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*Fire & Integrated  
Solutions*



## Your Fire Protection System and Equipment

A guide to Care and Maintenance, legislation and industry standards

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# Your Fire Protection System and Equipment

A guide to Care and Maintenance, legislation and industry standards

## 24 – 7 Service and Maintenance

Around the clock, around the UK and local to you.

### Your local contact details:

If you require assistance with your Fire Protection systems or have an emergency between the hours of 8.30am and 5.00pm Monday to Friday, please contact your local branch:

Local branch: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Telephone Number: \_\_\_\_\_

Should you have an Emergency or need to contact us outside of these hours, please call:

**0800 585 800**



## A guide to the Care and Maintenance of Fire Protection Systems and Equipment

This guide is designed to provide you with a clear understanding of the service and maintenance routines required to ensure your fire protection systems and associated equipment are maintained by competent persons and in accordance with relevant standards and good engineering practices.

Although standards are referred to in this guide, it is not an exhaustive list or detailed specification. You should check to ensure that all disciplines are included within the quotation or scope of works and that the relevant Authority Having Jurisdiction (e.g. Insurer, Fire Officer etc) is satisfied.

It should also be considered that each manufacturer of fire protection products and equipment will have their own specific maintenance requirements which may take precedence and consequently these may not be included within this guide.

### Index:

To further assist, we have used coloured text to help identify where a particular service and standard or recommendation has originated from and these are explained below:

✓ Items highlighted in **blue** (except where specified) meet the requirements of LPC Rules, BS and BS EN standards.

✓ Our (Tyco) recommendations are written in **purple** and are based on our industry experience, heritage and good engineering practice.

✓ NFPA/FM Global requirements, where different from the BS EN standards are highlighted in **red**.

✓ Manufacturer's recommendations, where different from the BS EN standards are highlighted in **green**. (Note: LPC Rules incorporating BS EN 12845 states that manufacturer's recommendations should be adhered to).

**Please note:** Daily, Weekly and Monthly service and maintenance routines may be able to be carried out by the Building Owner/Occupier providing a *competent and trained person* carries out the work. All other routines are to be performed by an *approved contractor*.

All information and references to any standards or publications in this guide are correct at time of publication and we take no responsibility for any changes which may have been made by governing bodies or standards organisations in the interim.

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## Fire Safety Law

Under local Fire Safety Law you have a **legal obligation** to ensure your Fire Systems and associated Equipment are adequately maintained and kept in good working order.

### The local laws in place are:

#### England and Wales:

The Regulatory Reform (Fire Safety) Order 2005 – which came into force in October 2006.

The Fire Safety Regulations 2010.

#### Northern Ireland:

The Fire and Rescue Services (Northern Ireland) Order 2006.

The Fire Safety Regulations (Northern Ireland) 2010.

#### Scotland:

The Fire (Scotland) Act 2005.

The Fire Safety (Scotland) Regulations 2006.

**These are legal requirements and you must comply with this legislation.**

**These laws generally require Service and Maintenance to be carried out by Third Party accredited companies.**

## Compliance with Fire Safety Law

The list below highlights the items you as the Building Owner/Occupier should undertake (as a minimum) to become compliant with Fire Safety Law. It should be noted that it is not an exhaustive list and simply adhering to this list may not constitute complete compliance as each individual site must take into account their own specific circumstances:

Does your site have a suitable and up to date Fire Risk Assessment?

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Has your premises, the occupancy/hazard or the people within/visiting your premises changed since your last Fire Risk Assessment was carried out?

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Have you developed an action plan to correct any deficiencies which have been raised within your Fire Risk Assessment?

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Are all of your employees adequately trained in Fire Safety Awareness?

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Are your designated Fire Marshalls appropriately trained?

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Do you have formal, compliant Service and Maintenance contracts in place for your Fire Protection Systems & Equipment?

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Do you have appointed people responsible for the upkeep of your Fire Protection Systems and Equipment and are they appropriately trained?

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Are all of the above aspects documented and readily available if you were subjected to a Fire and Rescue Authority audit?

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## Relevant Standards

The standards referenced and used in production of this guide for each discipline are as follows:

### Automatic Fire Sprinkler Systems:

LPC Rules for Automatic Sprinkler Installations: 2015, incorporating BS EN 12845

NFPA25 (including FM Global requirements)

BS9999:2017

### Dry/Wet Rising Mains and Hydrants:

BS9990:2015

BS9999:2017

### Hosereels:

BS5306 Part 1:2006

BS EN 671-3:2009

BS9999:2017

### Portable Fire Extinguishers:

BS5306-3:2017

BS9999:2017

### Fire Detection for Suppression Systems:

BS6266:2011

ISO 14520-1:2015

BS EN 15004-1:2019

BS5839-1:2017

BS7273-1:2006

### Fire Alarm and Detection Systems:

BS5839-1:2017

BS9999:2017

### Voice Alarm Systems:

BS5839-8:2013

## Relevant Standards (cont'd) .....

### Gaseous Fire Extinguishing Systems:

ISO 14520-1:2015

BS EN 15004-1:2019

BS5306-4:2001 + A1: 2012

BS9999:2017

### Foam Systems:

BS EN 13565-02:2018

NFPA 25

NFPA 11

NFPA 16

BS 9999:2017

### Powder Systems:

BS EN 12416-2:2001

BS 9999:2017

### R-102 Restaurant Suppression Systems:

UL300 manual

### Watermist:

BS 8489-1:2016

BS9999:2017

### Fire Doors and Shutters:

BS9999:2017

Doors and Hardware Federation Standard TS004: Annex 4 and Annex 9.

