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पोत परिवहन मंत्रालय / MINISTRY OF SHIPPING,
नौवहन महानिदेशालय/ DIRECTORATE GENERAL OF SHIPPING

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Engineering Circular No.6 of 2013

NO: ENG/MMAM-37(6)/99	Dated: 19th August 2013

Subject: Guidelines for maintenance and inspection of fire protection, detection and extinction equipment onboard Indian ships.

1. General:

The Maritime Safety Committee, at its ninetieth session, recognizing the need to include maintenance and inspection guidelines for the latest advancements in fire-protection systems and appliances, approved the Revised Guidelines for the maintenance and inspection of fire protection systems and appliances. These guidelines provide the minimum recommended level of maintenance and inspection for fire protection, detection and extinction equipment/systems on all ships, and are intended to demonstrate that the equipment/system is in good working order as specified in SOLAS, Chapter II-2.

2. Purpose:

This Directorate has been receiving requests for clarifications regarding the maintenance and inspection of various fire protection, detection and extinction equipment as required by the SOLAS, Chapter II-2, Regulation 14. The purpose of this Circular is to introduce a comprehensive procedural guideline for the periodical inspection and maintenance of all categories of fire protection, detection and extinction equipment used on merchant ships.

It should be noted that the general requirements contained in this Circular are not an all inclusive list of maintenance or inspection items for fire protection systems, fire fighting appliances, and emergency equipment. The specific requirements contained in this Circular are extracts from the respective IMO guidelines referred below and addresses areas where the Administration feels there is need for further clarification.

3. Reference:

No.	Reference	Details
1	IMO Resolution A. 951(23)	Improved Guidelines for marine Portable fire extinguishers
2	MSC.1/Circ. 1318	Guidelines for the maintenance and inspections of Fixed carbon dioxide fire-extinguishing systems
3	MSC.1/Circ. 1432	Revised guidelines for the maintenance and inspection of Fire protection systems and Appliances.
4	MSC.1/Circ. 1312	Revised guidelines for the performance and testing criteria, and surveys of Foam concentrates for fixed fire-extinguishing systems
5.	MSC/Circ. 670 & 798	Guidelines for the performance and testing criteria, and surveys of high-expansion & medium-expansion foam concentrates for fixed fire-extinguishing systems
6	MSC.1/Circ. 1275	Unified interpretation on the number and arrangement of portable fire extinguishers in the various types of spaces on board ships
7	ISO6406	Periodic inspection and testing of seamless steel gas cylinders.
8	Gas Cylinder Rules 2004	Gas Cylinder Rules 2004, as amended, promulgated by GOI.

4. Applicability:

This guideline applies to all Indian ships and supersedes the following circulars:-

a) Engineering Circular No.17 (ENG/MMAM-37(6)/99) dated 08/10/2003
b) Engineering Circular No.25 (ENG/MMAM-37(6)/99) dated 12/04/2004
c) Engineering Circular No.41 (ENG/FFA/436) dated 03/11/2004
d) Engineering Circular No.66 (ENG/MMAM-37(6)/99) dated 12/12/2005
e) Engineering Circular No.81 (ENG/MISC-29(11)/2006) dated 16/03/2007
f) Engineering Circular No.113 (ENG/MMAM-37(6)/99) dated 06/10/2009

5. Maintenance and Inspection guidelines:

5.1 The periodical maintenance and inspection routines of all fire protection, detection and extinction systems and appliances onboard any Indian ship, with effect from **1st June 2013** shall be be carried out in accordance with the ship's maintenance plan,

which should include the minimum elements listed in sections 4 to 10 of the **IMO MSC.1/Circ.1432** on "Revised guidelines for the maintenance and inspection of Fire protection systems and Appliances", as applicable.

5.2 In case of fixed carbon dioxide systems, the comprehensive instructions provided in the Guidelines for the maintenance and inspections of fixed carbon dioxide fire-extinguishing systems (**MSC.1/Circ.1318**), and, for Portable or Semi-portable fire extinguishers, the Improved Guidelines for marine portable fire extinguishers (**Resolution A.951(23**)) shall be additionally referred, the salient extracts of which are provided under paragraphs 6 and 7 of this Circular.

