

BS 5839 2002

A SUMMARY

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BS 5839 2002 - A Summary

Introduction

This document is a précis of the recommendations in the Standard. When first mentioned, principle and interesting changes from BS5839 1988 are indicated in italics, from p18 onwards it is best regarded as all new. The Standard itself is split into commentary and recommendations. The commentary provides an invaluable insight into the recommendations. When considering the recommendations it is necessary to remember that it is a code of practice. In the words of the Standards' principle author C.S.Todd "It is meant for the guidance of wise men and the blind obedience of fools".

This précis is aimed at people with a working knowledge of fire alarms and is not intended to be exhaustive or a substitute for reading the original text.

Need for a fire alarm

A complicated subject but in practice all but very small relatively open plan buildings where fire will be quickly spotted by occupants will need one. Domestic dwellings are covered by part 6 of the standard.

Categories of system

The Standard substitutes the word categories for the previous term levels. The substantive change is the addition of categories L4 and L5. Categories are split into L systems, where the prime aim is life saving and P systems, where the prime aim is the protection of property. M or manual systems consist of manual call points with no automatic detection. M systems are aimed at life protection rather than property. In practice all categories will include manual call points. The only exception would be remote unmanned buildings that require automatic detection only.

Categories

Life Protection	Property Protection	Means of detection
M	-	Manual call points only
L1	P1/M	M + detection throughout risk
L2	P2/M	M + L3 + detectors in areas of high risk
L3	P2/M	M + detection on escape routes and rooms off escape routes
L4	<i>P2/M</i>	<i>M + detection on escape routes and circulation areas</i>
L5	<i>P2/M</i>	<i>M + detection in high risk areas only</i>

Selection of categories

Choice is determined by many factors such as life and business risk, legal requirements, insurers requirements, etc, between the parties to the decision. Annex A of the Standard illustrates the typical range of current custom and practice. This is summarised below.

Type of Premises	Lower Risk End	Higher Risk End	Comments
Most places of work, offices, shops, warehouse, factories, restaurants	M or P/2M	P1/M	M normally meets legal requirements. Detection added to meet insurers and business interruption risk.
Hotels and Hostels	L2	L1	In sleeping areas L3 is the base recommendation level. In practice this becomes at least L2.
Pubs	M	L2	Pubs with no residential accommodation M. Pubs with residential accommodation L3/L2.
Schools	M	M/P2/L4	Normally based on fire risk assessment particularly arson risk. Detection also often added if in partial use for community activities.
Hospitals	L1	L1	Minor variations as per HTM1982
Places of assembly, eg entertainment	M	L1	Accommodation under 300 normally M. Larger premises L4 to L1. Large premises are usually L1.
Transportation terminals	M/L5	M/L5	
Covered shopping centres	L3	L1	
Residential care homes	L3	L1	L1 for large premises
Prisons	M	L5	
Phased evacuation buildings	L3	L3	
Buildings with means of escape difficulties	M/L5	M/L4	Extra risk to life posed by such things as inner rooms, unoccupied spaces, cross building risks, use of automatic door holders etc.
Insurer requirements	M/P2	M/P1	

Variations from code of practice

The term variations is used rather than deviations as this is a recommendation document based on good practice. Examples are given where search distances, sound levels, zone sizes, etc, might be relaxed on the advice of an expert. The variations are to be listed on the system certification. Variations should be clear to all approving parties and agreed between the parties.

Design Considerations

At design stage the system category and detection means should be clearly stated. Where the system coverage is specific as in P2 the areas being covered should be detailed.

In category L3 all rooms off escape routes should have detection. If a corridor is less than 4metres long the room detection can be omitted providing the corridor and any connections to the rest of the escape route is of fire resisting construction.

Room off detectors can be heat, smoke or combustion gas detectors.

In L1 and P1 systems the following areas need not be covered if they are of low risk:

- Toilets, shower rooms and bathrooms

- Stairway and toilet lobbies

- Voids under 800mm depth

- Cupboards under 1m square.

- Risers with fire resisting floors and ceilings can be considered cupboards.

Actuation of other fire protection systems or safety facilities

Covers activities such as closing down boilers, shutting doors, opening vents, etc, should comply to BS7273 or if not the requirements should be identified at design stage.

If fire testing could have undesirable effects on the linked systems then a disablement facility should be provided. BSEN 54-2 applies.

Other than for indicators, the linked systems should not draw power from the fire panel. Therefore do not power Magnetic door holders from the panel.

Systems in explosive gas and dust atmospheres

Systems or parts of systems in or passing through areas of explosive gas should comply to BSEN 60079-14 and explosive dust BS EN 50281-1-2.

System Components

Should conform to the relevant standard currently;

Manual Call Points	BS EN 54-11 for type A single action
Point Heat Detectors	BS EN 54-5 class A1 or A2
Point Heat above 40C	BS EN 54-5 class B-G
Point Smoke Detectors	BS EN 54-7
Flame Detectors	BS EN 54-10
Beam Detectors	BS EN 54-12
Carbon Monoxide detectors	No standard see below
Sounders and Bells	BS EN 54-3
Power Supplies	BS EN 54-4
Cables	BS 5839 2002 Clause 26
PC's	No standard see below
Panels etc	BS EN 54-2

As there is no relevant Standard for Carbon Monoxide detectors, users should seek manufacturer's assurance backed by third party attestation . In commentary the point is made that the user should be made aware at the outset of the 'through life cost' of ownership because of the need to change the sensing element. Equally the point is made that as they are more sensitive than heat detectors and less prone to false alarms than smoke detectors, they can be useful particularly as room detectors. Equally, Multisensors can achieve the same objective. It is a recommendation that in L1 systems only smoke detectors should be used as corridor detectors.

If a PC is used as a user interface it should be considered as a supplementary interface. A control and indicating equipment conforming to BS EN 54-2 should be fitted adjacent to it.

Radio pagers and Transmitters should comply to the relevant British Standard.

Circuit Monitoring

Within 100 seconds, panels should indicate; a short circuit, open circuit, removal of a detector, separate power supply circuit fault, rupture of fuse or other protective device, repeater/mimic circuit wiring fault, wiring link fault to remote station communicating equipment or voice system.

Panels should indicate within - 30 mins: mains failure to any part of the system

- 15 mins: failure of stand by power supply
- 30 mins: failure of battery charger
- 30 mins: out of standard battery voltages

Tactile fire alarm devices for people with impaired hearing should be monitored.

