22-01 Fire Alarms and Associated Equipment

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Version: 12
Unit of Measure: Nr

Summary	
Frequencies	**Tasks**
3M (Months) 30 mins	1 2
6M (Months) 120 mins	3 4 5 6 7 8 9 10 11 12 13 14 15 16
12M (Months) 150 mins	17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
Annual Timing	**510 mins**

Introduction

This section should be read in conjunction with the daily and weekly testing tasks as detailed in current British Standards. The client should carry out tests on equipment on a weekly basis in accordance with the local fire regulations. When carrying out maintenance any defects must be reported to the client.

A record of all tests and checks and any defects remedied should be maintained in the fire safety manual/log book.

Arrangements should be made for all fire safety equipment, installations and systems (including fire detection systems, automatic suppression systems, door control mechanisms, smoke control systems, evacuation and fire-fighting lifts, emergency lighting, stand-by power systems, escalators and all passive fire protection provisions) to be inspected and tested on a regular basis by a competent person. Alterations, additions, repairs or modifications to services and equipment should be carried out only by competent persons.

Although modern fire alarm systems may incorporate a high degree of monitoring so that faults are indicated automatically, it is still necessary for the responsible person nominated by the user to ensure that fault indications at the panel are identified for appropriate action. It is also vital for a regular test to be carried out to ensure that there has not been any major failure of the entire system or a significant part of the system.

Routine testing of the system also provides an opportunity for occupants of the building to become and remain familiar with the fire alarm signal(s) that the system produces. In systems with staged alarms that incorporate an “Alert” and an “Evacuate” signal, both signals need to be operated on the occasion of each test to ensure that occupants are aware of the existence of both signals and their different meaning.

The period between successive inspection and servicing visits should be based upon a risk assessment, taking into account the type of system installed, the environment in which it operates and other factors that may affect the long term operation of the system. If a risk assessment shows a need for more frequent inspection and servicing visits then all interested parties should agree the appropriate inspection and servicing schedule. If this recommendation is not implemented, it should be considered that the system is no longer compliant with British Standards.

All tests on equipment and trigger devices should be recorded in the log book. Due to the variety and complexity of fire alarms and associated systems they are not dealt with in detail in this specification but this task maintenance schedule indicates the minimum requirements. Specialist back-up may be required either from the manufacturers or specialist service providers especially in connection with intelligent systems.

All tasks should be carried out in accordance with current Statutory Requirements, Regulations and Manufacturers' Recommendations.

The system should be left fully operational at the end of any testing including the resetting of any interlocks with plant and devices.

Please refer to the overarching introduction (SFG 00-01) to make sure you are of the correct skill level as indicated within the task schedule to carry out the described works. Ensure you have read and understood the manufacturer’s recommendations, carried out risk assessment(s) on each item of plant to identify the correct frequency of maintenance, identified all safety

procedures that need to be applied and recorded in order to carry out the work in a safe and reliable manner.

Display Order	Tasks
1	**Smoke relief vents - fireman's control for vent plant** **Criticality:** Red **Frequency:** 3M **Skill Set:** Specialist **Action:** Check operation and log operation of fans and dampers. **Notes:**
2	**Emergency manual operated systems** **Criticality:** Red **Frequency:** 3M **Skill Set:** Specialist **Action:** Test operation. **Notes:** These devices should be tested frequently by the clients' operators.
3	**Log book** **Criticality:** Red **Frequency:** 6M **Skill Set:** Specialist **Action:** The system log book should be examined. It should be ensured that any faults recorded have received appropriate attention. **Notes:**
4	**Visual inspection** **Criticality:** Red **Frequency:** 6M **Skill Set:** Specialist **Action:** A visual inspection should be made to check whether structural or occupancy changes have affected the compliance of the system with the recommendations of this standard for the siting of manual call points, automatic fire detectors and fire alarm devices. **Notes:** Particular care should be taken to verify whether: 1 all manual call points remain unobstructed and conspicuous; 2 all manual call points are fitted with a protective cover which can be moved to gain access to the frangible element; 3 any new exits have been created without the provision of an adjacent manual call point; 4 any new or relocated partitions have been erected within 500mm horizontally of any automatic fire detector; 5 any storage encroaches within 300mm of ceilings; 6 a clear space of 500mm is maintained below each automatic fire detector and that the ability of the detector to receive the stimulus that it has been designed to detect has not been impeded by other means; 7 any changes to the use or occupancy of an area makes the existing types of automatic fire detector unsuitable for detection of fire or prone to unwanted alarms; 8 any building alterations or extensions require additional fire detection and alarm equipment to be installed. The building occupier should inform the maintenance engineer of any structural or occupancy changes which might affect the siting or operation of the detector.
5	**False alarms** **Criticality:** Red **Frequency:** 6M **Skill Set:** Specialist **Action:** The records of false alarms should be checked in accordance with current British Standards. The rate of false alarms during the previous 12 months should be recorded. Action taken in respect of false alarms recorded should comply with the recommendations in current BS Codes of Practice. **Notes:**
	Stand-by battery

