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To: All NSI Fire Gold and Fire Silver approved companies and applicants

TECHNICAL BULLETIN No: 0039

Revision of BS 5839-1

BS 5839-1:2017 has a publication date of 31 August 2017 and is available through licensed outlets including NSI who can supply copies at a discounted rate.

Implementation timescale for Applicant Companies

Applicant Companies will be audited against BS 5839-1:2017 with immediate effect and any Improvement Needs recorded against clauses of the Standard will have to be satisfactorily addressed before approval can be granted.

Implementation timescale for existing Approved Companies

Existing NSI approved companies have until 30 November 2017 to comply with the new standard. In the interim we may raise Auditor Notes for any of the requirements within the new standard that are not fully satisfied. If you do not address any Auditor Notes satisfactorily then these will be treated as Improvement Observation / Improvement Need Reports post 30 November 2017.

Note regarding the status of BS 5839-1:2017

Although issued as a code of practice by the British Standards Institution, it is important to note that compliance with the recommendations given in BS 5839-1:2017 is regarded as mandatory for all companies wishing to maintain an NSI approval; subject to any additional clarifications and guidance included within this Technical Bulletin or issued subsequently.

The recommendations given in BS5839-1:2017 must therefore be regarded as requirements in relation to NSI approval for Fire Gold and Fire Silver unless there is documentary evidence to demonstrate the client has accepted and agreed any variations against the recommendations of BS 5839-1:2017.

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Details of the changes

Where the actual wording of the standard is quoted, it is reproduced in bold text.

Where it is considered relevant to further clarify the specified requirement, additional guidance is included in italics.

We will consider alternative methods of achieving compliance with specified requirements where these can be demonstrated to be equivalent.

Foreword

BS 5839 is published by BSI Standards Limited under licence from The British Standards Institution and came into effect on 31st August 2017. It was prepared by Technical Subcommittee FSH/12/1, *Installation and servicing*, under the authority of Technical Committee FSH/12, *Fire detection and fire alarm systems*.

The Foreword clarifies that the 2017 edition **is a full revision of the Standard** and that it **supersedes BS 5839-1:2013, which is withdrawn**.

1 Scope

There have been no changes to the scope covered by BS 5839-1:2017.

2 Normative references

Normative references have been updated to include:

- **BS EN 54-21 - *Fire detection and fire alarm systems – Part 21: Alarm transmission and fault warning routing equipment.***
- **BS EN 54-29 - *Fire detection and fire alarm systems – Multi-sensor fire detectors – Point detectors using a combination of smoke and heat sensors.***
- **BS EN 54-30 - *Fire detection and fire alarm systems – Multi-sensor fire detectors – Point detectors using a combination of carbon monoxide and heat sensors.***
- **BS EN 54-31 - *Fire detection and fire alarm system – Part 31: Multi-sensor fire detectors – Point detectors using a combination of smoke, carbon monoxide and optionally heat sensors.***

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3 Terms and definitions

3.14 critical signal path
components and interconnections between every fire alarm initiation point (manual call point or automatic fire detector) and the input terminals on, or within, each fire alarm device and (where provided) transmission equipment within the premises for routing of signals to an ARC

The definition of "critical signal path" has been expanded to include transmission equipment for the routing signals to alarm receiving centres.

3.18 dual path alarm transmission system
alarm transmission system consisting of one primary alarm transmission system and one secondary alarm transmission system using diverse technology

This is a new definition not included in previous revisions of the standard.

3.63 unwanted fire alarm signal UFAS
false alarm from an automatic fire detection and fire alarm system that has been passed on to the Fire and Rescue Service

A new definition of "unwanted fire alarm signal (UFAS)" has been added, taking into account the effect on the fire and rescue service.

8 Relationship between system category and protected areas

8.2c) In Category L3 and L4 systems, smoke detectors, multi-sensor detectors conforming to the fire sensitivity requirements of BS EN 54-7 or a mixture of smoke and combustion gas detectors, should be provided in the following:

1) all escape stairways;

2) all corridors; and

3) any other areas that form part of the common escape routes.

Multi-sensor detectors are now considered as one of the detection options for Categories L3 and L4 systems and in escape routes for Category L1 systems.

11 System components

11.2a) Manual call points should conform to the requirements of BS EN 54-11 for Type A ("single action") manual call points.

NOTE 1 This part of BS 5839 recommends that a protective cover is fitted to a Type A manual call point, (see 20.2b).

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A note has been added recommending the fitting of protective covers to manual call points.