System Integrity

A fault on one circuit should not affect any other circuits.

A fault causing a cross connection between two circuits should not affect any other circuits.

A single fault on a detection circuit should not disable an area of

- more than 2000m sq.
- *more than one floor plus five devices on the floor above and five on the floor below.*

Two simultaneous faults on a detection circuit should not disable more than 10000m.

Where detectors are designed to be removed from their base for the purpose of routine maintenance of the system:

a) Removal of the detectors should not effect the operation of any call point regardless of whether locking devices are used to secure the detectors within their base.

b) If malicious removal of detectors is thought likely then a locking device should be used and planned for at design stage.

Disabling should be limited to one zone and not prevent the evacuation of the risk.

Removal of a call point or detector should have no affect on the sounder system, other than on a sounder that shares the same fixing.

Fire alarm devices should be capable of removal only with a special tool.

A single circuit failure should not stop all the sounders in a building and one sounder should be located in the vicinity of the panel. A drawing is used to illustrate that when loop sounders are used, a loop should be wired: panel-sounder-short circuit isolator. This assumes that a short circuit isolator is present at each end of the loop in the panel, which is normal. There need be only one adjacent sounder positioned either on the outgoing or incoming loop.

In commentary the point is made that due to the improvements in alarm line monitoring the interleaving of alarm circuits could reduce safety as the circuits are likely to be adjacent and could suffer simultaneous damage. The suggestion is to keep the lines separate whilst trying to get sound throughout the building, eg alternate floors and stairways on different circuits.

Two sounder circuits should be present in each compartmented space in buildings that accommodate the public in large numbers. That is

- Areas greater than 4000 m sq
- Or designed to accommodate more than 500

This recommendation is not intended to apply to small cellular or non- public areas.

If powered from a separate power supply the supply link to the panel should be duplicated.

Detection Zones

Call points in a stairwell should take the zone of adjacent accommodation on that floor.

If the total floor area of a building exceeds 300m sq each floor should be a zone.
If the total floor area of a building is less than 300m a zone may cover more than one storey.
Floor or ceiling voids in a zone may be included in that zone providing they are in one fire compartment.

Call point only zones

A single uncompartimentalised zone eg a warehouse with only call points may be up to 10,000m². If compartimentalised, maximum 2,000m².

Zones with conventional detectors

Maximum floor area 2000 sq m

Search distance should not exceed 60m. This is the worst case travel distance from any likely entrance to be aware of the seat of the fire.

Automatic detectors in a stairwell or other flue like structure should be on a separate zone.

Zones with addressable detectors

Zonal indication still required at panel in addition to addressable text.

Search distance 60m above does not apply providing the information provided at the panel would enable a person unfamiliar with the site to proceed to the source of the alarm.

Remote indicators should be clearly labelled as to their function and sited/labelled to assist the location of the detector they serve.

Alarm Zones

Alarm zone boundaries should be of fire resisting structure or outside walls.
The alarm sounds should be common throughout the risk.

Where there are more complex evacuation plans the cause and effect should be agreed with the fire authorities.

One alarm zone may contain a number of detection zones.

The boundaries of alarm and detection zones should coincide.

Care should be taken to avoid overlap of sound from one alarm zone to another.

Communication with the Fire Service

A telephone call from an occupied building via the emergency call system is the preferred method. Noise levels in the area from which the call is made should not interfere with the call.

Automatic direct calls to the Fire Brigade should not be used.

The need for an automatic call system to a central station should form part of the initial risk assessment.

If a P category is designated then there should be an automatic link unless the risk is 24 hour manned.

The automatic receiving centre should comply to BS5979.

The on site link to the communication equipment should be routed through areas of low risk and protected with detectors. The cables should be fire resistant. The link should also be monitored.

Automatic transmission should not be effected by the silencing of the alarms.

Audible Alarm Signals

General sound pressure level 65dBa or 5dBa above ambient.

Sounds unlikely to persist for more than 30 secs may be ignored.

Noise made by running water in bathrooms may be ignored.

65dBa may be reduced to 60dBa in stairways, enclosures of not more than 60m sq eg cellular offices, points of limited extent.

75dBa is considered necessary to rouse people from sleep. In practice this means a sounder in each bedroom.

120dBa is the maximum allowed at a particular point.

These figures are arbitrary and deemed to be appropriate.

One can ignore readings within 500mm of a partition or wall

An instrument complying to BS EN 60651 set to slow response and A weighting should be used to measure sound pressure.

If with the background sound present the sound meter rises by 6dBa then the 5dBa above ambient can be adjudged to have been met.

Frequency of sounders should lay between 500 and 1000Hz.

Fire sounders should be distinctive and all have the same sound ie no mixing of bells and sounders.

If music is being played at over 80dBa the system should automatically mute the music.

In noisy factory areas, primary sounders that meet the Standards' requirement when the machines are silent may be fitted, providing that they are supplemented by mains sounders on the same feed as the machines.

It may be that on large sites with multiple buildings, external sounders or strobes labelled "fire alarms" could be useful to the fire authorities.

A silence alarms facility should be available at the panel.

Alarm sounders will not normally silence automatically. Exceptions:

- *external sounders should silence after 30 mins unless site continuously manned*
- Radio sounders may silence after 30 mins
- Alert signals may be silenced

The minimum number of sounders on a system is two.
Other than for school class change the sounders should not be used for other purposes, unless the response required is the same as fire, eg bomb alert.

In hospitals and care homes HTM82 applies.

Appendix B of the standard details typical sound levels by building type

Visual Alarm Signals

Use if sound levels exceed 90DbA or hearing defenders are used.
Should be readily visible, but not cause glare, in all areas in normal ambient light.
Flash range 30-130 per minute.
Should be clearly distinguishable as fire therefore are normally red.
Minimum fixing height 2.1 metres.

Fire Warning For People With Impaired Hearing

Section 18 of the standard provides 13 recommendations on the subject and discusses the options. For the profoundly deaf a portable appliance such as tactile pagers are likely to be the best solution. The objective of the recommendations is that such devices need to be monitored to be sure they will work in an emergency. In the commentary the following point is made, "many people with severe impairment of hearing have sufficiently clear perception of some types of audible alarm signals to require no special warning of fires". The point is also made that people can be designated to provide the necessary warning. The practical problem arises when people are in isolated locations or move around a building.

Staged Fire Alarms

Such approaches require early consultation with the relevant authorities.
If the evacuation route stairway is insufficient to handle a simultaneous evacuation no single control should cause an evacuation.

