Annex – 2 Fixed Fire Fighting Systems

Summary of Maintenance, Testing and Inspection Intervals

	Aerosol fire-extinguishing systems	Regulation	Ship Type	Interval	By	Remarks
	Verify all electrical connections/and/or manual operating stations are properly arranged, and are in proper condition.	MSC.1/Circ. 1432, para 5.7.1	All	Monthly	Ship	
	Verify the actuation system/control panel circuits are within manufacturer's specifications.	MSC.1/Circ. 1432, para 5.7.2	All	Monthly	Ship	
	Verify that condensed or dispersed aerosol generators have not exceeded their mandatory replacement date. Pneumatic or electric actuators shall be demonstrated working, as far as practicable.	MSC.1.Circ. 1432, para 7.10	All	Annually	Ship	
	Condensed or dispersed aerosol generators to be renewed in accordance with manufacturer's recommendations	MSC.1/Circ. 1432, para 10.4	All	10-yearly	Shore	
	Fixed gas fire fighting system other than CO2 (e.g. FM200, NOVEC 1230)	**Regulation**	**Ship Type**	**Interval**	**By**	**Remarks**
	Verify all fixed fire-extinguishing system control panel indicators are functional by operating the lamp/indicator test switch	Msc.1/Circ. 1432, Para. 4.2.1	All	Weekly	Ship	
	Verify that all control/section valves are in the correct position	MSC.1/Circ. 1432, para 4.2.2	All	Weekly	Ship	
	Verify containers/cylinders fitted	MSC.1/Circ. 1432,	All	Monthly	Ship	

	with pressure gauges are in the proper range and the installation free from leakage	para 5.2				
	Visually inspect all accessible components for proper condition	MSC.1/Circ. 1432, para 7.3.1	All	Annually	Ship	
	Externally examine all high pressure cylinders for evidence of damage of corrosion	MSC.1/Circ. 1432, para 7.3.2	All	Annually	Ship	
	Check the hydrostatic test date of all storage containers	MSC.1/Circ. 1432, para 7.3.3	All	Annually	Ship	
	Functionally test all fixed system audible and visual alarms.	MSC.1/Circ. 1432, para 7.3.4	All	Annually	Ship	
	Verify all control/section valves are in the correct position.	MSC.1/Circ. 1432, para 7.3.5	All	Annually	Ship	
	Check the connections of all pilot release piping and tubing for tightness.	MSC.1/Circ. 1432, para 7.3.6	All	Annually	Ship	
	Examine all flexible hoses in accordance with manufacturer's recommendations.	MSC.1/Circ. 1432, para 7.3.7	All	Annually	Ship	
	Test all fuel shut-off controls connected to fire-protection systems for proper operation	MSC.1/Circ. 1432, para 7.3.8	All	Annually	Ship	
	The boundaries of the protected space should be visually inspected to confirm that no modifications have been made to the enclosure that has created uncloseable openings that would render the system ineffective.	MSC.1/Circ. 1432, para 7.3.9	All	Annually	Ship	
	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.	MSC.1/Circ. 1432, para 7.3.10	All	Annually	Ship	
	All high pressure extinguishing agents cylinders and pilot cylinders should be weighed or have their	MSC.1/Circ. 1432, para 8.1.1	All	2-yearly	Ship or Shore	

	contents verified by other reliable means to confirm that the available charge in each is above 95 per cent of the nominal charge. Cylinders containing less than 95 per cent of the nominal charge should be refilled					
	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.	MSC.1/Circ. 1432, para 8.1.2	All	2-yearly	Ship or Shore	
	Perform internal inspection of all control valves	MSC.1/Circ. 1432, para 9.1	All	5-yearly	Shore	
	Perform a hydrostatic test and internal examination of 10 percent of the system's extinguishing agent and pilot cylinders. If one or more cylinders fail, a total of 50 per cent of the onboard cylinders should be tested. If further cylinders fail, all cylinders should be tested. If permitted by the Administration, visual examination and NDT of Halon cylinders may be performed in lieu of hydrostatic testing.	MSC.1/Circ. 1432, para 10.1.1	All	10-yearly	Shore	
	Flexible hoses should be replaced at the intervals recommended by the manufacturer and not exceeding every 10 years	MSC.1/Circ. 1432, para 10.1.2	All	At least 10-yearly	Ship/ Shore	
	CO2 fire-extinguishing systems	**Regulation**	**Ship Type**	**Interval**	**By**	**Remarks**
	General visual inspection of the overall system condition for obvious signs of damage.	MSC.1/Circ. 1318, para 4..1	All	Monthly	Ship	
	Verify that all stop valves are in the closed position	MSC.1/Circ. 1318, para 4.1.1	All	Monthly	Ship	

	Verify that all releasing controls are in the proper position and readily accessible for immediate use.	MSC.1/Circ. 1318, para 4.1.2	All	Monthly	Ship	
	Verify all discharge piping and pneumatic tubing is intact and has not been damaged	MSC.1/Circ. 1318, para 4.1.3	All	Monthly	Ship	
	Verify that all high pressure cylinders are in place and properly secured	MSC.1/Circ. 1318, para 4.1.4	All	Monthly	Ship	
	Verify that the alarm devices are in place and do not appear damaged.	MSC.1/Circ. 1318, para 4.1.5	All	Monthly	Ship	
	In addition, for Low Pressure CO2 systems;					
	Verify that the pressure gauge is reading in the normal range	MSC.1/Circ. 1318, para 4.2.1	All	Monthly	Ship	Low Pressure CO2 system
	Verify that the liquid level indicator is reading within the proper level.	MSC.1/Circ. 1318, para 4.2.2	All	Monthly	Ship	Low Pressure CO2 system
	Verify that the manually operated storage tank main service valve is secured in the open position.	MSC.1/Circ. 1318, para 4.2.3	All	Monthly	Ship	Low Pressure CO2 system
	Verify that the vapour supply line valve is secured in the open position.	MSC.1/Circ. 1318, para 4.2.4	All	Monthly	Ship	Low Pressure CO2 system
	The boundaries of the protected space should be visually inspected to confirm that no modifications have been made to the enclosure that have created unclose able openings that would render the system ineffective	MSC.1/Circ. 1318, para 5.1	All	Annually	Ship	
	All storage containers should be visually inspected for any signs of damage, rust or loose mounting hardware. Cylinders that are leaking, corroded, dented or bulging should be hydrostatically retested or replaced.	MSC.1/Circ. 1318, para 5.2	All	Annually	Ship	
	System piping should be visually inspected to check for damage, loose supports and corrosion. Nozzles	MSC.1/Circ. 1318, para 5.3	All	Annually	Ship	