LPS 1197-3

**Please note:** For more detailed requirements of the procedures and routines for the testing and maintenance of Fire Protection Systems and Equipment, the above mentioned standards should always be referenced in full.

## Accreditation

We are certified to the following Third Party schemes:

**ISO 9001:2015** Quality Management Systems

**ISO 14001:2015** Environmental Management Systems

**BS OHSAS 18001:** Standard for Health and Safety

**LPS 1048:** LPCB approval for Automatic Fire Sprinkler Systems

**LPS 1014:** LPCB approval for Fire Alarm and Detection Systems

**LPS1204:** LPCB approval for Gaseous Suppression Systems

**LPS 1197:** LPCB approval for service and maintenance of Doors, Shutters and Smoke Barriers

**BAFE SP101/ST104:** Certification for maintenance of portable fire extinguishers

**Pressure Equipment Directive (PED) certified.**



## Section 1

# Service and Maintenance routines for Automatic Fire Sprinkler Systems

## Daily and Weekly routines for Automatic Fire Sprinkler Systems

### Daily Routines:

- SD1** Check air pressure readings on pressure vessels.
- SD2** Inspect the sprinkler system on a daily basis, (especially during periods of cold weather) to check that:
- Pump house and Valve Chamber heating is working correctly.
  - Trace heating of pipework and tank immersion heater is working correctly.
  - Condition of all pipework lagging is satisfactory.
  - Any leaks identified are stopped and damage rectified at earliest opportunity.
  - Ensure that any water filled pipework on your premises is not subject to freezing conditions.
- SD3** Check all heating systems for correct operation (cold weather periods only).

### Weekly Routines:

#### Testing and Inspection at each Installation Control Valveset as required by TB203:

- SW1** Check and record the pressures both above and below the alarm valves before testing the alarms.
- SW2** Test hydraulic alarm (Motor and Gong) by opening the 15mm test valve to simulate sprinkler operation.
- Note 1: On Alternate systems which are charged with water during the Summer months, the 15mm test valve above the Dry Pipe Valve must be used.*
- Note 2: Hydraulic alarms should sound for a minimum duration of 30 seconds.*
- Note 3: It may be necessary to isolate Electrical Alarm and associated signals.*
- SW3** Check and record the pressures above and below the alarm valves after testing the alarms.
- SW4** Ensure main stop valve is locked open and that all ancillary valves are secured in the correct orientation.
- SW5** Carry out a visual inspection of the system to check for presence of leaks/defects etc.

#### Testing and Inspection of Electric and Diesel Fire Pumps and Jockey Pump as required by TB203:

- SW6** Verify that the sprinkler water storage tank(s) is full prior to testing the pumps.
- SW7** Diesel Engines: Check oil levels.
- SW8** Diesel engines: Check coolant levels.
- SW9** Diesel engines: Check fuel level before and after testing and replenish where required. (Min level 75%).
- SW10** Diesel engines: Check battery electrolyte levels and specific gravity (when applicable and safe to do so).
- SW11** Check all pump house valves are in their correct orientation.
- SW12** Check Jockey Pump cut-in and cut-out pressures via the initiation test facility and record the pressures.
- SW13** Start the electric pump via the initiation test facility and record the cut-in pressure.
- SW14** Run the electric pump for minimum of 10 minutes duration, checking to ensure that water is flowing freely from the minimum flow line.

- SW15** Record the delivery pressure and visually check the electric pump for leaks, vibration and other defects.
- SW16** Stop the electric pump and restart with manual start if applicable. Run for an additional 2 minutes.
- SW17** Stop the electric pump and ensure that the “Supply Healthy” lamp is illuminated.
- SW18** Start the diesel pump via the initiation test facility and record the cut-in pressure.
- SW19** Run the diesel pump for a minimum of 30 minutes, checking to ensure water is flowing freely from the cooling line/ minimum flow line. **Note: Diesel Pumps should never be left unattended whilst being tested.**
- SW20** Where fitted, check the automatic ventilation louvres for correct operation.
- SW21** Monitor the engine temperature, oil pressure and cooling system whilst the diesel pump is running.
- SW22** Record delivery pressure and visually check the diesel pump for leaks, vibration and other defects.
- SW23** Stop diesel pump and restart with manual start. Run for a further 2 minutes.
- SW24** Stop diesel pump and record the hours run as detailed on the meter.
- SW25** Ensure that the control panel and battery chargers are all functioning correctly.
- SW26** Check all pump house valves are secured and in their correct orientation.
- Note: Upon completion of all testing procedures, the pumps should not still be running.**

**Ancillary Equipment (where applicable):**

- SW27** Check cut-in and cut-out pressures and oil levels of any air compressors which are installed.
- SW28** Check any associated heating systems for correct operation. (This may include, but not be restricted to; Trace Heating of Pipework, Pump house Heating, Storage Tank Immersion Heater and Lagging).
- SW29** Check that storage tanks, rivers, canals, lakes, reservoirs and priming tanks are full of water, any contents gauges are operational, any ball valves are operational and all infill valves are secured fully open.
- SW30** Check that air/water levels and associated pressure readings of any pressure vessels are satisfactory and that the sight glasses have been drained and isolated.
- SW31** Check any automatic monitoring signals are received and that all panels are reset.
- SW32** Check that the minimum distance between the top of any stored goods and the sprinkler head deflector is being maintained. (1000mm for High Hazard Free-Standing Storage, 500mm for Ordinary Hazard Free-Standing Storage and 150mm for In-Rack storage). Ensure all rack flue spaces are not obstructed.
- SW33** Check the sprinkler spares cabinet for availability of spare sprinkler heads and sprinkler wrench.
- SW34** Inspect all pump pressure relief valves.
- SW35** Check that Annex F (Life Safety) system monitoring panels are operating correctly.
- SW36** Check monitored and un-monitored Fire Brigade connections for continuity of connections.
- SW37** Check that all stop valves which control flow of water to the sprinkler system are secured fully open.
- SW38** Check that the pump house and/or valve chambers are kept secure from unauthorised access, are dry with no standing water present, lighting is adequate and that all drainage gulleys are clear and unobstructed.
- SW39** Check that water from the sprinkler water storage tank(s) is not discharging through the tell-tale outlet and/or overflow connections.