Staff Alarms

If staff alarms are used there must always be sufficient trained staff available. Normally this response would not be used for a call point, only for a detector. If it is applied to the operation of a call point the person activating the call point should be in no doubt as to the success of the operation. Visual alarms should comply to the relevant section above. An override evacuation capability should be available at the panel.

Alert signals

Alert signals should be intermittent 0.5 to 1.5 secs on 0.5 to 1.5 secs off.
Alert signals should be synchronised.
Manual provision for override to evacuate should be made.
Provision for alert signals to cease after 30 secs may be made providing they resound for 10 secs a minimum of every three minutes until manually silenced.

Manual Call Points

All identical, operation by breaking/displacing a frangible element and complying to BS EN 54-11.

Time from activation to evacuation signal should not exceed 3 secs. BE EN54-2 allows 10 secs and this is allowable subject to agreement with the enforcing authority but should be stated as a variation on the completion certification.

Should be located on escape routes, at all storey exits and at all exits to open air whether or not they are designated as fire exits.

If phased evacuation is used, call points must be located within the accommodation and at each designated exit from an alarm zone.

Normally may be in stairwell or on accommodation side.

Max distance to a call point 45m travel by normal route. At design stage if layout unknown use 30m straight line.

In environments with a risk of rapid fire spread or where the person likely to operate the call point has limited mobility reduce distances to 25m and 16m.

High risk activities, eg kitchens or spray booths, should have call points nearby.

Normal mounting height 1.4m plus or minus 200mm. May be lower for wheelchair users.

Should be located in well lit areas against a contrasting background and where they need to be viewed from the side eg corridors should protrude 15mm.

If covers are used to limit accidental or malicious operation then this should be agreed with the authorities and recorded as a variation.

In public car parks emergency voice communication complying to BS 5839-9 may be used subject to approval by the authorities.

Types of fire detectors and their application

Five pages of the standard are given over to commentary on this subject which should be fully understood by anyone designing fire alarm systems.

The detector chosen should provide adequate protection whilst minimising the risk of false alarms. In cases of doubts there should be consultation between the parties.

Heat Detectors

May be used anywhere except:

- In P systems where a small smouldering fire may result in unacceptable loss.
- On escape routes in L systems, but they may be used in rooms off escape routes.
- Where smoke could be a threat to the occupants escape before a heat detector would activate. A heat is normally suitable for a bedroom because the fire can be expected to awaken the occupant.

Smoke Detectors

May be used anywhere except:

- Where the principle hazard is flammable gases or liquids.

- Where there is a high risk of false alarms. Alternative strategies need to be evolved such as other detector types e.g. multi sensors, quick response, alarm filtering etc

Optical detectors should normally be used in corridors stairways etc.

Generally Optical detectors are less prone to false alarms than ionisation detectors but the choice of detector can significantly reduce the risk of false alarms. For example Ionisation detectors are less sensitive to cigarette smoke.

Ionisation detectors are not as good as other detectors for sensing smouldering fires for which optical, beam, carbon monoxide or multi-sensors are preferred.

Ionisation, multi-sensors, sensitive heat detectors or flame detectors are preferred to optical for sensing flaming fires.

Carbon monoxide detectors can be used wherever a heat detector can; in L3 and L4 category corridors, in conjunction with optical detectors or where there is test evidence to prove they offer adequate protection. The exception is in areas where rapid flaming fires are likely, then Carbon monoxide detectors are not suitable.

Video Smoke detection should be capable of detecting smoke reliably in the absence of mains supplies or any lighting provided to aid smoke detection.

Flame detectors must have a clear line of sight of the fire.

Spacing and Siting of Fire Detectors

Where and when to use detection depends on the category of design chosen. Which detector to select depends on the risk. The following recommendations clarify the position on voids and stairways.

In enclosed stairways on each principle landing

In any flue like structure, open stairways, lifts, hoists, etc, at the top of the structure and within 1.5m of the penetration on each floor.

Any horizontal void over 800mm. Consideration to omission of these detectors might be given if the void is very low risk. Such omissions should be agreed and recorded as a variation.

In lantern lights over 800mm in depth or if used as ventilation

Spacing

Smoke Detectors under a flat ceiling 7.5m.

Heat Detectors under a flat ceiling 5.3m

In corridors under 2m wide the spacing between detectors is 15m and 10.6m respectively but still 7.5m and 5.3m to the end wall.

On pitched roofs with detectors at or near the apex distances increase by 1% for each degree of slope to a maximum of 25%.

On apex roofs detectors should be sited in or near the apex (within 600mm of the apex).

Apex roofs can be treated as flat if the height drop is less than 600mm smoke detectors and 150mm heat detectors.

The sensitive element of detectors should be located:
Smokes 25mm - 600mm below the ceiling
Heats 25mm - 150mm below the ceiling

Within rooms off escape routes in category L3 systems detectors should be sited on ceilings as above or on a wall that opens on to the escape route. Wall mounted detectors should be mounted with the top of the sensitive element between 150mm and 300mm below the ceiling and the bottom of the sensing element above the door opening. If a sprinkler system initiates the fire alarm upon flow of water then for this room purpose a sprinkler head can be regarded as an automatic fire detector.

Other than in the above, detectors should not be located within 500mm of a wall or obstruction eg ductwork or beam of over 250mm depth. In areas under 1m in width, locate in the middle. If the obstruction is less than 250mm such as a light fitting then do not fit within twice the depth of the obstruction.

If a partition or storage rack reaches within 300mm of the ceiling treat as a wall.

If a ceiling obstruction is greater than 10% of the height of the room treat as a wall

In unventilated voids detectors should be located in the top 10% or 125mm whichever is the greater.

The standard provides tables and guidance on the location and spacing of detectors on and in cellular (honeycombed ceilings) and in beamed ceiling .See standard.

Detectors above a perforated ceiling may be used to protect the area below if:

- *The perforations are substantially uniform and make up more than 40% of the area of the ceiling*
- *Each perforation has a minimum dimension of over 10mm.*
- *The thickness of the ceiling is not more than three times the minimum dimension of the perforation*

If not the area above the ceiling is a void.

Detectors should not be mounted within 1m of air inlets or forced ventilation and the ceiling should not be perforated for a distance of more than 600mm around the detector.

A clear space of 500mm should be maintained below each detector.

Carbon monoxide detectors should be sited as per smoke detectors.

