FIRE PROTECTION SYSTEMS, APPLIANCES AND COMPRESSED GAS CYLINDERS PERIODIC MAINTENANCE, INSPECTION AND TESTING

Technical Notice SLS.6 Rev.4

Notice to Shipowners, Ship Operators, Managers, Masters, Owners' Representatives and Recognised Organisations

This Technical Notice is developed in line with IMO MSC.1/Circ.1432 as amended.

All fire protection systems and appliances shall always be in good order and available for immediate use while the ship is in service. If a fire protection system is under repair, then suitable arrangements to the satisfaction of the Recognized Organization and Administration shall be made to ensure that safety is not diminished.

FIXED FIRE DETECTION AND ALARM SYSTEMS

Weekly Testing and Inspections

Verify that all fire detection and fire alarm control panel indicators are functional by operating the lamp/indicator test switch.

Monthly Testing and Inspections

Test a sample of detectors and manual call points so that all devices have been tested within five years.

Annual Testing and Inspections

1. test all fire detection systems and fire detection systems used to automatically release fire-extinguishing systems for proper operation, as appropriate;
2. visually inspect all accessible detectors for evidence of tampering obstruction, etc., so that all detectors are inspected within one year; and.
3. test emergency power supply switchover.

PUBLIC ADDRESS AND GENERAL ALARM SYSTEM

Weekly Testing and Inspections

Verify that all public address systems and general alarm systems are functioning properly.

FIRE DOORS

Weekly Testing and Inspections

Verify that all fire door control panel indicators, if provided, are functional by operating the lamp/indicator switch.

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Quarterly Testing and Inspections
Test all fire doors located in main vertical zone bulkheads for local operation.

Annual Testing and Inspections
Test all remotely controlled fire doors for proper release.

LOW LOCATION LIGHTING

Weekly Testing and Inspections
Verify that low-location lighting systems are functional by switching off normal lighting in selected locations.

5-Yearly Service
Test that the luminance of all systems is in accordance with the procedures in Resolution A.752(18).

VENTILATION SYSTEMS AND FIRE DAMPERS

Quarterly Testing and Inspections
Test all fire dampers for local operation.

Annual Testing and Inspections
1. test all fire dampers for remote operation;
2. verify that galley exhaust ducts and filters are free of grease build-up; and
3. test all ventilation controls interconnected with fire-protection systems for proper operation.

FIRE MAINS, FIRE PUMPS, HYDRANTS, HOSES AND NOZZLES

Monthly Testing and Inspections
1. verify that all fire hydrants, hose and nozzles are in place, properly arranged, and are in serviceable condition;
2. operate all fire pumps to confirm that they continue to supply adequate pressure; and
3. that the emergency fire pump fuel supply is adequate, and the heating system is in satisfactory condition, if applicable.

Quarterly Testing and Inspections
Verify that international shore connection(s) is in serviceable condition.

Annual Testing and Inspections
1. visually inspect all accessible components for proper condition;
2. flow test all fire pumps for proper pressure and capacity. Test emergency fire pump with isolation valves closed;
3. test all hydrant valves for proper operation;
4. pressure test a sample of fire hoses at the maximum fire main pressure, so that all fire hoses

are tested within five years;
5. verify that all fire pump relief valves, if provided, are properly set;
6. examine all filters/strainers to verify they are free of debris and contamination; and
7. that nozzle size/type is correct, maintained and working.

FIREFIGHTER'S OUTFIT

Monthly Testing and Inspections

Verify that lockers providing storage for fire-fighting equipment contain their full inventory and equipment is in serviceable condition.

SELF-CONTAINED BREATHING APPARATUS (SCBA)

Spare Charges

The following spare charges are to be provided for each SCBA.

SHIP TYPE	SPARE CHARGES
Cargo ship without dedicated cylinder recharging facility	2
Cargo ship with dedicated cylinder recharging facility	1
Passenger ship carrying less than 36 passengers	1
Passenger ships carrying more than 36 passengers	At least 2

Weekly Testing and Inspections

A general examination of the SCBA, including cylinder gauges to confirm they are in the correct pressure range.