## Monthly and Quarterly Routines for Automatic Fire Sprinkler Systems:

### Monthly:

**SM1** Test hydraulic bell/flow switch on each system by opening ITC (Inspectors Test Connection) at end of line location. (Wet Systems only).

**SM2** Check electrolyte level of all non-sealed batteries. (If safe and staff are trained to do so)

**SM3** Check battery charging voltage and ensure it has not deteriorated since last inspection.

**SM4** Ensure the detachable access ladder to any water storage tank is locked in the pump house for security and that any ball valve housings are secured shut and locked.

### Quarterly:

**SQ1** Carry out a Review of Hazard in accordance with the criteria detailed within TB203 to check that the Hazard Classification is still valid and that the building structure and method and type of storage or process which may affect sprinkler operation has not changed in any way since the system was originally installed.

**Note 1:** *If any changes have taken place which might impact upon the effectiveness of the sprinkler protection, immediate remedial and corrective action must be taken.*

**Note 2:** *It is possible for this routine to be completed by either the sprinkler servicing contractor or alternatively by the sprinkler system user, who can submit a completed return to the sprinkler servicing contractor which details any changes. (See also Annual Routine SA15 below)*

**SQ2** Inspect all pipework and pipe supports for damage, corrosion, corrosion protection or leaks.

**SQ3** Inspect all sprinkler heads and Multiple-Jet Controls for damage, corrosion, corrosion protection, dirt or paint build-up and leaks. Any defects should be rectified by cleaning or in the case of any painted sprinkler heads, by immediate removal and replacement.

**Note 1:** *Painted sprinklers cannot be cleaned and must be removed and replaced.*

**Note 2:** *Any heads which are located within spray booths may require more frequent inspection.*

**SQ4** Check that the minimum distance between the top of any stored goods and the sprinkler head deflector is maintained. (1000mm for High Hazard Free-Standing Storage, 500mm for Ordinary Hazard Free-Standing Storage and 150mm for In-Rack storage.) Ensure all rack flue spaces are not obstructed.

**SQ5** Test all Water Flow Alarm Switches and/or Pressure Switches on Annex F (Life Safety Systems) for correct operation.

## Bi-Annual routines for Automatic Fire Sprinkler Systems:

**SB1** Change alternate systems from air to water in Spring and from water to air in Autumn. (Please note that these systems, at the approval of your Insurance Company may now be left on air (Permanently Dry) all year round, however there is still a requirement for the valve to be trip tested every six months.

**SB2** Trip test and reset all Dry Pipe, Deluge and Pre-Action valves.

**SB3** In conjunction with routine SB2, test the operation of any associated accelerators and exhausters.

**SB4** Test any automatic monitoring connections and electrical installation of Fire Brigade and remote Central Station Alarms.

**SB5** Check fire pump panels for correct operation.

**SB6** For Diesel pumps only a "Failed to Start" test should be carried out and then the pump should be started manually and run for a minimum of two minutes.

**SB7** Test all Water Flow Alarm Switches.

**SB8** Test all valve supervisory (anti-tamper) switches.

**SB9** Where test equipment is fitted, carry out a flow test on the water supply at the Installation Control Valveset location to verify and record that the specified flows and pressures are being achieved.

**SB10** Where applicable, carry out a flow test on the storage tank infill supply to prove adequacy of the water supplies on reduced capacity water storage tanks.

**SB11** A full flow test on the fire pumps should be carried out, whereby pressure, flow and engine speed/load current should all be recorded.

**Note: TB203 Appendix 'A', states the minimum Bi-annual service levels required for sprinkler fire pumps and associated equipment and which the pump servicing contractor shall complete.**

**SB12** Pump start low-level switches in suction lift header tanks should be tested for correct operation.

**SB13** Secondary electrical supplies from diesel generators or other similar back-up sources should be tested by the building owner/occupier to verify correct operation and the sprinkler servicing contractor notified.

**SB14** Test all stop valves, zone valves and subsidiary stop valves for correct operation in conjunction with any associated monitoring of these valves for correct operation.

## Annual routines for Automatic Fire Sprinkler Systems:

**SA1** Carry out major service of fire pumps, including but not limited to; changing fuel filters, oil filters and engine oil. Air filters should also be cleaned.

**Note:** TB203 Appendix 'A', states the minimum Annual service levels required for sprinkler fire pumps and associated equipment and which the pump servicing contractor shall complete.

**SA2** Inspect all sprinkler heads and Multiple-Jet Controls for damage, corrosion, corrosion protection, dirt or paint build up and leaks. Any defects should be rectified by cleaning or in the case of any painted sprinkler heads by removal and replacement.