Beam detectors follow generally the guidance on point smoke detectors. They should be sited so that no point to the side of the beam in the area covered is more than 7.5m from the beam and there should be 0.5m clearance in all directions around the beam. *Special rules apply to the coverage in high atria when two levels of beams are used.* See standard. The minimum fixing height for a beam is 2.7m above floor level. Always locate on solid constructions not subject to movement. The area covered should not exceed the rules on zone sizes.

Line heat detectors generally follow the guidance on point heat detectors. Except where they are installed to protect a particular cable or piece of plant, in these instances they should be installed as close as possible to the item they are protecting.

Generally aspirating smoke detector sampling points follow the guidance on point smoke detectors.

Flame detectors always need line of site to a specified risk and spacing should be as advised by the manufacturers.

Limits on ceiling heights

Normal

Detector type	General max ceiling Ht metres	10% of ceiling no greater than metres
Heat Class A	9.0	10.5
Heat Other	7.5	10.5
Smoke Detectors	10.5	12.5
Carbon Monoxide	10.5	12.5
Beam Detectors	25.0	25.0

Category P systems with 5 mins fire service attendance private or public

Detector type	General max ceiling Ht metres	10% of ceiling no greater than metres
Heat Class A	13.5	15.0
Heat Other	12.0	15.0
Smoke Detectors	15.0	18.0
Carbon Monoxide	15.0	18.0
Beam Detectors	40.0	40.0

Duct detectors should be fitted on straight sections at least three times the ducts width from the nearest bend or inlet. Normally the length of the probe should be at least two thirds the width of the duct. Always seek manufacturers guidance.

Control and Indicating Equipment

Location

Ideally locate at entrance in an easy to access and view location with low ambient noise unless there is a permanently manned control room. In non 24 hour buildings it is desirable that the panel or the information on the area in fire can be viewed from the outside.

The area in which the panel is located should be covered by automatic detection unless it is in a very low risk area or permanently manned area.

In multiple occupancy premises it should be in the communal or most generally occupied part.

Primary Indication

The primary indication of area in fire should be a zone and this should be an LED. This can be a numbered matrix or illuminated mimic. A VDU could be used for this purpose but it must be able to show all zones without manual intervention and there must be a back up VDU or printer.

A plan should be provided either in the form above or as a diagram showing, as a minimum the entrances and zoning.

Networked Systems

In networked systems a communications fault between sub panels should not affect the operation of a sub panel and the network links should be monitored.

Standard fire cables can be used for network cables providing that:

- *The network is a loop.*
- *There is diverse routing of the cables.*
- *A single short or open circuit will not cause loss of communications to a sub panel.*

The evacuate signal in the zone of origin upon activation of a call point shall not exceed 3 secs and in all others no more than 10 secs.

Power Supplies

Mains

As a note it is pointed out that this is an integral part of the fire alarm system and should be regarded as such for certification irrespective of who is responsible for its installation.

Should be supplied by a dedicated circuit via an isolating device from the load ("dead side") of the main isolating device for the building. It should be derived from a point near the main isolating device for the building. A means of isolation of the fire alarm during routine maintenance should be provided. The number of isolating points from incoming mains to fire alarm should be minimised. If, due to site conditions, power has to be derived from a local distribution board, this should be agreed between the parties and means sort of minimising isolation points and inadvertent disruption to supply during electrical supply maintenance.

A protective device that serves only the fire alarm and has no switch should be labelled "FIRE ALARM"

A switch that serves only the fire alarm "FIRE ALARM DO NOT SWITCH OFF"

If a switch controls supply to both fire alarm and other circuits "WARNING THIS SWITCH ALSO CONTROLS THE SUPPLY TO THE FIRE ALARM"

Labels should be clear and fade resistant

All switches should be protected from unauthorised use

A residual current device should not be used for fire alarm unless it is necessary to comply to BS7671. Where this is necessary for safety reasons a fault elsewhere in the building should not be capable of isolating the fire alarm.

The mains supply should in isolation be able to supply the maximum load of the system irrespective of the state of the secondary supply.

Power supplies

Transition between supplies to have no effect on system operation. Failure of a single protective device should not affect both supplies. The presence of the supplies normal and standby should be clearly indicated at the panel. Normal and standby supplies should be capable of supplying the systems full alarm load independently.

Standby Supplies

Comprises of a rechargeable battery and automatic charger. The battery should have an expected life of 4 years. Car batteries are not to be used. The batteries should be labelled with their date of installation. Battery should charge up from its final voltage in 24Hrs.

For category M and L systems the battery should be able to support the system for 24hrs and then ring the bells for half an hour. If a back up generator is used the battery should be able to support the system for 6hrs and then ring the bells for half an hour.

For category P the 24 hrs plus half an hour ring applies a) providing the building is manned so that staff would be aware in 6 hours of mains failure or b) Power failures are automatically notified to a remote station and hence to the key holder.

For category P the battery should support the system for 24 hrs longer than the building is unoccupied up to 72 hrs whichever is the less, plus half an hour ringing whatever applies. If the building is ever unoccupied for longer than the standby battery time and there is facility for remote transmission then the power fault should be remotely transmitted.

Cables and Wires

Background

All system cables including power supply cables now need to be fire resistant. The 1988 standard lumped all fire resistant cables together. Fire resistant cables are now split into two types; "Standard" which currently means soft skin cables such as Firetuff, Pirelli Gold, etc, and "Enhanced", the metal clad plastic sheathed cables MICC, etc. The choice at risk assessment/design stage is which to use and where.

Without doubt the metal clad cables are tougher and will withstand a combination of fire, water and vibration better than soft skin cables. However, they are more

expensive to buy, more difficult and expensive to install and much more likely to cause problems at commissioning and in the early months of a new system. Whilst fully accepting the demonstrable advantages of metal clad cables, the question at risk assessment is whether the real additional costs exceed the theoretical benefits.

Recommendations

All system cables including low voltage mains supply to the panel to be fire resistant. Standard fire resistant cables should be considered sufficient to meet the effects of fire with suitable jointing and support.

Enhanced cables are recommended

- Non-sprinkler buildings with more than four phases of evacuation.*
- Non-sprinkler buildings of greater than 30 metres in height.*
- Where the critical interlinking paths might be affected in unsprinklered linked buildings where occupants remain long into a fire eg hospitals. In practice this means that if one wishes to use standard cable for networks the network loop will need to be run out and back by different routes.*
- Where following risk assessment enhanced cables are deemed necessary.*

Tests for standard and enhanced cables involving a combination of fire water and vibration are detailed.