Annual Testing and Inspections

1. Check SCBA air recharging system(s), if provided, for air quality at a laboratory that is accredited to ISO/IEC 17025:2005, in accordance with BS-EN 12021 – *Respiratory protective devices – compressed air for breathing apparatus* or an equivalent national standard;
2. Check that SCBA face masks and air demand valves are in a serviceable condition; and
3. Check SCBA according to maker's instructions.

5-Yearly Service

1. Steel cylinders should be tested at an approved shore-based servicing station at the test pressure stipulated by the manufacturer and/or Recognized Organization.
2. Aluminium and composite cylinders should be tested at an approved shore-based servicing station at the intervals and the test pressure stipulated by the manufacturer and/or Recognized Organization.

EMERGENCY ESCAPE BREATHING DEVICES (EEBDs)

Maintenance and Records

Maintenance shall be carried out by the ship's crew in accordance with the manufacturer's instructions. Records of inspections and maintenance shall be duly maintained.

Weekly Testing and Inspections

A general examination of the EEBDs, including cylinder gauges to confirm they are in the correct pressure range.

Annual Testing and Inspections

Check EEBDs' according to maker's instructions.

Hydrostatic Pressure Test

Hydrostatic pressure testing shall be carried out at the intervals specified by the manufacturer at a shore-based testing facility and records of pressure tests are to be maintained.

MARINE PORTABLE FIRE EXTINGUISHERS

Instructions and Records

Manufacturer's instructions for recharging marine portable fire extinguishers should be available for use on board. Records of inspection, maintenance and tests should be maintained.

Spare Charges

1. For extinguishers of the same type that are capable of being recharged on board, spare charges shall be provided for 100% of the first 10 fire extinguishers and for 50% of the remaining extinguishers. Not more than a total of 60 spare charges need to be provided.
2. For extinguishers that cannot be recharged on board, additional extinguishers of the same quantity, type and capacity shall be provided for 100% of the first 10 extinguishers and for 50% of the remaining extinguishers. Not more than a total of 60 additional extinguishers need to be provided.

Annual Testing and Inspections

1. Service and inspection may be carried out by a ship's officer (appointed by the Company) in accordance with the established and dedicated maintenance schedule of the Safety Management System. The manufacturer's instructions in addition to the below guidance shall be taken into account. On board servicing and inspection is restricted to extinguishers of the non-permanently pressurized type.
2. Servicing and inspection of the permanently pressurized extinguishers shall be carried out at a shore servicing facility.
3. Water and foam charges to be removed to a clean container. If they are to be reused check if it is still suitable for further use. Check any charge container.
4. If powder charges are to be re-used, ascertained that the powder is free flowing and that there is no evidence of caking lumps or foreign bodies.
5. Gas cartridges to be checked for damage and corrosion.

5-Yearly Service

At least one extinguisher of each type manufactured in the same year and kept on board a ship should be test discharged as part of a fire drill.

1. Periodic inspection and inspection after discharge test should comprise of the following:
1.1 Prove clear passage by blowing through vent holes and vent devices in the cap. Check hose, nozzle strainer, discharge tube and breather valve, as applicable. Check the operating and discharge control. Clean and lubricate as required.
1.2 Check that the safety pin is removable and that the lever is undamaged.
1.3 Examine for damage and corrosion. Weigh the cartridge to ascertain that it is within prescribed limits.
1.4 Check O-rings and replace hose diaphragms if fitted.
1.5 Inspect the interior, check for corrosion and lining deterioration. Check separate containers for leakage or damage.
1.6 examine the body and check internally for corrosion and lining deterioration.

2. Inspection after recharge should comprise of the following:
2.1 Replace the charge in accordance with the manufacturer's instructions.
2.2 Reassemble the extinguisher in accordance with the manufacturer's instructions.
2.3 Fill in entry on maintenance label, including full weight.
2.4 Check the mounting bracket or stand.
2.5 Complete a report on the state of maintenance of the extinguishers.

