The fuel spray should be shut-off 15 seconds after extinguishment. At the end of the hold time, the fuel spray should be restarted for 15 seconds prior to reopening the door and there should be no re-ignition.

Figure 1: Test enclosure (Plan View all Dimensions in millimetres)



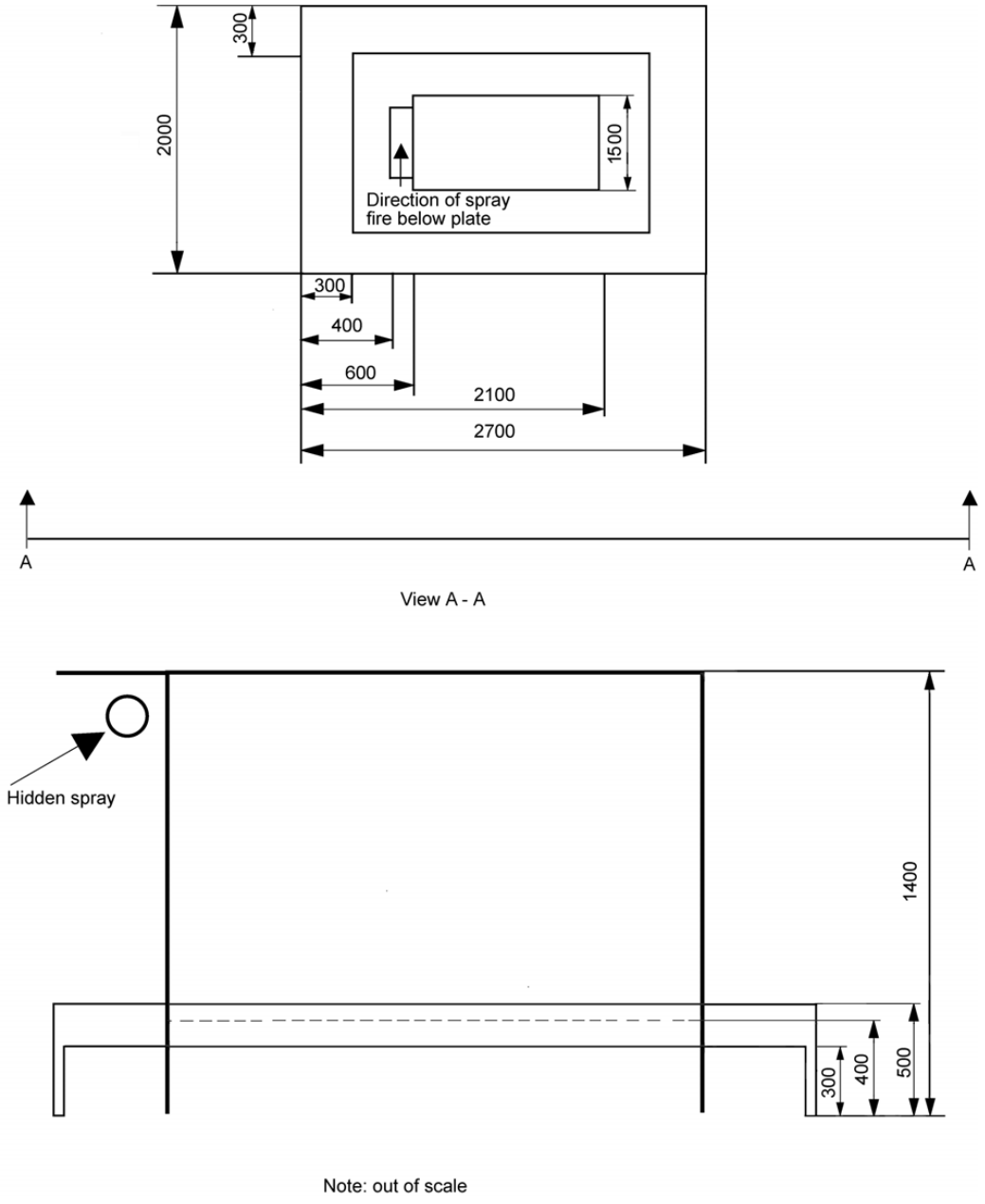
Note: out of scale

Shaded Area For Mock Engine Enclosure - Expanded in Figure 2

Table 1: Fire scenarios

Ref.	Constituents	Quantity	Container type	Container size
Tray A	Diesel fuel oil	10 l diesel fuel	Steel tray	1,20 m x 0,80 m = 0,96m2
Tray B	Engine lube oil and diesel fuel	5 l lube oil and 5 litre diesel fuel	Steel tray	1,00 m x 0,50 m =0,50 m2
Spray C	Hidden spray fire (Diesel fuel oil)	1 l/min	Pressurised container at 3 bar pressure	-
Cans 1-4	Heptane	0.3 l/can	Open tin approx. 10 cm diameter	0.75 l
Wood Crib	Kiln dried spruce or fir limber members	12 off 38 x 38 x 260 mm	-	The members are to be placed in 4 alternate layers of three at right angles to one another. Members are to be evenly spaced forming a square structure (spacing approx. 50 mm).

Figure 2: Engine mock-up (Plan View all Dimensions in millimetres)



View A-A showing elevation view of engine mock up and location of hidden spray (Spray C)

3.4 A pre-burn time of 2 minutes for the tray fires, and 5 seconds for the spray fire should be allowed before the fire extinguishing system is activated. The doors to the test enclosures should be closed just prior to system release to ensure Oxygen levels are not reduced significantly pre-test. Times to extinguishment and re-ignition, if any, should be noted, together with other details. The container should have some permanently open ventilation in the ceiling measuring at least 6 % of the ceiling area.

3.5 A continuous measure at a sampling rate of at least 1Hz should be made from temperature thermocouples located 1m above each tray and spray fire. Pressure readings, flow rates and duration of the discharge time should also be recorded. The extinguishing system should be installed in the test enclosure according to the manufacturer's design and installation instructions.

3.6 An overall restriction is imposed to the effect that the system is only considered suitable for installation in the machinery spaces of small vessels of less than 24 metre load line length. This is further subject to the volume of space to be protected not exceeding twice the test volume, for example a test in a 20ft ISO container of internal volume 32.6 m^3 could be used for system approvals in spaces up to 65.2 m^3net volume. For larger spaces, a larger test volume would be required.

