# BS 5839-9:2011



**BSI Standards Publication** 

# Fire detection and fire alarm systems for buildings

Part 9: Code of practice for the design, installation, commissioning and maintenance of emergency voice communication systems



...making excellence a habit."

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#### Summary of pages

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# Foreword

#### **Publishing information**

This part of BS 5839 is published by BSI and came into effect on 31 January 2011. It was prepared by Subcommittee FSH/12/5, *Alarm devices, voice alarm evacuation sub-systems and emergency voice communications*, under the authority of Technical Committee FSH/12, *Fire detection and alarm systems*. A list of organizations represented on this committee can be obtained on request to its secretary.

#### **Supersession**

This part of BS 5839 supersedes BS 5839-9:2003, which is withdrawn.

#### Information about this document

This is a full revision of BS 5839-9, and introduces the following principal changes.

- A clause on wireless-linked EVC systems has been included.
- A subclause on the use of audio frequency induction loop systems at EVC outstations has been included.

#### Use of this document

As a code of practice, this part of BS 5839 takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this part of BS 5839 is expected to be able to justify any course of action that deviates from its recommendations.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

#### **Presentational conventions**

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

The word "should" is used to express recommendations of this standard. The word "may" is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the clause. The word "can" is used to express possibility, e.g. a consequence of an action or an event.

Notes and commentaries are provided throughout the text of this standard. Notes give references and additional information that are important but do not form part of the recommendations. Commentaries give background information.

#### **Contractual and legal considerations**

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

# Introduction

Emergency voice communication (EVC) systems allow firefighters and others to communicate with one another during emergency situations in and around buildings and at sports and similar venues, such as entertainment centres. They also allow communication with disabled persons. Emergency voice communication systems, as later defined in this part of BS 5839, are used in connection with life safety and need, therefore, to be subject to high standards of design, manufacture, installation, commissioning and maintenance, similar to those covering fire detection and fire alarm systems and voice alarm systems.

This part of BS 5839 has been prepared to:

- a) give guidance to those who specify, design, manufacture, install, commission, maintain and use such emergency voice communication systems;
- b) ensure that high standards of reliability, safety and security are achieved, together with acceptable standards of performance.

# Section 1: General

### 1 Scope

This part of BS 5839 provides recommendations for the planning, design, installation, commissioning and maintenance of emergency voice communication systems in and around buildings and at sports, entertainment and similar venues. It does not recommend whether or not an emergency voice communication system should be installed in a given premises.

This part of BS 5839 primarily relates to the use of emergency voice communication (EVC) in assisting both firefighters and those responsible for evacuating buildings or sports stadiums in fire emergency situations, including evacuation of disabled persons. Use, other than in fire emergency situations, by disabled persons and others, although not precluded, is not addressed in detail.

Other than in exceptional circumstances, EVC systems are not intended as the means of raising a fire alarm, in lieu of manual call points. Refer to BS 5839-1 for guidance on fire detection and alarm systems.

This part of BS 5839 covers systems with components linked by wires, wirelessly, or a combination of both.

This part of BS 5839 covers emergency voice communication systems and is therefore not intended to cover general-purpose intercom systems, lift intercom systems, local (internal) telephone systems for general use, or any external communication systems, such as the public switched telephone network and cellular telephone networks.

Voice alarm systems are primarily intended for the automatic broadcasting of evacuation messages; they are covered by BS 5839-8 and are therefore excluded from this part of BS 5839.

# 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 476 (relevant parts), Fire tests on building materials and structures

BS 5499-1, Graphical symbols and signs – Safety signs, including fire safety signs – Part 1: Specification for geometric shapes, colours and layout

BS 5839-1:2002+A2:2008, Fire detection and alarm systems for buildings – Part 1: Code of practice for system design, installation, commissioning and maintenance

BS 7671, Requirements for electrical installations – IEE Wiring Regulations – Seventeenth edition

BS 9999:2008, Code of practice for fire safety in the design, management and use of buildings

BS EN 54-2:1998+A1:2006, Fire detection and fire alarm systems – Part 2: Control and indicating equipment

BS EN 54-3, Fire detection and fire alarm systems – Part 3: Fire alarm devices – Sounders

BS EN 54-4:1998+A2:2006, Fire detection and fire alarm systems – Part 4: Power supply equipment

BS EN 54-16:2008, Fire detection and fire alarm systems – Part 16: Voice alarm control and indicating equipment

BS EN 54-23, Fire detection and fire alarm systems – Part 23: Fire alarm devices – Visual alarm devices

BS EN 60529, Specification for degrees of protection provided by enclosures (IP code)