11.2h) Multi-sensor, optical and heat detectors should conform to either:

1) BS ISO 7240-15;

2) BS EN 54-29; or

3) BS EN 54-5 and BS EN 54-7.

Reference to CEA 4021 has been removed and reference to BS EN 54-29 added.

11.2i) Multi-sensor, carbon monoxide and heat detectors should conform to BS ISO 7240-8 or BS EN 54-30.

Reference to BS 54-30 added

11.2j) Multi-sensor detectors combining smoke, carbon monoxide and heat sensors should conform to BS EN 54-31.

New recommendation.

11.2k) If there is a facility in a multi-sensor detector to disable sensors leaving a single active sensor, the multi-sensor detector should also meet the performance requirements of the appropriate part of BS EN 54 relevant to that single active sensor.

New recommendation to take into account the disablement of an element(s) of a multi-sensor detector to ensure that compliance to the relevant part of BS EN 54 is maintained.

11.2l) Carbon monoxide fire detectors should conform to BS EN 54-26.

Sub-clause renumbered, existing text deleted and reference to BS 54-26 added

11.2u) Alarm transmission and fault warning routing equipment should conform to the product requirements (but not the installation requirements) specified in BS EN 54-21.

New recommendation that alarm transmission and fault warning routing equipment should conform to the requirements specified in BS EN 54-21.

Note: Sub-clauses 11.2(k) to 11.2(r) have been renumbered to 11.2(m) to 11.2(t) respectively

15 Communication with the fire and rescue service

15.2i) Any ARC to which fire alarm signals are relayed should conform to the recommendations of BS 8591 and have in place an agreement with the appropriate fire and rescue service to pass on fire signals from fire alarm systems at the monitored property.

Text updated to refer to BS 8591 which has now superseded BS 5979. Note 4 added to indicate that an ARC certificated to BS 5979 is acceptable.

Old "Note 4" is now "Note 5".

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15.2m) Power supplies for any facility used for the transmission of fire alarm signals to an ARC should conform to Clause 25.

NOTE 8 15.2m) does not apply to the mains power supplies for an intruder alarm system, to which 15.2n) applies.

New note added to indicate that mains power supplies to intruder alarm transmission systems no longer need to meet the recommendations of clause 25 except for sub-clause 25.4.

15.2n) Where fire alarm signals are routed via the routing equipment of an intruder alarm system, the standby power supplies for the routing equipment should conform to the recommendations in 25.4.

New recommendation.

15.2o) If it is intended for the CIE to signal a fault from the fire alarm system to an ARC, the CIE should have a suitably monitored means of interfacing with the relevant fault routing equipment.

NOTE 9 Monitoring may be performed by the fault routing equipment. For example, the connection between the CIE and the fault routing equipment may comprise a cable from an input in the fault routing equipment to the common fault relay in the CIE, such that an open circuit fault in the cable results in transmission of a fault signal to the ARC.

NOTE 10 It is common for the alarm routing equipment and the fault routing equipment to comprise a single device.

New recommendation and notes.

15.2p) Faults in either the alarm transmission equipment or in the alarm transmission path should be displayed at the CIE.

NOTE 11 It is recognized that temporary loss of service in the alarm transmission path or service provision might occur. The risk associated with loss of communications can be mitigated by use of a dual path alarm transmission system where primary and secondary signal paths are provided. For dual path alarm transmission systems, loss of both signal paths is indicated as a fault at the CIE. However, it is not necessary to indicate loss of a single transmission path at the CIE.

New recommendation and note.

15.2q) Where the alarm transmission path relies upon a physical TCP/IP or similar data connection, the following recommendations apply.

1) **Final connections to the alarm routing equipment should be secured against unauthorized disconnection.**
2) **Power supplies for routing equipment within the premises on which alarm transmission depends should conform to the recommendations of 25.4e).**

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NOTE 12 Where there is a dual path alarm transmission system, the recommendations contained in 15.2q)2) need only be applied to one of the transmission systems.

3) The physical data network cable used for alarm transmission within the building should be differentiated from other services by colour.

NOTE 13 Where the network cable cannot conform to the recommendations of 15.2q)3), or where local data network reliability is a concern, a dual path alarm transmission system would be beneficial.

New recommendation and notes.

17 Visual alarm signals

17.1 Commentary

Visual alarm devices recommended in this standard are intended to apply to circumstances in which the visual alarm is a primary warning of fire, but not to situations in which the visual alarm provides only supplementary information, such as those recommended in BS 7273-1 for areas protected by a gaseous fire suppression system.

