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Bulletin 012 - Maintenance and Inspection of Fire Protection Systems and Appliances

Notice to:
Shipowners, Operators, Officers, Flag State Inspectors and Recognised Organisations

1. References

- a) International Convention for the Safety of Life at Sea, 1974, as amended (SOLAS);
- b) Fire Safety Systems (FSS) Code;
- c) IMO Circular [MSC.1/Circ.1432](#) Revised Guidelines on maintenance and inspection of fire protection systems and appliances;
- d) IMO Circular [MSC.1/Circ.1318/Rev.1](#) Revised Guidelines for the maintenance and inspections of fixed carbon dioxide fire-extinguishing systems;
- e) IMO Assembly Resolution [A.951\(23\)](#) Improved Guidelines for Maintenance for Marine Portable Fire Extinguishers;
- f) IMO Assembly Resolution [A.1156\(32\)](#) Survey Guidelines under the Harmonized System of Survey and Certification (HSSC), 2021;
- g) IMO Circular MSC/Circ.775 – Ships with Reduced Halon Quantities;
- h) The International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code);
- i) IMO Circular [MSC.1/Circ.1275](#) Unified interpretation of SOLAS chapter II-2 on the number and arrangement of portable fire extinguishers on board ships, as corrected by [MSC.1/Circ.1275/Corr.1](#);
- j) IMO Circular [MSC/Circ.1002](#) Guidelines on alternative design and arrangements for fire safety, as corrected.
- k) IMO Circular [MSC.1/Circ.1395/Rev.4](#) Lists of solid bulk cargoes for which a fixed gas fire-extinguishing system may be exempted or for which a fixed gas fire-extinguishing system is ineffective;
- l) IMO Circular [MSC/Circ.670](#) Guidelines for the performance and testing criteria and surveys of high-expansion foam concentrates for fixed fire-extinguishing systems;
- m) IMO Circular [MSC/Circ.798](#) Guidelines for the performance and testing criteria and surveys of medium-expansion foam concentrates for fire-extinguishing systems;
- n) IMO Circular [MSC.1/Circ.1312](#) Revised guidelines for the performance and testing criteria, and surveys of foam concentrates for fixed fire-extinguishing systems, as corrected by [MSC.1/Circ.1312/Corr.1](#);
- o) IMO Circular [MSC.1/Circ.1555](#) Unified interpretation of SOLAS chapter II-2;
- p) IMO Circular [MSC/Circ.1081](#) Unified interpretation of the Revised SOLAS chapter II-2;
- q) IMO Circular [MSC/Circ.849](#) Guidelines for the performance, location, use and care of emergency escape breathing devices (EEBDs);
- r) IMO Resolution [MEPC.269\(68\)](#) 2015 Guidelines for the Development of the Inventory of Hazardous Materials.

2. Purpose

- 2.1 This Bulletin provides instructions for inspection, maintenance, testing and survey requirements of fire protection systems, appliances, and equipment.
- 2.2 The maintenance and inspection provisions for fixed carbon dioxide (CO₂) fire-extinguishing systems reflects the latest requirements of MSC.1/Circ.1318/Rev.1.

3. Application

3.1 This Bulletin applies to all Barbadian vessels, except pleasure yachts.

4. Operational Readiness and Temporary Permits

4.1 All fire protection systems and appliances must be in good order and available for immediate use while the vessel is in service.

4.2 If a fire protection system is under maintenance, testing, repair, or not working, then the ISM Managers have to provide suitable arrangements to ensure fire protection capability is not diminished by providing alternative fixed or portable fire protection equipment or other measures. The ISM Managers must request a Temporary Permit at ops@barbadosmaritime.com while the vessel is underway, or before it sails.

5. Onboard Maintenance and Competent Persons

5.1 As per MSC.1/Circ.1432 and MSC.1/Circ.1318/Rev.1, certain maintenance procedures and inspections may be performed by competent crew members who have completed an advanced fire-fighting training course meeting the requirements of Section A-VI/3 of the STCW code, while others should be performed by persons specially trained in the maintenance of such systems. The onboard maintenance plan should indicate which parts of the recommended inspections and maintenance are to be completed by trained personnel.

5.2 For the purpose of section 5.1, a "competent person" is defined as someone who has achieved a level of technical skill (incorporating theoretical knowledge and practical experience) to be able to complete a task or activity safely and to the specified standard. The ISM Managers are responsible for assessing and selecting a suitable "competent person". Appropriate procedures relating to this activity must be established within the Company's Safety Management System.