The standard cable supports shall perform in a fire as well as the cable. In practice this stops the use of plastic ties, trunking or clips where these are the sole means of support.

No external joints. Use junction boxes labelled "Fire Alarm" that have comparable fire resistance to the cables.

Standard cables below 2m height require mechanical protection unless surface clipped to strong construction in relatively benign environments eg offices shops etc.

All conductors should have a cross sectional area of at least 1mm sq.

Fire alarms should be segregated from other services in separate conduit or segregated trunking.

Any manufacturers' directions on avoiding electro-magnetic interference should be followed.

Where multicore cables are used none of the other cores should be used for other purposes.

Mains cables should be segregated from system cables outside and inside the panel. They should not enter the panel at the same point.

Fire cables should be a single common colour throughout a building to aid identification, e.g. red.

Radio Linked Systems

In the absence of UK Standards, components should comply to LPS 1257

Radio systems should comply to all the recommendations of the Standard except.

- All components to have dual power sources.
- Batteries may be used to provide normal power supply to components.
- Components shall give 30 days low battery warning at the panel.
- Components should give a 7 day fault warning at the panel
- Additionally Sounders should give a fault warning when supply falls below half an hour ring requirement.
- Components primary supplies shall have a normal operating life in excess of three years.
- Any loss of communication with a component should be indicated at the panel within 2 hours.

Antennae external to components should be fault monitored and give a fault indication in 100s.

Antennae cables that form part of the critical path should be 30 mins protected from fire or routed through low fire risk areas.

Removal of antennae should require a special tool.

A detector in fire must latch its LED for 20 mins unless reset from the panel.

Any device not transmitting a valid response in a two hour period should cause a fault at the panel.

After 30 secs of continuous interference to a transmitted signal a fault should be shown at the panel within 10 secs.

Installation should follow a comprehensive survey to show:

- There are no sources of significant radio interference.
- There is adequate signal strength between components allowing for background noise.
- There is adequate signal strength between panels allowing for background noise.
- Records of signal strength at time of survey should be kept for future reference

Survey kit should be approved by the manufacturer and kept under calibration.

Radio data should be recorded at commissioning

- System coding to avoid interference
- Signal levels and background noise at every point of the system.
- This should be carried out at every service.

Where signal levels fall outside specification, remedial action is required.

A copy of signal levels should be kept in the log book.

Where a network is employed the role of the panels should be defined by the system specification.

Electromagnetic compatibility

Systems should be designed and installed so they neither cause or are unduly affected by electromagnetic interference as per current regulations. Electromagnetic Compatibility Regs 1992 which implements EMC Directive 89/336/EEC.

- Each component must comply
- Cables must be segregated
- *Installation workmanship should comply with the recommendations of this standard. In particular MICC screens should be effective around 360 degrees of the screen. For softskin cables ensure the screen is continuous throughout the loop. An un-insulated earth within the cable is in continuous contact with the screen and is linked through the components*
- Manufacturers cable specifications should be adhered to
- Correct earthing is vital for EMC and electrical safety
- Exposure of cores outside the screen should be minimised
- If manufacturer advises the system is sensitive to multiple earths then this advice should be followed
- Cross other cables at right angles

Electrical Safety

- Design should meet BS7671.
- Earthing requirements of manufacturer should be met.
- Mains and system cables should be segregated.

For circuits with removable components and exposed parts with ELV potential, eg detectors:

- Relevant power supplies should conform to BS EN 54-4 and have safety isolating transformers conforming to BS EN 61558.
- In dry conditions detectors do not have to be locked in their bases.
- In wet areas one or more of the following should apply:
 - Circuit voltages less than 15V ripple free dc or 6V ac rms.
 - Special tool required to expose live parts.
 - Parts are positioned out of reach other than for maintenance personnel.

Section 3 Limitation of False Alarms - This is a new section

All involved; enforcing authority - insurers - designers - suppliers - installers - commissioning engineer - user, have a responsibility to ensure subject "to the overriding need for adequate protection of life or property, to act so as to minimise false alarms and to take action to remedy the situation when they become aware of circumstances that may give rise to false alarms". This includes listing such potential, where known on system certification and ensuring the user with sufficient information to limit the potential of false alarms.

The user should record for every false alarm

- date and time
- identity and location of device
- category of false alarm (if known)
- reason for false alarm (if known)
- activity in area (if the reason for the alarm is unknown)
- the person responsible for recording the information

At every service visit the rate of false alarms should be checked and recorded in the logbook by the service engineer.

- the rate in terms of number of false alarms per 100 detectors
- if any single device has given more than one false alarm since the last service visit, excluding false alarms with good intent
- if any persistent cause of false alarms can be identified

If any of the following apply at least a preliminary investigation should be undertaken on the service visit and advice issued to the customer as to appropriate action.

- false alarm rate exceeds 1 per 25 detectors per annum
- more than 10 false alarms in the last six months
- if any single device has given more than one false alarm since the last service visit, excluding false alarms with good intent.
- if any persistent cause of false alarms can be identified.

Categories of false alarms

The user should categorise the false alarm as one of the following:

Unwanted alarm: Covers the most common cause which is fire like phenomena such as burning toast or accidental damage. Accidental damage would be an unintentional activation of a call point or water in a detector.

Equipment false alarm: Covers malfunctioning of the equipment. If any doubt arises as to cause it should not be assumed it is the equipment and the cause should be recorded as unknown.

Malicious false alarm: Typically deliberate call point activation.

False alarm with good intent: Typically a call point activation in the genuine belief a fire was present.

Unknown: Cause not certain.

Acceptable rate of false alarms

The user should initiate an investigation by a specialist if:

In systems with more than 40 detectors the rate of false alarms exceeds one false alarm per 20 detectors per annum or if one particular detector or call point gives more than one false alarm in a year.

In systems with less than 40 detectors the rate of false alarms exceed 2 false alarms per year.

Causes of false alarms

Anyone involved in specifying, designing, commissioning or maintaining fire alarms should be familiar with the causes and means of avoiding false alarms of all types.