10-Yearly Service

1. Periodic inspection and inspection after discharge test should comprise of the following:
1.1 Prove clear passage by blowing through vent holes and vent devices in the cap. Check hose, nozzle strainer, discharge tube and breather valve, as applicable. Check the operating and discharge control. Clean and lubricate as required.
1.2 Check that the safety pin is removable and that the lever is undamaged.
1.3 Examine for damage and corrosion. Weigh the cartridge to ascertain that it is within prescribed limits.
1.4 Check O-rings and replace hose diaphragms if fitted. Inspect the interior, check for corrosion and lining deterioration. Check separate containers for leakage or damage.
1.5 Examine the body and check internally for corrosion and lining deterioration.
1.6 Extinguishers and propellant cartridges should be hydraulically tested in accordance with the manufacturer's instructions. Notwithstanding, whenever the loss in pressure of permanently pressurized marine portable fire- extinguishers exceeds 10% of the nominal pressure, the extinguishers shall be hydrostatically pressure tested before being recharged.

The test pressures should be in accordance with the following table.

Fire Extinguishers and Propellant Cartridges	**Test Pressure**
Water	At least 1.5 times w.p. (or 2 N/mm^2 if the w.p. is unknown)
Foam	
Dry Chemical	
Powder (permanently pressurized)	
Powder (non-permanently pressurized)	
Carbon Dioxide	At least 25 N/mm^2
Propellant Cartridges CO_2 type with safety devices CO_2 type without safety devices	At least 2 times w.p. or 25 N/mm^2 or 35 N/mm^2

w.p. – working pressure

During statutory surveys the attending Surveyor of the Recognized Organization may request hydrostatic pressure testing if the condition of the fire-extinguisher(s) so warrant. The test date and test pressure should be "hard-stamped" on the cylinders of CO_2 extinguishers and on propellant cartridges. As regards extinguishers of a type other thanCO_2 the test date and test pressure should be entered in the tag attached to the extinguisher.

2. Inspection after recharge should comprise of the following:
2.1 Replace the charge in accordance with the manufacturer's instructions.
2.2 Reassemble the extinguisher in accordance with the manufacturer's instructions.
2.3 Fill in entry on maintenance label, including full weight.
2.4 Check the mounting bracket or stand.
2.5 Complete a report on the state of maintenance of the extinguishers.

PORTABLE FOAM APPLICATORS

Monthly Testing and Inspections
Verify that all portable foam applicators are in place, properly arranged, and are in proper condition.

Annual Testing and Inspections
1. verify that all portable foam applicators are set to the correct proportioning ratio for the foam concentrate supplied and that the equipment is in proper order;
2. verify that all portable containers or portable tanks containing foam concentrate remain factory sealed, and the manufacturer's recommended service life interval has not been exceeded;
3. portable containers or portable tanks containing foam concentrate, excluding protein-based concentrates, less than 10 years old, that remain factory sealed can normally be accepted without the periodical foam control tests required in MSC.1/Circ.1312 being carried out;
4. protein based foam concentrate portable containers and portable tanks should be thoroughly checked and, if more than five years old, the foam concentrate should be subjected to the periodical foam control tests required in MSC.1/Circ.1312, or renewed; and
5. the foam concentrates of any non-sealed portable containers and portable tanks, and portable containers and portable tanks where production data is not documented, should be subjected to the periodical foam control tests required in MSC.1/Circ.1312.

WHEELED (MOBILE) FIRE EXTINGUISHERS

Monthly Testing and Inspections
Verify that all extinguishers are in place, properly arranged, and are in proper condition.

Annual Testing and Inspections
1. perform periodical inspections in accordance with the manufacturer's instructions;
2. visually inspect all accessible components for proper condition;
3. check the hydrostatic test date of each cylinder; and
4. for dry powder extinguishers, invert extinguisher to ensure powder is agitated.

5-Yearly Service
Visually examine at least one extinguisher of each type manufactured in the same year and kept on board.