5.3 Onboard maintenance and inspections are to be carried out in accordance with the vessel's maintenance plan, which should include the minimum elements listed in sections 4 to 10 of MSC.1/Circ.1432.

6. Specific Requirements for Fire Detection Systems

6.1 As per MSC.1/Circ.1432 sample of fire detectors and manual call points should be tested monthly, so that all devices have been tested at least once every 5 years.

6.2 Testing of manual call-points should be conducted at the same time as the detector tests.

6.3 The monthly testing schedule is to be prepared such that alternative detectors are physically tested at every monthly test. Remaining detectors must still to be visually inspected and/or tested with internal electronic self-test function, where provided.

6.4 For very large systems (1,000+ detectors), at least one detector should be physically tested in each large compartment, or one detector tested within several smaller compartments in the same locality within the same fire zone (e.g., multiple sleeping rooms on the same side of the ship located on the same deck and within the same fire zone). Whilst undertaking testing, all accessible detectors should be visually inspected for evidence of tampering, obstruction, etc.

6.5 At least one detector located along each cable line of the fire detection system and within each fire zone should be tested.

- 6.6 Where a fire detection system operating on an atmosphere sample extraction principal is installed the entire system should be physically tested every month. Where a ship fitted with such fire detection system undertakes laden voyages of longer than 1 month, the sample extraction fire detection system covering cargo compartments should be tested before loading cargo.

7. Specific Requirements for Fixed Gas Fire-Extinguishing Systems

- 7.1 Fixed gas fire-extinguishing systems have to be carefully and critically reviewed, routinely inspected, and maintained, verified, and tested to ensure that they will correctly operate during an emergency.
- 7.2 Monthly and annual inspections are to be carried out as per MSC.1/Circ.1432.
- 7.3 Flexible hoses have to be replaced at the intervals recommended by the manufacturer and in any case at intervals not exceeding 10 years.
- 7.4 Every two years (during the second or third periodical survey), fixed gas fire-extinguishing systems, except fixed carbon dioxide (CO₂) extinguishing systems (see section 8 below), have to be checked by an authorised service facility acceptable to the vessel's RO.
- 7.5 Every two years all high-pressure extinguishing agents, cylinders, and pilot cylinders have to 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 have to be refilled.
- 7.6 Every year, 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.
- 7.7 At least once every 10 years, a hydrostatic test and internal examination of 10% of the system's extinguishing agent and pilot cylinders has to be conducted. If one or more cylinders fail, a total of 50% of the onboard cylinders have to be tested. If further cylinders fail, all cylinders have to be tested.
- 7.8 With cylinders for fixed-gas fire-fighting systems (except Halon) that have been date stamped before vessel delivery, the first 10-year hydrostatic test may be harmonized with drydocking at the second renewal survey under the HSSC. This is contingent on the initial date stamp (month/year) on the cylinder not exceeding 12 months before the vessel delivery date.

8. Specific Requirements for Fixed CO₂ Systems

- 8.1 Monthly and annual inspections are to be carried out as per MSC.1/Circ.1318/Rev.1.
- 8.2 At least once in every 5-year period, control valves of fixed CO₂ systems are to be internally examined to ensure they can operate freely.
- 8.3 At least biennially (at intervals of 2 years \pm 3 months) in passenger ships, or at each intermediate, periodical or renewal survey (as per HSSC) in cargo ships, the following maintenance is to be carried out (to assist in carrying out the recommended maintenance, examples of service charts are set out in the appendix of MSC.1/Circ.1318/Rev.1):