6. General:

6.1 **Safety Management System:**

Maintenance and inspection should be carried out in accordance with the ship's maintenance plan having due regard to ensuring the reliability of the system. The onboard maintenance plan should be included in the ship's safety management system and should be based on the system manufacturer's recommendations

6.2 **Operational readiness:**

All fire protection system and appliances should be, at all times, 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 Recognized Organization that issued the pertinent Safety Certificate, shall be made to ensure safety is not diminished.

In cases where the Recognized Organization which has issued the vessel's Statutory Certificate determines that the equipment does not comply with the requirements of the corresponding mandatory regulations, they must approach the Directorate for an authorization for the issuance of the relevant Conditional Statutory Certificate prior to permit the vessel to operate. Any vessel in a port or dry-dock or anchorage or temporarily immobilized due to some reason, shall be construed to be as a vessel under operation.

6.3 **Maintenance and Testing Instructions:**

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

1. maintenance and repair instructions;
2. schedule of periodic maintenance;
3. list of replaceable parts; and
4. log for records of inspections and maintenance, listing identified non-

conformities and their targeted completion dates.

Compliance of this sub-para. inter alia, shall be the responsibility of the "Company" as defined in the ISM Code.

6.4 **Competent Persons:**

6.4.1 Certain maintenance procedures and inspections may be performed by *competent crew members*, while others should be performed by *authorised-service agencies*. The onboard maintenance plan should indicate which parts of the recommended inspections and maintenance should be completed by trained personnel.

6.4.2 "*Competent Crewmembers*" in this case is to be construed as that the basic and extended services may be carried out onboard ships under the supervision of an experienced person holding a Merchant Shipping STCW II/2 or III/2 unlimited certificate of competency and an Advanced Fire Fighting certificate.

6.4.3 "*Authorised Service Agency*" means a FFA Service station approved for the purpose by the Directorate General of Shipping, while the ship is in India. If the servicing is done outside India, the FFA service station must be certified by any Recognised Organization authorised by the GOI.

6.4.4 "*Competent Person*" is a person specifically trained and authorised for the specific service / maintenance activity by the equipment manufacturer.

6.5 **Records:**

The Master and / or the Chief Engineer as the case may be, should ensure that that the indicated weekly, monthly, quarterly, annual, two-yearly, five-yearly and ten-yearly inspections are taken for the specified equipment, if provided. Records of the inspections should be maintained on board the ship in hard or soft form. In cases where the inspections and maintenance are carried out by trained service technicians other than the ship's crew, inspection reports / certificate duly endorsed by the Competent person should be retained onboard for verification, with the identity of such person being clearly decipherable.

6.6 **Testing of Foam samples:**

Samples from all foam concentrates of carried onboard shall be subjected to the periodical control tests in accordance with MSC.1/Circ.1312, for low expansion foam, or MSC/Circ.670 for high expansion foam. The minimum periodicity of such testing varies depending upon the type and method of storage, a summary of which is provided in the following table:-

Minimum frequency for periodical testing of Foam concentrates.		
No	**Type of foam concentrate**	**Minimum frequency**
1	All Fixed systems *except* protein based non- alcoholic.	Within 3 years from the date of manufacture and every year thereafter.
2	All Fixed systems of protein based non-alcoholic.	Annually.
3	All factory-sealed portable containers *excluding* protein based	Ten yearly.
4	All factory-sealed portable containers of protein based concentrates	Five yearly.
5	All non-sealed portable containers	Within 3 years from the date of manufacture and every year thereafter.

6.7 Hydrostatic testing of pressure cylinders:

All pressurised cylinders carried onboard for various Fire fighting requirements shall be periodically subjected to Hydrostatic stretch test in accordance with ISO 6406 – "Periodic inspection and testing of seamless steel gas cylinders" or equivalent national or international standard as applicable. The minimum periodicity of such testing varies according to the type / material of construction of the cylinders and carriage material, a summary of which is provided in the following table:-

Minimum frequency for Hydrostatic test of pressure cylinders.		
No	**Type of Pressure Cylinder**	**Minimum frequency**
1	All steel cylinders of self-contained breathing apparatus (SCBA).	Five yearly.
2	All aluminium and composite cylinders of self-contained breathing apparatus (SCBA).	Five yearly.
3	All gas and water pressure cylinders of water mist, water spray and sprinkler systems	Ten yearly.
4	All powder containment vessels of Fixed dry chemical powder systems	Ten yearly.
5	Fixed CO_2 System storage cylinders	Ten yearly.
6	All type of Portable/Semi-Portable/Mobile extinguisher containers except CO_2 (Ref. BIS 2190:2010)	Three yearly.