6	**Criticality:** Red **Frequency:** 6M **Skill Set:** Specialist **Action:** The stand-by battery should be disconnected and full load alarm should be simulated. Check correct battery fuse rating and charge rate. Check battery, voltage and connections and test together with charging equipment. Check and record specific gravity of battery where applicable. Simulate mains and charger failure. **Notes:**
7	**Batteries and Chargers** **Criticality:** Red **Frequency:** 6M **Skill Set:** Specialist **Action:** Batteries and their connections should be examined and momentarily load tested with the mains disconnected (other than those within devices such as manual call points, detectors and fire alarm sounders of a radio-linked system) to ensure that they are in good serviceable condition and not likely to fail before the next service visit. Check condition and life. Check correct battery fuse rating and charge rate. Check battery, voltage and connections and test together with charging equipment. Check and record specific gravity of battery where applicable. Simulate mains and charger failure. For more information refer to (SFG 43-04). **Notes:** Check according to the manufacturer's recommendations.
8	**Fire alarm control and indicating equipment** **Criticality:** Red **Frequency:** 6M **Skill Set:** Specialist **Action:** The fire alarm functions of the control and indicating equipment should be checked by the operation of at least one detector or manual call point on each circuit. **Notes:** An entry should be made in the log book indicating which initiating devices have been used for these tests.
9	**Controls, fireman's switches and visual indicators** **Criticality:** Red **Frequency:** 6M **Skill Set:** Specialist **Action:** All controls, visual indicators at control and indicating equipment should be checked for correct operation. Test operation of fireman’s switch if fitted. **Notes:**
10	**Alarm signals** **Criticality:** Red **Frequency:** 6M **Skill Set:** Specialist **Action:** The operation of any facility for automatic transmission of alarm signals to an alarm receiving centre should be checked. Check operation interlinks with landlords systems if fitted. Check operation interlinks with plant, ensure shut down and reset at completion of test. **Notes:** Where more than one form of alarm signal can be transmitted (e.g. fire and fault signals) the correct transmission of each signal should be confirmed.
11	**Ancillary functions** **Criticality:** Red **Frequency:** 6M **Skill Set:** Specialist **Action:** All ancillary functions of the control and indicating equipment should be tested. **Notes:**
12	**Fault indicators** **Criticality:** Red **Frequency:** 6M **Skill Set:** Specialist **Action:** All fault indicators and their circuits should be checked where practicable, by simulation of fault conditions.