**Note 1:** Painted sprinklers cannot be cleaned and must be removed and replaced.

**Note 2:** Any heads which are located within spray booths may require more frequent inspection.

**SA3** All stop valves should be exercised and lubricated.

**SA4** Functional test and performance verification of Dry, Alternate and Type A & B Pre-Action systems and their associated monitoring alarms and fire signals shall be carried out.

**SA5** Ball valves on water storage tanks are to be checked for correct operation and serviced in accordance with the manufacturer's recommendations.

**SA6** Pump suction settling chambers and screens should be taken out, inspected and cleaned as necessary.

**SA7** All alarm and non-return valves on the system are to be examined, serviced and replaced or overhauled as necessary.

**SA8** Test antifreeze solution in system pipework for specific gravity.

**SA9** 50mm Drain Valve flow test to be carried out at each Installation Control Valve.

**SA10** Test all backflow preventers.

**SA11** Full trip test of Deluge systems to be carried out to prove water spray discharge and system operation.

**SA12** Check the first section of piping in freezer protection systems (Dry Pipe/Pre-Action) to look for formation of ice plug's which may have formed within the pipework.

**SA13** Test all Water Flow Alarm Switches for correct operation.

**SA14** Inspect all pipework and pipe supports for damage, corrosion, corrosion protection or leaks.

**SA15** Where the Quarterly Review of Hazard takes the form of returns submitted by the system user (see SQ1), at least one review per year shall be carried out by the sprinkler servicing contractor.

**SA16** The sprinkler system shall be periodically inspected at least once a year by a *totally independent third party* to determine whether the system is in accordance with the standard and to identify any deviations.

## On-going routines for Automatic Fire Sprinkler Systems:

### 2 Yearly:

**SO1** . Note: TB203 Appendix 'A', states the minimum 2 yearly service levels required for sprinkler fire pumps and associated equipment and which the pump servicing contractor shall complete.

### 3 Yearly:

**SO2** Towns main supply check valves, pressure vessel check valves, suction lift foot valves and all Installation Control Valve sets overhauled. (Unless manufacturer's recommendations state otherwise).

**SO3** Pressure vessels drained, cleaned, internally inspected and repainted if required.

**SO4** Water storage tanks with no corrosion protection ("Three Year" tanks), drained, cleaned as necessary, examined internally and externally for corrosion and fitness for purpose and fabric attended to as necessary and restored in accordance with manufacturers' recommendations.

**SO5** Water storage tanks with corrosion protection ("Ten Year" tanks), inspected, examined and repaired as necessary. If the condition of the tank indicates the need, the tank shall then be drained, cleaned and have the fabric attended to as necessary.

**SO6** Full trip test and performance verification of Dry, Alternate and Type A & B Pre-Action systems and their associated monitoring alarms and fire signals shall be carried out. (Note: This procedure allows water to fully enter the sprinkler system piping as if they were operating in a fire condition).

### 5 Yearly:

**SO7** Sample test high temperature sprinkler heads.

**SO8** Sample test solder-strut or solder link heads.

**SO9** Sample test sprinkler heads which are exposed to harsh environments, such as those in corrosive atmospheres or which may be subject to corrosive water supplies.

**SO10** Test Foam Proportioners and/or Inductors for correct operation.

**SO11** Inspect water storage tanks which have corrosion protection.

**SO12** Representative Sample Test Multiple Jet Controls where installed. (TB213)

**SO13** Representative Sample test Dry Pendant Pattern Sprinkler Drops where installed. (TB203)

**Note 1:** *These tests are to be carried out by an independent testing house.*

**Note 2:** *Function test failures shall be considered serious and all Multiple Jet Controls or Dry Pendant sprinkler heads in an installation representative of those which have failed should be replaced immediately.*

### 10 Yearly:

**SO14** "Ten Year" Water Storage Tanks drained, inspected internally and externally, cleaned and fabric attended to as necessary and restored in accordance with manufacturers' recommendations.

**SO15** Inspect foam storage tanks and bladder tanks.

**20 Yearly:**

**SO16** Representative Sample test Fast Response heads (then at ten yearly intervals thereafter).

**25 Yearly (or sooner if the condition of the system deems this necessary):**

**SO17** Sample sections of pipework should be internally and externally inspected.

**SO18** The sprinkler pipework should be flushed through the remote end of the distribution pipework array(s) until the water runs clear.

**Note:** *If the quality of the expelled water raises concerns or if diminished performance is detected by other means then further investigation should be undertaken and a decision made as to what further action required. If sufficient quantities of foreign matter are found, if pipework or sprinkler head waterways are found to be blocked, pinhole leaks are being experienced or if there is any increase in the time taken on dry systems for water to reach the remote test valve, then steps should be taken to ensure that all contaminants and debris are removed from all affected installations.*

**SO19** Representative sprinkler head samples should be removed and tested. The number of heads to be removed and submitted to be in accordance with TB203 Table 1.

**Note 1:** *These tests are to be carried out by an independent testing house.*

**Note 2:** *Function test failures shall be considered serious and all sprinkler heads in an installation representative of those which have failed should be replaced immediately.*

*Until the defective heads have been replaced, the system is to be considered impaired and the Authorities Having Jurisdiction shall be notified accordingly with appropriate additional fire safety precautions taken.*

**50 Yearly:**

**SO20** Representative Sample test other sprinklers not tested as above (then at 10 year intervals thereafter).



## Section 2

# Service and Maintenance routines for Fire Protection Equipment and Systems

## Dry/Wet Rising Mains

### Bi-Annually:

**MB1** Inspect all Inlets, Landing Valves, Doors, Cabinets, Hinges, Locking Devices, Handwheels, Spindles, Glands, Washers and Seals.

