KINGDOM OF BAHRAIN
Ministry of Transportation and Telecommunications

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# Directive No. SOLAS/12

# MAINTENANCE AND INSPECTION OF FIRE PROTECTION SYSTEMS AND APPLIANCES

Issued under the enabling power of the Ministerial Resolution 20/2016
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## 1 Introduction

(1) With reference to;

- Ports and Maritime Affairs (PMA) resolution no. 8/2016: regarding the implementation of the requirements of the International Convention for the Safety of Life at Sea, 1974 and its amendments
- SOLAS 1974, Chapter II-2, as amended
- International Code for Fire Safety Systems (FSS Code), as amended
- MSC/Circ. 670: Guidelines for the Performance and Testing Criteria and Surveys of High-expansion Foam Concentrates for Fixed Fire-extinguishing Systems;
- MSC.1/Circ.1312: Revised Guidelines for the Performance and Testing Criteria and Surveys of Foam Concentrates for Fixed Fire-Extinguishing Systems;
- MSC.1/Circ.1318: Guidelines for the Maintenance & inspections of fixed Carbon Dioxide Fire-extinguishing Systems;
- MSC.1/Circ.1432: Revised Guidelines for the Maintenance and Inspection of Fire Protection Systems and Appliances;
- MSC.1/Circ.1516: Amendments to the Revised Guidelines for the Maintenance and Inspection of Fire Protection Systems and Appliances and
- Resolution A.951(23): Improved Guidelines for Marine Portable Fire Extinguishers

(2) This directive provides guidance on the inspection, maintenance, testing and survey requirements of fire fighting systems and appliances, and is intended to supplement SOLAS Regulation II-2/14 and manufacturer's maintenance instructions.

## 2 Application

This directive applies to all Bahraini flagged ships and mobile offshore units (MOUs) subject to SOLAS Convention.

## 3 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 PMA and the ship's Classification Society shall be made to ensure fire protection capability is not diminished. Prior to sailing or in the case of Mobile Offshore Drilling Units (MODUs) and Mobile Offshore Units (MOUs) engaging in operations with a fire protection system under repair, a dispensation must be obtained from the PMA.

## 4 Maintenance and testing

(1) **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:

(a) maintenance and repair instructions;
(b) schedule of periodic maintenance;
(c) list of replaceable parts; and
(d) log for records of inspections and maintenance, listing identified non-conformities and their targeted completion dates.

(2) Certain maintenance procedures and inspections may be performed by **competent crew members** who have completed an advanced fire-fighting training course, while others should be performed by persons specially trained in the maintenance of such systems. The on board maintenance plan should indicate which parts of the recommended inspections and maintenance are to be completed by trained personnel.

(3) Inspections should be carried out by the crew to ensure that the indicated weekly, monthly, quarterly, annual, two-year, five-year and ten-year actions are taken for the specified equipment, if provided. Records of the inspections should be carried on board the ship, or may be computer-based. In cases where the inspections and maintenance are carried out by trained service technicians other than the ship's crew, inspection reports

should be provided at the completion of the testing.

(4) In addition to the on board maintenance and inspections stated in this directive, manufacturer's maintenance and inspection guidelines should be followed. The quality of water in automatic sprinkler systems is of particular importance and should be maintained in accordance with manufacturer guidelines. Records of water quality should be maintained on board in accordance with the manufacturer's guidelines.

(5) Where particular arrangements create practical difficulties, alternative testing and maintenance procedures should be to the satisfaction of the PMA.

## 5 Weekly Testing and Inspections

(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.

(2) **Fixed gas fire-extinguishing systems**
(a) verify all fixed fire-extinguishing system control panel indicators are functional by operating the lamp/indicator test switch; and
(b) verify all control/section valves are in the correct position.

(3) **Fire doors**
Verify all fire door control panel indicators, if provided, are functional by operating the lamp/indicator switch.

(4) **Public address and general alarm systems**
Verify all public address systems and general alarm systems are functioning properly.

(5) **Breathing apparatus**
Examine all breathing apparatus and EEBD cylinder gauges to confirm they are in the correct pressure range.

(6) **Low-location lighting**
Verify low-location lighting systems are functional by switching off normal lighting in selected locations.

(7) **Water mist, water spray and sprinkler systems**
(a) verify all control panel indicators and alarms are functional;
(b) visually inspect pump unit and its fittings; and
(c) check the pump unit valve positions, if valves are not locked, as

applicable.

## 6 Monthly testing and inspections

Monthly inspections must be carried out to ensure that the indicated actions are taken for the specified equipment.