12 continued	**Notes:**
13	**Printers** **Criticality:** Red **Frequency:** 6M **Skill Set:** Specialist **Action:** All printers should be tested to ensure that they operate correctly and that characters are legible. **Notes:** It should be ensured that all printer consumables are sufficient in quantity or condition to ensure that the printer can be expected to operate until the time of the next service visit.
14	**Radio systems** **Criticality:** Red **Frequency:** 6M **Skill Set:** Specialist **Action:** Radio systems of all types should be serviced in accordance with the recommendations of the manufacturer. **Notes:**
15	**Manufacturers checks and tests** **Criticality:** Red **Frequency:** 6M **Skill Set:** Specialist **Action:** All further checks and tests recommended by the manufacturer of the control and indicating equipment and other components of the system should be carried out. **Notes:**
16	**Completion** **Criticality:** Red **Frequency:** 6M **Skill Set:** Specialist **Action:** On completion of the work any outstanding defects should be reported to the responsible person, the system log book should be completed and a servicing certificate should be issued. **Notes:** The work described may be carried out over the course of two or more service visits during each twelve month period.
17	**Electrical - main panels and repeater panels** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** Check electrical terminations for security. Examine and report on condition of all associated wiring, ensure security of terminations. Carry out insulation resistance and protective conductor tests, record results. Check and ensure security of all wiring facility and cable gland terminations. **Notes:** Under current regulations the entire fire alarm system is defined as an electrical installation and is therefore subject to inspection, testing and certification. These tasks relate to the wiring to the main panel and repeater panels. The testing referred to in these actions does not relate to the loop circuits from the panels.
18	**Sounders - Decibel Level** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** Check output. Check after alterations. Noise level should be above 65 db but this varies according to the type of building, background noise within the building and the people within the building so ensure you refer to BS 5839 part 1 for the correct level. **Notes:** The time period for checking sounders should be agreed with the client. Refer to BS 5839.
19	**Manual call points** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** Check mounting of casing and replace if cracked.

19 continued	Ensure all manual call points are fitted with a protective cover which can be moved to gain access to the frangible element. The switch mechanism of every manual call point should be tested either by removal of a frangible element, insertion of a test key or operation of the device as it would be operated in the event of fire. **Notes:**
20	**Automatic detectors** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** All automatic fire detectors should be examined as far as practicable, to ensure that they have not been damaged, painted or otherwise adversely affected. Thereafter, every detector should be functionally tested. The tests used need prove only that the detectors are connected to the system, are operational and are capable of responding to the phenomena they are designed to detect. **Notes:** General : Mounting – check security.
21	**Heat detectors** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** Every heat detector should be functionally tested by means of a suitable heat source, unless operation of the detector in this manner would then necessitate replacement of part or all of the sensing element (e.g. as in fusible link point detectors or non-integrating line detectors). Special test arrangements will be required for fusible link heat detectors. The heat source should not have the potential to ignite a fire; live flame should not be used, and special equipment might be necessary in explosive atmospheres. **Notes:**
22	**Point smoke detectors** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** Point smoke detectors should be functionally tested by a method that confirms that smoke can enter the detector chamber and produce a fire alarm signal (e.g. by use of apparatus that generates simulated smoke or suitable aerosols around the detector). It should be ensured that the material used does not cause damage to or affect the subsequent performance of the detector. The manufacturer's guidance on suitable materials should be followed. **Notes:**
23	**Optical beam smoke detectors** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** Optical beam smoke detectors should be functionally tested by introducing signal attenuation between the transmitter and receiver either by use of an optical filter, smoke or simulated smoke. **Notes:**
24	**Aspirating fire detection systems, VESDA System** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** Aspirating fire detection and fire alarm systems should be functionally tested by a method that confirms that smoke can enter the detector chamber and produce a fire alarm signal. It should be ensured that the material used does not cause damage to or affect the subsequent performance of the detectors; the manufacturer's guidance on suitable materials should be followed.

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continued

All fault and alarm output functions of the ASD should be tested where practicable and also any interfaces which may form part of the system. It is important to ensure that operation during testing does not result in an unwanted signal being sent from the ASD to another system.

Where ASD systems contain power supplies and battery back-ups these should be checked and tested in accordance with appropriate national standards).

Any components fitted to the system with a defined operating life as defined by the manufacturer should be examined and replaced if necessary (e.g. filters, batteries).

It should be checked that there have been no unauthorised changes to the system configuration (e.g. Sensitivity). If changes are required or have taken place, then these must be documented.

Any systems reliant on additional additives should be topped up in accordance with the manufacturer's recommendations.

A visual inspection should be made to check whether structural, building or occupancy changes have affected the design requirements for the pipework and sampling points.

A visual inspection should be made of all sampling points, pipework, fittings, cables and equipment for secure fixing, appropriate labelling and for absence of damage and freedom from obstructions.