10-Yearly Service
All extinguishers together with propellant cartridges should be hydrostatically tested in accordance with recognized standards or the manufacturer's instructions at an approved servicing and testing station.

GALLEY DEEP FAT COOKING FIRE-EXTINGUISHING SYSTEMS

Annual Testing and Inspections
Check galley and deep fat cooking fire-extinguishing systems in accordance with the manufacturer's instructions.

FIXED AEROSOL EXTINGUISHING SYSTEMS

Monthly Testing and Inspections
1. verify that all electrical connections and/or manual operating stations are properly arranged, and are in proper condition; and
2. verify that the actuation system/control panel circuits are within manufacturer's specifications.

Annual Testing and Inspections
Verify that condensed or dispersed aerosol generators have not exceeded their mandatory replacement date. Pneumatic or electric actuators should be demonstrated as working, as far as practicable.

10-Yearly Service
Condensed or dispersed aerosol generators shall be renewed in accordance with manufacturer's recommendations.

FIXED DRY CHEMICAL POWDER SYSTEMS

Monthly Testing and Inspections
Verify that all control and section valves are in the proper open or closed position, and all pressure gauges are in the proper range.

Annual Testing and Inspections
1. visually inspect all accessible components for proper condition;
2. verify that the pressure regulators are in proper order and within calibration; and
3. agitate the dry chemical powder charge with nitrogen in accordance with system manufacturer's instructions.
   (Note: Due to the powder's affinity for moisture, any nitrogen gas introduced for agitation must be moisture free.)

Biennial Testing and Inspections
1. blow dry nitrogen through the discharge piping to confirm that the pipe work and nozzles are clear of any obstructions;
2. operationally test local and remote controls and section valves;
3. verify the contents of propellant gas cylinders (including remote operating stations);
4. test a sample of dry chemical powder for moisture content; and
5. subject the powder containment vessel, safety valve and discharge hoses to a full working pressure test.

10-Yearly Service
Subject all powder containment vessels to hydrostatic or non-destructive testing carried out by an accredited service agent.

FOAM FIRE-EXTINGUISHING SYSTEM

Monthly Testing and Inspections
Verify that all control and section valves are in the proper open or closed position, and all pressure gauges are in the proper range.

Quarterly Testing and Inspections
Verify that the proper quantity of foam concentrate is provided in the foam system storage tank.

Annual Testing and Inspections
1. visually inspect all accessible components for proper condition;
2. functionally test all fixed system audible alarms;
3. flow test all water supply and foam pumps for proper pressure and capacity and confirm flow at the required pressure in each section (Ensure all piping is thoroughly flushed with fresh water after service.);
4. test all system cross connections to other sources of water supply for proper operation;
5. verify all pump relief valves, if provided, are properly set;
6. examine all filters/strainers to verify they are free of debris and contamination;

7. verify that all control/section valves are in the correct position;
8. blow dry compressed air or nitrogen through the discharge piping or otherwise, confirm that the pipework and nozzles of high expansion foam systems are clear of any obstructions, debris and contamination. This may require the removal of nozzles, if applicable;
9. samples of all foam concentrates carried on board are to be subjected to the periodical control tests in MSC.1/Circ.1312, for low expansion foam, or MSC/Circ.670 for high expansion foam at an approved independent/manufacturer laboratory. (Note: Except for non-alcohol resistant foam, the first test need not be conducted until 3 years after being supplied to the ship); and
10. test all fuel shut-off controls connected to fire-protection systems for proper operation.

5-Yearly Service

1. perform internal inspection of all control valves;
2. flush all high expansion foam system piping with fresh water, drain and purge with air;
3. check all nozzles to prove they are clear of debris; and
4. test all foam proportioners or other foam mixing devices to confirm that the mixing ratio tolerance is within +30 to -10% of the nominal mixing ratio defined by the system approval.

WATER MIST, WATER SPRAY AND SPRINKLER SYSTEM

Weekly Testing and Inspections

1. verify that all control panel indicators and alarms are functional;
2. visually inspect pump unit and its fittings; and
3. check the pump unit valve positions, if valves are not locked, as applicable.