(1) **Fire mains, fire pumps, hydrants, hoses and nozzles**

(a) verify all fire hydrants, hose and nozzles are in place, properly arranged and are in serviceable condition;

(b) operate all fire pumps to confirm that they continue to supply adequate pressure; and

(c) emergency fire pump fuel supply adequate, and heating system in satisfactory condition, if applicable.

(2) **Fixed gas fire-extinguishing systems**

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

(3) **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.

(4) **Water mist, water spray and sprinkler systems**

(a) verify all control, pump unit and section valves are in the proper open or closed position;

(b) verify sprinkler pressure tanks or other means have correct levels of water;

(c) test automatic starting arrangements on all system pumps so designed;

(d) verify all standby pressure and air/gas pressure gauges are within the proper pressure ranges; and

(e) 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.)

(5) **Firefighter's outfits**

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

(6) **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.

(7) **Fixed aerosol extinguishing systems**

(a) verify all electrical connections and/or manual operating stations are properly arranged, and are in proper condition; and

(b) verify the actuation system/control panel circuits are within manufacturer's specifications.

(8) **Portable foam applicators**

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

(9) **Wheeled (mobile) fire extinguishers**

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

(10) **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 Ship Registry.

## 7 Quarterly testing and inspections

Quarterly inspections must be carried out to ensure that the indicated actions are taken for the specified equipment:

(1) **Fire mains, fire pumps, hydrants, hoses and nozzles**

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

(2) **Foam fire-extinguishing systems**

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

(3) **Ventilation systems and fire dampers**

Test all fire dampers for local operation.

(4) **Fire doors**

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

(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.

## 8 Annual testing and inspections

Annual inspections must be carried out to ensure that the indicated actions are taken for the specified equipment:

(1) **Fire mains, fire pumps, hydrants, hoses and nozzles**
- (a) visually inspect all accessible components for proper condition;
- (b) flow test all fire pumps for proper pressure and capacity. Test emergency fire pump with isolation valves closed;
- (c) test all hydrant valves for proper operation;
- (d) pressure test a sample of fire hoses at the maximum fire main pressure, so that all fire hoses are tested within five years;
- (e) verify all fire pump relief valves, if provided, are properly set;
- (f) examine all filters/strainers to verify they are free of debris and contamination; and
- (g) nozzle size/type correct, maintained and working.

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

(3) **Fixed gas fire-extinguishing systems**
- (a) visually inspect all accessible components for proper condition;
- (b) externally examine all high pressure cylinders for evidence of damage or corrosion;
- (c) check the hydrostatic test date of all storage containers;
- (d) functionally test all fixed system audible and visual alarms;
- (e) verify all control/section valves are in the correct position;
- (f) check the connections of all pilot release piping and tubing for tightness;
- (g) examine all flexible hoses in accordance with manufacturer's recommendations;
- (h) test all fuel shut-off controls connected to fire-protection systems for proper operation;
- (i) 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

(j) 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.

(4) **Foam fire-extinguishing systems**

(a) visually inspect all accessible components for proper condition;
(b) functionally test all fixed system audible alarms;
(c) 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);
(d) test all system cross connections to other sources of water supply for proper operation;
(e) verify all pump relief valves, if provided, are properly set;
(f) examine all filters/strainers to verify they are free of debris and contamination;
(g) verify all control/section valves are in the correct position;
(h) 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;
(i) take samples from all foam concentrates carried on board and subject them to the periodical control tests in MSC.1Circ.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.); and
(j) test all fuel shut-off controls connected to fire-protection systems for proper operation.

(5) **Water mist, water spray and sprinkler systems**

(a) verify proper operation of all water mist, water-spray and sprinkler systems using the test valves for each section;
(b) visually inspect all accessible components for proper condition;
(c) externally examine all high pressure cylinders for evidence of damage or corrosion;
(d) check the hydrostatic test date of all high pressure cylinders;
(e) functionally test all fixed system audible and visual alarms;
(f) flow test all pumps for proper pressure and capacity;
(g) test all antifreeze systems for adequate freeze protection;
(h) test all system cross connections to other sources of water supply for

proper operation;

(i) verify all pump relief valves, if provided, are properly set;

(j) examine all filters/strainers to verify they are free of debris and contamination;

(k) verify all control/section valves are in the correct position;

(l) 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;

(m) test emergency power supply switchover, where applicable;

(n) visually inspect all sprinklers focusing in areas where sprinklers are subject to aggressive atmosphere (like saunas, spas, kitchen areas) and subject to physical (like luggage handling areas, gyms, play rooms, etc.) so that all sprinklers are inspected within one year. Sprinklers with obvious external damage, including paint, must be replaced;

(o) check for any changes that may affect the system such as obstructions by ventilation ducts, pipes, etc.;

(p) 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

(q) test automatic and automatic water mist nozzles in accordance with the flow chart included in MSC.1/Circ. 1516.