7	All Portable/Semi-Portable/Mobile CO_2 fire extinguisher containers (Ref. BIS 2190:2010)	Five yearly.

Note:

a) The above mentioned frequency is minimum, subject to any reduced frequency as specified by applicable national / international standards or the manufacturer and to be suitably recorded in writing with justifiable reasons, by the concerned Company as defined in the ISM Code.

b) In India, all the above test facilities (except for Sr.No.6) shall be approved by the Chief Controller of Explosives in accordance with the Gas Cylinder Rules 2004, as amended, promulgated by the GOI. Outside India, such facility shall be approved by any Recognised Organization authorized by the GOI.

7. Portable and Semi-portable Fire Extinguishers:-

7.1 Inspection guideline:

7.1.1 The periodical inspection and maintenance of all the portable and semi-portable extinguishers onboard shall be governed, as a minimum, by the **IMO Resolution A.951(23)** - "Improved guidelines for marine portable fire extinguishers."

7.1.2 A portable extinguisher is one, which is designed to be carried and operated by hand, and which in working order has a total weight of not more than 23 kg. A semi-portable fire extinguisher means wheeled (mobile) fire extinguishers of higher capacity.

7.1.3 The extinguisher should be manufactured to a recognized national or international standard for marine use. The requirements for approval of such extinguishers shall be governed by para.6 of the DGS Order 6 of 2013.

7.2 Annual Maintenance:

7.2.1 All fire extinguishers must be checked for proper location, charging pressure, and condition, according to the ship's Fire Control Plan (FCP) and should be subject to periodical inspections in accordance with the manufacturer's instructions and serviced at intervals not exceeding one year and duly recorded by a management level officer whose identity is clearly decipherable. During these services any plastic collars, etc. which may conceal the condition of the cylinder underneath need to be removed to aid in the inspection.

7.2.2 This servicing, covering only the basic aspects, can be undertaken by Competent Crewmembers or by an authorised service agency, at the choice of the ship owner. If undertaken by ship-staff, it should be carried out as part

of a Planned Maintenance System with all necessary procedures, work instructions, tools and equipment readily available.

7.2.3 Each extinguisher should be provided with a sign (maintenance label) clearly and indelibly indicating that it has been examined on a certain date by a competent person.

7.2.4 Records of inspections should be maintained onboard for verification, showing, inter-alia, the date of inspection, the type of maintenance carried out and whether or not a pressure test was performed.

7.2.5 Charges of dry chemical/water type fire extinguishers should be renewed if, on checking, there is any indication of deterioration in the contents or as specified by the manufacturer, but in any case not later than once every five years.

7.2.6 The premixed agent in liquid charge-type AFFF (aqueous film-forming foam) and FFFP (film-forming fluoro-protein foam) fire extinguishers shall be replaced at least once every year. The agent in solid charge-type AFFF fire extinguishers shall be replaced once every 5 years (Ref. BIS 2190:2010).

7.2.7 Carbon dioxide extinguishers and gas expellant cartridges should be recharged or renewed if the gas loss by weight exceeds 10 % of the original charge.

7.2.8 Dry powder extinguishers may suffer from compaction when subject to vibration. At least one extinguisher should therefore be discharged annually at random and the retention of contents checked. When the retention is found to be in excess of 15% of the initial charge, further extinguishers should be discharged to determine the average compaction that is seen to be occurring.

7.2.9 Any extinguisher or bottle which indicates excessive corrosion shall be replaced.

7.3 **Five year service:**

At least one extinguisher of each type manufactured in the same years and kept onboard a ship should be test discharged once every five year intervals (as part of a fire drill), in any case.