3.7 Please note that this test method has been agreed by the MCA for UK operation and may not be accepted by other maritime administrations.

3.8 The test arrangement should be representative of the expected arrangement in a ship's machinery space, for example the distance between generators and the seat of the fire should be similar.

3.9 The release of an extinguishing agent may produce significant over & under pressurization in the protected space. Measures to limit the induced pressures to acceptable limits may have to be provided.

4. Principal Requirements

4.1 The components to be tested should be supplied by the manufacturer together with design and installation criteria, operational instructions, drawings and technical data sufficient for the identification of the components.

4.2 The test procedure is intended for the determination of the effectiveness of different aerosol agent extinguishing systems against Class A fires and Class B spray & pool fires.

4.3 For aerosol systems, the discharge time should not exceed 120 seconds to achieve 85 % of the design density. Systems may need to discharge in a shorter time for reasons other than for fire-extinguishing performance.

4.4 The quantity of extinguishing agent for the protected space should be calculated at the minimum expected ambient temperature using the design density based on the net volume of the protected space.

4.5 The gross volume of a protected space is calculated from the dimensions of the space.

4.6 The net volume of the space is determined by removing the volume of the machinery in the space from the gross volume. The objects that occupy volume in the protected space include, but are not necessarily limited to auxiliary machinery, boilers, condensers, evaporators, main engines, reduction gears, tanks and enclosed trunks.

4.7 When calculating the net volume of a protected space, the volumes of the bilges, or the fire extinguishing system itself should not be removed from the gross volume.

4.8 The volume of free air contained in air receivers that in the event of a fire may be released into the protected space also has also to be considered and will add to the net volume.

4.8.1 The volume of air in air receivers is the volume of air that would be released in the event of a fire to the protected space ambient pressure and temperature. For example, a 10 litre air receiver at 10 bar pressure would have an equivalent volume of 100 litres when released to the protected space which is at a nominal 1 bar pressure.

4.9 Subsequent modifications to the protected space that alter the net volume of the space should require the quantity of extinguishing agent to be adjusted to meet the requirements.

