



Fire Industry Association

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GUIDANCE REGARDING FIRE ALARM SYSTEMS TO BS5839-1:2002

1. FOREWARD

This Fact File is based on the current versions of the standards and will be amended when the modifications to BS 5839-1 are agreed and both EN54 part 2/A1 and EN54 part 4/A2 are published.

2. INTRODUCTION

This fact file has been prepared for the benefit of BFPSA members so that they take appropriate action regarding the relevant standards. BS 5839-1 was revised in 2002 and BS 5839-4 is now withdrawn, and replaced by BSEN 54-2 and 4. It is important to be aware of the recommendations, applying to control and indicating and power supply equipment in BS 5839-1: 2002. Some of these recommendations are in addition to the requirements in EN 54-parts 2 and 4.

3. CONTROL PANEL STANDARD BS5839 PART 4 AND EN54 PART 2 & 4

Concerns have been expressed relating to EN54 Part 2 and Part 4, the Fire Alarm Control and Indicating Equipment and Power Supply Equipment Standards.

BS5839 Part 1: 1988 Code of Practice for Fire Alarm System refers to BS5839 Part 4, the Control Panel Standard. For the past 10-15 years, there has been a tremendous amount of effort to publish a European Standard EN54 Part 2 for the Control and Indicating Equipment (c.i.e.) and EN54 Part 4 for the Power Supply Equipment (p.s.e.). This was finally completed mid 1999. The transition period where both BS and EN Standards are acceptable within the market place has now lapsed. One point to note is that there are a large amount of control panels and p.s.e.s that are approved to BS5839 Part 4 with certification bodies such as LPCB, however, more and more control panels are being approved to EN54 Part 2 and Part 4.

The new revision to BS5839 Part 1:2002 was published in October 2002. This revised Code of Practice does call up EN54 Part 2 and 4 for Control and Indicating Equipment and Power Supply Equipment, however it recognizes that extended or altered systems would not necessarily have to comply with the recommendations of latest version of the code.

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In the UK, there has always been a very high level of quality fire detection and alarm products, specifically meeting the requirements of the UK market. This has not suddenly changed. These new Standards and Codes of Practice are not intended to be retrospective. If any risk assessment process, as highlighted in the Fire Precautions (Workplace) Regulation: 1997 (amended 1999), indicates that the fire detection and alarm system is suitable for purpose, then there is no reason to change the system. Remember also that BS5839 Part 1 is a Code of Practice and takes the form of guidance and recommendations to follow, to achieve an adequate or suitable system.

EN54 Pt 2 and 4 are excellent new Standards and will further the technical design, performance and quality of Fire Alarm control panels and power supply equipment.

4. SUMMARY OF ASPECTS WITHIN BS5839-1:2002 ASSOCIATED WITH CONTROL AND INDICATING EQUIPMENT, POWER SUPPLY EQUIPMENT AND EN54 PARTS 2 AND 4

- i. Clause 20.2. Within EN54 Part 2, clause 7.1.4 requires that “The c.i.e. shall enter the fire alarm condition within 10 s of the activation of any manual call point BS5839-1: 2002 and the previous version (1988) recommend that the delay between the operation of a manual call-point and the giving of an ‘evacuate’ signal in, at least, the zones in alarm should not exceed 3 seconds. There is recognition in BS 5839-1: 2002 that EN 54-2 specifies 10 seconds and a note suggests that failure to meet the 3 seconds would result in a variation, which will need to be agreed with all interested parties.
- ii. Clause 16.2.1 h) 1) of BS 5839-1 states that “any fire alarm sounder (see 16.2.1 f) in Category L and P systems should silence automatically after 30 min, unless the premises are continuously occupied.” However, in EN 54-2, the standard does not allow the automatic silencing of fire alarm devices by the control and indicating equipment. The requirement in BS 5839-1 should be regarded as a systems operation. Therefore the automatic silencing function should be configured as part of the complete system and not part of control panel operation.
- iii. Clause 12.2.1. Fault monitoring includes the indication of a fault if either a detector or a sounder or a manual call point is removed where they are designed to be detachable.
- iv. Clause 12.2.1. All critical signal paths should be monitored and faults indicated. This includes:
 - a. Alarm device circuits (no change).
 - b. Detector circuits (no change).
 - c. Power supplies including power supplies to remote devices and interfaces, e.g. for a sounder control unit.
 - d. Fault monitoring of batteries connected in parallel to show if part of the battery becomes open circuit.
 - e. Connections to ARC communication equipment, any fault to be indicated at the c.i.e..
 - f. Connections to voice alarm systems (repeats what has always been within BS 5839-8).
- v. Clause 12.2.2. Detector and alarm cross connections should only affect those circuits with that fault condition. This implies that power supply and battery protection fuses should not be affected.
- vi. Any condition in one zone should not affect the operation of another zone (an example of a system not complying with this would be certain two-wire sounder/detector-zone circuits).
- vii. Clause 12.2.2. A fault in a remote power supply connection should not totally remove power from the c.i.e.. This applies to power supplies housing both battery and mains derived power. Failure of connections to a remote battery box containing battery only, would not totally remove power. Where the power supply contains both battery and mains derived power, duplicated wiring from the control and indicating equipment to the remote power supply may be required. Refer also to interfaces required in EN 54 –4 clause 6.4, to prevent a fault on one part of the duplicated circuit reflecting on the other.

