



THE REPUBLIC OF LIBERIA
LIBERIA MARITIME AUTHORITY

Marine Notice

FIR-001
Rev. 10/21

TO: ALL SHIPOWNERS, OPERATORS, MASTERS AND OFFICERS OF MERCHANT SHIPS, AND AUTHORIZED CLASSIFICATION SOCIETIES

SUBJECT: Fire-Protection Systems and Appliances

- References:**
- (a) **Maritime Regulation 2.36**
 - (b) **SOLAS Chapter II-2, as amended**
 - (c) **MSC Circular 849 adopted 8 June 1998**
 - (d) **MSC.1/Circ.1312, adopted 10 June 2009**
 - (e) **MSC.1/Circ.1312/Corr.1, adopted 22 November 2011**
 - (f) **MSC.1/Circ.1432, adopted 31 May 2012 as amended**
 - (g) **MSC.1/Circ1516 adopted 08 June 2015**
 - (h) **MSC.1/Circ.1318, Rev.1 adopted 25 May 2021**
 - (i) **Resolution A.951(23) adopted 5 December 2003**
 - (j) **International Code for Fire Safety Systems (FSS Code), as amended**

Supersedes: Marine Notice FIR-001, dated 07/20

Revised to incorporate:

- a. **Revised Section 2.2 with new requirement that 100% of FFE cylinders be hydrostatically tested at 20 years of age**
- b. **Revised Sections 9.2 and 9.3 to incorporate the interpretation in MSC.1/Circ.1616 of the required type of fire-fighter's two-way portable radiotelephone apparatus**

PURPOSE:

This Notice provides Administration guidelines for the proper maintenance and inspection of fire protection systems, appliances and emergency equipment as well as the provision for certain equipment. General guidelines applicable to all fire protection systems and appliances and specific guidelines applicable to testing and examination of fixed and portable fire extinguishers, foam systems, and self-contained breathing apparatus are provided. Specific guidelines regarding the provision of portable radios for the firefighting parties are also provided in this Notice. It should be noted that the general guidelines contained in this Notice are not an all-inclusive list of maintenance or inspection items for fire protection systems, fire-fighting appliances and emergency equipment.

APPLICABILITY:

This Notice applies to all ships and mobile offshore units (MOUs), including MODUs.

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Inquiries concerning the subject of this Notice should be directed to the Office of the Deputy Commissioner, Republic of Liberia, the Liberian International Ship & Corporate Registry, 22980 Indian Creek Drive., Suite 200, Dulles, VA 20166, USA. The most current version of all Marine Notices are available in the Online Library at: <http://www.lisrc.com>

GUIDELINES:

1.0 General Guidelines for the Maintenance and Inspection of Fire-Protection Systems and Appliances:

The specific guidelines contained in this Notice address areas where the Administration feels there is need for additional guidance or clarification. Vessel owners should be familiar with and follow the equipment manufacturer's recommendations, class society requirements and applicable requirements of SOLAS except where these recommendations or requirements are superseded by this Notice.

1.1 Operational Readiness:

All fire protection systems and appliances should at all times 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 acceptable to the vessel classification society and this Administration should be made to ensure safety is not diminished. While underway or prior to sailing or in the case of MODUs and MOUs engaging in operations, with a fire protection system under repair, a dispensation must be obtained from the Administration.

1.2 Maintenance and Testing:

Instructions for on-board maintenance, not necessarily by the vessel crew, and testing of active and passive fire protection systems and appliances should be easily understood. They should be illustrated wherever possible and, as appropriate, should include the following for each system or appliance:

- .1 maintenance and repair instructions;
- .2 schedule of periodic maintenance;
- .3 list of replaceable parts; and
- .4 log and records of testing, inspections and maintenance, listing identified non-conformities and their targeted completion dates.

1.3 Weekly Testing and Inspections:

Weekly inspections should be carried out to ensure that:

1.3.1 Fixed fire detection and alarm systems

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

1.3.2 Fixed gas fire-extinguishing systems

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

1.3.3 Fire doors

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

1.3.4 Public address and general alarm systems

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

1.3.5 Breathing apparatus

Examine all breathing apparatus and EEBD cylinder gauges to confirm they are in the correct pressure range.

1.3.6 Low-location lighting

Verify low-location lighting systems are functional by switching off normal lighting in selected locations.

1.3.7 Water mist, water spray and sprinkler systems

- .1 verify 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.

1.4 Monthly Examinations and Inspections:

1.4.1 Ships officers are responsible for performing monthly examinations of firefighting system equipment and recording the examinations in the ship's official logbook. Monthly inspections should be carried out to ensure that the indicated actions are taken for the specified equipment:

- .1 fire extinguishers, fire pumps, fire hydrants, hose and nozzles are in place, properly arranged, and are in proper condition;
- .2 dry pipe sprinkler systems have appropriate pressures as indicated by gauges;
- .3 sprinkler system pressure tanks have correct levels of water as indicated by glass gauges;
- .4 sprinkler system pumps automatically operate on reduction of pressure in the systems;
- .5 fire pumps are operated to confirm they supply adequate pressure.
- .6 emergency fire pump fuel supply adequate and heating system in satisfactory condition.

1.4.2 With regards to fixed firefighting systems, a general visual inspection should be made of the overall system condition for obvious signs of damage, and should include verification that:

- .1 fixed fire-extinguishing installations using extinguishing gas are free from leakage.
- .2 stop valves are in the closed position;
- .3 releasing controls are in the proper position and readily accessible for immediate use;
- .4 discharge piping and pneumatic tubing is intact and has not been damaged;
- .5 high pressure cylinders are in place and properly secured;
- .6 alarm devices are in place and do not appear damaged.
- .7 containers/cylinders fitted with pressure gauges are in the proper range and the installation is free from leakage.