4.10 No fire suppression system should be used which is carcinogenic, mutagenic or teratogenic at concentrations expected during use. The discharge of aerosol systems to extinguish a fire could create a hazard to personnel from the natural form of the aerosol, or from certain products of aerosol generation (including combustion products and trace gases from condensed aerosols). Other potential hazards that should be considered for individual systems are the following: noise from discharge, turbulence, cold temperature of vaporizing liquid, reduced visibility, potential toxicity, thermal hazard and potential toxicity from the aerosol generators, and eye irritation from direct contact with aerosol particles. Unnecessary exposure to aerosol media, even at concentrations below an adverse effect level, and to their decomposition products should be avoided. All aerosols used in fire-extinguishing systems should have non-ozone depleting characteristics.

4.11 All systems should employ two separate control actions for releasing the extinguishing medium into a protected space, such as lift cover and turn key or similar. Means should be provided for automatically giving audible warning of the release of fire-extinguishing medium into any space in which personnel normally work or to which they have access. The alarm should operate for a suitable period, (at least 20 seconds) before the medium is released. Exposure to aerosol media, even at concentrations below an adverse effect level, should be avoided, proper the use of the isolation switch will avoid inadvertent exposures.

4.12 The MCA only approves fixed aerosol fire extinguishing systems for use in *not normally occupied spaces.* However IMO circular 1270 “Revised Guidelines for the Approval of Fixed Aerosol Fire-Extinguishing Systems Equivalent to Fixed Gas Fire-Extinguishing Systems, as Referred to in SOLAS 74, for Machinery Spaces” (4 June 2008) contains further requirements for *normally occupied spaces* related to the *No Observable Adverse Effect Levels (NOAEL)* for aerosol systems and their by-products (such as Carbon Monoxide). Compliance with these requirements does not need to be demonstrated for systems to be used in *not normally occupied spaces,* however as the spaces are occasionally occupied, the MCA will review manufacturer’s evidence of aerosol and by-products toxicity before approving any systems for use in *not normally occupied spaces*.

4.13 In no case should a dispersed aerosol system be used with halocarbon carrier gas concentrations above the “Lowest Observed Adverse Effect Level (LOAEL) nor the “Approximate Lethal Concentration (ALC)”. Nor should a dispersed aerosol system be used with an inert gas carrier at gas concentrations above 52 % calculated on the net volume of the protected space at the maximum expected ambient temperature, without the use of controls.

4.14 The system and its components should be suitably designed to withstand ambient temperature changes, vibration, humidity, shock, impact, clogging, electromagnetic compatibility and corrosion normally encountered in machinery spaces. Generators in condensed aerosol systems should be designed to prevent self-activation at a temperature below 250 °C.

4.15 The system and its components should be designed, manufactured and installed in accordance with standards acceptable to the International Maritime Organisation (IMO) and the National Authority (MCA). As a minimum, the design and installation standards should cover the following elements:

4.15.1 Safety:

Toxicity.

Noise - Generator/Nozzle discharge.

Decomposition products.

Obscuration.

4.15.2 Storage container design and arrangement strength requirements:

Maximum / minimum fill density, operating, temperature range.

Pressure & weight indication.

Pressure relief.

Agent identification, production date, installation date & hazard classification.

4.15.3 Agent supply, quantity, quality standards, shelf wife & service wife of an agent and igniter.

4.15.4 Handling & disposal of generator after service life.

4.15.5 Pipes and fittings:

Strength, material properties, fire resistance and cleaning requirements.

4.15.6 Valves:

Testing requirements; and

Elastomer compatibility.

4.15.7 Generators/Nozzles:

Height & testing requirements; and

Elevated temperature resistance.

4.15.8 Actuation & Control Systems:

Testing requirements; and

Backup power requirements.

4.15.9 Alarms & Indicators:

Predischarge alarm, agent discharge alarms & time delays.

Supervisory Circuit requirements.

Warning signs, audible & visual alarms.

Annunciation of faults (fault warning).

4.15.10 Enclosure integrity & leakage requirements:

Enclosure leakage.

Openings.

Mechanical ventilation interlocks.

4.15.11 Design density requirements, total flooding quantity.

4.15.12 Agent flow calculation:

Verification & approval of design calculation method.

Fitting losses and/or equivalent length.