Monthly Testing and Inspections

1. verify that all control, pump unit and section valves are in the proper open or closed position;
2. verify that sprinkler pressure tanks or other means have correct levels of water;
3. test automatic starting arrangements on all system pumps so designed;
4. verify all standby pressure and air/gas pressure gauges are within the proper pressure ranges; and
5. test a selected sample of system section valves for flow and proper initiation of alarms. (Note – The valves selected for testing should be chosen to ensure that all valves are tested within a one-year period.)

Quarterly Testing and Inspection

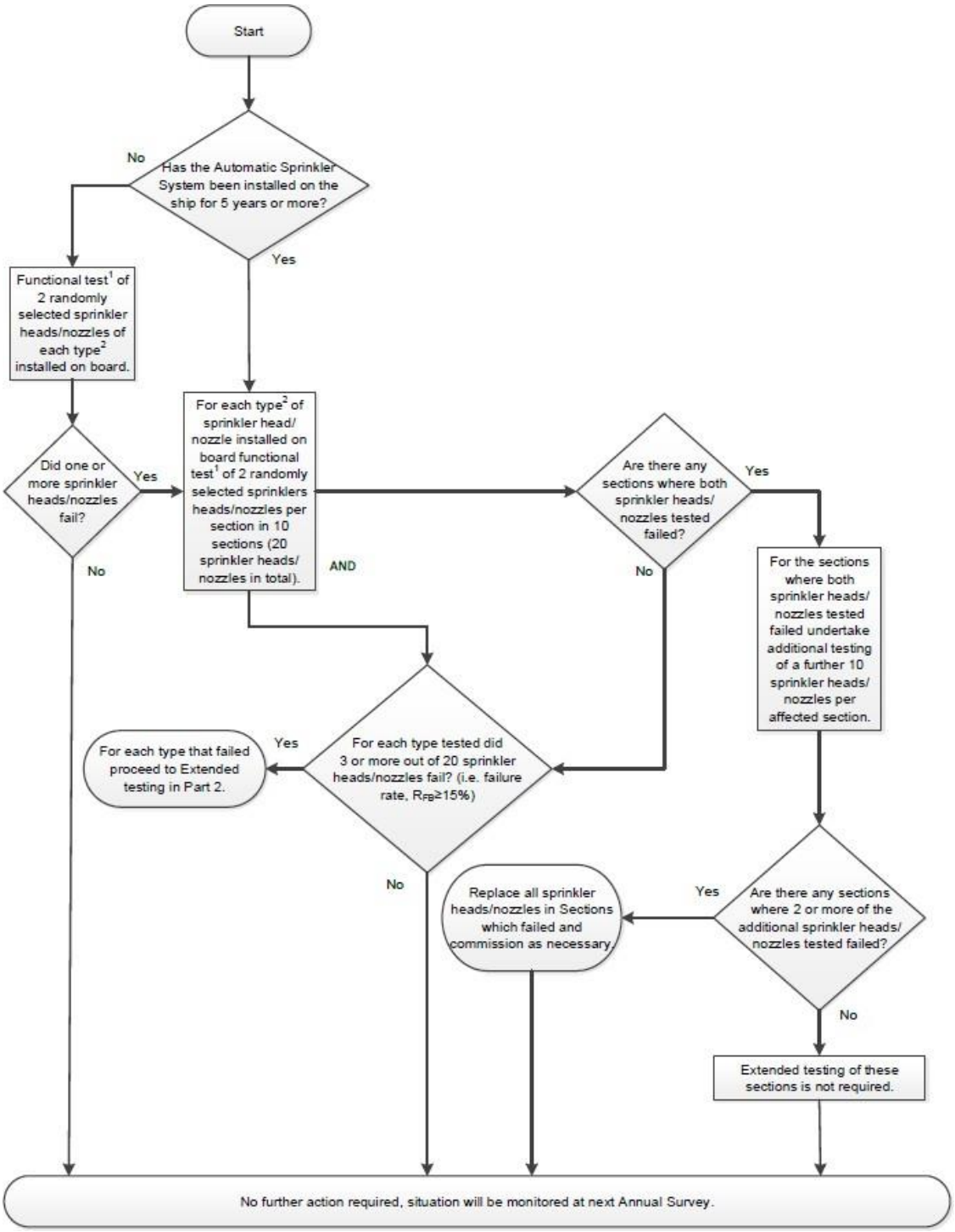
Assess system water quality in the header tank and pump unit against the manufacturer's water quality guidelines.