1.4.3 In addition, on low pressure systems the inspections should verify that:

- .1 the pressure gauge is reading in the normal range;
- .2 the liquid level indicator is reading within the proper level;
- .3 the manually operated storage tank main service valve is secured in the open position; and
- .4 the vapor supply line valve is secured in the open position.

1.4.4 Foam fire-extinguishing systems

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

1.4.5 Water mist, water spray and sprinkler systems

- .1 verify all control, pump unit and section valves are in the proper open or closed position;
- .2 verify 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;
- .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.)

1.4.6 Firefighter's outfits

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

1.4.7 Fixed dry chemical powder systems

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

1.4.8 Fixed aerosol extinguishing systems

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

1.4.9 Portable foam applicators

Verify all portable foam applicators are in place, properly arranged, and are in proper condition.

1.4.10 Wheeled (mobile) fire extinguishers

Verify all extinguishers are in place, properly arranged, and are in proper condition.

1.4.11 Fixed fire detection and alarm systems

Test a sample of detectors and manual call points so that all devices have been tested within five years. For very large systems the sample size should be determined by the Administration.

1.5 Quarterly Examinations and Inspections:

Ships officers are responsible for performing quarterly tests and examinations of the following firefighting system equipment and recording the test and examinations in the ship's official logbook. Quarterly inspections should be carried out to ensure that the indicated actions are taken for the specified equipment:

1.5.1 Fire mains, fire pumps, hydrants, hoses and nozzles

Verify international shore connection(s) is in serviceable condition.

1.5.2 Foam fire-extinguishing systems

Verify the proper quantity of foam concentrate is provided in the foam system storage tank.

1.5.3 Ventilation systems and fire dampers

Test all fire dampers for local operation.

1.5.4 Fire doors

Test all fire doors located in main vertical zone bulkheads for local operation.

1.5.5 Water mist, water spray and sprinkler systems

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

1.6 Annual Testing and Inspections:

As part of the annual statutory survey for Safety Equipment Certification, the following inspections and tests should be carried out to ensure that the indicated actions are taken for the specified equipment:

1.6.1 Fire mains, fire pumps, hydrants, hoses and nozzles

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

1.6.2 Fixed fire detection and fire alarm systems

- .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.

1.6.3 Fixed gas fire-extinguishing systems

- .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 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 uncloseable openings that 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.