4.15.13 Inspection, maintenance, service and testing requirements.

4.15.14 Handling & storage requirements for pyrotechnical components.

4.16 The Generator / nozzle type, maximum generator/nozzle spacing, maximum generator / nozzle installation height & minimum generator / nozzle pressure should be within limits tested.

4.17 Agent containers may be stored within a protected machinery space if the containers are distributed throughout the space. The arrangements of generators, containers, electrical circuits & piping essential for the release of any system should be such that in the event of damage to any one power release line through fire or explosion in the protected space (i.e. a single fault concept), at least the design density of the fire-extinguishing charge as required in paragraph 2.15.11 above can still be discharged having regard to the requirement for uniform distribution of medium throughout the space.

4.18 For all ships, the fire-extinguishing system design manual should address recommended procedures for the control of products of agent decomposition. The decomposition products should not be discharged in the vicinity of assembly spaces.

4.19 Spare parts and operating & maintenance instructions for the system should be provided as recommended by the manufacturer.

5. Test Report:

5.1 The test report should include the following information:

5.1.1 Name and Address of the Test Laboratory.

5.1.2 Date and Identification Number of the Test Report.

5.1.3 Name and Address of Client.

5.1.4 Purpose of the Test.

5.1.5 Method of Sampling System Components.

5.1.6 Name and Address of Manufacturer or Supplier of the Product

5.1.7 Name or other Identification Marks of the Product (for example serial numbers, date of manufacture, expiry date etc.)

5.1.8 Description of the Tested Product;

5.1.8.1 Drawings.

5.1.8.2 Descriptions.

5.1.8.3 Assembly Instructions.

5.1.8.4 Specification of included Materials.

5.1.8.5 Detailed Drawing of Test Set-up.

5.1.9 Date of Supply of the Product.

5.1.10 Date of Test.

5.1.11 Test method.

5.1.12 Drawing of each test configuration.

5.1.13 Identification of the Test Equipment and Instruments used.

5.1.14 Conclusions.

5.1.15 Deviations from the Test Method, if any.

5.1.16 Test Results including measurements and observations during and after the test.

5.1.17 Date, Name and Signature of qualified person witnessing the test.

6. Certificate:

6.1 On successful completion of the eight tests mentioned in paragraph 1.6 a Certificate of Inspection and Tests will be issued and the Aerosol system / product will be considered suitable for installation in normally unoccupied spaces containing fuel having a flash point of not less than 43°C (closed cup test), of vessels of less than 24 metres load line length, where the space to be protected does not exceed a deck height of 4 metres, or deck area greater than 64 square metres equal to 256m^3, this volume is the maximum permitted volume for approvals under this MGN however, as a reminder, the volume approved for a system is a maximum of twice the volume of the test enclosure. The certificate will state that the system/product is acceptable for the purpose of complying with the requirements of:

6.1.1 MGN 280 - Small Vessels in Commercial Use for Sport or Pleasure, Workboats and Pilot Boats - Alternative Construction Standards. As Amended

6.1.2 The Codes of Practice for the Safety of Small Commercial Motor or Sailing Vessels of up to 24 metres Load Line length.

6.1.3 “The Safety of Small Workboats and Pilot Boats—A Code of Practice

6.1.4 MSN 1871 (F) The Code of Practice for the Safety of Small Fishing Vessels of less than 15m Length Overall As Amended

6.1.5 MSN 1872 The Code of Safe Working Practice for the construction and use of fishing vessels of 15m length overall to less than 24m registered length As Amended

6.1.6 The Codes of Practice for Police Boats.

7. References:

(a) International Maritime Organization MSC.1/Circ.1270 of 4 June 2008 "Revised Guidelines for the Approval of Fixed Aerosol Fire Extinguishing Systems Equivalent to Fixed Gas Fire Extinguishing Systems, as referred to in SOLAS 74, for Machinery Spaces.

(b) International Maritime Organization MSC/Circ. 668 of 30 December 1994 "Alternative arrangements for Halon Fire Extinguishing Systems in Machinery Spaces and Pump Rooms".

(c) IMO 2010 FTP Code. International Code for Application of Fire Test Procedures, 2010 ISBN 978 92 801 1548 2 (International Maritime Organization).