	should be inspected to ensure they have not been obstructed by the storage of spare parts or a new installation of structure or machinery.					
	The manifold should be inspected to verify that all flexible discharge hoses and fittings are properly tightened.	MSC.1/Circ. 1318, para 5.4	All	Annually	Ship	
	All entrance doors to be protected space should close properly and should have warning signs, which indicate that the space is protected by a fixed carbon dioxide systems and that personnel shall evacuate immediately if the alarms sound. All remote releasing controls shall be checked for clear operating instructions and indication as to the space served	MSC.1/Circ. 1318, para 5.5	All	Annually	Ship	
	All high pressure cylinders and pilot cylinders shall 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. **Low pressure CO2 System:** The liquid level of low pressure storage tanks should be checked to verify that the required amount of carbon dioxide to protect the largest hazards is available.	MSC.1/Circ. 1318, para 6.1.1	Passenger ships	2-yearly+- 3months	Shore	
			Cargo ships	During periodical/ intermediate and renewal surveys	Shore	
	The hydrostatic test date of all storage containers should be checked	MSC.1/Circ. 1318, para 6.1.2	Passenger ships	2-yearly+- 3 months	Shore	
			Cargo ships	During periodical/ intermediate	Shore	

				and renewal surveys		
	The discharge piping and nozzles shall be tested to verify that they are not blocked. The test shall be performed by the discharge piping from the system and flowing dry air or nitrogen from test cylinders or suitable means through the piping.	MSC.1/Circ. 1318, para 6.1.3	Passenger ships	2-yearly +-3 months	Shore	
			Cargo Ships	During periodical/ intermediate and renewal surveys	Shore	
	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 case where this is not possible, pilot lines shall 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 shall be carried out from one or more release stations when installed. If manual pull cables operate the remote release controls, they shall 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.	MSC.1/Circ. 1318, para 6.2.1	Passenger ships	2-yearly +-3 months	Shore	
			Cargo Ships	At least 5-yearly	Shore	

	All cable components should be cleaned and adjusted as necessary, and the cable connectors shall be properly tightened, If the remote release controls are operated by pneumatic pressure, the tubing shall be checked for leakage, and the proper charge of the remote releasing station pilot gas cylinders shall be verified. All controls and warning devices shall function normally, and the time delay, if fitted shall prevent the discharge of gas for the required time period.	MSC.1/Circ. 1318, para 6.2.2	Passenger ships	2-yearly+-3months	Shore	
			Cargo Ships	At least 5-yearly	Shore	
	After completion of the work, the system shall be returned to service. All releasing controls shall be verified in the proper position and connected to the correct control valves. All pressure switch interlocks shall be rest and returned to service. All stops valves shall be in the closed position.	MSC.1/Circ. 1318, para 6.2.3	Passenger Ships	2-yearly+-3 months	Shore	
			Cargo Ships	At least 5 yearly	Shore	
	High pressure cylinders shall be subjected to periodical tests at intervals not exceeding 10 years. At the 10-years 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.	MSC.1/Circ. 1318, para 6.1.2	All	10-yearly	Shore	

	Flexible hoses shall be replaced at the intervals recommended by the manufacturer and not exceeding 10 years	MSC.1/Circ. 1318, para 6.1.2	All	At least 10-yearly	Ship / Shore	
	Dry Chemical powder systems	**Regulation**	**Ship Type**	**Interval**	**By**	**Remarks**
	Verify that all control and section valves are in the proper open or closed position, and all pressure gauges are in the proper range.	MSC.1/Circ. 1432, Para 5.6	All	Monthly	Ship	
	Visually inspect all accessible components for proper condition.	MSC.1/Circ. 1432, Para 7.9.1	All	Annually	Ship	
	Verify that the pressure regulators are in proper order and within calibration	MSC.1/Circ. 1432, Para 7.9.2	All	Annually	Ship	
	Agitate the dry chemical powder charge with nitrogen in accordance with system manufacturer's instructions	MSC.1/Circ. 1432, Para 7.9.3	All	Annually	Ship	
	Blow dry nitrogen through the discharge piping to confirm that the pipe work and nozzles are clear of any obstructions.	MSC.1/Circ. 1432, Para 8.2.1.	All	2-yearly	Shore	
	Operationally test local and remote controls and section valves.	MSC.1/Circ. 1432, Para 8.2.2	All	2-yearly	Shore	
	Verify the contents of propellant gas cylinders (including remote operating stations).	MSC.1/Circ. 1432, Para 8.2.3	All	2-yearly	Shore	
	Test a sample of dry chemical powder for moisture content.	MSC.1/Circ. 1432, Para 8.2.4	All	2-yearly	Shore	
	Subject the powder containment vessel, safety valve and discharge hoses to a full working pressure test	MSC.1/Circ. 1432, Para 8.2.5	All	2-yearly	Shore	

	Subject all powder containment vessels to hydrostatic or non-destructive testing (NDT) carried out by an accredited service agent.	MSC. 1/Circ. 1432, para. 10.3	All	10-yearly	Shore	
	Foam Fire-Extinguishing systems	**Regulation**	**Ship Type**	**Interval**	**By**	**Remarks**
	Verify that all controls and section valves are in the proper open or closed position, and all pressure gauges are in the proper range.	MSC. 1/Circ. 1432, para.5.3	All	Monthly	Ship	
	Verify that the proper quantity of foam concentrate is provided in the foam system storage tank.	MSC. 1/Circ. 1432, para.6.2	All	Quarterly	Ship	
	Visually inspect all accessible components for proper condition.	MSC. 1/Circ. 1432, para 7.4.1.	All	Annually	Ship	
	Functionally test all fixed system audible alarms	MSC. 1/Circ. 1432, para.7.4.2	All	Annually	Ship	
	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).	MSC. 1/Circ. 1432, para.7.4.3	All	Annually	Ship	
	Test all system cross connections to other sources of water supply for proper operation.	MSC. 1/Circ. 1432, para.7.4.4	All	Annually	Ship	
	Verify all pump relief valves, if provided, are properly set.	MSC. 1/Circ. 1432, para.7.4.5	All	Annually	Ship	
	Examine all filters/strainers to verify they are free of debris and contamination.	MSC. 1/Circ. 1432, para.7.4.6	All	Annually	Ship	