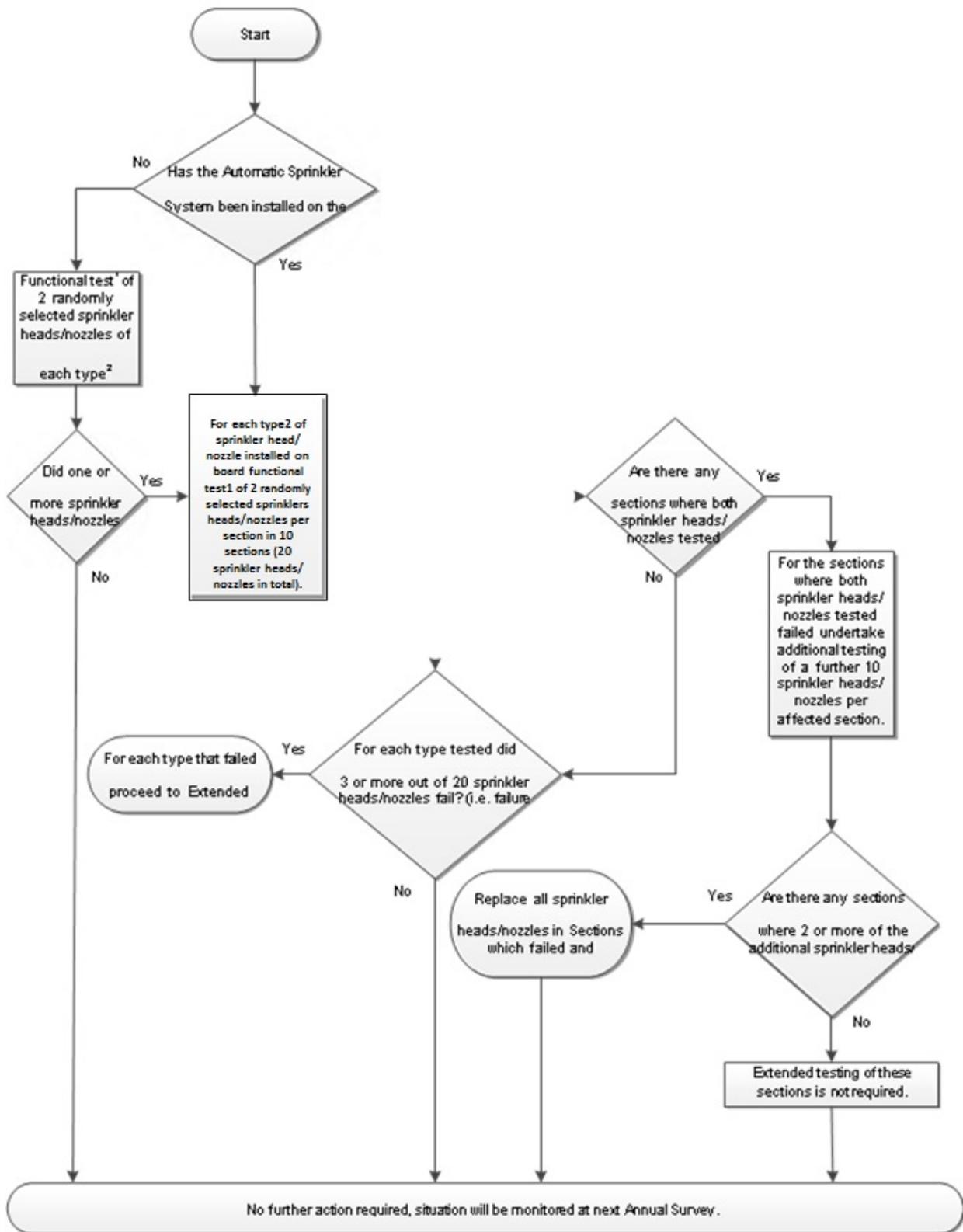
1.6.4 Foam fire-extinguishing systems

- .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 all control/section valves are in the correct position;
- .8 blow dry compressed air or nitrogen through the discharge piping or otherwise confirm 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 take samples from all foam concentrates carried on board and subject them to the periodical control tests in MSC.1/Circ.1312, for low expansion foam, or MSC/Circ.670 for high expansion foam.
(Note: Except for non-alcohol resistant foam, the first test need not be conducted until 3 years after being supplied to the ship.);
- .10 test all fuel shut-off controls connected to fire-protection systems for proper operation.

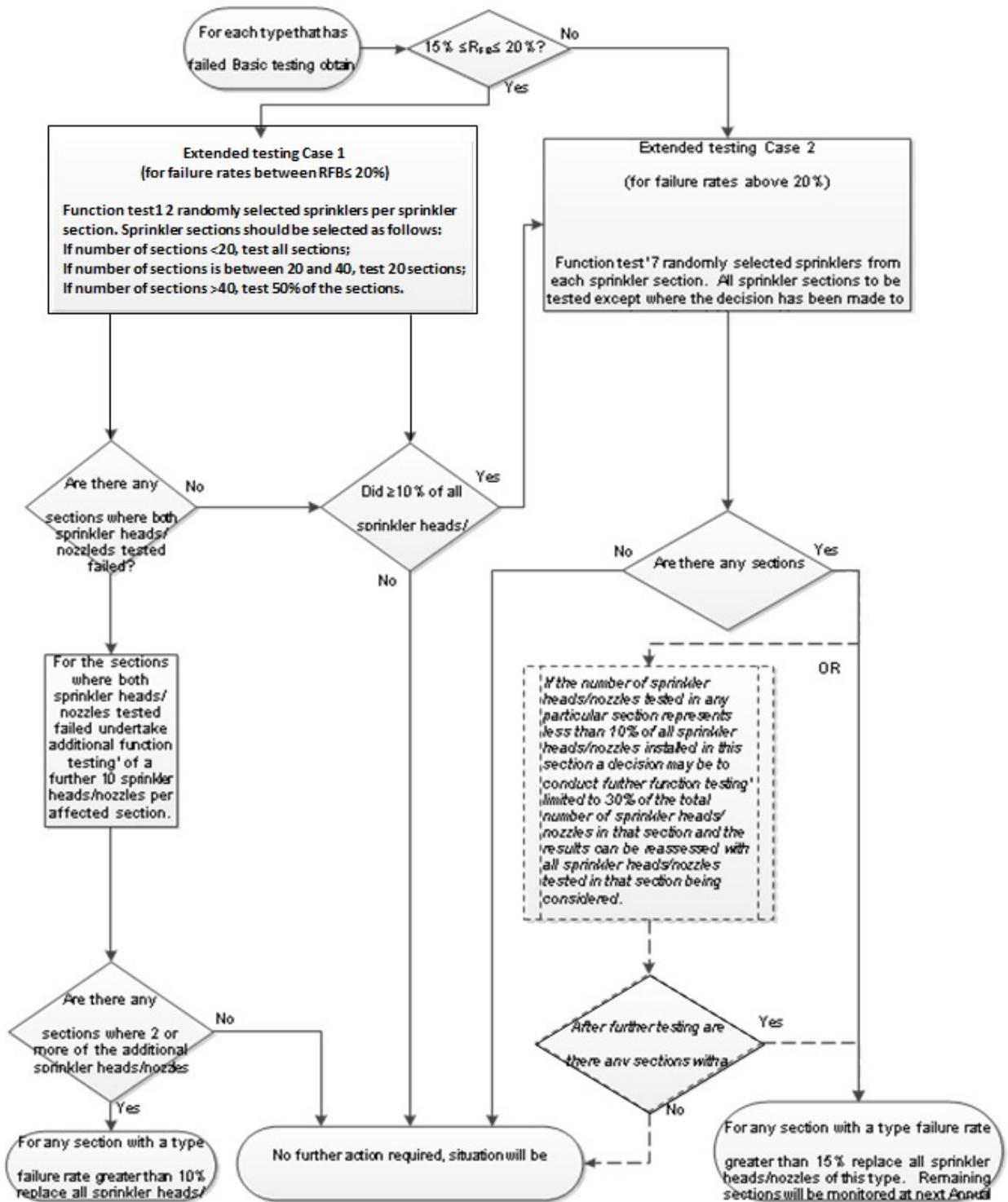
1.6.5 Water mist, water spray and sprinkler systems

- .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 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 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 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;
- .17 test automatic sprinklers and automatic water mist nozzles in accordance with the following flow chart:

Part 1 – Basic Testing



Part 1 – Extended Testing



Explanatory notes to the flow chart

- 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 maintained in the system at all times prior to activation.
- 4 All testing should be carried out at static/standby pressure.
- 5 *Failure rate (RFB)* is the number of sprinkler heads/nozzles to fail testing divided by test sample size multiplied by 100; and

- .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."

1.6.6 Ventilation systems and fire dampers

- .1 test all fire dampers for remote operation;
- .2 verify 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.

1.6.7 Fire doors

Test all remotely controlled fire doors for proper release.