7.4 **Ten year service:**

7.4.1 Containers of permanently pressurized and non-permanently pressurized portable/ non-portable fire extinguishers together with propellant cartridges should be hydraulically pressure tested as specified in the respective

national/international standard or as per the manufacturer's instructions and in any case at intervals not exceeding ten (10) years.

7.4.2 This hydrostatic test shall not be carried out onboard and shall be undertaken by an authorised service agency. Appropriate test records / certificates duly endorsed by the competent person of the Service station, with his identity readily decipherable, shall be retained onboard for verification.

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

7.5.1 Spare charges shall be provided for 100% of the first 10 extinguishers and 50% of the remaining fire extinguishers capable of being recharged onboard. Not more than 60% total spare charges are required to be maintained onboard. Instructions for recharging shall be carried on board.

7.5.2 For fire extinguishers which cannot be recharged onboard, additional ready-to-use portable fire extinguishers of the same quantity, type, capacity shall be carried in lieu of spare charges.

7.5.3 Periodic refilling of the cylinders should be in accordance with the manufacturer's recommendations. Only refills approved for the concerned extinguisher may be used for recharging. Partially emptied extinguishers should be recharged immediately.

7.6 Number and arrangement of portable fire extinguishers:

The number and arrangement of portable fire extinguishers in accommodation spaces, service spaces, control stations machinery spaces of category A, other machinery spaces, cargo spaces, weather deck and other spaces shall be as per the approved Fire Control Plan (FCP) on board ship. However, for vessels constructed on or after 1 January 2009, it shall comply with the MSC.1/Circ. 1275, as minimum.

8. Fixed Gas Fire Extinguishing System :-

8.1 Maintenance guideline:

8.1.1 The periodical inspection and maintenance of *Fixed Gas* Fire Extinguishing systems shall be broadly guided by the **IMO Circular MSC.1/Circ.1432**- "Revised guidelines for the maintenance and inspection of fire protection systems and appliances."

8.1.2 However, in case of *Fixed Carbon Dioxide* Fire extinguishing systems, the **IMO Circular MSC.1/Circ.1318**, "Guidelines for the maintenance and inspections of fixed carbon dioxide fire-extinguishing systems" shall be additionally referred to for specific guidance.

8.2 **Weekly, Monthly, Quarterly and Annual inspections & maintenance:**

8.2.1 The weekly, monthly, 3-monthly and annual routine maintenance and inspections as specified in MSC.1/ Circ.1432 shall be ensured, as minimum, for all systems of Fixed Gas fire extinguishing systems, including for the Fixed CO_2 systems. This Guideline is intended to supplement the fire-extinguishing system manufacturer's approved maintenance instructions and may be performed by competent crew members.

8.2.2 However, in case of Fixed CO_2 systems, the following additional periodic inspections / maintenance, as provided under MSC.1/ Circ.1318 shall be undertaken by persons specially trained in the maintenance of such systems, from an authorised service agency.

8.3 **Two – yearly maintenance/ inspections:**

In addition to the above mentioned routine maintenance requirements, at least biennially (i.e. intervals of 2 years ± 3 months) in passenger ships or at each intermediate / **periodical or renewal Safety equipment (SEQ)** survey in cargo ships, the following maintenance should be carried out (to assist in carrying out the recommended maintenance, examples of service charts are set out in the **Appendix-2**):

8.3.1 All high pressure cylinders and pilot cylinders should be weighed or have their contents verified by other reliable means to confirm that the available charge in each is above 90% of the nominal charge. Cylinders containing less than 90% of the nominal charge should be refilled. The liquid level of low pressure storage tanks should be checked to verify that the required amount of carbon dioxide to protect the largest hazard is available;

8.3.2 The discharge piping and 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 blowing dry air or nitrogen from test cylinders or suitable means through the piping

8.4 **Five-yearly maintenance / inspections:**

In addition to the above, at least biennially (intervals of 2 years ± 3 months) in passenger ships or at each **renewal Safety Equipment (SEQ)** survey in cargo ships, the following maintenance should be carried out by service technicians/specialists trained to standards accepted by the Administration:

8.4.1 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, move freely and, do not require excessive amount of travel to activate the system;

8.4.2 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 necessary 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

8.4.3 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.