- .1 all high-pressure 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 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 must be checked to verify that the required amount of carbon dioxide to protect the largest hazard is available;
 - .2 the hydrostatic test date of all storage containers must be checked. High-pressure cylinders and pilot cylinders should be subjected to periodical tests at intervals not exceeding 10 years. At the 10-year inspection, at least 10% of the total number provided must be subjected to an internal inspection and hydrostatic test. If one or more cylinders fail, a total of 50% of the onboard cylinders must be tested. If further cylinders fail, all cylinders must be tested. Before the 20-year anniversary and every 10-year anniversary thereafter, all cylinders must be subjected to a hydrostatic test. Flexible hoses must be replaced at the intervals recommended by the manufacturer and not exceeding every 10 years. When cylinders are removed for testing, the cylinders must be replaced 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; and
 - .3 the discharge piping and nozzles must be tested to verify that they are not blocked. The test should be performed by isolating the discharge piping from the system and blowing dry air or nitrogen from test cylinders or suitable means through the piping.
- 8.4 For the purpose of section 8.3.2 above, the BMSR interprets MSC.1/Circ.1318/Rev.1 as follows:
- .1 at the 10-year anniversary of the initial hydrotest, 10% of all CO₂ cylinders are to be hydrotested. If one or more cylinders fail, a total of 50% of the onboard cylinders must be tested. If further cylinders fail, all cylinders must be tested;
 - .2 prior to the 20-year anniversary of the initial hydrotest, all CO₂ cylinders are to be hydrotested, however cylinders tested satisfactorily at the 10-year anniversary need not be tested;
 - .3 at every 10-year anniversary thereafter, all CO₂ cylinders are to be hydrotested.
- 8.5 For vessels aged between 20 and 30 years as of May 2021, all CO₂ cylinders have to be hydrotested at the first drydock.
- 8.6 The ISM Managers can request a Temporary Permit from the BMSR to allow all hydrotests to be completed at the same time. Applications for the permit is to be submitted to BMSR at ops@barbadosmaritime.com by the ISM Managers and include:
- .1 The reason for not completing the hydrotest at 20 years;
 - .2 The proposed testing schedule, which should ensure that all cylinders are hydrotested at the earliest opportunity, taking into account the vessel's operations;
 - .3 Most recent service reports for the untested cylinders, including content check (by weighing or ultrasonic level detection);
 - .4 A statement from the Master attesting to the condition of the untested CO₂ cylinders.
- 8.7 The above provisions apply equally to ships using a low-pressure high volume refrigerated vessel for liquified CO₂ storage.
- 8.8 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:

- .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.

9. Specific Requirements for Halon Gas Systems

- 9.1 In accordance with Regulation of SOLAS II-2/10.4.1.3, fire extinguishing systems using Halon 1211, Halon 1301, Halon 2402, and perfluorocarbons are prohibited on all new buildings and on new installations on existing vessels.
- 9.2 In an existing installation and in the event of the discharge or loss of pressure of Halon gas cylinder(s), the BMSR might accept the replenishment of the discharged cylinder(s), if they remain in satisfactory condition.
- 9.3 The contents of the Halon cylinders should be weighed or have their contents verified by other reliable means at least every two years, plus or minus three months, as part of the survey for issuing the SOLAS Safety Equipment Certificate (SEC). This is to confirm that the available charge in each is above 95% of the nominal charge as far as reasonably practicable, as determined by the BMSR. Cylinders with less than 95% of the nominal charge should be refilled.
- 9.4 All Halon cylinders have to be hydrostatically tested:
 - .1 after each 20 years of service;
 - .2 before recharging a discharged cylinder; or
 - .3 when visual inspection reveals a potential defect.
- 9.5 Hydrostatic test dates have to be stamped on the cylinders. Hydrostatic testing have to be performed by an authorised servicing facility certified by a government agency or RO. The facility must be acceptable to the attending RO surveyor. The same facility should recharge the cylinders after testing to demonstrate their serviceability.
- 9.6 Visual inspection and non-destructive testing (NDT) of Halon cylinders may be performed instead of hydrostatic testing by an authorised servicing facility which has been certified by a government agency or RO.
- 9.7 The safety of the vessel and its crew remains paramount and if Halon gas is not readily available, the ISM Managers have to ensure that the affected space has adequate temporary firefighting capability prior to departure from port.

- 9.8 The adequacy of any temporary arrangements and procedures is to be assessed by the RO prior to application for acceptance by the BMSR.
- 9.9 Application for acceptance of any temporary arrangements is to be made to the BMSR by the RO and, as per MSC/Circ.775, shall establish procedure to enable the ship to safely depart the port, call at specified ports for discharge or loading of cargo, and arrive at the port for rectification of the deficiency. Where, such a procedure should specify the "port and date of departure", the "port of rectification of the deficiency", the "maximum duration of the voyage" and the "ports of call and operations approved en route".
- 9.10 There is currently no internationally agreed date for the phasing out of Halon gas in existing installations, however there may be local or regional regulations that impose restrictions on the use and/or phase out of Halon. The BMSR recommends that ISM Managers of affected Barbadian ships make themselves aware of any restrictions that may be applied by the country or region in which the ship is trading.
- 9.11 ISM Managers operating ships with existing Halon systems should note that the worldwide stock of Halon is diminishing, and it is strongly recommended that a plan is implemented for the replacement the Halon system on board.
- 9.12 It should be further noted that where Halon replenishment is not permitted by the country or region in which the ship is operating, the ship may be detained and/or prohibited from leaving port until a new fixed firefighting system is installed.
- 9.13 Details of any proposed replacement of a system containing Halon must be forwarded to the BMSR for review by the RO.
- 9.14 As per MEPC.269(68), the Halons are Ozone Depleting Substances (ODS) and the Supplement to the International Air Pollution Prevention Certificate may identify the presence of onboard. The ODS Record Book must be kept up to date and may form part of an existing logbook or electronic record book.