1.6.8 Breathing apparatus

- .1 check breathing apparatus air recharging systems, if fitted, for air quality;
- .2 check all breathing apparatus face masks and air demand valves are in serviceable condition; and
- .3 check EEBDs according to maker's instructions.

1.6.9 Fixed dry chemical powder systems

- .1 visually inspect all accessible components for proper condition;
- .2 verify 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.)

1.6.10 Fixed aerosol extinguishing systems

Verify condensed or dispersed aerosol generators have not exceeded their mandatory replacement date.

1.6.11 Portable foam applicators

- .1 verify all portable foam applicators are set to the correct proportioning ratio for the foam concentrate supplied and the equipment is in proper order;
- .2 verify 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;
- .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.

1.6.12 Wheeled (mobile) fire extinguishers

- .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.

1.6.13 Galley and deep fat cooking fire-extinguishing systems

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

The verification of the examinations and tests described Section 1.2 thru 1.6 above are an integral part of the annual statutory surveys for the SOLAS Safety Equipment Certificate. The inspection and/or verification of the applicable items in Section 1.2 thru 1.7 shall be to the satisfaction of the attending classification society surveyor.

1.7 Two-year testing and inspections

Two-year inspections should be carried out to ensure that the indicated actions are taken for the specified equipment.

1.7.1 Fixed gas fire-extinguishing systems

- .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.

1.7.2 Fixed dry chemical powder systems

- .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.

1.8 Five-year Service:

At least once every five years, the following inspection and test should be carried out for the specified equipment:

1.8.1 Fixed gas fire-extinguishing systems

Perform internal inspection of all control valves.

1.8.2 Foam fire-extinguishing systems

- .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.

1.8.3 Water mist, water spray and sprinkler systems

- .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 7.5.18 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 new baseline reference to assist future water quality monitoring for each corresponding section."

1.8.4 Breathing apparatus

Perform hydrostatic testing of all steel self-contained breathing apparatus cylinders. Aluminum and composite cylinders should be tested to the satisfaction of the Administration.

1.8.5 Low-location lighting

Test the luminance of all systems in accordance with the procedures in resolution A.752 (18).

1.8.6 Wheeled (mobile) fire extinguishers

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

1.9 Ten-year service

At least once every 10 years, the following inspections should be carried out for the specified equipment:

1.9.1 Fixed gas fire-extinguishing systems

- .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; and
- .3 if permitted by the Administration, visual inspection and NDT (non-destructive testing) of halon cylinders may be performed in lieu of hydrostatic testing.

1.9.2 Water mist, water spray and sprinkler systems

Perform a hydrostatic test and internal examination for gas and water pressure cylinders according to flag Administration guidelines or, where these do not exist, EN 1968:2002 + A1.

1.9.3 Fixed dry chemical powder systems

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

1.9.4 Fixed aerosol extinguishing systems

Condensed or dispersed aerosol generators to be renewed in accordance with manufacturer's recommendations.

1.9.5 Wheeled (mobile) fire extinguishers

All extinguishers together with propellant cartridges should be hydrostatically tested by specially trained persons in accordance with recognized standards or the manufacturer's instructions.

2.0 Fixed CO₂ Fire Fighting Systems:

Fixed CO₂ systems in addition to complying with the maintenance and inspection requirements contained Sections 1.0 thru 1.7 of this Marine Notice, shall also comply with the following requirements for verification of the cylinder contents and hydrostatic testing of the cylinders:

2.1 Verification of Cylinder Contents:

At least biennially (intervals of 2 years \pm 3 months) in passenger ships or at each intermediate, periodical or renewal survey in cargo ships, the following maintenance should be carried out:

1. High pressure 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 90% of the nominal charge. Cylinders containing less than 90% of the nominal charge should be refilled. The liquid level of low pressure storage tanks should be checked to verify that the required amount of carbon dioxide to protect the largest hazard is available.

2.2 Hydrostatic Testing:

Hydrostatic testing must be performed by an authorized servicing facility which has been certified by a government agency or recognized classification society, or by extinguisher manufacturer to perform this type of work. The facility must be acceptable to the attending classification society surveyor. The same facility should recharge the cylinders after testing to demonstrate serviceability.

At least biennially (intervals of 2 years \pm 3 months) in passenger ships or at each renewal survey in cargo ships, hydrostatic test dates stamped on the cylinders of all equipped cylinders should be checked and cylinders are to be hydrostatically tested according to the following schedule depending on the vessel's age:

1. New and Existing ships with cylinders less than 10 years of age:
 - a. A least 10% of the total number provided should be subjected to an internal inspection and hydrostatic test at the cylinders 10-year anniversary date of the last hydrostatic test. If one or more cylinders fail, a total of 50% of the onboard cylinders should be tested. If further cylinders fail, all cylinders should be tested. Before the 20-year anniversary and every 10-year anniversary thereafter, all cylinders should be subjected to a hydrostatic test.
2. Existing ships with cylinders greater than 10 years of age, but less than 20 years of age that are equipped with no cylinders that have been hydrostatically tested:
 - a. 10% of the total number provided at the next annual survey. If one or more cylinders fail, a total of 50% of the onboard cylinders should be tested. If further cylinders fail, all cylinders should be tested.
 - b. 100% of the cylinders at the intermediate or renewal survey coinciding with the cylinders reaching 20 years of age.
3. Existing ships with cylinders reaching 20 years of age that are equipped with no cylinders that have been hydrostatically tested:
 - a. 100% of the total number of cylinders at the intermediate or renewal survey coinciding with the cylinders reaching 20 years of age and every 10-year anniversary thereafter, all cylinders should be subjected to a hydrostatic test.
4. Existing ships with cylinders 20 years of age or older and only 20% of the cylinders have been hydrostatically tested:

- a. The remaining 80% of the cylinders shall be hydrostatically tested at the vessel's next intermediate or renewal survey whichever happens first.
 - b. The 80% of the cylinders hydrostatically tested in accordance with item .4a above shall be hydrostatically tested at each ten year anniversary of the test carried out in accordance with item.4a.
 - c. The 20% of the cylinders that were hydrostatically tested at the 20-year anniversary of the cylinders in accordance with item .4 shall all be hydrostatically tested at the 30-year anniversary and every ten year anniversary thereafter. Also, at the 30-year anniversary of the cylinders, 10% of the remaining cylinders shall be hydrostatically tested. If one or more of these cylinders fail, a total of 50% of these cylinders shall be tested. If further cylinders fail, all of the cylinders shall be tested.
5. High pressure cylinders shall also be hydrostatically tested prior to recharging a discharged cylinder or when visual or annual inspections reveals a potential defect.
 6. When cylinders are removed for testing, if the fixed system remains operational, the shipowner shall ensure that a sufficient number of cylinders remain connected to the system such that the quantity of fire- extinguishing medium continues to satisfy the requirements of 2.2.1 of chapter 5 of the FSS Code, subject to SOLAS regulation II-2/14.2.

In cases where cylinders for fixed-gas fire-fighting systems (except Halon systems) have been date stamped prior to delivery of a vessel, the first 10-year hydrostatic test may be harmonized with drydocking at the Second Special Survey provided that the initial date stamp (month/year) on the cylinder does not exceed 12 months before the vessel delivery date.

In cases where the 20-year hydrostatic test date does not align with the vessel's drydock survey due date, vessel owners/operators may request an extension not exceeding 12 months from the hydrostatic test due date in order to harmonize the testing with the vessel's next scheduled drydock survey.

2.3 Flexible Hoses:

Flexible hoses should be replaced at intervals recommended by the manufacturer, or if such recommendation is not provided, then at intervals not exceeding every 10 years.

2.4 Metallic Hoses:

Metallic can be classified as flexible tubes and need not be replaced at 10-year intervals if the manufacturer has no recommendation that it be done. The flexible tubes should be inspected and hydrostatically tested at the 10-year interval.

2.5 Discharge Piping:

The discharge piping nozzles should be tested to verify that they are not blocked. The test should be performed by isolating the discharge piping from the system and flowing dry air or nitrogen from the test cylinders or suitable means through the piping.

2.6 Additional Required Maintenance by an Authorized Service Facility:

In addition to the items listed in Section 2.0 thru 2.5, at least biennially (intervals of 2 years \pm 3 months) in passenger ships or at each renewal survey in cargo ships, the following maintenance should be carried out by service technicians/specialists trained to standards accepted by the Administration:

1. where possible, all activating heads should be removed from the cylinder valves and tested for correct functioning by applying full working pressure through the pilot lines. In cases where this is not possible, pilot lines should be disconnected from the cylinder valves and blanked off or connected together and tested with full working pressure from the release station and checked for leakage. In both cases this should be carried out from one or more release stations when installed. If manual pull cables operate the remote release controls, they should be checked to verify the cables and corner pulleys are in good condition and freely move and do not require an excessive amount of travel to activate the system;
 - a. all cable components should be cleaned and adjusted as necessary, and the cable connectors should be properly tightened. If the remote release controls are operated by pneumatic pressure, the tubing should be checked for leakage, and the proper charge of the remote releasing station pilot gas cylinders should be verified. All controls and warning devices should function normally, and the time delay, if fitted should prevent the discharge of gas for the required time period; and after completion of the work, the system should be returned to service. All releasing controls should be verified in the proper position and connected to the correct control valves. All pressure switch interlocks should be reset and returned to service. All stop valves should be in the closed position.

3.0 Halon System:

SOLAS Regulation II-2/10 permits the use of Halons as fire-extinguishing media on ships built before 01 October 1994. The Administration has not established a phase out date for existing Halon firefighting systems on ships registered in the Liberian flag. It is the Administration's interpretation of the IMO rules regarding the use of Halon that only new installations are prohibited. Existing systems may be continued in use as long as the systems remain serviceable.

It should be noted that the EU regulations regarding a prohibition of the use of Halon do not apply to non-EU-flagged vessels but may have operational effects on non-EU flagged vessels because of the unavailability of Halon service/supply in EU ports. The EU requirement regarding the prohibition of refilling or topping off existing Halon system after December 31, 2002 and to prohibit certain Halon systems after December 31, 2003 is not an international requirement and is not applicable to Liberian flagged vessels.

If any Liberian shipowner experiences difficulties in obtaining replenishment Halon supplies the shipowner should notify this Administration immediately.

It should be noted that in accordance with the provisions MARPOL Annex VI, any deliberate emissions of ozone depleting substances, including halon, shall be prohibited. Deliberate emissions include emissions occurring in the course of maintaining, servicing, repairing, or disposing of systems or equipment. This Administration should be notified immediately by the shipowner of emissions arising from leaks of an ozone depleting substance whether or not the leaks were deliberate.

3.1 Halon Systems Maintenance and Inspection:

Fixed Halon systems in addition to complying with the maintenance and inspection requirements contained Sections 1.0 thru 1.7 of this Marine Notice, shall also comply with the following requirements for verification of the cylinder contents and hydrostatic testing of the cylinders:

3.2 Halon System Hydrostatic Testing:

All Halon cylinders must be hydrostatically tested as follows:

1. After each 20 years of service;
2. Prior to recharging a discharged cylinder; or
3. When visual inspection reveals a potential defect.