Annual Testing and Inspections

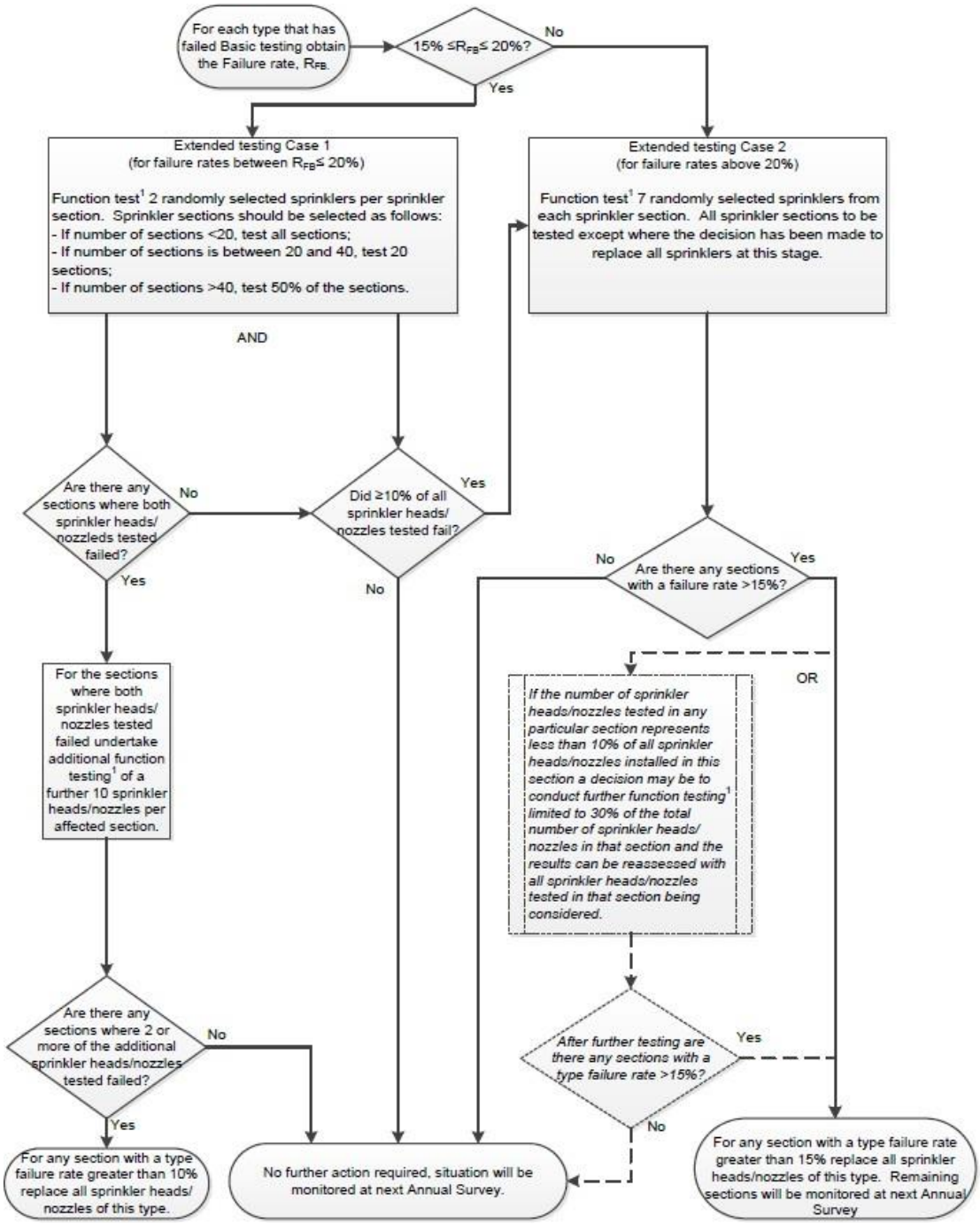
1. verify proper operation of all water mist, water-spray and sprinkler systems using the test valves for each section;
2. visually inspect all accessible components for proper condition;
3. externally examine all high pressure cylinders for evidence of damage or corrosion;
4. check the hydrostatic test date of all high pressure cylinders;
5. functionally test all fixed system audible and visual alarms;