(r) during basic testing, and extended testing when applicable, of automatic sprinkler heads/nozzles as outlined in flow chart included in MSC.1/Circ. 1516, water quality testing should be conducted in each corresponding piping section.

(6) **Ventilation systems and fire dampers**

(a) test all fire dampers for remote operation;

(b) verify galley exhaust ducts and filters are free of grease build-up; and

(c) test all ventilation controls interconnected with fire-protection systems for proper operation.

(7) **Fire doors**

Test all remotely controlled fire doors for proper release.

(8) **Breathing apparatus**

(a) check breathing apparatus air recharging systems, if fitted, for air quality;

(b) check all breathing apparatus face masks and air demand valves are in serviceable condition;

(c) check EEBDs according to maker's instruction; and
(d) SCBA cylinders should be used on a rotation basis in drills and should have their air charge used or blown-off and refilled as per the manufacturer's guidelines.

(9) **Fixed dry chemical powder systems**
(a) visually inspect all accessible components for proper condition;
(b) verify the pressure regulators are in proper order and within calibration; and
(c) 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.)

(10) **Fixed aerosol extinguishing systems**
verify condensed or dispersed aerosol generators have not exceeded their mandatory replacement date. Pneumatic or electric actuators should be demonstrated working, as far as practicable.

(11) **Portable foam applicators**
(a) verify all portable foam applicators are set to the correct proportioning ratio for the foam concentrate supplied and the equipment is in proper order;
(b) 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;
(c) 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;
(d) protein based foam concentrate portable containers and portable tanks must be thoroughly checked and, if more than five years old, the foam concentrate must be subjected to the periodical foam control tests required in MSC.1/Circ.1312, or renewed; and
(e) 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/Cird.1312.

(12) **Wheeled (mobile) fire extinguishers**
(a) perform periodical inspections in accordance with the manufacturer's

instructions;

(b) visually inspect all accessible components for proper condition;

(c) check the hydrostatic test date of each cylinder; and

(d) for dry powder extinguishers, invert extinguisher to ensure powder is agitated.

(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.

## 9 Two-Year Testing and Inspections

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

**(1) Fixed gas fire-extinguishing systems**
The system should be inspected by a competent person and must include:

(a) all high pressure extinguishing agents cylinders and pilot cylinders must be weighed or have their contents verified by other reliable means to confirm that the available charge in each is above 95% of the nominal charge. Cylinders containing less than 95% of the nominal charge should be refilled; and

(b) 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.

**(2) Fixed dry chemical powder systems**

(a) blow dry nitrogen through the discharge piping to confirm that the pipe work and nozzles are clear of any obstructions;

(b) operationally test local and remote controls and section valves;

(c) verify the contents of propellant gas cylinders (including remote operating stations);

(d) test a sample of dry chemical powder for moisture content; and

(e) subject the powder containment vessel, safety valve and discharge hoses to full working pressure test.

## 10 Five-Year Service

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

**(1) Fixed gas fire-extinguishing systems**
Perform internal inspection of all control valves.

**(2) Foam fire-extinguishing systems**

(a) perform internal inspection of all control valves;

(b) flush all high expansion foam system piping with fresh water, drain and purge with air;

(c) check all nozzles to prove they are clear of debris; and

(d) 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.

**(3) Water mist, water spray and sprinkler systems**

(a) flush all ro-ro deck deluge system piping with water, drain and purge with air;

(b) perform internal inspection of all control/section valves; water quality testing should be conducted in all corresponding piping sections, if not previously tested within the last five years;

(c) check condition of any batteries, or renew in accordance with manufacturer's recommendations; and

(d) 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.

**(4) Breathing apparatus**

(a) perform hydrostatic testing of all steel self-contained breathing apparatus cylinders;

(b) aluminium and composite cylinders may require more frequent testing as stipulated by manufacturer's instructions;

(c) hydraulic testing must be carried out by an accredited service agent or test facility;

(d) following the hydraulic test, a thorough inspection and internal examination must be carried out prior to recharging;

(e) the test pressure and test date must be stamped clearly on each steel cylinder. Aluminium or composite cylinders will require a permanent marking or tag; and

(f) test certificates must be provided and retained on-board for inspection.