Hydrostatic test dates must be stamped on the cylinders. Hydrostatic testing must be performed by an authorized servicing facility which has been certified by a government agency, or Classification Society, and by extinguisher manufacturer to perform this type of work. The facility must be acceptable to the attending Classification Society surveyor. The same facility should recharge the cylinders after testing to demonstrate serviceability.

Non-destructive testing (NDT) of Halon cylinders may be performed in lieu of hydrostatic testing by an authorized servicing facility which has been certified by a government agency or Classification Society.

3.3 Relaxation of Halon Hydrostatic Testing:

This Administration is aware of the increasing difficulty with regards to locating servicing facilities and suppliers for the testing and maintenance of existing fixed halon fire suppression systems and components. Therefore, with regards to the fixed halon cylinders the Administration is willing to authorize a five year extension of the 20 year hydrostatic testing requirement for the halon cylinders subject to the following conditions:

1. Determination that a cylinder has not been discharged during its service history;
2. The cylinder's contents are verified by weighing or isotropic measurement;
3. The cylinder's pressure/levels are verified to be acceptable;
4. A thorough visual inspection of cylinders reveal no potential defects; and
5. Each cylinder is to be gauged or ultrasonically tested to the extent considered necessary to determined cylinder wall thickness. The wall thickness readings shall be kept on board for future comparative reference.

3.3.1 In addition, a thorough examination shall be made of all accessible component parts of the halon system, including control valves and connections, to verify satisfactory condition and freedom from leakage. Selected control valves shall be opened for internal examination to the extent deemed necessary by the attending class surveyor.

3.3.2 The above required examinations and thickness measurements shall be done to the satisfaction of the vessel's class society. Any suspect cylinders that do not meet the provisions stated above must be hydrostatically tested or taken out of service. If a cylinder is taken out of service the fixed halon system must still be capable of supplying sufficient halon to meet the fire suppression requirements for the compartment(s) that the system is designed to protect. This may require the installation of a replacement cylinder or alternative fire extinguishing appliances.

- 3.3.3 The aforementioned cylinder inspection requirements shall be completed annually except for the requirement for ultrasonic testing/thickness gauging until the end of the five (5) year period of extension. The ultrasonic testing/thickness gauging of the cylinders shall be repeated no later than 36 months after the implementation of this dispensation as part of the applicable annual servicing requirement of the halon system.
- 3.3.4 Upon satisfactory completion of the aforementioned requirements the vessel class society should enter a memo/note in the vessel's record that the hydrostatic testing date for the halon cylinders has been extended for five years and the cylinders are due for thickness measurement no later than 36 months from the last such measurement.
- 3.3.5 Consideration for the application of the relaxed hydrostatic testing requirements for the fixed Halon system storage cylinders will be given on a case-by-case basis and must be approved in writing by the Administration. At the end of the five year extension period the Administration will consider a renewal of the extension upon receipt of a request from the owners for such an extension.

4.0 Fixed Foam System:

4.1 Maintenance and Inspection:

Foam fire-fighting systems, in addition to complying with the applicable maintenance and inspection requirements contained Sections 1.0 thru 1.7 of this Marine Notice, shall also comply with the revised guidelines contained in [MSC.1/Circ.1312](#), Performance and Testing Criteria, and Surveys of Foam Concentrates for Fixed Fire-Extinguishing Systems (reference (d) above), with reference to [MSC.1/Circ.1312/Corr.1](#) (reference (e) above), for verification of the foam concentrates.

4.2 Periodical Controls of Foam Concentrates Stored on Board:

Certain installation conditions such as excessive ambient storage temperature, contamination of the foam concentrate and incomplete filling of the tank may lead to abnormal ageing of the concentrates. As a result, periodic testing of concentrates is necessary.

- 4.2.1 The first periodical control of foam concentrates (except for protein-based alcohol resistant foam concentrates) should be performed not more than three (3) years after being supplied to the ship, and after that, every year. These tests should be performed by the shipowner or operator via laboratories or authorized service suppliers deemed acceptable to the Classification Society. It should be noted that the Administration may require testing of the foam at other times if there is cause to question the suitability of the foam or condition of the storage tank.
- 4.2.2 Protein-based alcohol-resistant foam concentrates should be subjected to a chemical stability test prior to delivery to the ship and annually thereafter.
- 4.2.3 Guidance on performance and testing criteria and surveys of low-expansion concentrates, medium-expansion concentrates and high-expansion concentrates for fixed fire-extinguishing systems are found in IMO Circulars [MSC.1/Circ.1312](#), [MSC/Circ.798](#) and [MSC/Circ.670](#), respectively.

4.3 Records:

A record of the age of the foam concentrates and of subsequent controls should be kept on board.

5.0 Fixed Dry Chemical Powder Fire-Extinguishing Systems:

5.1 Maintenance and Inspection:

- .1 Such systems are to be serviced and tested by an approved service supplier in accordance with the Manufacturer's requirements and the Classification Society's requirements, should it have any. Particular attention is to be paid to the condition of the powder for any sign of moisture ingress and that its properties remain as per type approval.
- .2 At each annual, periodical, renewal survey, the attending Class Surveyor(s) is (are) to perform a general examination of the distribution piping and installation of the dry chemical powder fire-extinguishing system to confirm that the system has not been modified from its original installation. Part of such verification should include also the following minimum requirements:
 - a) The piping distribution system is to be blown through with Nitrogen (N2) or dry air to ensure it is free of any obstruction. The nozzles, if any, are to be removed to ensure that they are free and not blocked during the blow-through operation.
 - b) Operational test of local and remote controls and section valves.
 - c) The contents verification of propellant gas cylinders containing Nitrogen (N2) including remote operating stations is to be confirmed.
 - d) Flexible discharge hoses are to be inspected to confirm that they are maintained in good condition and have not perished, especially when located on open decks. In case of any doubt the hoses are to be subjected to a full working pressure test.
 - e) The dry chemical powder containment tank and its associate safety valves are to be inspected for signs of corrosion or deterioration which may affect the safety of the system. In case of any doubt the tank is to be tested and safety valve set points adjusted and confirmed at the shop.
- .3 High pressure cylinders, including N2 cylinders, shall be subjected to periodical tests at intervals not exceeding 10 years as provided in paragraph 6.1.2 of IMO Circular [MSC.1/Circ.1318](#). (see Section 2.2. of this Notice).