8.5 **Ten-yearly maintenance/ inspections:**

8.5.1 High pressure cylinders should be subject to periodical tests at intervals not exceeding 10 years. At the 10-year inspection, at 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. Flexible hoses should be replaced at the intervals recommended by the manufacturer and not exceeding every 10 years;

8.5.2 Hydrostatic testing for the fixed CO2 system shall be carried out at test facilities approved by the Chief Controller of Explosives in accordance with the Gas Cylinder Rules 2004, as amended, and as promulgated by the GOI. The test shall be witnessed and certificate endorsed by the 'Competent Person', if approved by the DGS and by a Surveyor of the Administration or recognized RO as the case may be, if the facility is not approved by the Directorate General of Shipping.

8.5.3 Test certificates, duly endorsed by the concerned surveyor must be provided and kept on board for inspections. Test date and pressure must be stamped on each bottle. This test shall not be carried out on board;

8.5.4 For subsequent 10-year services, alternation of the inspected cylinders must be carried out, i.e. different cylinders must be inspected from those done in

the previous service, if 100% of them were not inspected during the previous in stance; and

8.5.5 Ships of 10 years or older coming into Indian flag will be required to carry this test at the next scheduled dry-docking.

8.5.6 All Flexible hoses should be replaced at the intervals recommended by the manufacturer and not exceeding every 10 years;

8.5.7 All discharge pipe lines shall be tested to a pressure of a maximum working pressure of the respective sections or as specified by the manufacturer, whichever is higher.

9. A Table showing the periodicity of various onboard maintenance and inspection of Fire protection System and Appliances is attached as **Appendix-1**.

10. Mere compliance of the aforesaid procedures does not absolve the Company, as defined in the ISM Code, from ensuring that all appliances/equipment shown in foregoing shall be satisfactorily maintained at all times, for ready-use during exigencies.

This is issued with the approval of the competent authority and comes into effect from the date of issue of this circular.

SD/-
(K.M. Rao)
E&SS-cum-Dy. DG (Tech)

To,

1. The Principal Officer, Mercantile Marine Department, Mumbai/Kolkata/ Chennai/ Kandla/Cochin.
2. The Surveyor-in-charge, Mercantile Marine Department, Goa/Jamnagar/Port Blair /Visakhapatanam /Tuticorin /Delhi /Haldia/ Paradip /Mangalore.
3. All Classification Societies.
4. Indian National Shippers Association (INSA), Mumbai
5. ICC Shipping Association (ICCSA), Mumbai
6. All Shipping Companies
7. CS/NA/CSS
8. The Engineering Branch
9. The Nautical Branch
10. The Naval Architecture Branch
11. Hindi Cell
12. Guard file
13. Computer Cell

On-board Maintenance and Inspection of Fire Protection Systems and Appliances							
Fire Protection System or Appliance	**Intervals**						
	Weekly	**Monthly**	**3-Monthly**	**Annually**	**2-Yearly**	**5-Yearly**	**10-Yearly**
Breathing Apparatus (MSC Circ.1432)	X			X		X	
Emergency Escape Breathing Devices (EEBD) (MSC Circ. 1432)	X			X			
Fire Doors (MSC Circ. 1432)	X		X	X			
Fire Mains, fire pumps, hydrants, hoses and nozzles (MSC Circ. 1432)		X	X	X			
Fire-fighters' Outfits (MSC Circ. 1432)		X					
Fixed Carbon Dioxide (CO_2) Fire Extinguishing Systems (MSC Circ. 1318)		X		X	X	X	X
Other fixed Gas Fire-Extinguishing Systems (MSC Circ. 1432)	X	X		X	X	X	X
Fixed aerosol Extinguishing Systems		X		X			X
Fixed Dry Chemical Powder Fire-Extinguishing Systems (MSC Circ. 1432)		X		X	X		X
Fixed Fire Detection and Fire Alarm Systems (MSC Circ. 1432)	X	X		X			
Fixed Foam Fire-Extinguishing Systems (MSC Circ. 1432)		X	X	X		X	
Gallery and deep fat cooking fire-extinguishing systems (MSC Circ. 1432)				X			
Low Location Lighting (LLL) Systems (MSC Circ. 1432)	X					X	
Portable Fire-Extinguishers (Res.A.951(23))				X		X	X
Portable Foam Applicators (MSC Circ. 1432)		X		X			
Public address and general alarm systems (MSC Circ. 1432)	X						
Ventilation systems and fire dampers (MSC Circ. 1432)			X	X			
Water mist, water spray and sprinkle systems (MSC Circ. 1432)	X	X		X		X	X
Wheeled (mobile) Fire-Extinguishers (MSC Circ. 1432)		X		X		X	X