	Verify that all control/section valves are in the correct position.	MSC. 1/Circ. 1432, para.7.4.7	All	Annually	Ship	
	Blow dry compressed air or nitrogen through the discharge piping or otherwise confirm the pipe work and nozzles of high expansion foam systems are clear of any obstructions, debris and contamination. This may require the removal of nozzles, if applicable.	MSC. 1/Circ. 1432, para.7.4.8	All	Annually	Ship	
	Foam Concentrates: The first periodical control of foam concentrates should be performed not more than 3 years after being supplied to the ship, and after that every year (except protein)	MSC.1/Circ.1312, para 5	All	3 years after supplying and after that every year	Shore	
	Foam Concentrates: For protein based alcohol resistant foam concentrates – test to be performed prior to delivery to the ship and annually thereafter.	MSC.1/Circ.1312, para 5	All	Prior delivery and then every year	Shore	
	Test all fuel shut-off controls connected to fire protection system for proper operation.	MSC. 1/Circ. 1432, para.7.4.10	All	Annually	Ship	
	Perform internal inspection of all control valves.	MSC. 1/Circ. 1432, para.9.2.1	All	5-yearly	Shore	
	Flush all high expansion foam system piping with fresh water, drain and purge with air.	MSC. 1/Circ. 1432, para.9.2.2	All	5-yearly	Shore	
	Check all nozzles to prove they are clear of debris	MSC. 1/Circ. 1432, para.9.2.3	All	5-yearly	Shore	

	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.	MSC. 1/Circ. 1432, para.9.2.4	All	5-yearly	Shore	
	Water mist, water spray and sprinkler systems	**Regulation**	**Ship Type**	**Interval**	**By**	**Remarks**
	Verify that all control panel indicators and alarms are functional.	MSC. 1/Circ. 1432, para 4.7.1	All	Weekly	Ship	
	Visually inspect pump unit and its fittings	MSC. 1/Circ. 1432, para 4.7.2	All	Weekly	Ship	
	Check the pump unit valve positions, if valves are not locked, as applicable.	MSC. 1/Circ. 1432, para 4.7.3.	All	Weekly	Ship	
	Verify all control, pump unit and section valves are in the proper open or closed position.	MSC. 1/Circ. 1432, para 5.4.1	All	Monthly	Ship	
	Verify sprinkler pressure tanks or other means have correct levels of water.	MSC. 1/Circ. 1432, para 5.4.2	All	Monthly	Ship	
	Test automatic starting arrangements on all system pumps so designed.	MSC. 1/Circ. 1432, para 5.4.3	All	Monthly	Ship	
	Verify that all standby pressure and air/gas pressure gauges are within the proper pressure ranges.	MSC. 1/Circ. 1432, para 5.4.4	All	Monthly	Ship	
	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.)	MSC. 1/Circ. 1432, para 5.4.5	All	Monthly	Ship	

	Assess system water quality in the header tank and pump unit against the manufacturer's water quality guidelines.	MSC.1/Circ. 1432 as amended by MSC.1/Circ.1516, para 2 (6.5)	All	Quarterly	Ship	Water sprinkler system only
	Verify proper operation of all water mist, water-spray and sprinkler system using the test valves for each section.	MSC. 1/Circ. 1432, para 7.5.1	All	Annually	Ship	
	Visually inspect all accessible components for proper condition	MSC. 1/Circ. 1432, para 7.5.2	All	Annually	Ship	
	Externally examine all high pressure cylinders for evidence of damage or corrosion	MSC. 1/Circ. 1432, para 7.5.3	All	Annually	Ship	
	Check the hydrostatic test date of all high pressure cylinders.	MSC. 1/Circ. 1432, para 7.5.4	All	Annually	Ship	
	Functionally test all fixed system audible and visual alarms	MSC. 1/Circ. 1432, para 7.5.5	All	Annually	Ship	
	Flow test all pumps for proper pressure and capacity	MSC. 1/Circ. 1432, para 7.5.6	All	Annually	Ship	
	Test all antifreeze systems for adequate freeze protection.	MSC. 1/Circ. 1432, para 7.5.7	All	Annually	Ship	
	Test all system cross connections to other sources of water supply for proper operation.	MSC. 1/Circ. 1432, para 7.5.8	All	Annually	Ship	
	Verify all pump relief valves, if provided, are properly set.	MSC. 1/Circ. 1432, para 7.5.9	All	Annually	Ship	
	Examine all filters/strainers to verify they are free of debris and contamination	MSC. 1/Circ. 1432, para 7.5.10	All	Annually	Ship	
	Verify that all control/section valves are in the correct position.	MSC. 1/Circ. 1432, para 7.5.11	All	Annually	Ship	
	Blow dry compressed air or nitrogen through the discharge piping of dry pipe systems or otherwise confirm the pipe work and nozzles are clear of any obstructions. This may require	MSC. 1/Circ. 1432, para 7.5.12	All	Annually	Ship	

	the removal of nozzles, if applicable.					
	Test emergency power supply switchover, where applicable	MSC. 1/Circ. 1432, para 7.5.13	All	Annually	Ship	
	Visually inspect all sprinklers focusing in areas where sprinklers are subject to aggressive atmosphere (like saunas, spas, kitchen areas) and subject to physical damage (like luggage handling areas, gyms, play rooms, etc) so that all sprinklers are inspected within one year. Sprinklers with obvious external damage, including paint, should be replaced and not included in the number of sprinklers tested in accordance with the flow charts Part 1 – Basic Testing and Part 2 – Extended Testing as indicated in MSC. 1/Circ. 1516	MSC. 1/Circ. 1432, para 7.5.14	All	Annually	Ship	See Annex 1
	Check for any changes that may affect the system such as obstructions by ventilation ducts, pipes, etc.	MSC. 1/Circ. 1432, para 7.5.15	All	Annually	Ship	
	Test a minimum of one section in each open head water mist system by flowing water through the nozzle. The section tested should be chosen so that all sections are tested within a five-year period.	MSC. 1/Circ. 1432, para 7.5.16	All	Annually	Ship	
	Test automatic sprinklers and automatic water mist nozzles in accordance with the flow charts Part 1 – Basic Testing and Part 2 – Extended Testing as indicated in MSC. 1/Circ. 1516	MSC.1/Circ. 1432 as amended by MSC.1/Circ.1516, para 3 (7.5.17)	All	Annually	Ship	

	During basic testing, and extended testing when applicable, of automatic sprinkler heads/nozzles as outlined above, water quality testing should be conducted in each corresponding piping section.	MSC.1/Circ. 1432 as amended by MSC.1/Circ.1516, para 3 (7.5.18)	All	Annually	Ship	
	Flush all ro-ro deck deluge system piping with water, drain and purge with air.	MSC. 1/Circ. 1432, para 9.3.1	All	5-yearly	Shore	
	Perform internal inspection of all control/section valves; water quality testing should be conducted in all corresponding piping section, if not previously tested within the last five year.	MSC. 1/Circ. 1432, para 9.3.2	All	5-yearly	Shore	
	Check condition of any batteries, or renew in accordance with manufacturer's recommendations	MSC. 1/Circ. 1432, para 9.3.3	All	5-yearly	Shore	
	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.	MSC.1/Circ. 1432 as amended by MSC.1/Circ.1516, para 4 (9.3.4)	All	5-yearly	Shore	Water sprinkler system only
	Perform a hydrostatic test and internal examination for gas and water pressure cylinders according to flag Administration guidelines or, where these do not exist, EN 1968:2002 +A1	MSC. 1/Circ. 1432, para 10.2	All	10-yearly	Shore	