**MB2** Additionally for Wet Rising mains, any pumps and the associated electrical and mechanical apparatus should be inspected to ensure they are functioning correctly.

### Annually:

**MA1** A wet pressure test (hydrostatic) on any Dry Rising mains should be carried out to check for leaks. This should be to a pressure equal to its design pressure at inlet level for no less than 15 minutes.

**MA2** For Wet Rising mains, any associated water storage tanks should be internally checked for cleanliness and any Wet Riser pumps should be serviced.

**MA3** *We would recommend that Wet Riser pumps should be serviced to the same recognised routines and levels as that of fire sprinkler pumps as detailed within Section 1.*

## Hydrants

### Weekly:

**HW1** Inspections should be carried out to ensure hydrants are not obstructed in any way and all indicator plates are clearly legible and in position.

**HW2** All valves should be checked to ensure they are in the correct orientation. (This equipment should be secured in the open position).

### Annually:

**HA1** All hydrants should be serviced annually to ensure they are in good serviceable condition.

**HA2** A flow test should be carried out to determine if there has been any deterioration in water flow and/or pressure since the previous test was completed.

**HA3** All valves should be checked to ensure they are in their correct orientation. (This equipment should be secured in the open position).

## Hosereels

**Note:** *In addition to the routines detailed below, it is also necessary for a responsible person to carry out regular checks to ensure hosereels are not obstructed in any way and are free from corrosion and leaks, have clearly legible operating instructions and are located in the designated position. The frequency of these inspections should be determined by risk/hazard assessment and/or environmental circumstances.*

### Monthly:

**HRM1** All hosereels should be inspected and particular attention made to ensure there are no leaks and that the drum rotates freely on its spindle.

### Annually:

**HRA1** Run out the hose fully under pressure and check for cracks, splits, kinks, leaks or other damage.

**HRA2** Carry out a flow and pressure test.

**HRA3** Check the drum rotates freely on its spindle and in the case of swinging hosereels that they swing easily through 180°.

**HRA4** Inspect all nozzles and isolating valves and check they work correctly, are easy to operate and that they are left in their correct orientation.

**HRA5** Check that reel guides are fixed securely and work correctly.

### 5 Yearly:

**HRF1** All hoses should be pressure tested in accordance with BS EN 671-1 and/or BS EN 671-2.

## Fire Extinguishers

### Monthly:

**FEM1** Inspect all extinguishers to ensure they are in their correct location, clearly visible and unobstructed. The operating instructions should be clean, legible and outwardly facing. Check that all pressure gauges are within operational limits and that any tamper seals/indicators are not damaged, broken or missing.

**FEM2** Check that each extinguisher has not been operated and is showing no obvious signs of damage.

### Annually:

**FEA1** All extinguishers are to be serviced annually.

### 5 Yearly:

**FEF1** All extinguishers with the exception of Halon, Primary Sealed Dry Powder and CO2 should be discharge tested and recharged or replaced as necessary.

### 10 Yearly:

**FET1** Halon and CO2 extinguishers to be overhauled and recharged or replaced as necessary.

**FET2** Primary Sealed Dry Powder Extinguishers to be returned to the manufacturer for testing/refilling.

## Fire Doors and Shutters

### Daily:

**DD1** All door release mechanisms that hold open hinged doors should be released.

**DD2** Check all shutter guides are not damaged and the guides and the area beneath the shutter are free from obstructions.

### Monthly:

**DM1** Any fail-safe devices for automatic opening doors should be tested for correct operation. This can be achieved by simulating mains power failure.

**DM2** Any devices which hold hinged doors normally open should be tested by simulating mains power failure or operating the fire alarm to ensure the doors close correctly.

### Bi-annually:

***All fire doors should be tested and inspected to ensure:***

**DB1** Heat activated seals and/or smoke seals are not damaged.

**DB2** Door leaves and frames are not damaged, bowed, deformed or corroded and door gaps are not too small to cause binding or too large so as not to provide sealing from fire or smoke.

**DB3** Devices for hanging, securing, self-closing and automatic opening are clean, lubricated and operating correctly.

**DB4** Door opens freely and all fixings are secure.

**DB5** All handles, locks and panic latches operate correctly and are secure. Check, clean and lubricate in accordance with the manufacturer's instructions.

**DB6** Signage and labels are clean and legible.

**DB7** Clean and lightly lubricate any tracks, guides, channels and operating mechanisms.

**DB8** Shutters are aligned and balanced.

**DB9** Shutters close correctly. This can be done by simulating release in a fire condition; reset all devices and motors following successful demonstration.

**DB10** Where fitted, check all control equipment, warning signs and that repeater alarms function correctly. Reset following test.

## Foam Systems

### Weekly:

- FW1** Check that all gauges and indicators are functioning correctly.
- FW2** Check that the system (including all pipework and nozzles) is in its designated position and is free from damage, dirt or dust and isn't leaking.
- FW3** Check that the quantity of foam concentrate or pre-mixed solution is correct.
- FW4** Check that the fire risk and the protected enclosure hasn't changed.
- FW5** Check all controls are correctly set and accessible.
- FW6** Check that water supplies are available and are at the correct pressure.

### Monthly:

- FM1** Check to ensure that any personnel who may have cause to use the equipment are properly trained and authorised to do so, particularly any new employees.