Known causes of false alarms are listed as:

- fumes and heat from cooking
- steam from bathrooms or industrial processes
- tobacco smoke
- dust
- insects
- aerosol sprays
- high air velocities
- smoke from outside a building e.g. a bonfire
- cutting welding and other hot works
- processes that produce heat or smoke
- cosmetic smoke in theatres
- incense
- candles
- electromagnetic interference
- high humidity
- water ingress
- substantial fluctuation in temperatures
- accidental damage
- testing the system without appropriate disablements or warnings
- pressure surges on water mains of interlinked sprinkler systems

These can be minimised by good design and use of appropriate equipment.

False alarms from equipment failures can be minimised by using good equipment.

Malicious false alarms can be reduced by careful consideration of the location of call points or by using devices requiring a double action.

Design processes for limiting false alarms

Formal consideration required at the design stage with a view to confirming that the frequency of false alarms is likely to be acceptable.

Any design information regarding false alarms should be recorded in the design certification.

The following are points for consideration but not rules.

Siting of call points

Avoid locations that are likely to be exposed to accidental damage, e.g. forklifts. Consider hinged protection against damage, e.g. gymnasium, or malicious activation, e.g. schools. This should be recorded as a variation and agreed.

Use waterproof call points in exposed wet areas.

In public places, shopping malls, theatres, pubs, etc. Consider locating call points in staff only areas. Subject to agreement by all and there being adequate surveillance by staff or CCTV.

Consider using emergency voice communication in car parks.

Siting of automatic smoke detectors

If the risk of false alarms is high, are smoke detectors necessary to meet the objectives of the system?

Heat detectors give fewer false alarms; will they meet the objectives of the system?

Heat detectors should not be set less than 29°C above ambient and 4°C above expected short-term maximum temperature.

Avoid rate of rise heat detectors where rapid temperature change can be expected e.g. kitchens, boiler rooms, loading bays by large doors.

Optical beam detectors must be properly mounted and not located where obstruction of the beams may occur in normal circumstances.

Locating point and beam smoke detectors

Area	Smoke detectors should never be installed	Smoke detectors should be avoided if possible	If smoke detectors are installed they should not be of the type indicated
Kitchens	XXX		
Close to kitchens		X	Ionisation chamber
Rooms with toasters		X	Ionisation chamber
Smoking rooms		X unless there is adequate ventilation	Optical
Bathrooms and shower rooms	XXX		
Steam is normal		X	Optical
Dusty rooms		X Regular cleaning may be necessary	Optical
Small insects (thrips)			Optical Unless suitably designed
Areas of high air velocity			Ionisation
Areas of high humidity		X	Ionisation
Vehicle or exhaust fumes present		X	Ionisation Optical beam
Close to openable windows		X	
Combustion gases present		X	

NOTE above table does not apply if:

1 Filtering methods are employed that overcome the unsuitability of the detector type

2 Timings are used to avoid periods when the environment is unsuitable

3 Multi sensing overcomes the unsuitable environmental condition

Aspirating fire detection systems can be much more sensitive than point smoke systems so special care is required to avoid unwanted alarms. If high sensitivity is not required then the sensitivity should be set at equivalent levels to point smoke detectors.

Carbon Monoxide detectors should be avoided where the gas may be present eg kitchen, laboratories, where exhaust fumes are present or where contamination of the electro – chemical cell could lead to false alarms.

Flame detectors should not be located in areas with infra red or ultra violet radiation sources.

Selection of system type

Systems with high number of detectors, over 100, should normally be analogue addressable.

Where evidence suggests that multi sensors will reduce false alarms their use should be considered.

Protection against electromagnetic forces

See recommendations on electromagnetic interference

Account should be taken of likely sources of interference.

In high force areas, e.g. radio transmitters, radar, airport terminals, etc, guidance should be sought on any special protection measures that may be required. In an existing building the information provided to the manufacturer should include field strength measures.

Performance monitoring of newly commissioned systems

Systems containing over 50 automatic fire detectors should be soak tested for a week after commissioning.

During the soak test they should not be operational and each call point should be marked out of use.

A soak test should only be regarded as successful if no false alarm is recorded or every false alarm has been investigated and remedied.

Our View: Clearly this section is good practice and is sensible particularly on very large systems, where it is proposed to make a link to a central station or where there are significant costs or difficulties with an unplanned evacuation. Interestingly we have been unable to find any evidence of a false alarm caused by a detector or call point in the first week after commissioning by our engineers in recent years. The basic technology is continuously improving and at least for us this is yesterday's problem.

Filtering measures

Filtering means varying detector sensitivity through time or delaying the operation of the alarm circuitry to allow an investigation by staff (staff alarms).

Should only be adopted:

- After consultation with relevant authorities and insurers if it is a P system
- Where the number of false alarms cannot be reduced to a level acceptable to the fire authority and user
- Where filtering does not negate the objectives of the system in terms of protection of life, property and the environment

Filtering should not be applied to manual call points.

Time related systems should be automatic

- Should not rely on human action
- Procedures should be in place to deal with British summer time, bank holidays and any unexpected vacation of the building. These procedures should be fully understood by the users
- During times when the system is less effective than normal there should be indication at the panel

See recommendations on staff alarms. The fire brigade should be summoned immediately on the end of the staff alarm period at the latest. Remote connection to a monitoring centre would aid this recommendation.

Hydraulic or electronic time delay should apply to inputs from automatic sprinkler systems.

System Management

The user should ensure building staff and contractors are aware of the measures required to minimise false alarms.

Tender documentation for contract work should place responsibility on the contractor to minimise the causes of false alarm.

If temporary works involve paint spray, dust or smoke generation precautions to avoid unwanted alarms should be taken. One management method is a permit to work system. Suitable measures include:

- Temporary change out of detectors e.g. heat for smoke
- Use of a temporary screen
- Brightly coloured detector covers
- Detection disablement

Upon completion a responsible person should be appointed to ensure proper reinstatement of the system.

Building occupants and remote receiving stations should be informed of any test proposals.

The user should ensure that building defects, e.g. leaking roofs, plant defects, e.g. steam leaks, and environmental problems such as inadequate ventilation that could cause unwanted alarms are dealt with.

False alarms should be properly recorded in the systems logbook.

Service and maintenance

Should be carried out by a competent organisation in accordance with the recommendations of section 6 of this standard

Section 4 Installation

The changes are such that it all needs reading. These sections have received a major rewrite aimed at making compliance auditable

Installers Responsibility

Installers' responsibility should be defined and documented prior to commencement of works.

Installation of line equipment should be as per the relevant section of this standard. Power supplies should comply with this standard.

Panels should be accessible for maintenance.

On completion of works the installer should issue a certificate as per model attached.