Flag States Specific Requirements:

1	Marshall Islands	Ref Document	Ship Type	Interval	By	Remarks
A	Fixed CO2 extinguishing systems shall be checked by an authorized service facility acceptable to the vessel's Classification Society	Marine Notice No. 2-011-14	All	2 yearly	Shore	
B	At least once every five (5) years, all control valves of fixed CO2 systems are to be internally examined.	Marine Notice No. 2-011-14	All	5 yearly	Shore	
C	**Halon System:** The content of the Halon cylinders should 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 as far as reasonable and practicable. Cylinders containing less than 95% of the nominal charge should be refilled.	Marine Notice No. 2-011-14	All	at least biennially (2 years +/- 3 months	Shore	
D	Hydrostatic testing of all halon cylinders to be carried out. Visual inspection and NDT may be performed in lieu of hydrostatic testing subject to approval by Administration, by an authorized servicing facility which has been certified by a government agency or Classification Society. (maintenance & inspection of Halon system to be asper co2 system) Relaxation- Consideration for the application of the relaxed hydrostatic testing requirements	Marine Notice No. 2-011-14	All	After each 20 years of service prior to recharging a discharged cylinder any potential defect found	an authorized service facility certified by government agency or class society	Relaxation for hydro testing beyond 20 year as per administration prior approval

	for the fixed Halon system storage cylinders will be given on a case by case basis, and must be approved in writing by the Administration. The hydrostatic testing interval of 20 years for the Halon cylinder may be extended by 5 year extension based on following-cylinder content verified, cylinder not discharge in service, no visual defect, cylinder pressure level verified, each cylinder gauged or NDT to determine wall thickness .NDT report to be placed onboard. Examination of all accessible component, include control and connection to verify satisfactory condition and also selected valve to open for internal examination. If any cylinder do not meet relaxation requirement than must be hydro tested or taken out of service, if cylinder removed than system still be capable of supplying fire extinguisher. The inspection requirement to be done annually including NDT until end of 5 year period.					
E	**Water Mist, Water Spray, and Sprinkler Systems:** Ten yearly hydrostatic test and internal examination for gas and water pressure cylinders shall be conducted in accordance with Transportable Gas Cylinders – Periodic Inspection and Testing of Seamless Steel Gas Cylinders (EN 1968:2002 +A1), or equivalent Classification Society requirements.					

2	Bahamas	Ref Document	Ship Type	Interval	By	Remarks
A	**Fixed CO2 extinguishing systems**: At least once every five (5) years, all control valves of fixed CO2 systems are to be internally examined.	Information Bulletin No. 150	All	5 yearly	Shore	
B	**Automatic Sprinkler System:** All initial and basic testing shall be conducted onboard for sprinkler as per 150	Information Bulletin No. 150	All	During Annual Survey		See Annex 1
	Extended testing shall be conducted onboard	Information Bulletin No. 150	All	During Annual Survey		See Annex 1
	Water quality shall be assessed through periodic sampling and analysis in accordance with manufacturer's instructions	Information Bulletin No. 150	All	Periodically		
3	**Liberia**	**Ref Document**	**Ship Type**	**Interval**	**By**	**Remarks**
A	**Sprinkler System:** All automatic alarms for the sprinkler systems are tested using the test valves for each section.	Marine Notice FIR-001 Rev.06/12	All	Quarterly	Ship	
B	**Fixed CO2 extinguishing systems**: All CO2 bottle connections for cable operating system clips should be checked for tightness on fixed fire-extinguishing installations.	Marine Notice FIR-001 Rev.06/12	All	Quarterly	Ship	
C	At least once every five (5) years, all control valves of fixed CO2 systems are to be internally examined.	Marine Notice FIR-001 Rev.06/12	All	5 yearly	Shore	
D	Existing ship with co2 cylinder 10 year old but less than 20 year	Marine Notice FIR-001 Rev.06/12	All		Shore	

	cylinder to have hydro tested (At least 10% of the total number of CO2 cylinders should be hydrostatically tested. 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). Co2 cylinder more than 20 year old, not tested so far, have to be hydro tested by next annual or intermediate and to be 50% of onboard. If any fail than all to be tested.					
E	**<u>Halon System:</u>** All halon cylinders must be hydrostatically tested(maintenance and inspection of Halon system to be as per co2 system) **Relaxation**- 5 year extension for the 20 year old cylinder based on following- cylinder content verified, cylinder not discharge in service, no visual defect, cylinder pressure level verified, each cylinder gauged or NDT to determine wall thickness .NDT report to be placed onboard. Examination of all accessible component , include control and connection to verify satisfactory condition and also selected valve to opened for internal examination If any cylinder does not meet relaxation requirement then must be hydro tested or taken out of service, if cylinder removed than system still be capable of supplying fire	Marine Notice FIR-001 Rev.06/12	All	After each 20 years of service prior to recharging a discharged cylinder When visual inspection reveals a potential defect	An authorized service facility	Relaxation for hydro testing beyond 20 year as per administration prior approval

	extinguisher. This may require replacement or alternate fire extinguishing systems. Inspection requirement to be done annually. The NDT requirement not to be repeated later than 36 month. Note to be recommended in survey status of vessel regarding same, and this procedure to be done as per flag authorization.					
F	**<u>Fixed Dry Chemical Powder Fire Extinguishing Systems:</u>** General examination of distribution piping and installation of the dry chemical powder fire fighting system to confirm that the system has not been modified from its original installation.	Marine Notice FIR-001 Rev.06/12	All	Each annual, periodic, renewal survey	Ship /Shore	
4	**Dominica**	**Ref Document**	**Ship Type**	**Interval**	**By**	**Remarks**
A	All CO2 bottle connections for cable operating system clips should be checked for tightness on fixed fire-extinguishing installations	CD-MSC 33-01 Rev 01	All	Quarterly	Ship	
B	Air should be blown through the piping of extinguishing gas system	CD-MSC 33-01 Rev 01	All	Annually	Ship	
C	**<u>Fixed CO2 System</u>**: Every two years the contents of the cylinders are verified by weight or isotropic measurement as part of the survey for issuance of the SOLAS SEC. Weight scales may be used to verify cylinder contents	CD-MSC 33-01 Rev 01	All	2-yearly	Shore	

	and recharging is required if the loss in charge is 10 percent or more.					
D	Control valves of fixed fire fighting systems should be internally inspected.	CD-MSC 33-01 Rev 01	All	5-yearly	Shore	
E	All fixed CO2 and Halon cylinders must be hydrostatically tested	CD-MSC 33-01 Rev 01	All	after each 20 years of service prior to recharging a discharged cylinder, if 10 years or more since last hydrostatic test when visual inspection reveals a potential defect	An authorized station	
F	**<u>Foam Analysis:</u>** Foam analysis is a part of the survey for issuance of the SOLAS Safety Equipment Certificate and thus is performed every two years.	CD-MSC 33-01 Rev 01	All	Every 2 years (any other times if there is cause to question the suitability of the foam or condition of the storage tank)	Shore	