Furthermore, appropriate testing should be performed to verify that smoke is able to enter each sampling point (or collection of sampling points that are recommended by the manufacturer to cover the same area as a point smoke detector).

This can be achieved by introducing smoke into each sampling point in turn and verifying a response at the detector. However, where access is restricted or other site conditions prevent this, other verification techniques should be employed such as:

1 Verifying transport time from furthest hole or a dedicated test point and comparing with previously recorded results to identify deviations.
2 Confirming that the flow monitoring is capable of detecting loss of a single sampling point (or collection of sampling points that are deemed to be acceptable for the risks involved).
3 Inspection of flow readings and comparing with previously recorded results to identify deviations which would indicate a loss of detection performance.
4 Measurement of the pressure at each sampling point and comparing with previously recorded results to identify deviations which would indicate a loss of detection performance.

The technique used is dependent on the particular features of the ASD technology, the risk and details of the specific application. Such techniques may also be supported by visual inspection of sampling points where this is possible but it is essential to verify that adequate detection performance is maintained.

Details of the techniques used should be recorded and agreed with all parties.

Notes: Not all test products may be appropriate for the purpose.

The frequency and method of maintenance should be clearly documented for each installation and determined by a risk assessment that should include consideration of at least the following:

1 Equipment installed in dirty conditions will need to be checked more thoroughly and at more frequent intervals than that in clean and dry situations.
2 The class of the system.
3 Value or extent of the risk.
4 Detector technology employed.
5 Manufacturer's recommendations.
6 Practicalities of performing maintenance/testing of sampling points.

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Beam detectors

Criticality: Red **Frequency:** 12M **Skill Set:** Specialist

25 continued

Action: Check condition, check exterior and clean.

Check condition of connections and make good if necessary.

Check and monitor the sensing device and where appropriate the sampling system for cleanliness and possible obstructions according to the manufacturer's instructions.

WARNING

Ionisation detectors emit radiation, refer to manufacturer. Certain devices such as ionisation detectors have no serviceable components and should not be exposed as a radioactive risk may occur. Always refer to manufacturer's instructions and follow all recommended safety procedures.

Test for correct response and operation. Refer to manufacturer's instructions (where appropriate) for recommended testing procedures.
NB: Some types of sensor have a finite life cycle and need to be replaced at intervals specified by the manufacturer.

Check condition of the device and clean as necessary.
NB: this frequency will be dependent upon environmental conditions and may be subject to additional service inspections.

Notes: Frequency will depend upon environmental conditions and should be agreed with the client.

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Carbon monoxide fire detectors

Criticality: Red **Frequency:** 12M **Skill Set:** Specialist

Action: Carbon monoxide fire detectors should be functionally tested by a method that confirms that carbon monoxide can enter the detector chamber and produce a fire alarm signal (e.g. by use of apparatus that generates carbon monoxide or a gas that has a similar effect on the electro-chemical cell as carbon monoxide).

Notes: It should be ensured that any test gas used does not cause damage to or affect the subsequent performance of the detector. The manufacturer's guidance on suitable test gases should be followed.

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Flame detectors

Criticality: Red **Frequency:** 12M **Skill Set:** Specialist

Action: Flame detectors should be functionally tested by a method that confirms that the detector will respond to a suitable frequency of radiation and produce a fire alarm signal. The guidance of the manufacturer on testing of detectors should be followed.

Notes:

28

Analogue values

Criticality: Red **Frequency:** 12M **Skill Set:** Specialist

Action: In fire detection systems that enable analogue values to be determined at the control and indicating equipment, it should be confirmed that each analogue value is within the range specified by the manufacturer.

Notes:

29

Sensors

Criticality: Red **Frequency:** 12M **Skill Set:** Specialist

Action: Check exterior and clean.

Notes: Check and monitor according to manufacturer's instructions.
For more information refer to SFG series 50.