### Bi-annually:

- FB1** Inspect foam proportioners and/or inductors
- FB2** Examine pipework and fittings and if any is identified as damaged or corroded, carry out a hydraulic pressure test.
- FB3** Clean and inspect all strainers and/or foam making gauzes. This also needs to be done following any test or discharge of the system.
- FB4** Check all manual and automatic valves for operation and function.
- FB5** Visually inspect foam concentrate tanks without draining for deterioration and/or damage.
- FB6** Check spare foam containers for deterioration and/or damage.

### Annually:

- FA1** Take 1 litre foam sample from foam tanks and/or systems and send for laboratory testing and report. This applies to concentrate, pre-mixed foam solution and pre-primed water/foam systems. Correct any deterioration identified according to the manufacturer's recommendations.
- FA2** Exercise each foam proportioning system and take a sample of the foam produced. Have the sample checked for correct proportioning.

### Other:

- FO1** As required by statutory regulations (e.g. Pressure Vessel regulations. Pressure Equipment Directives etc) alternatively otherwise and when convenient to do so (e.g. following emptying of the tank for any reason) – inspect all tanks internally.
- FO2** Test all associated detection systems in accordance with BS5839-1: 2017

## Powder Systems

### Daily:

**PD1** Visual check of indicators.

### Weekly:

**PW1** Check that all gauges and indicators are working correctly.

**PW2** Check system (including pipework and nozzles) is in its designated position and is free from damage, dirt or dust and isn't leaking.

**PW3** Check that the quantity of extinguishing medium is correct.

**PW4** Check that the fire risk and the protected enclosure haven't changed.

**PW5** Check all controls are properly set and accessible.

### Monthly:

**PM1** Check to ensure that any personnel who may have cause to use the equipment are properly trained and authorised to do so, particularly any new employees.

**PM2** Clean exterior pipework and fittings with compressed air/nitrogen or similar.

**PM3** Inspect operational position of all valves.

**PM4** Ensure any protective nozzle covers are in place.

**PM5** Inspect the quantity of expellant gas (by pressure measurement or weighing) and quantity of the powder.

**PM6** Inspect the release mechanism.

### Bi-annually:

**PB1** The system should be maintained in accordance with the manufacturer's instructions.

### Annually:

**PA1** At least annually, the quality of the powder should be inspected.

### Other:

**PO1** Test all associated detection systems in accordance with BS5839-1:2017

## R-102 Restaurant Suppression Systems

### **Bi-annually:**

**RB1** Visually check condition and quantity of *Ansulex* liquid by removing tank from its enclosure or bracket.

**RB2** Check contents of gas cartridge by weighing.

**RB3** Check all nozzles are clean, have silicon grease coating on the orifice and have "blow-off" caps in place.

**RB4** Check all pipework and fittings.

*Please note, if there is any cooking grease evident in the nozzle, the nozzle and piping must be thoroughly cleaned and/or replaced as necessary.*

**RB5** Test the automatic release mechanism using a test link and check the wire rope.

**RB6** Replace all fusible links.

**RB7** Test manual pull stations and check the wire rope.

**RB8** Check all 'O' rings and burst discs for damage.

**RB9** Survey the system and risk to ensure protection is still correct and in accordance with requirements.

**RB10** Inspect all hoses, piping and fittings on actuation lines. Vacuum test actuation lines where installed.

**RB11** Test mechanical gas shut off valves where fitted.

### **Annually:**

**RA1** Replace all rubber blow-off caps.

**RA2** Blow through the lines to prove that the pipework, fittings and nozzles are clear of debris.

### **12 Yearly:**

**RT1** The regulated actuator must be tested (or replaced) and the tank(s) must be pressure tested (or replaced). (See below)

*Note: Under the P.E.D. the tank(s) must be pressure tested (or replaced) every ten years and not twelve as stated in the contents of the manufacturers manual, which is based upon USA regulations.*

## Gaseous Fire Suppression Systems - Mechanical

### Weekly:

- GW1** Check that all gauges and indicators are working correctly.
- GW2** Check that the system (including piping and nozzles) is in its designated position, is free from damage, dirt or dust and is not leaking.
- GW3** Check that the quantity of extinguishing medium is correct.
- GW4** Check that the fire risk and the protected enclosure haven't changed.
- GW5** Check all controls are properly set and accessible.

### Monthly:

- GM1** Check to ensure that any personnel who may have cause to use the equipment are properly trained and authorised to do so, particularly any new employees.

### Quarterly/Bi-annually:

- GQ1** Ensure all previously identified faults have been rectified.
  - GQ2** Externally examine pipework and fittings to determine their condition. Any pipework or fittings which display signs of corrosion or mechanical damage to be repaired, replaced and pressure tested as necessary.
  - GQ3** Check all control valves for correct manual function and where applicable check all automatic valves for correct automatic function.
  - GQ4** Externally examine containers for signs of damage, corrosion or unauthorised modification and for any damage to system hoses.
  - GQ5** Check contents for any loss of extinguishing medium. Replace and/or refill as necessary.
- 
- GB1** Inspect all components of system including all drop flaps, curtains and pneumatic heat operated devices.
  - GB2** For Low Pressure CO2 systems, check the refrigerant unit to ensure the refrigerant charge is intact and there are no leaks.
  - GB3** Manually exercise any directional valves.

### Annually:

- GA1** Carry out all Quarterly/Six Monthly routines.
- GA2** Carry out an integrity test of the protected enclosure(s) and carry out any remedial action if required.
- GA3** Thoroughly test and inspect the system for correct operation.



**10 Yearly:**

**GT1** All cylinders should be subject to internal examination, pressure testing and overhaul. (P.E.D)

**GT2** Replace all rubber hoses (or earlier, if examination shows signs of poor condition) which may include but not limited to; condition of outer layer, cracks, cuts, blisters, deformity, embitterment, abrasion or kinks.