5	Barbados	Ref Document	Ship Type	Interval	By	Remarks
A	**Sprinkler System:** All automatic alarms for the sprinkler systems are tested using the test valves for each section.	Information Bulletin No. 230	All	Quarterly	Ship	
B	**Fixed CO2 extinguishing systems**: All CO2 bottle connections for cable operating system clips should be checked for tightness on fixed fire-extinguishing installations.	Information Bulletin No. 230	All	Quarterly	Ship	
C	Air should be blown through the piping of extinguishing gas system	Information Bulletin No. 230	All	Annually	Ship	
D	Existing ships equipped with storage co2 containers that are 10 years old or older but less than 20 years of age shall have the storage containers hydrostatically tested at latest by the vessel's next intermediate or special survey. (At least 10% of the total number of CO2 cylinders should be hydrostatically tested. 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).	Information Bulletin No. 230	All		Shore	
E	**Low Pressure CO2 Systems:** At least once every five years, the control valves of fixed fire-fighting systems should be internally inspected.	Information Bulletin No. 230	All	5-yearly	Shore	

F	N2 high pressure cylinders shall be subjected to periodical tests at intervals as IMO recommends for CO2 cylinders	Information Bulletin No. 230				
6	**Kiribati**	**Ref Document**	**Ship Type**	**Interval**	**By**	**Remarks**
A	**Low Pressure CO2 Systems:** may be exempted from hydrostatic pressure testing subject to the following: 1. The tank is to be constructed of a material which is not ordinarily prone to corrosion (e.g. Stainless Steel, Aluminium or similar), and 2. Fittings and inspection of the tank are in accordance with Classification Society requirements; and 3. Documentary evidence to show that the tank and associated systems have been inspected and serviced annually. Annual inspection should include removal of insulation and sample inspection in way of pipe and fittings. The insulation and vapour barrier is to be properly reinstated, and 4. The tank shall not be exposed to extremes of temperature or pressure. Such exposure will require the inspection and testing	Marine Circular No. 16/2012	All			

	regime to be reviewed and the Administration should be notified in such cases.					
B	All CO2 bottle connections for cable operating system clips should be checked for tightness on fixed fire-extinguishing installations	Marine Circular No. 16/2012	All	Quarterly	Ship	
C	Control valves of fixed fire fighting systems should be internally inspected.	Marine Circular No. 16/2012	All	5-yearly	Shore	
D	**Hydrostatic Pressure Testing**					
	First pressure test within 20 years of initial pressure test of manufacturer provided annual test have been carried out with satisfactory results	Marine Circular No. 16/2012	All		an accredited service agent	
	Subsequent pressure tests of 25% of the storage cylinders every 5 years thereafter if any one cylinder fails whilst test all remaining cylinders are to be tested					
	If annual visual inspection are not carried out or there is no record, all cylinders are to be hydraulically tested after ten (10) years and twenty (20) years from the date of manufacture and every 5 years thereafter					
	In order to extend the cylinder test period beyond 20 years a thorough examination of all cylinders to be carried out					
E	**Fixed Foam System:** Inspection shall be carried out on fixed foam extinguishing systems	Marine Circular No. 16/2012	All	2-yearly	an accredited service agent	

F	**Halon systems** must be inspected and tested	Marine Circular No. 16/2012	All	Annually	an accredited service agent	
	During inspection a leak test must be completed and nay cylinders showing signs of leakage, loss of contents 5% from installed quantity, signs of mechanical damage or excessive corrosion must be withdrawn from service. Upon application hydro testing of HALON cylinder hydro testing exemption may be granted by flag, subject to Alternate inspection proposed by RO					
7	**Tuvalu**	**Ref Document**	**Ship Type**	**Interval**	**By**	**Remarks**
A	All CO2 bottle connections for cable operating system clips should be checked for tightness on fixed fire-extinguishing installations	MARINE CIRCULAR MC-7/2011/1	All	Quarterly	Ship	
B	**Fixed CO2 extinguishing systems**: visual inspection of each cylinder, fitting and securing arrangement.	MARINE CIRCULAR MC-7/2011/1	All	2-yearly	Shore	
	Accurate determination of the contents and comparison with original readings like liquid level gauging, test weighing.	MARINE CIRCULAR MC-7/2011/1	All	2-yearly	Shore	

	Any cylinders showing signs of mechanical damage, excessive corrosion or loss of contents exceeding 10% of installed quantity for CO2 should be withdrawn from service and sent ashore for pressure testing and full periodic service and inspection	MARINE CIRCULAR MC-7/2011/1	All			
C	Control valves of fixed fire fighting systems should be internally inspected.	MARINE CIRCULAR MC-7/2011/1	All	5-yearly	Shore	
D	**Hydrostatic Pressure Testing**	MARINE CIRCULAR MC-7/2011/1	All		an accredited service company	
	First pressure test within 20 years of initial pressure test of manufacturer provided annual test have been carried out with satisfactory results					
	Subsequent pressure tests of 25% of the storage cylinders every 5 years thereafter if any one cylinder fails whilst test all remaining cylinders are to be tested					
	If annual visual inspection are not carried out or there is no record, all cylinders are to be hydraulically tested after ten (10) years and twenty (20) years from the date of manufacture and every 5 years thereafter					

	In order to extend the cylinder test period beyond 20 years a thorough examination of all cylinders to be carried out					
E	**<u>Halon System</u>**	MARINE CIRCULAR MC-7/2011/1	All	Annually	an accredited service company	
	Halon systems must be inspected and tested					
	During inspection a leak test must be completed and any cylinders showing signs of leakage loss of contents 5% from installed quantity signs of mechanical damage or excessive corrosion must be withdrawn from service (Relaxation- 5 year extension for the 20 year old cylinder based on following- cylinder content verified, cylinder not discharge in service, no visual defect, cylinder pressure level verified, each cylinder gauged or NDT to determine wall thickness .NDT report to be placed onboard. Examination of all accessible component, include control and connection to verify satisfactory condition and also selected valve to open for internal examination. If any cylinder do not meet relaxation requirement than must be hydro tested or taken out of service, if cylinder removed than system still be capable of supplying fire extinguisher. The inspection requirement to be done annually including NDT until end of 5 year period.					Upon application hydro testing of HALON cylinder hydro testing exemption may be granted by flag, subject to Alternate inspection proposed by RO