10. Specific Requirements for Fixed Dry Chemical Powder Fire-Extinguishing Systems

- 10.1 Monthly and annual inspections are to be carried out as per MSC.1/Circ.1432.
- 10.2 Every 10 years fixed dry chemical powder fire-extinguishing systems have to be serviced and tested in accordance with the manufacturer's and the RO's requirements. Particular attention must be paid to the powder condition for any signs of moisture ingress and that its properties remain as per the type approval.
- 10.3 In accordance with MSC.1/Circ.1432, two-yearly inspections have to be carried out on fixed, dry chemical powder systems by an authorised service facility acceptable to the vessel's RO or the attending RO surveyor(s), who have to perform a general distribution piping and installation examination of the dry chemical powder fire-extinguishing system to confirm, to the extent possible, that the system has not been modified from its original installation.
- 10.4 This verification should also include the following minimum requirements:
- .1 the piping distribution system have to be blown through with nitrogen (N₂) or dry air to ensure it is free of any obstruction. The nozzles, if any, have to be removed to ensure that they are free and not blocked during the blow-through operation;
 - .2 operational testing of local and remote controls and section valves;
 - .3 the contents verification of propellant gas cylinders containing N₂, including remote operating stations, must be confirmed;

- .4 flexible discharge hoses have 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 have to be subjected to a full working pressure test;
- .5 the dry chemical powder containment tank and its associate safety valves have to be inspected for signs of corrosion or deterioration which may affect the safety of the system. In case of any doubt, the tank has to be tested, and safety valve set points adjusted and confirmed by the authorised service facility.

11. Specific Requirements for Alternative Fixed Gas Firefighting Media

- 11.1 Alternative firefighting systems referred in Chapter II-2 of SOLAS and the IGC Code for protection of machinery and accommodation spaces, pump rooms and cargo spaces may be fitted on board, subject to the approval, including any attached conditions, of a Barbados RO or a SOLAS contracting Government in accordance with the requirements for alternative firefighting systems and relevant guidance stated in IMO Circular MSC/Circ.1002. The BMSR must receive prior notification of intention to fit an alternative system which has not been previously accepted by the BMSR.
- 11.2 The BMSR accepts the use of (non-asphyxiating) fire extinguishing agents in machinery spaces for which no specific provisions for fire-extinguishing appliances are prescribed under the provisions of Chapter II-2 of SOLAS, (such as "Novec™ 1230" fluid, INERGEN, FM 200, etc.). Acceptance of such agents is subject to conditions, agreed on a case-by-case basis, appropriate to the space in question and provided that the space is not connected to an accommodation space.

12. Specific Requirements for Alternatives to Ineffective Fixed Gas Firefighting Systems

- 12.1 Water supplies as defined in SOLAS Regulation II-2/19.3.1.2 are considered an alternative for the ineffective fixed gas fire-extinguishing system, when ships are allowed to carry cargoes contained in MSC.1/Circ.1395/Rev.4, Table 2. Such an arrangement has to be verified for compliance by the vessel's RO.

13. Specific Requirements for Foam Concentrates: Fixed Fire-Extinguishing Systems and Portable Applications

- 13.1 The first periodical control for foam concentrates (except protein-based, alcohol-resistant ones) should be performed not more than three years after being supplied to the ship, and after that, every year. These tests should be conducted by laboratories or authorised service suppliers acceptable to the RO.
- 13.2 Protein-based, alcohol-resistant foam concentrates should be subjected to a chemical stability test before delivery to the vessel and annually thereafter.
- 13.3 Guidance on performance and testing criteria and surveys of low, medium, and high-expansion concentrates for fixed fire-extinguishing systems are found in IMO Circulars MSC/Circ.670, MSC/Circ.798, and MSC.1/Circ.1312.
- 13.4 In accordance with MSC.1/Circ.1432 portable containers or portable tanks containing foam concentrate (excluding protein-based ones), less than 10 years old, that remain factory sealed, may normally be accepted without carrying out the periodical foam control tests referred to in MSC.1/Circ.1312.
- 13.5 Protein-based foam concentrate portable containers and portable tanks have to be thoroughly checked. If more than five years old, the foam concentrate has to be given the periodical foam control tests required or renewed, as referred to in MSC.1/Circ.1312.