**GT3** Replace check valves on TBSP FM200 Manifolded Systems.

**Other:**

**GO1** Test all associated detection systems in accordance with BS5839-1:2017

**GO2** 20 Years: Inspect and replace as necessary steel reinforced thermoplastic hoses on 200 Bar Inergen Systems and Aramid reinforced thermoplastic hoses used on 300 Bar Inergen Premier Systems.

It should also be considered that each manufacturer of fire protection products will have their own specific maintenance requirements which may take precedence and these may not be included in this guide.

This is particularly relevant when applied to the detection system components installed independently and in association with other Fire Suppression systems.

## Watermist Systems

### Weekly:

- WMW1** Check that all water and air pressure gauge readings on systems, trunk mains and pressure vessels.
- WMW2** Check all water levels in water storage tanks (including priming tanks and pressure vessels).
- WMW3** Check the correct position of all valves which control the flow of water to the system.
- WMW4** Check Jockey Pump cut-in and cut-out pressures by simulating a reduction in system pressure and record the pressures.
- WMW5** Start the electric fire pump (where installed) by simulating a reduction in system pressure and run for a minimum period of 10 minutes or for the duration as specified by the supplier.
- WMW6** Where diesel driven fire pumps are installed, check fuel and engine lubrication oil levels.
- WMW7** Start the diesel fire pump by simulating a reduction in system pressure and run for a minimum period of 20 minutes or for the duration as specified by the supplier.
- WMW8** Check diesel fire pump oil pressure and flow of cooling water through open circuit cooling systems.
- WMW9** Stop diesel engine and restart using manual test button – allow to run for 2 minutes.
- WMW10** Check water level in the primary circuit of closed circuit cooling systems.
- WMW11** Check oil pressure, engine temperature and coolant levels.
- WMW12** Check all hoses for condition and carry out general inspection of fuel, coolant and exhaust fumes.
- WMW13** Check all heating systems for correct function.

### Monthly:

- WMM1** Check electrolyte level of all non-sealed batteries. (If safe and staff are qualified to do so)
- WMM2** Test all associated detection systems in accordance with BS5839-1:2017.

### Quarterly:

**WMQ1** Carry out a Review of Hazard: The effect of any changes of structure, occupancy, storage configuration, heating, lighting or equipment etc. of a building on hazard classification or installation design should be identified and assessed by a competent person. Any modifications deemed necessary shall be carried out immediately.

**WMQ2** Any nozzles affected by deposits should be changed.

**Note:** *Due to the harsh environmental conditions, Watermist nozzles in deep fat fryers and spray booths require more frequent cleaning and/or replacement measures.*

**WMQ3** Check pipework, fittings and pipe supports for corrosion and mechanical damage.

**WMQ4** Each water supply should be tested with each control valve in the system. Sequential starting of multiple pumps and pumps using multiple drivers should be undertaken.

**WMQ5** Any secondary electrical supplies from diesel back-up generators should be checked for satisfactory operation.

**WMQ6** All stop valves controlling the flow of water to the system should be operated to ensure that they are in working order and secured in the correct mode.

**WMQ7** Water Flow Alarm Switches and/or Pressure Switches should be checked for correct function.

**WMQ8** Check all spare parts and replenish as necessary.

#### **Bi-Annually:**

**WMB1** Exercise the moving parts of dry and open-head control valves in dry pipe installations and subsidiary extensions in accordance with manufacturer's recommendations.

**WMB2** Examine cylinders and water storage vessels externally for signs of damage or unauthorised modification and for damage to system hoses. The contents should be checked and confirmed that they are within 5% of correct charge pressure. Any showing a greater loss to be refilled or replaced.

**WMB3** The function of all re-settable valves and actuators should be checked, unless testing of the valves would result in water discharge from the nozzles.

**WMB4** Check the electrical transmission and receipt of any signals to the Fire and Rescue Authority and the remote alarm receiving centre.

**WMB5** The associated fire detection and alarm system should be tested and serviced in accordance with BS5389-1:2017

#### **Annually:**

**WMA1** All systems should be thoroughly inspected and tested for correct operation by competent personnel.

**WMA2** Full flow tests to be carried out on all water supply pumps.

**WMA3** For Diesel pumps only a "Failed to Start" test should be carried out and then the pump should be started manually and run for a minimum of two minutes.

**WMA4** Ball valves on water storage tanks are to be checked for correct operation and serviced in accordance with the manufacturer's recommendations.

**WMA5** System strainers to be inspected and cleaned as necessary. Identify and remediate should the strainers be clogged by any product.

**Three Yearly:**

**WMT1** Examine all water storage tanks externally for corrosion and if deemed necessary drain, clean and examine internally for corrosion. Refurbish corrosion protection or repaint required.

**WMT2** All water supply stop valves, control valves and check valves should be examined and replaced or overhauled as necessary.

**WMT3** Twenty nozzles, or 1% of the total installed (whichever is greater), should be removed from various parts of the system and sent away for independent testing.

**Ten Yearly:**

**WMO1** All water storage tanks should be cleaned and examined internally and the fabric attended to as necessary.

**WMO2** All pressure vessels should be hydrostatically tested.

**Note:** *Spare Watermist nozzles, together with Watermist nozzle spanners as supplied by the system installer should be housed in a cabinet located in a prominent and easily accessible position*

*The number and type of spare Watermist nozzles per system should be not less than the number required to reinstate the system to operational status should it operate.*

It should also be considered that each manufacturer of fire protection products will have their own specific maintenance requirements which may take precedence and these may not be included in this guide.

