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The planned maintenance of fire fighting and safety equipment برنامه ریزی نگهداری تجهیزات ایمنی و مقابله با آتش

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All respectful ICS Surveyors/ Customers

This Technical Information is published to presents a summary of required and mandatory Maintenance and Inspection of Fire-Protection System and life saving equipment and appliances based on SOLAS and IMO resolutions and circulars. Generally this requirements are mandated by the flag administrations requirements, although SOLAS convention requires all the vessels by minimum maintenance and inspection schedule for life saving appliances and fire fighting and protection measures.

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A.Gholam Abolfazl
head of Convention & Legislation
Department
Iranian Classification Society – ICS

کلیه بازرسان و مشتریان محترم ICS

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ع. غلام ابوالفضل

سرپرست واحد کنوانسیون ها و مقررات دریایی

موسسه رده بندی ایرانیان

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SECTION A)

1. General guide for Firefighting appliances(FFA):

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.

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:

- maintenance and repair instructions;
- schedule of periodic maintenance;
- list of replaceable parts; and
- log and records of testing, inspections and maintenance, listing identified nonconformities and their targeted completion dates.

1.3 Weekly Testing and Inspections:

Weekly inspections should be carried out to ensure that:

- all public address systems and general alarm systems are functioning properly;
- breathing apparatus cylinders do not present leakages; and
- all fireman's outfits and EEBDs are appropriately supplied, arranged, and in proper condition

1.4 Monthly Examinations and Inspections:

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:

- all fire extinguishers, fire hydrants, hose and nozzles are in place, properly arranged, and are in proper condition
- dry pipe sprinkler systems have appropriate pressures as indicated by gauges
- sprinkler system pressure tanks have correct levels of water as indicated by glass gauges
- all sprinkler system pumps automatically operate on reduction of pressure in the systems
- all fire pumps are operated

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:

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

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:

- all automatic alarms for the sprinkler systems are tested using the test valves for each section;
- the international shore connection is in proper condition;
- lockers and fire stations providing storage for fire-fighting equipment contain proper inventory and equipment is in proper condition;
- all fire doors and fire dampers are tested for local operation; and
- 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:

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

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

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 by an **approved firm**.

Details of firefighting appliances maintenance requirements are as follows:

2. Fixed CO₂ Fire Fighting Systems:

Fixed CO₂ systems in addition to complying with the maintenance and inspection requirements mentioned above, 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) the following maintenance should be carried out by an **approved firm**:

- 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) 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 by an **approved firm**. At that inspection:

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

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), the following maintenance should be carried out by service technicians/specialists trained to standards accepted by the Administration:

- 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;

- 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;
- 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. Fixed Foam System:

3.1 Maintenance and Inspection:

Foam fire fighting systems, in addition to complying with the applicable maintenance and inspection requirements mentioned in general section, 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, with reference to MSC.1/Circ.1312/Corr.1, for verification of the foam concentrates.

3.2 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.

3.2.1 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 ship owner 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.

3.2.2 Protein-based alcohol-resistant foam concentrates should be subjected to a chemical stability test prior to delivery to the ship and annually thereafter.

3.3 Records:

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

4. Portable Fire Extinguishers:

4.1 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.

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

Excepting CO₂ portable fire extinguishers which to be checked annually by **approved firms**, a vessel crew may service powder,

foam, or water type portable fire extinguishers subject to the following:

- The equipment required to test, examine, and service the extinguishers is obtained and maintained in a calibrated and serviceable condition.
- The crew is properly trained in the testing and examination, and servicing of fire extinguishers and the extinguisher manufacturer's servicing instructions are followed.
- 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.

4.3 Verification of Fire Extinguishers

Contents:

Every two years in conjunction with the issuance of the SOLAS Safety Equipment Certificate the contents of the cylinders for CO₂, DP, water, and foam fire extinguishers must be verified by an **approved firm**. 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 used, spot checks of cylinder contents by weighing may be required to verify the accuracy and consistency of the measurement device.

4.4 Spare Charges, Additional Fire Extinguishers, and Refilling of Extinguishers:

- 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).
- 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.
- 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.

4.5 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.