14. Specific Requirements for Portable Fire Extinguishers and Spare Charges

- 14.1 All portable fire extinguishers have to be periodically inspected in accordance with the manufacturer's instructions.
- 14.2 Where recharged on board, all portable fire extinguishers should be provided with a visual discharge indicator. The manufacturer's instructions for recharging should be available onboard.
- 14.3 All portable fire extinguishers must be serviced at intervals not exceeding one year.
- 14.4 At least one extinguisher of each type, manufactured in the same year and kept on board a ship, should be test discharged at five-year intervals as part of a fire drill.
- 14.5 All fire extinguishers, together with propellant cartridges, must be hydrostatically tested in accordance with the recognized standard or the manufacturer's instructions at intervals not exceeding 10 years.
- 14.6 A hydrostatic test may be also required by the RO Surveyor or BMSR Appointed Nautical Inspector (ANI) if visual examination indicates a potential defect in the cylinder.
- 14.7 Service and inspection should only be undertaken by, or under the supervision of, a person with demonstrable competence, based upon the inspection guide in A.951(23) (Table 9.1.3).
- 14.8 The hydrostatic test date must be permanently and clearly marked on the bottles.
- 14.9 The servicing facility performing the hydrostatic tests have to be:
- .1 certified by a government agency or an RO; and
 - .2 accepted by the vessel's RO or the extinguisher manufacturer.
- 14.10 The same facility should recharge the cylinder after testing to demonstrate serviceability.
- 14.11 The number of portable fire extinguishers on board should be determined as follows:
- .1 Vessels built prior to 01 January 2009 - the number of portable fire extinguishers provided is to satisfy the requirements of the relevant Classification Society. In accommodation spaces, service spaces and control stations on vessels of 1,000 gross tonnage and upwards, no less than five (5) portable fire extinguishers are to be provided. ISM Managers are encouraged to apply the provisions of MSC.1/Circ.1275 where practicable.
 - .2 Vessels built on or after 01 January 2009 - the number of portable fire extinguishers to be provided should be determined in accordance with MSC.1/Circ.1275. In accommodation spaces, service spaces and control stations on ships of 1,000 gross tonnage and upwards, no less than five (5) portable fire extinguishers are to be provided.
- 14.12 The minimum number of spare charges carried on board for portable & semi-portable extinguishers shall be in accordance with SOLAS Chapter II-2, namely:
- .1 100% for the first ten (10) extinguishers; and
 - .2 50% for the remaining extinguishers up to a maximum of sixty (60).
- 14.13 Additional extinguishers of the same type and capacity shall be carried in lieu of spare charges for any extinguishers which cannot be charged on board.

15. Specific Requirements for Ten-Year Servicing: Water Mist, Water Spray, and Sprinkler Systems

15.1 The hydrostatic test and internal examination for gas and water pressure cylinders has to be conducted in accordance with EN 1968:2002+A1, Transportable Gas Cylinders – Periodic Inspection and Testing of Seamless Steel Gas Cylinders, or equivalent RO requirements. See also section 7.8 above of this Bulletin about harmonization with drydocking.

16. Specific Requirements for Self-Contained Breathing Apparatus

16.1 Self-Contained Breathing Apparatus (SCBA) Cylinders should be inspected weekly to ensure that they are in the correct pressure range.

16.2 A responsible ship's officer must inspect SCBAs at least once a month.

16.3 All SCBAs and their onboard means of recharging (if fitted) have to be inspected and tested at least annually by competent crew members unless manufacturers require annual servicing by an authorised agent.

16.4 The tests and examinations required by the HSSC must be carried out in the presence of an RO surveyor.

16.5 Hydrostatic testing of SCBA cylinders has to be carried out once every five years. Where:

- .1 the hydrostatic test date must be permanently marked on the bottles;
- .2 intervals for hydrostatically testing cylinders of the ultra-lightweight type may vary and will depend upon the requirements of the cylinder manufacturer and the ship's RO.
- .3 cylinder servicing has to be performed to the satisfaction of the RO surveyor.