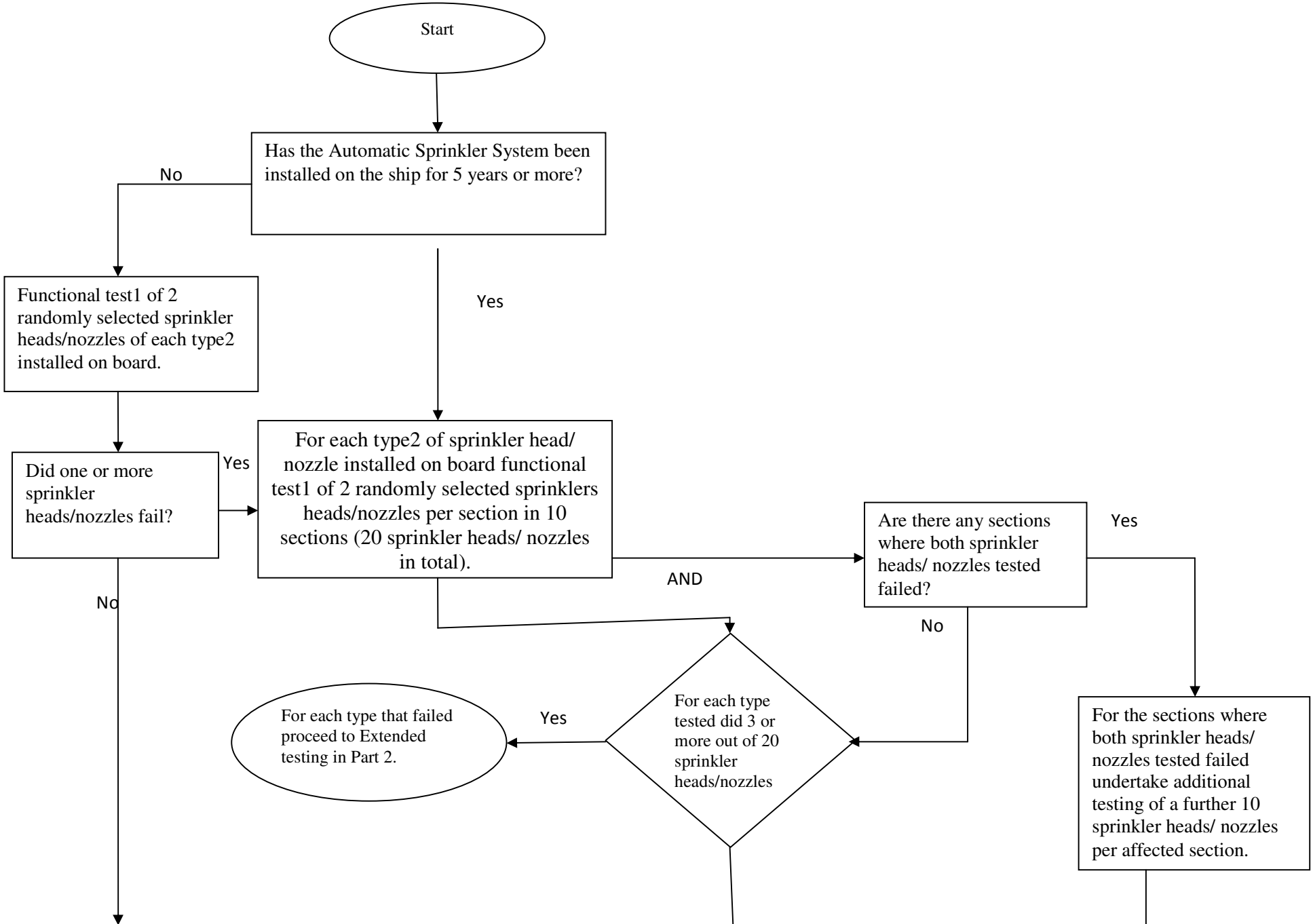
F	**Fixed Foam System:** Inspection shall be carried out on fixed foam extinguishing systems	MARINE CIRCULAR MC-7/2011/1	All	2-yearly	an accredited service agent ashore	
G	**Low Pressure CO2 Systems:** may be exempted from hydrostatic pressure testing subject to the following: 1. The tank is to be constructed of a material which is not ordinarily prone to corrosion(e.g. Stainless Steel, Aluminium or similar), and 2. Fittings and inspection of the tank are in accordance with Classification Society requirements; and 3. Documentary evidence to show that the tank and associated systems have been inspected and serviced annually. Annual inspection should include removal of insulation and sample inspection in way of pipe and fittings. The insulation and vapour barrier is to be properly reinstated, and 4. The tank shall not be exposed to extremes of temperature or pressure. Such exposure will require the inspection and testing regime to be reviewed and the Administration should be notified in such cases.	MARINE CIRCULAR MC-7/2011/1	All			