6. flow test all pumps for proper pressure and capacity;
7. test all antifreeze systems for adequate freeze protection;
8. test all system cross connections to other sources of water supply for proper operation;
9. verify that all pump relief valves, if provided, are properly set;
10. examine all filters/strainers to verify they are free of debris and contamination;
11. verify that all control/section valves are in the correct position;
12. blow dry compressed air or nitrogen through the discharge piping of dry pipe systems, or otherwise, confirm that the pipework and nozzles are clear of any obstructions. This may require the removal of nozzles, if applicable;
13. test emergency power supply switchover, where applicable;
14. visually inspect all sprinklers focusing in areas where sprinklers are subject to aggressive atmosphere (like saunas, spas, kitchen areas) and subject to physical damage (like luggage handling areas, gyms, play rooms, etc.) so that all sprinklers are inspected within one year. Sprinklers with obvious external damage, including paint, should be replaced and not included in the number of sprinklers tested in subparagraph .17;
15. check for any changes that may affect the system such as obstructions by ventilation ducts, pipes, etc.;
16. test a minimum of one section in each open head water mist system by flowing water through the nozzles. The sections tested should be chosen so that all sections are tested within a five-year period; and
17. test automatic sprinklers and automatic water mist nozzles in accordance with the flow charts *Part 1 – Basic Testing* and *Part 2 – Extended Testing*.
18. during basic testing, and extended testing when applicable, of automatic sprinkler heads/nozzles as outlined in subparagraph 17, water quality testing should be conducted in each corresponding piping section. (Note – should a tested sprinkler fail, assessing the corresponding water quality at that time would assist in determining the cause of failure).

Part 1
Basic Testing



Part 2
Extended Testing



Explanatory Notes to flow charts *Part 1 – Basic Testing* and *Part 2 – Extended Testing*

1 *Functional Test* is defined as a test that demonstrates the operation and flow of water from sprinkler head/nozzle.
2 *Type* is defined as each different manufacturer model of sprinkler head/nozzle.
3 *Static/standby pressure* is defined as the constant pressure always maintained in the system prior to activation.
4 All testing should be carried out at static/standby pressure.
5 *Failure rate* (R_{FB}) is the number of sprinkler heads/nozzles to fail testing divided by test sample size multiplied by 100.

5-Yearly Service

1. flush all ro-ro deck deluge system piping with water, drain and purge with air;
2. perform internal inspection of all control/section valves; water quality testing should be conducted in all corresponding piping sections, if not previously tested as outlined in paragraph 18 of section *Annual Testing and Inspections* within the last five years;
3. check condition of any batteries, or renew in accordance with manufacturer's recommendations; and
4. for each section where the water is refilled after being drained or flushed, water quality should meet manufacturer's guidelines. Testing of the renewed water quality should be conducted and recorded as a baseline reference to assist future water quality monitoring for each corresponding section.

10-Yearly Service

Perform a hydrostatic test and internal examination for gas and water pressure cylinders according to EN 1968:2002 + A1.

FIXED GAS FIRE-EXTINGUISHING SYSTEMS (OTHER THAN CO_2)

Weekly Testing and Inspections

1. verify that all fixed fire-extinguishing system control panel indicators are functional by operating the lamp/indicator test switch; and
2. verify that all control/section valves are in the correct position.