APPENDIX-2

EXAMPLE SERVICE CHARTS

HIGH PRESSURE CO_2 SYSTEM

Date :	Name of ship/unit :	IMO No. :	

Technical description

No.	Text	Value
1	Manufacturer	
2	Number of main cylinders	
3	Main cylinders capacity (each)	
4	Number of pilot cylinders	
5	Pilot cylinder capacity (each)	
6	Number of distribution lines	
7	Oldest cylinder pressure test date	
8	Protected space (s)	
9	Date flexible hoses fitted/renewed	

Description of inspection/Tests

No.	Description	Carried out	Not carried out	Not applicable	Comment
1	Release controls and distribution valves secured to prevent accidental discharge				
2	Contents in main cylinders checked by weighing				
3	Contents in main cylinders checked by liquid level indicator				
4	Contents of pilot cylinders checked				
5	All cylinder valves visually inspected				
6	All cylinder clamps and connections checked for tightness				
7	Manifold visually inspected				
8	Manifold tested for leakage, by applying dry working air				
9	Main valve and distribution valves visually inspected				
10	Main valve and distribution valves tested for operation				
11	Time delay devices tested for correct setting*				
12	Remote release system visually inspected				
13	Remote release system tested				
14	Servo tubing/pilot lines pressure tested at maximum working pressure and checked for leakages and blockage				

15	Manual pull cables, pulleys, gang releases tested, serviced and tightened/adjusted as necessary				
16	Release stations visually inspected				
17	Warning alarms (audible/visual) tested				
18	Fan stop tested*				
19	10% of cylinders and pilot cylinder/s pressure tested every 10 years				
20	Distribution lines and nozzles blown through, by applying dry working air				
21	All doors, hinges and locks inspected*				
22	All instruction and warning signs on installation inspected				
23	All flexible hoses renewed and check valves in manifold visually inspected every 10 years				
24	Release controls and distribution valves reconnected and system put back in service				
25	Inspection date tags attached				

* If fitted as part of the CO2 system

LOW PRESSURE CO2 SYSTEM

Date :	Name of ship/unit :	IMO No. :	

Technical description

No.	Text	Value
1	Manufacturer	
2	No. of tanks	
3	Tanks capacity (tonnes)	
4	Number of pilot cylinders	
5	Pilot cylinder capacity (each)	
6	Number of distribution lines	
7	Protected space(s)	

Description of inspection/Tests

No.	Description	Carried out	Not carried out	Not applicable	Comment
1	Tank main service valve closed and secured to prevent accidental discharge				
2	Distribution valves verified closed				
3	Check correct function of level indicator				
4	Contents of pilot cylinders checked Contents of CO2 tank checked by tank level indicator				
5	Contents of CO2 tank checked by riser tube				

	reading				
6	Contents of CO2 tank checked by level control valve				
7	Supports of tank inspected				
8	Insulation on tank inspected				
9	Safety valves of tank inspected				
10	Safety valves of tank tested				
11	Time delay devices tested for correct setting*Contents of pilot cylinders checked				
12	Start/stop function of cooling compressors tested				
13	All connected electrical alarms and indicators tested				
14	Main manifold valve inspected				
15	Main manifold valve tested				
16	Distribution valves inspected				
17	Distribution valves tested				
18	Release stations inspected				
19	Total flooding release mechanism inspected				
20	Total flooding release mechanism tested				
21	Time delay devices tested for correct setting*				
22	Warning alarms tested				
23	Fan stop tested*				
24	Distribution lines and nozzles inspected				
25	Distribution lines and nozzles tested				
26	Distribution lines and nozzles blown through				
27	All doors, hinges and locks inspected*				
28	All instruction plates inspected				
29	Tank main service valve reopened and secured open				
30	System put back in service				
31	Inspection date tags attached				

* If fitted as part of the CO2 system