6.0 Portable Fire Extinguishers:

6.1 Annual Survey:

The examination of the fire extinguishers is an integral part of the annual statutory surveys for the SOLAS Safety Equipment Certification. The fire extinguishers should be examined and, if necessary, serviced annually by an authorized service facility unless the crew is properly trained and such servicing is acceptable to the vessel's classification society. The classification society surveyor must be satisfied with the condition of the extinguishers.

6.2 Servicing of Fire Extinguishers by the Crew of a Vessel:

A vessel crew may service powder, foam, or water type portable fire extinguishers subject to the following:

- .1 The equipment required to test, examine, and service the extinguishers is obtained and maintained in a calibrated and serviceable condition.
- .2 All the portable fire extinguishers have a visual indication of discharge and instructions for maintenance and recharging provided by the manufacturer and be available onboard.
- .3 The crew is properly trained in the testing and examination, and servicing of fire extinguishers and the extinguisher manufacturer's servicing instructions are followed.
- .4 The Administration will accept crew who have successfully completed advanced training in techniques for fighting fire and who have demonstrated competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/3 of the STCW Code and in the tasks listed on the inspection found in Table 9.1.3 contained in IMO [Resolution A.951\(23\)](#), Improved Guidelines for Marine Portable Fire Extinguishers
- .5 The testing and inspection is carried out to the satisfaction of the attending classification society surveyor
- .6 The attending classification society surveyor may require the testing and inspection be conducted in his presence.

6.3 Verification of Fire Extinguishers Contents:

Every two years in conjunction with the issuance of the SOLAS Safety Equipment Certificate the contents of the cylinders must be verified. Weighing of the portable CO₂ cylinders in the presence of the classification society surveyor is an acceptable method of verification. Other methods of determining contents of the cylinders, such as isotropic measurement, may also be accepted provided the equipment is properly calibrated, the operator of the device is trained and qualified in its use, and the classification society surveyor is satisfied with the measurements. If an alternative method is use, spot checks of cylinder contents by weighing may be required to verify the accuracy and consistency of the measurement device.

6.4. Spare Charges, Additional Fire Extinguishers, and Refilling of Extinguishers:

- .1 For fire extinguishers of the same type, capable of being recharged on board, the spare charges should be provided as follows:
 - a) 100% for the first 10 extinguishers and 50% for the remaining extinguishers but not more than 60 (fractions to be rounded off to next whole number).
- .2 For extinguishers which cannot be recharged by the crew, additional portable fire extinguishers of the same quantity, type, capacity and number as determined in paragraph a) above should be provided in lieu of spare charges.
- .3 Instructions for recharging the extinguishers should be carried on board. Periodic refilling of the cylinders should be in accordance with the manufacturer's recommendations. Lacking same, refill is required when the extinguishing media starts to lose effectiveness. Partially emptied extinguishers should also be recharged. Only refills approved for the fire extinguisher in question may be used for recharging.

6.5 Five Year Inspection/Service

Five (5)-year Inspection/Service At least one (1) extinguisher of each type manufactured in the same year and kept on board a ship should be test discharged at five (5) year intervals as part of a fire drill.

6.6 Authorized Servicing Facilities:

The classification society surveyor may also accept a servicing certificate from an authorized servicing facility acceptable to the society for the annual and biannual examination, servicing and verification of the portable fire extinguishers.

6.7 Hydrostatic Testing of Portable Fire Extinguishers:

Portable fire extinguishers shall be hydrostatically tested as follows:

- .1 Dry Powder Extinguishers every 10 years;
- .2 CO₂ Extinguishers every 10 years;
- .3 Other Extinguishers every 10 years.

A hydrostatic test may also be required by the classification society surveyor or Liberian Nautical Inspector if visual examination indicates a potential defect in the cylinder. The hydrostatic test date must be permanently marked on the bottles.

6.8 Hydrostatic Testing Facilities:

Hydrostatic testing must be performed by a servicing facility which has been certified by a government agency or classification society, and by the extinguisher manufacturer to perform this type of work. The facility must be acceptable to the attending classification society surveyor. This same facility should recharge the cylinder after testing to demonstrate serviceability.

7.0 Self-Contained Breathing Apparatus (SCBA):

7.1 Weekly Inspections:

SCBA should be inspected weekly to ensure that they do not present leakages.

7.2 Monthly Inspections:

For ships subject to the International Gas Carrier Code and International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, SCBAs, should be inspected at least once a month by a responsible and properly trained ship's officer and inspected and tested by an expert at least once a year.

7.3 Annual Examination:

All SCBAs shall be examined at least annually as part of the annual statutory survey for the Safety Equipment Certificate (SEC) or MODU Code certificate. If applicable, the breathing apparatus air recharging systems should be checked for air quality as part of the annual statutory survey for the SEC or MODU Code certificate in accordance with Compressed Air Breathing Quality (BS EN 12021), or equivalent standard acceptable to the attending Classification Society surveyor

- .1 For ships subject to the International Gas Carrier Code and International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, Compresses Air Equipment including breathing air compressor air quality should be inspected and tested by an authorized service technical at least once a year.