16.6 In cases where SCBA cylinders have been date stamped before a vessel's delivery, the first five-year hydrostatic test may be harmonised with drydocking at the First Special Survey under the HSSC. This is possible provided that the initial date stamp (month/year) on the cylinder is not more than six months before the vessel delivery date.

16.7 Two interchangeable spare charges suitable for SCBA use have to be provided for each required apparatus.

16.8 In accordance with SOLAS II-2/10, only one interchangeable spare charge is needed for each required apparatus on passenger ships carrying not more than 36 passengers and cargo ships. A suitably located means for fully recharging breathing air cylinders, free from contamination, is required for passenger ships constructed on or after 01 July 2010 carrying more than 36 passengers.

16.9 All vessels, unless provided with an onboard means of recharging breathing apparatus cylinders, are required to have a suitable number of spare cylinders to replace those used during training or drills. The BMSR does not prescribe any minimum number. The shipboard SMS should include provisions to ensure that sufficient spares are available onboard (see also IMO Circular MSC.1/Circ.1555) corresponding to the number of breathing apparatuses being used during drills.

17. Specific Requirements for Emergency Escape Breathing Devices

17.1 The BMSR considers the Guidelines contained in MSC/Circ.849 to be mandatory.

17.2 Only control spaces and workshops that are remotely located from the machinery space escape routes should be considered to comply with MSC/Circ.849, paragraph 4.6.

- 17.3 To comply with MSC/Circ.849, paragraph 4.6, a minimum of two EEBDs should be located on each level of the machinery space. If a machinery space contains an enclosed primary escape trunk with a door at each level, only one EEBD need be located on each level.
- 17.4 With reference to section 17.3 above, the term level should be interpreted as meaning a deck where watchstanding personnel reside, workshops and control stations are located, or the crew may be employed during routine maintenance. In essence, two EEBDs are required only on those deck "levels" where people are likely to be employed. Platform decks that serve to divide long ladders into segments and partial decks where personnel are not likely to be employed for any significant period of time are not considered as "levels" and do not require EEBDs.
- 17.5 An EEBD must not be used under any circumstances to enter an enclosed shipboard space in which the atmosphere is known or suspected to be oxygen-depleted or enriched, toxic, or flammable.
- 17.6 EEBDs have to be examined and maintained in accordance with the manufacturer's instructions, including those for hydrostatic testing.
- 17.7 It should be noted that when an EEBD is fitted with a small capacity oxygen cartridge (two inches (50.8mm) or less in diameter), some manufacturers specify a fixed service life without scheduled hydrostatic pressure testing. In the absence of manufacturer's instructions, hydrostatic testing has to be carried out at intervals not exceeding five years, unless specifically prohibited by the manufacturers.
- 17.8 In cases where EEBD cylinders have been date stamped before delivery of a vessel, the first hydrostatic test may be harmonized with drydocking at the First Special survey under the HSSC. This is provided that the initial date stamp (month/year) on the cylinder is not more than six months before the vessel delivery date.
- 17.9 Maintenance requirements, manufacturer's trademark and serial number, shelf life with accompanying manufacture date, and name of the approving authority have to be printed on each EEBD as per MSC/Circ.849, paragraph 5.3.
- 17.10 Sufficient spare EEBDs should be on board to replace units that are used, reach their expiry date, or otherwise become unserviceable. MSC/Circ.1081 addresses the number of EEBDs, including spares, required under SOLAS II-2.

18. Additional Survey Requirements

- 18.1 In surveying the safety equipment on a vessel, the RO has to verify that:
- .1 all firefighting equipment has been inspected and maintained in accordance with the manufacturer's instructions and the foregoing requirements; and
 - .2 the manufacturer's maintenance instructions are on board; and
 - .3 records of inspections, maintenance and pressure tests are maintained as per section 18.3 below; and
 - .4 spare charges or extinguishers are provided in accordance with sections paragraphs 14.12 and 14.13 above.
- 18.2 The RO has to refer to the BMSR, with relevant recommendations, any cases where a Barbados vessel does not satisfy the foregoing requirements, prior to the issue or endorsement of a Cargo Ship Safety Equipment Certificate, Passenger Ship Safety Certificate or any other statutory certificate that relates to safety equipment.

18.3 The following records have to be maintained on board:

- .1 Weekly testing and inspections;
- .2 Monthly testing and inspections;
- .3 Quarterly testing and inspections;
- .4 Annual testing and inspections;
- .5 Two-year testing and inspections;
- .6 Five-year service;
- .7 Ten-year service.