4.6 Hydrostatic Testing of Portable Fire Extinguishers:

Portable fire extinguishers shall be hydrostatically tested by an **approved firm** as follows:

- Dry Powder Extinguishers every 10 years;
- CO₂ Extinguishers every 10 years;
- Other Extinguishers every 10 years.

A hydrostatic test may also be required by the classification society surveyor if visual examination indicates a potential defect in

the cylinder. The hydrostatic test date must be permanently marked on the bottles.

4.7 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.

5. Self-Contained Breathing Apparatus (SCBA):

5.1 Weekly Inspections:

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

5.2 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.

5.3 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 by crew provided that **4.2** is fulfilled.

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.

5.4 Hydrostatic Testing of Self-contained Breathing Apparatus Cylinders:

Hydrostatic testing of SCBA cylinders shall be carried out once every five years or in accordance with manufacturers instruction but not later than five years by **approved firms**. 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.

5.5 Spare Charges and Recharging of Breathing Apparatus Air Cylinders:

- Two spare charges suitable for use with the breathing apparatus should be provided for each required apparatus.
- 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.
- 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:
 - i) 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;
 - ii) 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.

6. Emergency Escape Breathing Devices (EEBDs):

6.1 Maintenance and Care:

- The EEBD should be examined and maintained in accordance with the manufacturer's instructions.
- The ship's periodic safety appliance and equipment inspection and testing procedures should be modified to incorporate the inspection of EEBDs.
- 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.
- 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.
- Unless specifically required by the manufacturer it 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.
- EEBDs having air container, annual inspection can be done by crew provided that 4.2 is fulfilled and 5 yearly hydrostatic test shall be carried out by **approved firms**.

SECTION B)

1. General guide for Life saving appliances(LSA):

Maintenance, testing and inspections of life-saving appliances shall be carried out based on the guidelines developed by the Organization and in a manner having due regard to ensuring reliability of such appliances. The Administration may accept, a shipboard planned maintenance programme, which includes the requirements of regulation 36 of SOLAS chapter III. This regulation contains:

- a checklist for use when carrying out the inspections required by regulation 20.7 of SOLAS chapter III.
- Maintenance and repair instructions;
- schedule of periodic maintenance;
- diagram of lubrication points with the recommended lubricants;
- list of replaceable parts;
- list of sources of spare parts;
- log for records of inspections and maintenance.

2. Maintenance of falls:

Falls used in launching shall be inspected periodically with special regard for areas passing through sheaves, and renewed when necessary due to deterioration of the falls or at intervals of not more than 5 years, whichever is the earlier.

3. Spares and repair equipment

Spares and repair equipment shall be provided for life-saving appliances and their components which are subject to excessive wear or consumption and need to be replaced regularly.

4. Weekly inspection

The following tests and inspections shall be carried out weekly and a report of the inspection shall be entered in the log-book:

- all survival craft, rescue boats and launching appliances shall be visually inspected to ensure that they are ready for use. The inspection shall include, but is not limited to, the condition of hooks, their attachment to the lifeboat and the on-load release gear being properly and completely reset;
- all engines in lifeboats and rescue boats shall be run for a total period of not less than 3 min, provided the ambient temperature is above the minimum temperature required for starting and running the engine. During this period of time, it should be demonstrated that the gear box and gear box train are engaging satisfactorily. If the special characteristics of an outboard motor fitted to a rescue boat would not allow it to be run other than with its propeller submerged for a period of 3 min, a suitable water supply may be provided. In special cases, the Administration may waive this requirement for ships constructed before 1 July 1986;
- lifeboats, except free-fall lifeboats, on cargo ships shall be moved from their stowed position, without any persons on board, to the extent necessary to demonstrate satisfactory operation of launching appliances, if weather and sea conditions so allow;
- the general emergency alarm shall be tested.

5.Monthly inspection:

- All lifeboats, except free-fall lifeboats, shall be turned out from their stowed position, without any persons on board if weather and sea conditions so allow.
- Inspection of the life-saving appliances, including lifeboat equipment, shall be carried out

monthly using the checklist required by regulation 36.1 of SOLAS chapter III to ensure that they are complete and in good order. A report of the inspection shall be entered in the log-book.