This is particularly relevant when applied to the detection system components installed independently and in association with other Fire Suppression systems.

## Section 3

# Service and Maintenance routines for Electrical Fire Systems

## Daily, Weekly, Monthly and Bi-Annual checks for Fire Detection and Alarm Systems

### Daily:

**AD1** Inspect all control panels to ensure there are no faults.

### Weekly:

**AW1** Test a manual call point to make sure that the alarm is sounded and to check that any alarm monitoring station receives the correct signal. A different manual call point should be used each week.

**AW2** Check fuel levels and fluid levels of any standby generators.

**AW3** Check for adequate supply of printer ink and paper.

### Monthly:

**AM1** If an emergency generator is used as the standby power supply for fire alarm and detection systems, it should be tested under load for one hour.

**AM2** If vented batteries are used as a standby power supply for fire alarm and detection systems, the batteries, electrolyte level and connections should be visually inspected.

### Quarterly/Bi-Annually:

**AB1** Check the logbook to ensure all previously identified faults have been rectified.

**AB2** Inspect the entire system to ensure that any changes which have taken place to or within the building structure do not impair the system in any way and to check if any additional devices are required.

**AB3** Check all batteries (except those in radio controlled devices) to ensure they are in date, in good condition and their electrolyte levels and specific gravity are correct. Then, carry out a load test to ensure they are not likely to fail before the next service visit is due.

**AB4** At least one device on each circuit should be tested to ensure the correct operation of the system.

**AB5** All functions, indications and controls should be checked for correct operation.

**AB6** All fault indications and circuits should be tested by simulating faults where possible.

**AB7** All printers should be checked for operation and to ensure all printed text is legible.

**AB8** All remote fire and fault signal monitoring should be checked to ensure the correct signals are received.

**Note:** *When a servicing organisation takes over the servicing responsibilities for an existing system, a special inspection should be carried out and when available existing records should be consulted to obtain sufficient information to enable effective future servicing of the system.*

**Annually:**

**AA1** Every device should be inspected to ensure it is in good condition and not covered in paint, dirt, dust or has been damaged in any way. Cables and fixings should be checked for damage.

**AA2** Every device should be checked for functionality by operating the device. The devices must be tested to ensure they respond to the phenomena they are designed to detect – e.g. heat detectors respond to heat, smoke detectors respond to smoke etc. Simulated tests are allowed – e.g. optical filters for beam detectors, synthetic smoke detector spray etc.

**AA3** All devices that determine analogue values must be checked to ensure they are within the manufacturer's parameters.

**AA4** All alarm devices should be checked for operation and any visual devices should be clean and not obstructed.

**AA5** Check remote indicators.

**AA6** Change all permanently illuminated unmonitored filament lamps.

**AA7** Check to ensure radio signal strengths are adequate.

**AA8** The cause and effect programme should be correct.

**AA9** Standby power supplies should be checked for correct capacity. Quiescent and alarm loads are required and verification calculations completed.

### Detection Systems for Fire Suppression Installations:

Detection systems used for the operation of Fire Suppression Systems such as Gaseous, Foam, Dry Powder and/or Sprinkler Systems such as Pre-Action or Deluge should be maintained to the same level of frequency as for Fire Alarm and Detection systems, with the additional requirements listed below:

Particular care should be taken not to operate the suppression systems when carrying out any weekly testing.

Where detection is combined for building detection and operation of the suppression systems, the suppression systems should be isolated when any call point in the protected area is operated on a weekly test.

**Bi-Annually:**

**SD1** In the case of sprinkler systems, the detection system should be operated to demonstrate that the alarm valve operates in the correct manner.

**SD2** In the case of other suppression systems, the detection system should be operated to prove that any firing mechanism operates without discharging the extinguishing medium.

It should also be considered that each manufacturer of fire protection products will have their own specific maintenance requirements which may take precedence and these may not be included in this guide.

This is particularly relevant when applied to the detection system components installed independently and in association with other Fire Suppression systems.

## Voice Alarm Systems

### **Weekly:**

**VW1** Operate a manual call point to test all voice alarms to ensure the correct message is sounded and test any emergency microphones for correct operation.

### **Quarterly:**

**VQ1** Voice alarm batteries should be checked to ensure they are in date. If vented batteries are used as a standby power supply, these should be visually inspected alongside the electrolyte level and connections.

### **Bi-Annually:**

**VB1** Check the logbook to ensure all previously identified faults have been rectified.

**VB2** Inspect the entire system to ensure that any building structure changes that have taken place do not impair the system in any way and to check if any additional devices are required.

**VB3** Check all batteries (except those in radio controlled device) to ensure they are in date, in good condition and their electrolyte levels and specific gravity are correct. Then carry out a load test to ensure they are not likely to fail before the next service visit is due.

**VB4** All fault indications and circuits should be tested by simulating faults where possible.

**VB5** All printers should be checked for operation and to ensure that all printed text is legible.

### **Annually:**

**VA1** All areas should be tested to ensure the correct messages are received in each area, that the messages are intelligible and audible and the sound levels compare to previous tests.

**VA2** Inspect loud speakers for damage.

**VA3** Check phased evacuation programmes.

**VA4** Test manually operated messages.

**VA5** Check cables and fixings for damage.

**VA6** Check remote indicators.

**VA7** Change permanently illuminated unmonitored filament lamps.

**VA8** Check to ensure radio signal strengths are adequate.