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Multi-sensor detectors

Criticality: Red **Frequency:** 12M **Skill Set:** Specialist

30 continued	**Action:** Multi-sensor detectors should be operated by a method that confirms that products of combustion in the vicinity of the detector can reach the sensors and that a fire signal can be produced as appropriate. **Notes:** The guidance of the manufacturer on the manner in which the detector can be functionally tested effectively should be followed.
31	**Visual devices** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** All fire alarm devices should be checked for correct operation. It should be confirmed that visual fire alarm devices are not obstructed from view and that their lenses are clean. This includes Emergency Do Not Enter (EDNE) signs. **Notes:**
32	**Filament lamps** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** All unmonitored permanently illuminated filament lamp indicators at control and indicating equipment should be replaced. **Notes:**
33	**Radio signal** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** Radio signal strengths in radio-linked systems should be checked for adequacy. **Notes:**
34	**Cables and Connections** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** A visual inspection should be made to confirm that all readily accessible cable fixings are secure and undamaged. Check condition of all connections and make good if necessary. **Notes:**
35	**Cause and effect** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** The cause and effect programme should be confirmed as being correct. **Notes:**
36	**Stand-by power** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** The stand-by power supply capacity should be checked to establish it remains suitable for continued service. **Notes:**
37	**Shutters** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** Operation - Check and ensure action responds to appropriate signals. Indicator lights - Check operation and replace any faulty lamps. **Notes:**
38	**Drop fire curtains** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist

38 continued	**Action:** Condition – Check for mechanical damage. Operation - Check operation and control mechanisms. **Notes:** For more information refer to SFG series 52. You must refer to the site specific Fire Strategy/Cause and Effect document(s) BEFORE making any adjustments to the operation of smoke curtains, time delays, drop heights or drop stages.
39	**Magnetic door latches** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** Condition – Check for mechanical damage. Operation - Check operation and control mechanisms. **Notes:** For more information refer to SFG series 52.
40	**Smoke relief vents** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** Condition – Check for mechanical damage. Operation - Check operation and control mechanisms **Notes:** For more information refer to SFG series 52.
41	**Interlocks** **Criticality:** Red **Frequency:** 12M **Skill Set:** Specialist **Action:** Condition – Check for mechanical damage. Operation - Check operation and control mechanisms. **Notes:** Interlocks will be with heating, ventilating and cooling equipment and with fire extinguishing and other systems i.e. Smoke Curtains (SFG 52-04).

Legislation, Regulations and Guidance
http://shop.bsigroup.com/ProductDetail?pid=000000000030337834 BS 5839-1:2017 Fire detection and fire alarm systems for buildings. Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises
http://shop.bsigroup.com/ProductDetail?pid=000000000030370704 BS 5839-6:2019 Fire detection and fire alarm systems for buildings. Code of practice for the design, installation, commissioning and maintenance of fire detection and fire alarm systems in domestic premises
http://shop.bsigroup.com/ProductDetail?pid=000000000030351309 BS 9991:2015 Fire safety in the design, management and use of residential buildings Code of Practice
http://shop.bsigroup.com/ProductDetail?pid=000000000030357099 BS 9999:2017 Fire safety in the design, management and use of buildings. Code of practice
http://www.legislation.gov.uk/nisr/2012/192/contents/made Building Regulations (Northern Ireland) 2012 (Part E)
http://www.gov.uk/government/publications/fire-safety-approved-document-b Building Regulations 2010 Approved Document B: Fire Safety, Volume 1 and Volume 2 plus amendments
http://www.gov.scot/policies/building-standards/monitoring-improving-building-regulations/ Building Standards (Scotland) Regulations
http://shop.bsigroup.com/ProductDetail?pid=000000000030011142 DD CEN/TS 54-14:2004 Fire detection and fire alarm systems. Guidelines for planning, design, installation, commissioning, use and maintenance
http://www.legislation.gov.uk/asp/2005/5/contents Fire (Scotland) Act 2005
http://www.legislation.gov.uk/nisi/2006/1254/contents Fire And Rescue Services (Northern Ireland) Order 2006

http://www.legislation.gov.uk/ssi/2006/456/contents/made Fire Safety (Scotland) Regulations 2006
http://www.legislation.gov.uk/nisr/2010/325/contents/made Fire Safety Regulations (Northern Ireland) 2010
http://www.legislation.gov.uk/uksi/2005/1541/contents/made Regulatory Reform (Fire Safety) Order 2005