**(5) Low-location lighting**

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

**(6) Wheeled (mobile) fire extinguishers**

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

## 11 Ten-Year Service

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

**(1) Fixed gas fire-extinguishing systems**

(a) perform a hydrostatic test and internal examination of 10% of the system's extinguishing agent and pilot cylinders. 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) flexible hoses should be replaced at the intervals recommended by the manufacturer and not exceeding every 10 years; and

**(2) Water mist, water spray and sprinkler systems**

These systems should be inspected and tested by a **competent person** as per the manufacturer's instructions, and as a minimum should include perform a hydrostatic test and internal examination for gas and water pressure cylinders according to EN 1968:2002.

**(3) Fixed dry chemical powder systems**

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

**(4) Fixed aerosol extinguishing systems**

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

**(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.

## 12 Specific requirements for Halon gas systems

(1) In accordance with the provisions of SOLAS Chapter II-2, Regulation 10.4.1.3, fire extinguishing systems using Halon 1211, Halon 1301, Halon 2402 and perfluorocarbons are prohibited on all new buildings and new installations on existing vessels.

(2) The release of Halons into the atmosphere when testing existing systems

is prohibited

## 13 Records

Records shall be maintained on board of:

(1) Weekly inspections;
(2) Monthly inspections;
(3) Annual inspections;
(4) Other maintenance and testing, including whether a pressure test was performed; and
(5) Deficiencies identified and corrective actions taken.

## 14 Penalty

Failure to comply with this directive, the Navigation License may be withdrawn, and/or the ship's master and the company may be fined in accordance with Amiri Decree No. 14/1978.

## 15 Revision History:

Revision No. 1 of the present Directive is the first revision.

**Hassan Ali Al Majed**
Undersecretary for Ports and Maritime Affairs
29th December 2016

## ANNEX 1
## Minimum Requirements for Spare Charges Required to be Carried on Board

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|---|---|
| **Portable Fire Extinguishers** | **Ships constructed before 01 July 2002**<br>50% for each type of fire extinguisher required to be provided. If they cannot be recharged on board an additional portable fire extinguisher of the same type, or its equivalent, shall be provided.<br><br>**Ships constructed on or after 01 July 2002**<br>100% for the first 10 then 50% of the remaining extinguishers. Not more than 60 total spare charges are required. If they cannot be recharged on board an additional portable fire extinguisher of the same quantity, type and capacity shall be provided. |
| **Portable Foam Applicator Unit** | 1 spare tank of 20 litres foam concentrate. |
| **Semi Portable Foam, Dry Powder and CO2 Extinguishers** | Nil |
| **Self-Contained Breathing Apparatus (SCBA) Air bottles** | **Ships constructed before 01 July 2002**<br>Every breathing apparatus shall be provided with fully charged spare cylinders having a spare storage capacity of at least 2,400 litres of free air except that:<br>1. if the ship is carrying five sets or more the total spare free air shall not be required to exceed 9,600 litres; or<br>2. ii) if the ship is equipped with means for re-charging the air cylinders on-board this spare air may be reduced to 1,200 litres per cylinder and the total storage of free air need not exceed 4,800 litres.<br><br>**Ships constructed on or after 01 July 2002**<br>Two spare charges shall be provided for each required breathing apparatus.<br><br>**Passenger ships** carrying not more than 36 passengers and cargo ships that are equipped with suitably located means for fully recharging the air cylinders free from contamination need carry only one spare charge for each required apparatus. In passenger ships carrying more than 36 passengers, at least two spare charges for each breathing apparatus shall be provided. |
| **Emergency Escape Breathing Devices (EEBDs)** | **Ships constructed before 01 July 2002**<br>No spares required.<br><br>**Ships constructed after 01 July 2002**<br>50% spares of the number of EEBDs required to be carried up to a maximum of four.<br><br>Spare EEBDs can be carried ready for use, but must be marked as spare. |

