



Office of
Deputy Commissioner
of Maritime Affairs

THE REPUBLIC OF LIBERIA
LIBERIA MARITIME AUTHORITY

Marine Notice

FIR-001
Rev. 06/12

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

SUBJECT: Maintenance and Inspection of 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 Circular 850 adopted 8 June 1998**
- (e) **MSC.1/Circ.1312, adopted 10 June 2009**
- (f) **MSC.1/Circ.1312/Corr.1, adopted 22 November 2011**
- (g) **MSC.1/Circ.1318, adopted 11 June 2009**
- (h) **International Code for Fire Safety Systems (FSS Code), as amended**

Supersedes: Marine Notice FIR-001, dated 11/02

PURPOSE:

This Notice provides Administration guidelines for the proper maintenance and inspection of fire protection systems, appliances, and emergency 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. 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 mobile offshore units (MOUs), including MODUs.

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 manufacturers recommendations, as well as class society requirements and applicable requirements of SOLAS, except where these recommendations or requirements are superseded by this Notice.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. Prior to sailing or in the case of MODUs and MOUs engaging in operations with a fire protection system under repairs, a dispensation must be obtained from the Administration.

1.2 Maintenance and Testing:

Instructions for on-board maintenance, not necessarily by the ship's crew, and testing of active and passive fire protection systems and appliances should be easily understood, 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 all public address systems and general alarm systems are functioning properly;
- .2 breathing apparatus cylinders do not present leakages; and
- .3 all fireman's outfits and EEBDs are appropriately supplied, arranged, and in proper condition.

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:

- .1 all fire extinguishers, 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 all sprinkler system pumps automatically operate on reduction of pressure in the systems;
- .5 all fire pumps are operated; and

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

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.

1.5 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:

- .1 all automatic alarms for the sprinkler systems are tested using the test valves for each section;
- .2 the international shore connection is in proper condition;
- .3 lockers and fire stations providing storage for fire-fighting equipment contain proper inventory and equipment is in proper condition;
- .4 all fire doors and fire dampers are tested for local operation; and
- .5 all CO₂ bottle connections for cable operating system clips should be checked for tightness on fixed fire-extinguishing installations.

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:

- .1 all fire extinguishers are checked for proper location, charging pressure, and condition;
- .2 fire detection systems are tested for proper operation, as appropriate;
- .3 all fire doors and dampers are tested for remote operation;
- .4 all foam-water and water-spray fixed fire-fighting systems are tested for operation;
- .5 all accessible components of fixed fire-fighting systems are visually inspected for proper condition;
- .6 all fire pumps, including sprinkler system pumps, are flow tested for proper pressures and flows;
- .7 all hydrants are tested for operation;
- .8 all antifreeze systems are tested for proper solutions;
- .9 sprinkler system connections from the ship's fire main are tested for operation;

- .10 all fire hoses are hydrostatically tested;
- .11 breathing apparatus air recharging systems checked for air quality;
- .12 control valves of fixed fire-fighting systems should be inspected; and
- .13 air should be blown through the piping of extinguishing gas systems.

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 Five-year Service:

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

- control valves of fixed fire-fighting systems should be internally inspected.

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. All 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:

At least biennially (intervals of 2 years \pm 3 months) in passenger ships or at each renewal survey in cargo ships, maintenance the hydrostatic test date of all storage containers should be checked. High pressure cylinders should be subjected to periodical tests at intervals not exceeding 10 years. At that inspection:

1. A least 10% of the total number provided should be subjected to an internal inspection and hydrostatic test.
2. If one or more cylinders fail, a total of 50% of the onboard cylinders should be tested.
3. If further cylinders fail, all cylinders should be tested.

High pressure cylinders shall also be hydrostatically tested prior to recharging a discharged cylinder or 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 recognized 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.

2.3 Implementation on Existing Ships:

Existing ships equipped with storage containers that are 10 years old or older but less than 20 years of age shall have the storage containers hydrostatically tested in accordance with the aforementioned guidelines at latest by the vessel's next intermediate or special survey. Existing ships with CO₂ storage containers 20 years of age that have not undergone a hydrostatic test shall at the latest by the vessel's next annual or intermediate survey hydrostatically test a total of 50% of the onboard cylinders. If one or more cylinders failed then all cylinders should be tested.

2.4 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

2.5 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 ± 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;
- .2 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

- .3 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:

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 **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:

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.

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 (e) above), with reference to MSC.1/Circ.1312/Corr.1 (reference (f) 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.

4.3 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.
2. N2 high pressure cylinders shall be subjected to periodical tests at intervals as IMO recommends for CO2 cylinders, (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. The annual servicing/examination of the portable fire extinguishers can be carried out by the crew, if the crew is properly trained and such servicing is acceptable to the vessel's classification society, or by an authorized service facility. 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 The crew is properly trained in the testing and examination, and servicing of fire extinguishers and the extinguisher manufacturer's servicing instructions are followed.
- .3 The testing and inspection is carried out to the satisfaction of the attending classification society surveyor, and if required by the surveyor, in the presence of the surveyor.

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:
 - 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 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.

6.6 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.

6.7 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.

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 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.

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.

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 manufacturers 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 devices. 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.

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