- viii. Clause 13.2.4. For addressable detection zones indication of the zone on fire (e.g. LED) should be given in addition to any text display (e.g. LCD). This may not necessarily be on the control panel but may in the form of a zonal mimic display.
- ix. Clause 19.2.3. Alert signals for staged alarms are defined as 1 +/- 0.5 second ON, 1 +/- 0.5 second OFF.
- x. Requirements for power supplies:
 - a. Clause 11.2 and 29.2. All power supplies should conform to the requirements of EN54-4.
 - b. Clause 29.2. The power supply should incorporate a safety-isolating transformer conforming to BSEN 61558 and the power supply should be marked with the appropriate symbol.
 - c. For L Category systems, the minimum standby time is 24 hours and then power should be provided for all the fire alarm devices and auxiliaries for a period of 30 minutes.
 - d. For P Category systems, if the unoccupied time is greater than 48h (making 72h standby), then a FAULT connection to an ARC is recommended.
 - e. For P Category systems, the standby period should be 24 hours plus the unoccupied time up to a maximum of 72 hours and then provide power for all the fire alarm devices and auxiliaries for a period of 30 minutes.
- xi. Clause 24.2. For wired networks the communication paths should be monitored as per clause 12.2.1.
- xii. Clause 12.2.2. System integrity recommends that where detectors are designed to be removable then any detector(s) removed should not affect the operation of any manual call point, regardless of any locking screw on the detector.
- xiii. Clause 12.2.2. Alarm devices should need a special tool to remove.
- xiv. Clause 12.2.2. Removing a detector should not affect an alarm device unless it is a combined detector/alarm, incorporated in a single fixing.
- xv. Clause 29. Electrical safety issues:
 - a. Authentication and marking of the power supply unit with the safety isolating symbol
 - b. Extra low voltages used in wet conditions
 - c. Distinction between circuit protective conductor and screens on, for example loop cables.
 - d. Screen connections for loop and network cables, fig 15.
- xvi. Clause 25.1 and Clause 46.2. Under the Health and Safety (Safety Signs and Signals) Regulation 1996 requires that a fire alarm warning system must be provided with an emergency supply in the event of a power supply loss. Consequently, systems that do not have a standby power supply are not legal.

5. RADIO BASED SYSTEMS

Clause 27. System requirements for radio based systems:

- i. Components should have 2 power supplies (i.e. mains + battery or main and reserve battery).
- ii. Battery life should be at least 3 years.
- iii. 30-day battery warning fault with a 7 day warning prior to end of life.
- iv. To save battery power a fire detector device can automatically cancel a fire indication after 20 minutes and a fire alarm device can stop automatically after 30 minutes.
- v. Antenna cables should be monitored.
- vi. Additional fault indications for the reception of no radio signals after 100 seconds and that the receiver detects 30 seconds of continuous radio signal.
- vii. Removal of any devices should be indicated within 2 hours.

6. OTHER ISSUES NOT NECESSARILY DIRECTLY CONNECTED WITH THE CONTROL AND INDICATING EQUIPMENT AND POWER SUPPLY EQUIPMENT

Clause 28. All components should be compliant with EMC regulations and care should be taken to follow manufacturer's instructions to avoid electromagnetic interference to the fire detection and alarm system. No definitive guidance on separation is given for EMC, so manufacturers should ensure their instruction manuals do give the necessary guidance. This includes separation of cables, proximity to high current power cables, correct earthing and screen terminations.

Clause 38.3 b). Insulation resistance of 2Mohms is recommended. The note that follows gives advice suggesting that higher figures for larger systems are likely to be required to avoid indicating an earth fault.

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DISCLAIMER

The information set out in this document is believed to be correct in the light of information currently available but it is not guaranteed and neither the Fire Industry Association nor its officers can accept any responsibility in respect of the contents or any events arising from use of the information contained within this document.