# ANNEX 2
## Testing & Inspection Schedule

| System or appliance | Shipboard inspection | Periodic inspection and service | Hydrostatic Pressure test |
|---|---|---|---|
| **Portable & semi portable fire extinguishers** | Monthly to check for proper location, charging pressure and condition. | **Annually** by a competent person<br>**5 yearly** test discharge | Portable extinguishers every **10 years.**<br>Semi-portable refer to manufacturer's guidelines. |
| **$CO_2$ High pressure cylinders - fixed installations** | **Monthly** in accordance with MSC.1/Circ.1318 by a competent person.<br><br>**Annual** inspection in accordance with MSC.1/Circ.1318 by a competent person. | **Biennially** (intervals of 2 years ± 3 months) in passenger ships or at each<br><br>**intermediate, periodical** or **renewal** survey in cargo ships in accordance with MSC.1/Circ.1318 by an accredited service agent. | At intervals not exceeding **10 years** at least **10%** of the total number provided must be subjected to an internal inspection and hydrostatic test in accordance with MSC.1/Circ 1318 by an accredited service agent. |
| **Fixed gas fire-extinguishing systems (for $CO_2$ see requirements stated above)** | **Monthly** in accordance with MSC.1/Circ.1432 by a competent person.<br>**Annual** inspection in accordance with MSC.1/Circ.1432 by a competent person. | **Two-year & five year** testing and inspection in accordance with MSC.1/Circ.1432 | At intervals not exceeding **10 years** at least **10%** of the total number provided must be subjected to an internal inspection and hydrostatic test in accordance with MSC.1/Circ.1432 by an accredited service agent. |
| **Foam Systems (fixed and portable)** | Fixed systems:<br>**Quarterly:** verify the proper quantity of foam concentrate in the storage tank.<br>**Yearly:** A full test and inspection of the system and verify portable applicators are set correctly. | **Annual foam test** in accordance with MSC.1/Circ.1312 for low expansion foam, or MSC/Circ.670 for high expansion foam.<br>Except for non-alcohol resistant foam, the first test need not be conducted until **3 years** after being supplied to the ship. | - |
| **Fixed dry chemical powder systems** | **Monthly** verify control and section valves are in the correct position an pressure gauges are in the proper range.<br>**Annually**: agitate the dry chemical powder charge - $N_2$ blow-through | Every **2 years** inspected by an accredited service agent + sample of dry powder tested for moisture absorption | Subject all powder containment vessels to hydrostatic or non-destructive testing carried out by an accredited service agent. |
| **Water mist, water spray and sprinkler systems** | Weekly, monthly and annual checks by a competent person | **5 yearly** inspection by a competent person | **10 yearly** hydrostatic test and internal examination for gas and water pressure cylinders in accordance with MSC.1/Circ.1432. |
| **Breathing apparatus** | Check pressure weekly | Every **year** check the air quality of BA air recharging systems to a recognised national standard.<br>Check EEBDs according to the maker's instructions | Every **5 years** perform hydrostatic testing of all steel self-contained BA cylinders. Aluminium and composite cylinders to be tested as per the manufacturer's instructions. |

## ANNEX 3
## Portable Fire Extinguisher Inspection Guide
Reference: IMO Resolution A.951(23)

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|---|---|---|
| **Monthly** | External examination | Check for proper location, charging pressure and condition, which shall include an inspection for corrosion, dents or damage which may affect the safe operation of the extinguisher. |
| **Annual** | Safety clip and indicating devices | Check to see if the extinguisher may have been operated. Where fitted, check to see that the pressure is within limits. |
| | Pressure indicating device | Check that dust covers on pressure indicating devices and relief valves are in place. |
| | Weight | Weigh the extinguisher and check the mass compared to the fully charged extinguisher. |
| | Hose and nozzle | Check that hoses and nozzles are clear and undamaged. |
| | Operating instructions | Check that they are in place and legible. |
| **At recharge** | Water and foam charges | Remove the charge to a clean container if to be reused and check if it is still suitable for further use. Check any charge container. |
| | Powder charges | Examine the powder for reuse. Ensure that it is free flowing and that there is no evidence of caking lumps or foreign bodies. |
| | Gas cartridge | Examine for damage and corrosion. |
| **At 5 and 10 year intervals After discharge test** | Air passages and operating mechanism | 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 |
| | Operating mechanism | Check that the safety pin is removable and that the lever is undamaged |
| | Gas cartridge | Examine for damage and corrosion. Weigh the cartridge to ascertain that it is within prescribed limits. |
| | O-rings washers and hose diaphragms | Check O-rings and replace hose diaphragms if fitted. |
| | Water and foam bodies | Inspect the interior. Check for corrosion and lining deterioration. Check separate containers for leakage or damage. |
| | Powder body | Examine the body and check internally for corrosion and lining deterioration. |
| **After recharge** | Water and foam | Replace the charge in accordance with the manufacturer's instructions. |
| | Reassemble | Reassemble the extinguisher in accordance with the manufacturer's instructions |
| | Maintenance label | Fill in entry on maintenance label, including full weight. |
| | Mounting of extinguishers | Check the mounting bracket or stand. |
| | Report | Complete a report on the state of maintenance of the extinguisher |