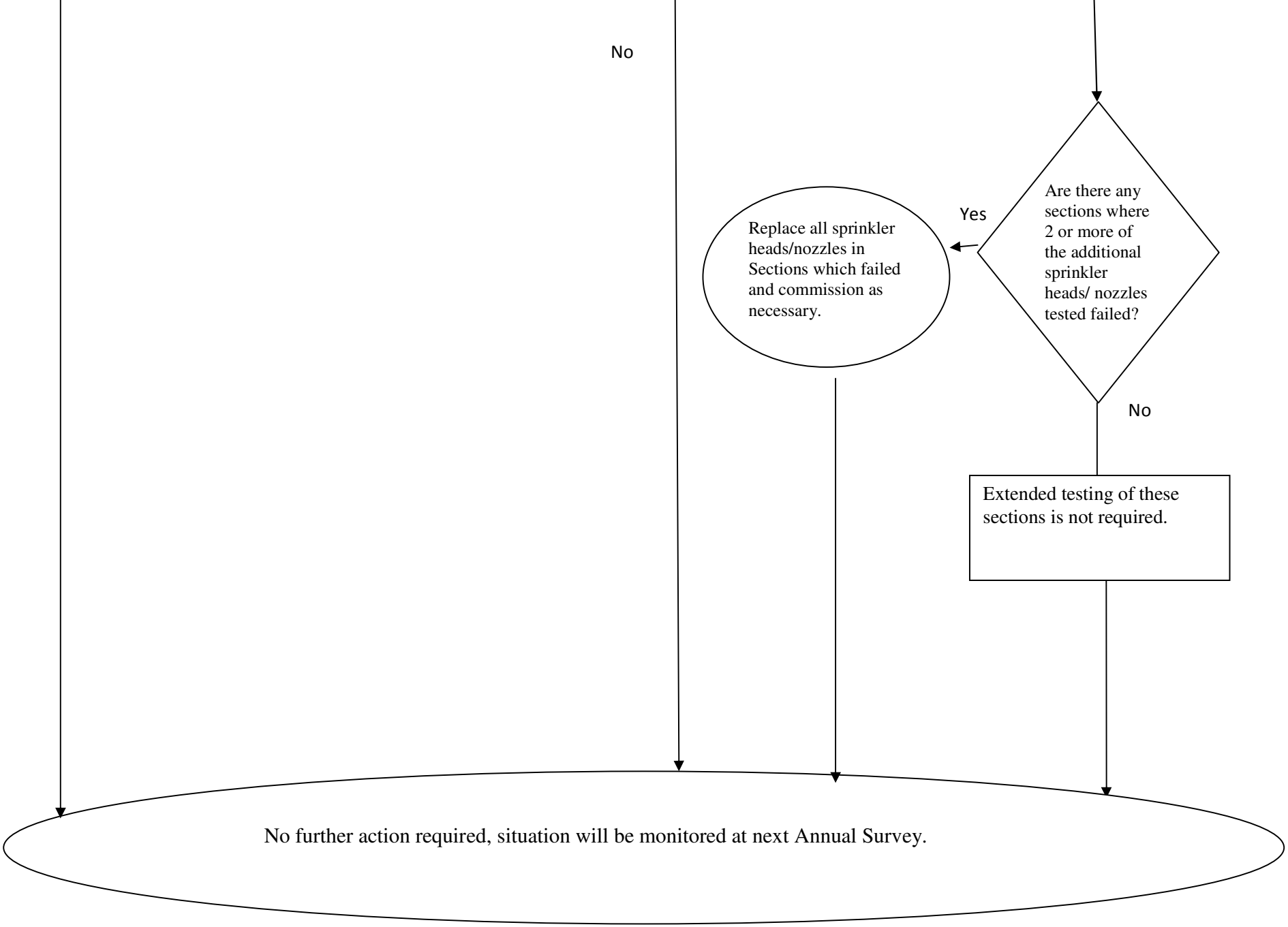
8	St. Vincent and the Grenadines	Ref Document	Ship Type	Interval	By	Remarks
A	Halon is not accepted as fire extinguishing means onboard any ship applying for registration under the SVG Flag since 1st January 2002. Alternate arrangement is required. Halon fire extinguishing system should be replaced by either CO2 or other suitable system.	Circular NO. SOL 006 Rev. 10	All			Applicable to ship register since 1 Jan 2002
	Halon System (For existing fixed halon fire extinguishing system) **Hydrostatic Pressure Test or Thickness Measurement:**					
	At least 50% of the Halon bottles should be tested by hydraulic pressure	Circular NO. SOL 006 Rev. 10	All	over a maximum period of 10 years	an approved service company	For halon banking facility
	100% of the halon bottles should be tested	Circular NO. SOL 006 Rev. 10	All	over a maximum period of 20 years		
	Halon cylinders should be subject to thickness measurement in lieu of the hydrostatic pressure test as required. at least 50% should be thickness measured	Circular NO. SOL 006 Rev. 10	All	over a period of 10 years	an approved service company	if banking facility is unavailable
	100% of the halon bottles should be thickness measured	Circular NO. SOL 006 Rev. 10	All	over a period of 20 years		

	occasional hydrostatic pressure testing or thickness measurement as applicable may be requested at the discretion of the attending class surveyor conducting the statutory surveys	Circular NO. SOL 006 Rev. 10	All			if evidence exists to cause concern on condition of the cylinders
9	**Panama**	**Ref Document**	**Ship Type**	**Interval**	**By**	**Remarks**
A	Full scale tests of halon fire-extinguishing system onboard ships are prohibited, however leakage check shall be carried out annually. If any of the cylinders showing signs of leakage and loss of content exceeds 5% from the installed quantity, signs of mechanical damage or excessive corrosion must be withdrawn from service.	MMC-281	All	Annual	chief engineer (if provided with proper equipment and training)	MSC.1/Circ.600
B	**Fixed dry chemical powder system:** subject all powder containment vessels to hydrostatic or non destructive testing	MMC-281	All	10-yearly	by accredicated service agent	
10	**India (Engineering Circular No.6 of 2013)**					
A	**Fixed CO2 system:** At the 10 year inspection, at least 10% of the total number of CO2 cylinders 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. **For subsequent 10-year service, alteration 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 instance. Ships of 10 years or older coming into Indian flag will be required to carry this test at the next scheduled dry-docking.**					
B	**Fixed CO2 system:** Every ten years - 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.					
C	The weekly, Monthly, Quarterly and Annual routine maintenance and inspections as specified in MSC.1/Circ.1432 shall be ensured, as minimum, for all systems of Fixed Gas extinguishing systems, including for the Fixed CO2 systems.					