New paragraph added to commentary explaining that visual first stage indicators for fire suppression systems do not have to meet the requirements for VADs.

19 Staged fire alarms

19.2.2c) Staff alarms should normally be generated only in response to signals from automatic fire detectors, but not in response to signals from manual call points, heat detectors or sprinkler systems. However, in premises, other than residential care homes, that generate a high number of unwanted fire alarm signals, automatic transmission of a signal to an ARC might be delayed pending investigation of alarm signals from these devices. Any proposal to use a staff alarm as the initial response to a signal from a manual call point should be subject to special consideration. In such special circumstances, there should be adequate arrangements to ensure that a person operating a manual call point is not left in doubt as to the success of the operation (e.g. by means of visual indication at the call point that the signal has been correctly received at the control equipment and a suitable warning that operation of the manual call point will not result in an immediate audible fire warning).

Text revised to acknowledge that, in premises, other than residential care homes, which generate a high number of unwanted fire alarm signals, automatic transmission of a signal to an alarm receiving centre may be delayed pending investigation of alarm signals from these devices.

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19.2.2g) A staff alarm signal should automatically change to an audible fire warning in at least the relevant alarm zone if a second detector operates before the system is reset. (This is known as "coincidence detection").

NOTE 2 Coincidence may be arranged such that a full alarm is given only if the second detector is in the same defined area as the first detector or if a second detector anywhere in the building operates.

NOTE 3 A typical staff alarm arrangement is shown in Figure 5.

New recommendation, notes and diagram.

19.2.2h) In buildings with a staff alarm, smoke detectors in access rooms that form the only means of escape from inner rooms should give an immediate local warning of fire to occupants of the inner rooms, even though the alarm signal might be delayed elsewhere in the building, unless there is adequate vision between the inner room and the access room.

New recommendation.

20 Manual call points

20.1 Commentary

Manual call points (MCPs) need to be prominently sited, readily distinguishable from non-fire alarm call points and need to be distributed such that, from any point in the building, it is impossible to leave the storey or the building without passing a manual call point.

Sufficient call points need to be provided to minimize, to a reasonable extent, the delay between discovery of a fire and the sounding of the alarm. Where the fire hazard level is high and rapid fire development is anticipated, this delay needs to be commensurately shorter.

MCPs can, if present in unsupervised areas, be subject to malicious operation. For this reason, they are not normally provided in, for example, public common areas of shopping complexes and certain public houses. In public car parks within a building, use of an emergency voice communication system could be considered instead of MCPs.

In the event of an evacuation signal, people evacuate the building via an exit that leads to a place of ultimate safety; that is, a place in which there is no immediate or future danger from fire. To conform to BS 5839-1, MCPs are sited adjacent to all storey exits and exits to open air that lead to a place of ultimate safety.

Therefore, if, for example, a door leads to an enclosed courtyard that is in the open air but has no exit to a place of ultimate safety, this door would not need to be provided with an MCP as the provision of an MCP at this point could infer that the door leads to a place of safety. Moreover, to escape, people would need to re-enter the building and would therefore be afforded an opportunity to operate the fire alarm system on their

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route to a suitable exit. Similarly, the same would apply to a door leading to a flat-roofed area from which there is no suitable means of escape (e.g. external escape stairway).

Some openings in the building envelope (such as a roller shutter door) are not normally considered as a pedestrian exit, but in an emergency are likely to be used as such. It might, therefore, be appropriate to consider them as an exit and provide an MCP at the opening. If openings cannot be used as a means of safe egress from the premises to a place of ultimate safety, MCPs might not need to be provided.

Commentary revised to clarify the location and siting of manual call points.

20.2b) All MCPs should be fitted with a protective cover, which is moved to gain access to the frangible element.

It is now recommended that a protective cover is fitted to a Type A manual call point to help prevent false alarms.

21 Types of fire detector and their selection

21.1.7 Video fire detectors

Fire can also be detected by video techniques in which video cameras monitor the protected space.

The images from each camera are analysed electronically to detect the presence of smoke and/or flames by monitoring changes that occur in the camera's field of view.

Video fire detectors rely on appropriate and continuous illumination of the field of view. Such lighting can be normal lighting, specially installed infrared light sources, or a combination of the two.

Video fire detectors can also be used as a means of verifying a fire (see Section 3). Where they are the sole means of detection, they need to be designed, and their suitability and performance verified, by a qualified specialist.