6.Servicing of inflatable liferafts, inflatable lifejackets, marine evacuation systems and maintenance and repair of inflated rescue boats:

6.1 Every inflatable liferaft, inflatable lifejacket, and marine evacuation system shall be serviced:

- at intervals not exceeding 12 months, provided where in any case this is impracticable, the Administration may extend this period to 17 months.
- at an approved servicing station which is competent to service them, maintains proper servicing facilities and used only properly trained personnel.(refer to attachments)

6.2 All repairs and maintenance of inflated rescue boats shall be carried out in accordance with the manufacturer's instructions. Emergency repairs may be carried out on board the ship;however, permanent repairs shall be effected at an approved servicing station.

7.Periodic servicing of hydrostatic release units:

Hydrostatic release units, other than disposable hydrostatic release units, shall be serviced:

- at intervals not exceeding 12 months, provided where in any case this is impracticable, the Administration may extend this period to 17 months.
- at a servicing station which is competent to service them, maintains proper servicing facilities

and uses only properly trained personnel.

8. Periodic servicing of launching appliances and on-load release gear:

8.1 qualification level :

Weekly and monthly inspections, and routine maintenance as specified in the equipment maintenance manual(s), should be conducted under the direct supervision of a senior ship's officer in accordance with the maintenance manual(s).

All other inspections, servicing and repair should be conducted by the manufacturer's representative or other person appropriately trained and certified (service providers) for the work to be done in accordance with MSC.1/Circ.1277 which attached to present technical information.

8.2 Launching appliances shall be:

- Maintained in accordance with instructions for on-board maintenance as required by regulation 36 of SOLAS chapter III.
- Subject to a thorough examination at the annual surveys required by regulations I/7 or I/8, as applicable.
- Upon completion of the examination referred to above, subjected to a dynamic test of the winch brake at maximum lowering speed. The load to be applied shall be the mass of the survival craft or rescue boat without persons on board, except that, at intervals not exceeding five years, the test shall be carried out with a proof load equal to 1.1 times the weight of the survival craft or rescue boat and its full complement of persons and equipment.

8.3 Lifeboat or rescue boat on-load release gear, including free-fall lifeboat release systems, shall be:

- Maintained in accordance with instructions for on-board

maintenance as required by regulation 36 of SOLAS chapter III.

- Subject to a thorough examination and operational test during the annual surveys required by regulations I/7 and I/8 of SOLAS by properly trained personnel familiar with the system .
- Operationally tested under a load of 1.1 times the total mass of the boat when loaded with its full complement of persons and equipment whenever the release gear is overhauled. Such overhauling and test shall be carried out at least once every five years
- notwithstanding above, the operational testing of free-fall lifeboat release systems shall be performed either by free-fall launch with only the operating crew on board or by a simulated launching carried out based on guidelines attached to this technical information (MSC.1/Circ.1206/Rev.1).

8.4 Davit-launched liferaft automatic release hooks shall be:

- Maintained in accordance with instructions for on-board maintenance as required by regulation 36 of SOLAS chapter III.
- Subject to a thorough examination and operational test during the annual surveys required by regulations I/7 and I/8 of SOLAS by properly trained personnel familiar with the system.
- Operationally tested under a load of 1.1 times the total mass of the liferaft when loaded with its full complement of persons and equipment whenever the automatic release hook is overhauled. Such overhauling and test shall be carried out at least once every five years.

SECTION C)

Attachments:

- 1) MEASURES TO PREVENT ACCIDENTS WITH LIFEBOATS WITH GUIDELINES FOR PERIODIC SERVICING AND MAINTENANCE OF LIFEBOATS, LAUNCHING APPLIANCES AND ON-LOAD RELEASE GEAR (MSC.1/Circ.1206/Rev.1)
- 2) RECOMMENDATION ON CONDITION FOR THE APPROVAL OF SERVICE STATIONS FOR INFLATABLE LIFERAFTS(RES.A.761(18))
- 3) RECOMMENDATION ON CONDITIONS FOR AUTHORIZATION OF SERVICE PROVIDERS FOR LIFEBOATS, LAUNCHING APPLIANCES AND ON-LOAD RELEASE GEAR
- SOLAS CHAPTER III (LIFE SAVING APPLIANCES AND ARRANGEMENT)
- IMO RESOLUTIONS AND CIRCULARS FOR FFA MAINTENANCE