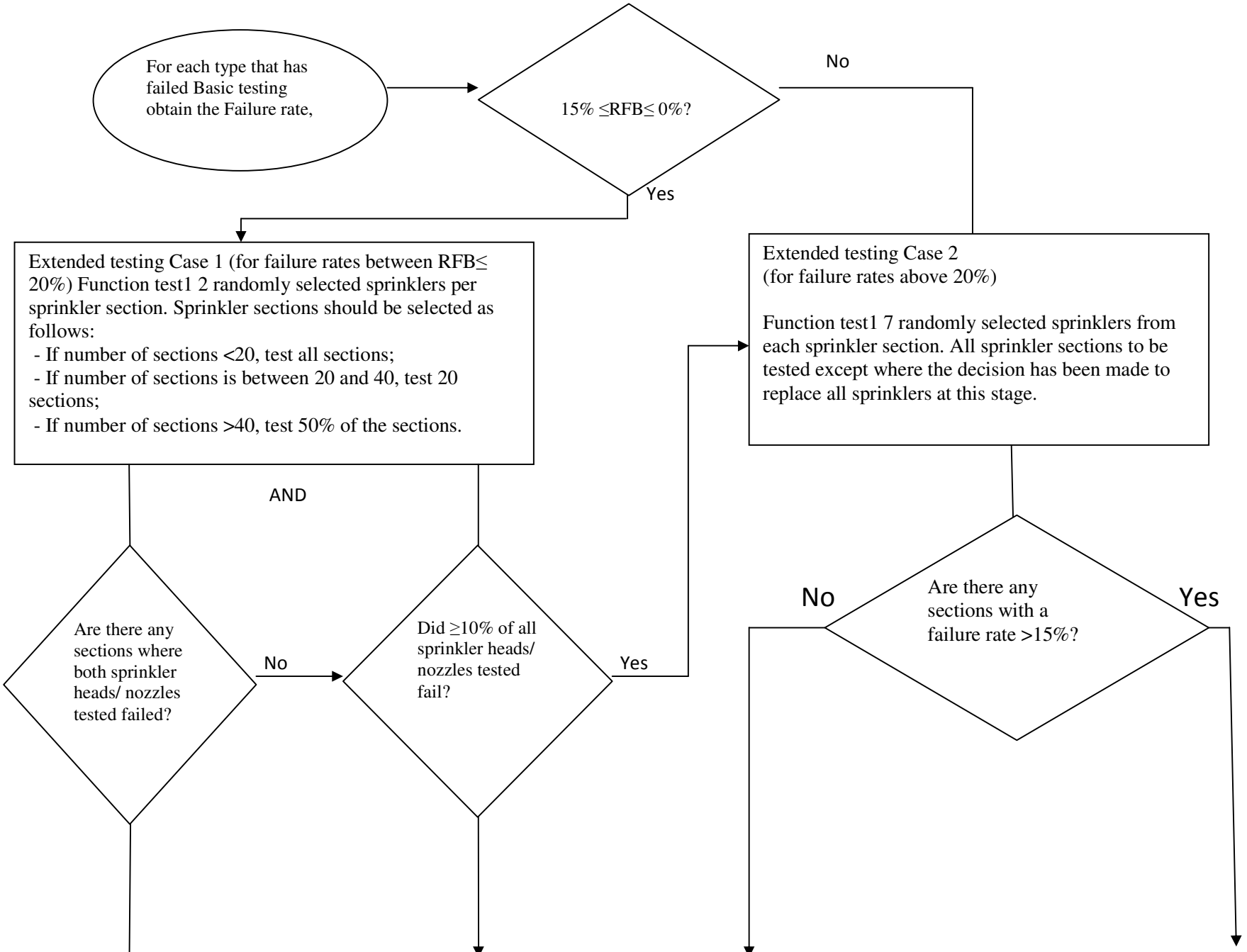
Annex 1

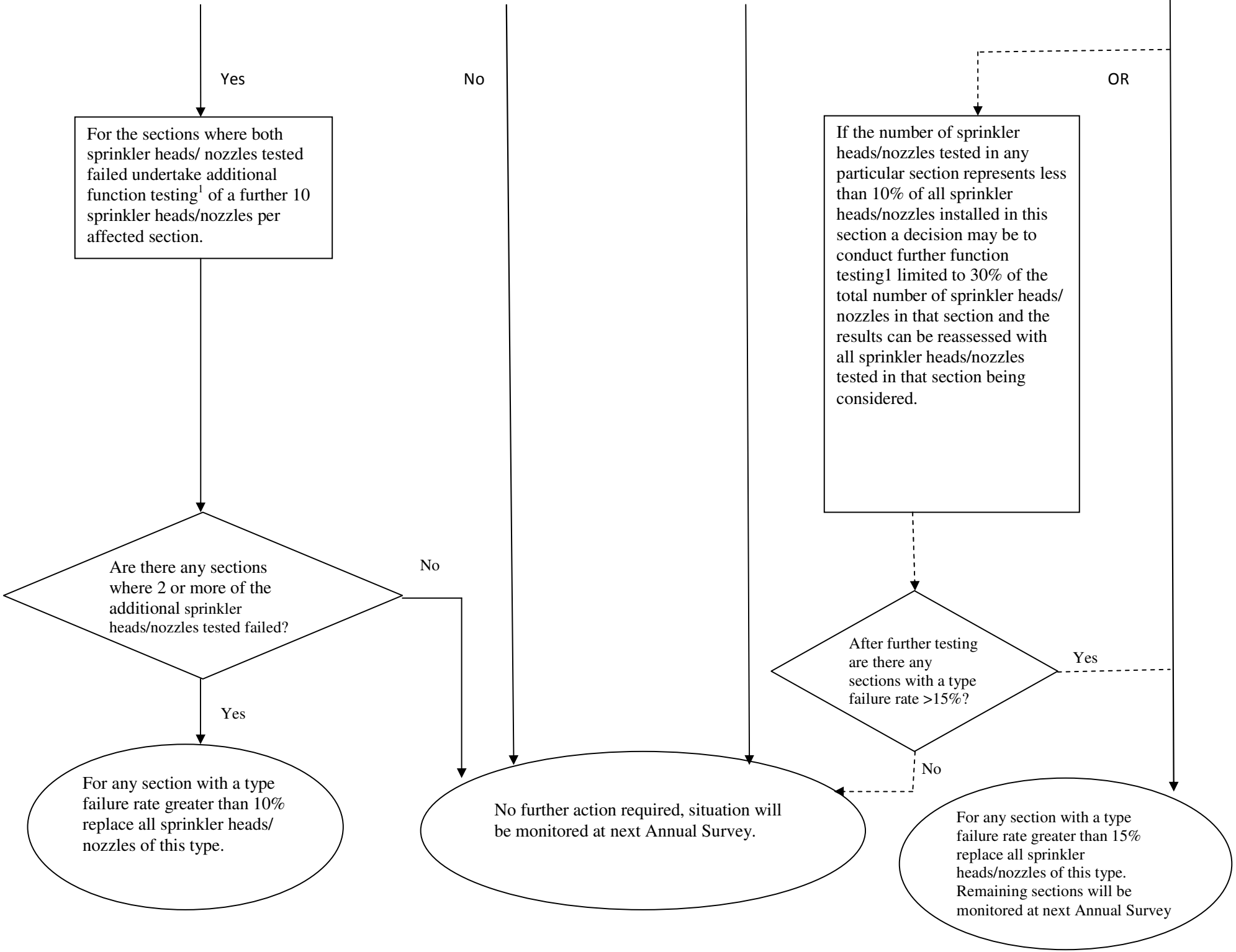
Part 1 – Basic Testing




No
Are there any sections where 2 or more of the additional sprinkler heads/ nozzles tested failed?
Yes
Replace all sprinkler heads/nozzles in Sections which failed and commission as necessary.
No
Extended testing of these sections is not required.
No further action required, situation will be monitored at next Annual Survey.

Part 2 – Extended Testing




Yes
No
OR
For the sections where both sprinkler heads/ nozzles tested failed undertake additional function testing[1] of a further 10 sprinkler heads/nozzles per affected section.
If the number of sprinkler heads/nozzles tested in any particular section represents less than 10% of all sprinkler heads/nozzles installed in this section a decision may be to conduct further function testing1 limited to 30% of the total number of sprinkler heads/ nozzles in that section and the results can be reassessed with all sprinkler heads/nozzles tested in that section being considered.
Are there any sections where 2 or more of the additional sprinkler heads/nozzles tested failed?
No
Yes
After further testing are there any sections with a type failure rate >15%?
Yes
No
For any section with a type failure rate greater than 10% replace all sprinkler heads/ nozzles of this type.
No further action required, situation will be monitored at next Annual Survey.
For any section with a type failure rate greater than 15% replace all sprinkler heads/nozzles of this type. Remaining sections will be monitored at next Annual Survey

ANNEX 2

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.

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 Administration 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.

Competent Persons/ Crew members:

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.

Competent Crew members 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.

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

Records:

The Master and / or the Chief Engineer as the case may be, should ensure 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.