Installation practices and workmanship

This section needs to be read in conjunction with the cable and wires section starting on page 14

Conform to BS7671 and BS5839, if conflict arises BS5839 takes precedence

Cables should be securely fixed and not rely on suspended ceilings for their support

All system cables to be fire resistant as per the Standard

Joints outside equipment enclosures should be avoided where possible

Earthing should be as per manufacturers' recommendations and *care should be taken to ensure electrical continuity of electromagnetic screens including the metallic sheath of cables.*

Cables passing through an outside wall should be contained in a smooth bore non-hygroscopic sleeve sealed into the wall. The sleeve should slope downwards and be plugged with a non-hardening waterproof material.

Cables can pass through a small clearance hole; a sleeve may be used if additional mechanical protection is required.

Any sleeve used should not have sharp edges.

Sleeves passing through floors should be extended to protect the cable a minimum of 300mm.

All spaces around cables, trunking, conduit etc should be minimised and made good with fire stopping material such that the fire resistance of the construction is not materially reduced.

Where cables are installed in channels, ducts, etc, fire resisting barriers are required as they pass through floors or ceilings. If the channel duct is of an equivalent fire resistance to the construction penetrated then a fire-stopping barrier is required only where cables enter or leave the channel or duct.

Inspection and testing of wiring

Mains rated cables should receive a 500 v d.c. test. All equipment should be disconnected prior to test. *The insulation resistance between each conductor and earth should be at least 2 M ohms.*

An explanatory note points out that fire panels have earth fault sensing indication. If this sensing is set at a typical value of 1 M ohm then on large systems a test result would need to be much higher than 2 M ohms if an overall value of other 1 M ohm is to be achieved and nuisance fault indications avoided.

Earth continuity and mains supply earth fault loop impedance should be tested to ensure compliance to BS7671.

If measurement of the maximum circuit resistance is specified by the manufacturer then each circuit should be measured as part of installation. As should any other tests specified by the manufacturer. Undertaking these tests can only be passed on to the commissioning body if there is specific agreement.

All test results should be recorded and made available to the commissioning body

Section 5 Commissioning and handover

The changes are such that it all needs reading. These sections have received a major rewrite aimed at making compliance auditable.

Applies to new systems and modifications to existing systems

Commissioning should be carried out by a competent person who has access to the systems specification and any other relevant documentation and drawings.

The entire system should be inspected and tested to ensure it operates satisfactorily.

In particular:

- All call-points and detectors
- All labelling as specified has been carried out
- All devices indicate in the correct zone and give the correct text output
- Reflective beam detectors testing should include checking that the potential of reflections has been minimised
- Adequate sound levels are achieved throughout the risk. In the case of voice alarms that they are also intelligible throughout the building
- Any remote transmission path is working
- Any designer required cause and effect are met
- *All alarm and control equipment and their accessories operate correctly and are adequately labelled*
- No changes to the building since the original design have compromised compliance to BS5839
- Siting of all system equipment complies too standard
- *A suitable zone plan is displayed*
- Mains power supplies are inspected as far as is reasonably practical to ensure compliance
- Standby power supplies comply to standard and systems actual load are close to the predictions used by the designer to determine the specified battery requirements
- As far as is reasonable check that correct cable types have been used and the workmanship complies to standard
- Check for false alarm potential as per the relevant section of the Standard
- *Check for and document obvious non-compliance to the category eg L1 of the Standard specified*
- Radio strengths are adequate to ensure reliable system operation
- *Adequate records of the electrical tests exist, see installation section. If these tests have not been carried out then they should be*
- All relevant documentation has been provided to the user/purchaser
- *Labels indicating the date of installation should be attached to the batteries*
- A commissioning certificate, in line with the model form, should be signed and issued

Acceptance

A purchasing specification should detail acceptance procedures including any tests that are to be witnessed and notice periods.

The purchaser's representative should ensure:

- Installation work appears satisfactory
- The system can provide a fire alarm signal
- That any remote transmission link works
- The following documentation has been provided
 - as fitted drawings
 - operating and maintenance instructions
 - design, installation and commissioning certificates
 - a log book
- Sufficient of the users staff have received adequate instruction on system operation. At a minimum this is all means of triggering a fire signal, system silencing, system reset and avoidance of false alarms
- A nominated responsible person has been appointed and advised of their responsibilities and how they might be discharged

The purchaser or his representative should sign an acceptance certificate.

Verification

If the purchaser considers there is, due to division of responsibilities, questions around compliance to these standards then verification should be arranged.

The verifier should be competent with the design of fire alarm systems in accordance with BS5839 and familiar with installation practices.

The scope of work should be agreed by the parties.

On completion a certificate should be issued covering compliance to standard, variations from standard.

Section 6 Maintenance

Weekly test by user

Each week a call point should be operated. It should be confirmed that the system operated correctly. The central station should be informed, if applicable. If any items need to be isolated, this should be carried out before the test.

The test should be carried out at approximately the same time each week and staff should be asked to report any poor audibility.

If some employees do not work at the time of the test then additional tests should be carried out for these employees at least once a month.

A different call point should be operated each week. The identity of the call point tested should be recorded in the log book. Thus each of the call points are tested in rotation.

The sounder activation should not last more than one minute.

Voice alarm systems should be tested in accordance with BS5839-8

Radio systems should be tested according to manufacturers' guidance.

User monthly test

The person carrying out these tests should be technically competent, trained and able to carry out the works safely.

If the standby power supply is an automatically started generator it should be tested by simulation of the primary power supply for a minimum of one hour. All fuel oil and coolants should be checked and topped up at the end of the test.

If vented batteries are used they should be checked to see that they are in good condition and connected securely. The electrolytic level should be topped up as necessary.

Inspection and servicing

Quarterly vented batteries should be tested by someone competent in battery installation and maintenance.

Remote automatic monitoring can be used if it meets the same objectives as the testing detailed below.

Periodic inspection

The works should be carried out by a competent person defined in the commentary as a person with specialist knowledge of fire detection and alarm systems, including knowledge of the causes of false alarms, sufficient information on the system, and adequate access to spares.

The time between inspections should be based on risk assessment but should not exceed six months. The time between inspections should be agreed between the parties. If this recommendation is not followed the system should be considered as no longer compliant to BS5839.

Actions on service visit

Inspect logbook and ensure any faults have received adequate attention. Make a visual inspection of site to see if any changes have affected compliance to standard.