There are currently no product standards that define the performance of video fire detectors and reliance is placed on manufacturers' recommendations. In many cases, they tend to be used as supplemental detection or for special applications where other detection techniques are inappropriate or ineffective.

A new sub-clause, **21.1.7**, has been introduced specifically addressing video fire detectors, re-grouping text which was in different sub-clauses in the 2013 edition of the code.

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21.1.8 Choice of fire detection principle

New text in **21.1.8** commentary explains detection principle choices involving single sensor detectors and multi-sensor detectors.

22 Spacing and siting of automatic fire detectors

22.9 Recommendations and limits of ceiling height

Heat, smoke and combustion gas detectors should not be mounted on ceilings higher than the limits recommended in column 1 of Table 3. If small sections of ceiling, not exceeding in total 10% of the ceiling area within the protected area, exceed these limits, these higher sections are adequately protected provided that the ceiling height does not exceed the limits in column 2 of Table 3.

The limits recommended in Table 3 are intended for ceilings over large, open areas. In vertical or flue-like structures, such as lift shafts and stairwells, the limits should be used for guidance.

NOTE 1 A very high shaft (e.g. exceeding 25 m) would be better protected by detection at several levels and/or greater sensitivity at the ceiling.

NOTE 2 The recommendations in Table 3 for the Class and minimum number of ASD sampling holes may be adapted for vertical or flue-like structures. For example, the detection provided by 15 Class C sample points on a ceiling covering just 200 m^2 can be achieved using fewer sample points at a higher sensitivity, e.g. just 3 sample points which are 5 times more sensitive than the Class C.

In **22.9** and Table 3, it is now recommended that the limits specified for ceiling heights should only be used as guidance for vertical or flue-like structures, such as lift shafts and stairwells.

23 Control and indicating equipment

23.2.2e) On or adjacent to indicating equipment, there should be a diagrammatic representation of the building, showing at least the building entrances, the main circulation areas and the division into zones. The diagrammatic representation may comprise any of the following:

1) an illuminated mimic diagram;

2) a VDU with an appropriate back up; or

3) a printed, correctly orientated, zone plan (see 3.68).

Text revised to clarify recommendations.

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25 Power supplies

25.2c) To facilitate local isolation during maintenance, suitable means should be provided for local isolation of the low voltage supply circuit that serves the power supply and control equipment [see 29.2e)].

NOTE 2 Safe isolation is required under the terms of the Electricity at Work Regulations 1989 [10].The previous version of this standard recommended double pole isolation. This is no longer specifically recommended as, under the Electricity at Work Regulations 1989 [10], safe isolation requires verification that isolation has been successful (see Clause 45).

A number of switching devices do not meet the required isolation performance criteria. BS 7671 details whether a particular device can actually be used for the purpose of "isolation".

The recommendation to provide double pole isolation has been replaced with a recommendation to provide local safe isolation.

25.2h) An informative note has been added to explain what is meant by "special tool".

26 Cables, wiring and other interconnections

In **26.2**, the recommendations for cables, wiring and other interconnections have been updated to reflect the currently available standards: BS EN 60702-1, BS EN 60702-2, BS 7629-1 and BS 7846. In addition, the duration of survival of cables has been referred to the tests in BS EN 50200 and BS 8434-2.

29 Electrical earthing

The heading of Clause **29**, "Electrical safety", has been replaced by the new heading "Electrical Earthing".

Section 3: Limitation of false alarms and unwanted fire alarm signals

Section **3** has been expanded and introduces the concept of "unwanted fire alarm signals". To minimize the risk of false alarms and unwanted fire alarm signals, it recommends that manual call points should be fitted with protective covers and that systems that incorporate connection to an alarm receiving centre should have this connection disabled during the soak period.

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45 Inspection and servicing

In Clause **45**, recommendations have been added for:

1) measuring the battery voltage (sub-clauses 45.3(d)(e))
2) testing of multi-sensor fire detectors (sub-clause 45.4(j))
3) for using different types of devices when carrying out system tests (sub-clause 45.4(j))
4) checking whether a suitable zone plan has been provided (sub-clause 45.4(q))
5) testing of video fire detectors (sub-clause 45.4(s))

Annex E (informative)

The selection and application of fire detectors

There is a new Annex E (informative), which gives advice regarding selection and application of fire detectors.

Annex F in the 2013 edition, which gave guidance on visual alarm device illumination characteristics, has been removed as it duplicated the information in the referenced code LPS CoP 0001.

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