7.4 Hydrostatic Testing of Self-contained Breathing Apparatus Cylinders:

Hydrostatic testing of SCBA cylinders shall be carried out once every five years. The hydrostatic test date must be permanently marked on the bottles. Intervals for hydrostatically testing cylinders of the ultra-lightweight type may vary and will depend upon the requirements of the cylinder manufacturer and the vessel's classification society. Servicing of the cylinders must be performed to the satisfaction of the Classification Society surveyor.

In cases where SCBA cylinders have been date stamped prior to delivery of a vessel, the first five (5)-year hydrostatic test may be harmonized with drydocking at the First Special Survey provided that the initial date stamp (month/year) on the cylinder does not exceed six (6) months before the vessel delivery date.

7.5 Spare Charges and Recharging of Breathing Apparatus Air Cylinders:

- .1 Two spare charges suitable for use with the breathing apparatus should be provided for each required apparatus.
- .2 If passenger ships carrying not more than 36 passengers and cargo ships are equipped with suitably located means for fully recharging the air cylinders free from contamination, only one spare charge is required for each required apparatus.
3. Passenger ships carrying more than 36 passengers constructed on or after 1 July 2010 shall be fitted with a suitably located means for fully recharging breathing air cylinders, free from contamination. The means for recharging shall be either:
 1. breather air compressors supplied from the main and emergency switchboard, or independently driven, with a minimum capacity of 60 l/min per required breathing apparatus, not to exceed 420 l/min; or
 2. self-contained high-pressure storage systems of suitable pressure to recharge the breathing apparatus used on board, with a capacity of at least 1,200/per required breathing apparatus, not to exceed 50,000 l of free air.
4. All ships, unless provided with an onboard means of recharging breathing apparatus cylinders, shall have a sufficient number of spare charges, in addition to the requirements of 7.5.1 - 7.5.3 above, on board for the use of SCBAs during drills and training.

8.0 Emergency Escape Breathing Devices (EEBDs):

8.1 Maintenance and Care:

- .1 The EEBD should be examined and maintained in accordance with the manufacturer's instructions.
- .2 The ship's periodic safety appliance and equipment inspection and testing procedures should be modified to incorporate the inspection of EEBDs.
- .3 Maintenance requirements, manufacturer's trademark and serial number, shelf life with accompanying manufacture date and name of approving authority should be printed on each EEBD.
- .4 EEBDs, which have exceeded their service life as indicated by the manufacturer, should be discarded. Any unusable or damaged EEBDs should be promptly disposed of in accordance with manufacturer's instructions.

- .5 Unless specifically required by the manufacturer Liberia does not require periodic hydrostatic testing for EEBD cylinders. Where required by the manufacturer hydrostatic testing should be carried out in accordance with the manufacturer instructions and at intervals specified by the manufacturer.

8.2. Spare EEBDs:

- .1 Ships with ten or less EEBDs on board shall carry at least one spare device. Ships with 11 to 20 EEBDs on board shall carry at least two spare devices. Ships with more than 20 EEBDs on board shall carry spares equal to at least 10% of the total EEBDs but no more than 4 spares will be required.

9.0 **Portable Radios for Fire Fighting Parties:**

- 9.1 For ships constructed on or after 1 July 2014, a minimum of two two-way portable radiotelephone apparatus for each fire party for firefighter's communication shall be carried on board. The purpose of these fire-fighter radios is to provide a dedicated means of communication between a team of fire fighters entering the space and the crew member located outside the space who is assigned to control this team.
- 9.2 Two-way portable radiotelephone apparatus shall be of certified safe type suitable for use in zone 1 hazardous areas, as defined in IEC Publication 60079. The minimum requirements in respect to the apparatus group and temperature class are to be consistent with the most restrictive requirements for the hazardous area zone on board which is accessible to fire party.
- 9.3 All radio accessories capable of generating electricity, a spark, or heat must also be certified safe type suitable for use in zone 1 hazardous areas.
- 9.4 FM, UHF, and VHF portable radios are acceptable as long as they are explosion proof or intrinsically safe. However, if the UHF or some other type of non-VHF radio is used then the vessel may need to obtain an amended radio station license from the Administration in order to list the UHF frequencies in use.
- 9.4 Each Fire Party must have at least two explosion proof or intrinsically safe portable radios dedicated only for the use by the fire party.
- 9.5 The total number of these radios to be carried on board will depend upon the number of fire parties detailed on the ship's Muster List and in the ship's Safety Management System rather than the number of fire-fighter outfits.
- 9.6 The two-way portable radiotelephones designated as the firefighters radios should be stored together with fire-fighter's outfit to ensure easy access and availability with the fire-fighter's outfit in order not to waste valuable time collecting fire-fighter radios from a separate location. If not stored with the fire-fighters outfit the fire-fighter radios should be marked or colored to identify such radios from other on board portable radios in order to ensure that they are:
 - .1 kept ready for use by the fire party,
 - .2 not inadvertently used for another purpose, and
 - .3 so that they are recognizable to the surveyor during survey.

10.0 Records

- 10.1 Records of the inspections shall be carried on board the ship, or may be computer based. They shall include as appropriate:
- .1 weekly inspections;
 - .2 monthly inspections;
 - .3 quarterly inspections;
 - .4 annual inspections;
 - .5 biennial (two (2)-yearly) inspections;
 - .6 five (5)-year inspections;
 - .7 10-year inspections;
 - .8 20-year inspections;
 - .9 other maintenance and testing, including whether a pressure test was performed;
 - .10 records of water quality in automatic sprinkler systems
 - .11 age of foam concentrates and subsequent controls; and
 - .12 deficiencies identified and corrective actions taken.
- 10.2. In cases where the inspections and maintenance are carried out by trained service technicians other than the ship's crew, inspection reports shall be requested to be provided at the completion of the testing. These reports shall be included in the records of inspections.

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