Monthly Testing and Inspections

Verify thatcontainers/cylinders fitted with pressure gauges are in the proper range and the installation free from leakage.

Annual Testing and Inspections

1. visually inspect all accessible components for proper condition;
2. externally examine all high pressure cylinders for evidence of damage or corrosion;
3. check the hydrostatic test date of all storage containers;
4. functionally test all fixed system audible and visual alarms;
5. verify that all control/section valves are in the correct position;
6. check the connections of all pilot release piping and tubing for tightness;
7. examine all flexible hoses in accordance with manufacturer's recommendations;
8. test all fuel shut-off controls connected to fire-protection systems for proper operation;
9. the boundaries of the protected space should be visually inspected to confirm that no

modifications have been made to the enclosure that have created openings that cannot be closed and thus would render the system ineffective; and

10. if cylinders are installed inside the protected space, verify the integrity of the double release lines inside the protected space, and check low pressure or circuit integrity monitors on release cabinet, as applicable.

Biennial Testing and Inspections

1. all high pressure extinguishing agents cylinders and pilot cylinders should be weighed or have their contents verified by other reliable means to confirm that the available charge in each is above 95 per cent of the nominal charge. Cylinders containing less than 95 per cent of the nominal charge should be refilled; and
2. blow dry compressed air or nitrogen through the discharge piping or otherwise, confirm the pipe work and nozzles are clear of any obstructions. This may require the removal of nozzles, if applicable.

5-Yearly Service

Perform internal inspection of all control valves.

10-Yearly Service

1. perform a hydrostatic test and internal examination of 10 per cent of the system's extinguishing agent and pilot cylinders. If one or more cylinders fail, a total of 50 per cent of the onboard cylinders should be tested. If further cylinders fail, all cylinders should be tested;
2. flexible hoses should be replaced at the intervals recommended by the manufacturer and not exceeding every 10 years;

FIXED CARBON DIOXIDE FIRE-EXTINGUISHING SYSTEMS

Maintenance and inspections of fixed carbon dioxide fire-extinguishing systems shall be carried out in line with MSC.1/Circ.1318 as amended (Guidelines for the maintenance and inspections of fixed carbon dioxide fire-extinguishing systems).

The due date of the hydrostatic servicing is to be counted from the “hard stamped” date on the cylinder.

MEDICAL OXYGEN CYLINDERS

For pressure requirements and quantities on the number of medical oxygen cylinders, reference shall be made to the Merchant Shipping (Maritime Labour Convention) Rules.

The company (on the advice of a medical practitioner) is to ensure that the quantities on board the vessel are sufficient and reflect the Category in which the vessel falls, the nature of the voyage (in particular ports of call, destination and duration), the type or types of work to be carried out during the voyage, the nature of the cargo and the number of crew.

For vessels that the IBC and IGC codes apply, reference shall be made to the requirements under the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG) Code.

Annual Testing and Inspections

Cylinders should be inspected annually by the manufacturer or his authorized agent. Alternatively, annual inspection may be carried out on board by a senior member of the ship's staff provided that the manufacturer's instructions are available on board and adhered to.

3-Yearly Testing and Inspections

1. Cylinders should be re-charged with medical oxygen at intervals not exceeding 3 years but, in any case, prior to the stipulated expiration date.
2. Pressure pipes connecting the cylinder to the regulator should be subject to a pressure test every 3 years or at more frequent intervals if so, prescribed by the manufacturer.

5-Yearly Service

1. Hydrostatic pressure testing of cylinders shall be carried out at an approved shore-based servicing station every 5 years or at more frequent intervals if so, prescribed by the manufacturer.
2. Pressure regulators should be serviced at a shore-servicing facility at least every 5 years.
3. Medical oxygen re-charging periods should be harmonized with the due date for hydrostatic pressure testing of the medical oxygen cylinders.

Merchant Shipping Directorate 06 February 2025