Particular items to check are:

- Call points clear and unobstructed
- Any new exit has an adjacent manual call point
- Any new partition is not within 500mm of a detector
- Any storage encroaching within 300mm of a ceiling
- A clear space of 500mm exists below each detector and its function has not been impeded by other means
- Any changes in occupancy rendering the form of detection unsuitable or prone to false alarms
- Any building alterations requiring additional fire equipment

Check the record, rate and action taken in regard to false alarms.

Disconnect the batteries and simulate a full alarm load.

Batteries and their connections should be examined to check that they are in good condition; they should be momentarily tested with mains disconnected.

At least one device on each circuit should be tested for correct system operation of the control equipment and the identity of the device tested recorded in the logbook. The operation of fire alarm devices should be checked.

All control and visual indications should be checked for correct operation.

The operation of any automatic remote signal should be checked; both fire and fault if they are both monitored.

All ancillary functions at the control and indicating equipment should be checked

All fault indications and their circuits should be checked, where practicable by simulation of the fault.

All printers should be checked and the related consumables checked to ensure they are sufficient in quantity and condition to last to the next service visit.

Radio systems should be checked as advised by the manufacturers.

All further checks recommended by the manufacturers of the equipment should be carried out.

On completion, outstanding defects should be reported to a responsible person, the systems logbook completed and a service certificate issued.

Annual tests

Annual tests should be carried out in addition to the periodic tests. They could, however, be carried out during the course of the other maintenance visits.

The switch mechanism of each call point should be tested

All detectors should be examined and functionally tested. The test must prove that; they are connected to the system, they are operational and are capable of responding to the phenomena they are designed to detect.

Every heat detector should be tested unless the test would necessitate replacement/repair of the detector.

Point smoke detectors should be tested by a method that confirms that smoke can enter the chamber and produce a fire alarm signal. The testing method should not damage or affect the subsequent performance of the detector.

Beam detectors may be tested by an optical filter or smoke. Their lenses should be cleaned.

All other detector types should be functionally tested

The analogue levels of each detector should be checked and appropriate action taken

Radio signal strengths should be checked for adequacy

Cable fixings should be checked

The cause and effect programme should be confirmed as correct

Standby power supplies should be checked

Any other checks recommended by the manufacturer should be carried out

On completion, outstanding defects should be reported to a responsible person, the systems logbook should be completed and a service certificate issued.

Non-Routine Attention

Special inspection upon appointment of a new servicing organisation

On takeover a review and collation of the information available on the system should be undertaken, this information should then be made available to assist future effective servicing of the system. This includes studying the existing documentation.

Major areas of non-compliance should be identified, documented and brought to the attention of the users' responsible person. "Major" is subjective and the need for rectification should be subject to agreement between the parties. Examples of major non-compliance are:

- Inadequate number of call points
- Inadequate number of call points to meet the category of system
- Inadequate sound levels
- Non-compliant standby power supplies. Systems with no standby power supplies breach the Health and Safety Regulations 1996
- Inadequate fire resistance in the cabling
- Non compliant monitored circuits
- Inadequate standards of electrical safety
- Layout changes that may impact on the effectiveness of the system

If no logbook exists one should be provided by the service organisation.

Arrangements for repair of faults or damage

Where a third party maintains a system there should be an emergency call out agreement such that on a 24hr basis a technician can attend site within 8 hours of a call-out.

The name and telephone number of the third party should be prominently displayed at the fire panel.

All faults or damage should be recorded in the logbook.

Modifications to the system

Responsibility should lie with someone with at least a basic understanding of BS5839 design requirements and this section.

Care should be taken to ensure that the modification does not detrimentally affect compliance with fire safety legislation. Where doubt exists the fire authorities should be contacted.

The responsible person should agree in writing to the modifications and consult the fire authorities and/or the insurers as appropriate.

All circuits, components and system operations affected by the modification should be fully tested following modification. In addition, tests should be carried out to ensure that there is no adverse effect on the entire system:

- If a device(s) has been added or removed from a circuit, at least one other device on the circuit should be tested.
- If the panel has been modified, at least one device on each circuit should be tested.
- If additional load has been placed on the system, the rating of the power supply and back up batteries should be checked.
- If software has been changed, sample testing of other parts of the system should be undertaken.

On completion as-fitted drawings and system records should be updated.

A commissioning certificate should be issued for the modification, a model of which is provided.

Any person carrying out remote modifications should have access to as-fitted drawings and current system configuration. That person should be conversant with this part of BS5839.

Action for unacceptable rate of false alarms

Any investigation and subsequent modification should take into account section 3 of the standard (design). If the cause cannot be identified the recognised causes listed earlier should be formally considered.

Following modifications the system should continue to comply with this standard or at least not be more non-compliant unless agreed with all interested parties.

Relevant documentation should be put with the systems documentation.

Inspection and test following a fire

All system elements that have or could have been affected by the fire should be tested.

On completion any non-compliance should be recorded in the logbook.

Inspection and test following long periods of disconnection

A full 12 months test should be undertaken.

Section 7 Users responsibilities

A single responsible person should be appointed to supervise all matters pertaining to the fire alarm systems. They should have the authority to carry out the duties as described in the Standard and normally be the keeper of the system documentation.

Responsibilities:

The panel should be checked at least every 24 hrs for fault indications

Arrangements should be in place for testing and maintenance of the system

The logbook should be kept up to date and available for inspection

All relevant occupants should be instructed in the use of the system and how to respond to fire or fault indications

All occupants should be aware of the measures to avoid false alarms

Appropriate action should be taken to limit false alarms

A space of 500mm should be maintained around each detector

All call points should remain unobstructed

There should be a liaison with those involved in any building changes to ensure that the effects on the fire system are properly considered

System documentation should be updated, including as-fitted drawings

Six spare glasses and a call point testing tool should be kept as spares

Other spares should be agreed with the maintenance company

If a system has less than 12 call points a minimum of two spare glasses will suffice

Action in case of pre-alarms

Thoroughly inspect the area from which the alarm has arisen.

- If it is a fire follow pre agreed routine
- If no fire present record events near the suspect detector in the logbook and inform the maintenance company as appropriate

Logbook

The following should be recorded:

- *name of responsible person*
- *brief details of maintenance arrangements*
- *details of all fire alarm signals whether false or real and the device initiating the signal*
- *causes, circumstances surrounding and category for all false alarms*
- *dates times and types of all tests*
- *dates times and types of all faults and defects*
- *dates and types of all maintenance activities*