BS EN 60702-1, Mineral insulated cables and their terminations with a rated voltage not exceeding 750 V – Part 1: Cables [IEC 60702-1]

BS EN 60702-2, Mineral insulated cables and their terminations with a rated voltage not exceeding 750 V – Part 2: Terminations [IEC 60702-2]

BS EN 60118-4, Electroacoustics – Hearing aids – Part 4: Induction loop systems for hearing aid purposes – Magnetic field strength

BS EN 61672-1, *Electroacoustics – Sound level meters – Part 1:* Specifications

- [1] Approved Document B (Fire safety) Volume 2: Buildings other than dwellinghouses (2006 edition). ISBN-13: 978 0 117 03725 0.
- [2] Department for Culture, Media and Sport (DCMS). Guide to Safety at Sports Grounds. The Stationery Office, 2008. ISBN-13: 978 0 11 702074 0.
- [3] Fire Safety Guide No. 3, Phased Evacuation from Office Buildings. London District Surveyors Association.

# 3 Terms and definitions

For the purposes of this part of BS 5839, the following terms and definitions apply.

#### 3.1 access level

one of several states of the EVC system in which selected:

- controls can be operated,
- manual operations can be carried out,
- indications are visible and/or
- information can be obtained

NOTE Further information on access level is given in Annex A.

#### 3.2 competent person

person with the necessary training and experience, and with access to the requisite tools, equipment and information, and capable of carrying out a defined task

#### 3.3 duplex operation

operation of transmitting and receiving apparatus at one location in conjunction with associated transmitting and receiving equipment at another location, the processes of transmission and reception being concurrent

3.4 emergency voice communication system EVC system

> system that allows voice communication in either direction between a central control point and a number of other points throughout a building or building complex, particularly in a fire emergency situation

#### 3.5 evacuation lift

lift that may be used for the evacuation of disabled people in a fire under the direction of management or firefighters

#### 3.6 EVC mode

status of a system whereby communication is taking place between type A or B outstations and a master station

NOTE If the system is used for purposes other than EVC, then their functions are to be overridden by the EVC functions.

#### 3.7 firefighting lobby

protected lobby providing access from a firefighting stair to the accommodation area, and to any associated firefighting lift

#### 3.8 firefighting stair

protected stairway communicating with the accommodation area only through a firefighting lobby

#### 3.9 fire telephone system

commonly-used form of emergency voice communication system that includes telephone handsets at outstations and usually also at master stations

#### 3.10 group call

call made from a master station to more than one outstation simultaneously

#### 3.11 handset

part of a telephone, combining receiver and transmitter, one at each end of the handle

#### 3.12 hook-switch

switch operated automatically by removal of a handset from, or replacement of a handset in, its rest position

#### 3.13 intelligibility

measure of the proportion of the content of a speech message that can be correctly understood

#### 3.14 master station

control unit located at a central control point which controls the EVC system

*NOTE* In large buildings or building complexes, there may be several master stations communicating with each other.

#### 3.15 non-EVC mode

status of a system whereby communication is taking place between devices other than type A and B outstations and the master station

*NOTE* Non-EVC functions typically include help points, lift intercoms and accessible toilet alarms.

#### 3.16 off-hook

status of a handset when removed from its normal rest position to initiate an outgoing call or receive an incoming call

#### 3.17 on-hook

status of a handset when in its normal rest position, terminating a call or permitting notification of an incoming call

#### 3.18 outstation

unit, located at a strategic point in a building or building complex, that allows two-way voice conversation with a master station

#### 3.19 phased evacuation

system of evacuation in which different parts of the premises are evacuated in a controlled sequence of phases, those parts of the premises expected to be at greatest risk being evacuated first

#### 3.20 protected lobby/corridor

circulation area consisting of a lobby or corridor enclosed with fire-resisting construction (other than any part that is an external wall of a building)

#### 3.21 protected stairway

stair discharging through a final exit to a place of safety (including any exit passageway between the foot of the stair and the final exit) that is enclosed with fire resisting construction

#### 3.22 refuge

area that is enclosed with fire-resisting construction (other than any part that is an external wall of a building) and served directly by a safe route to a storey exit, evacuation lift or final exit, thus constituting a temporarily safe space for disabled people to await assistance for their evacuation

NOTE The term disabled people can also include any person who is unable to safely use an exit route, e.g. people with back or sports injuries, pregnant women and those who cannot walk unaided.

#### 3.23 VSWR

#### voltage standing wave ratio

measure of how efficiently radio-frequency power is transferred to the antenna system

#### 3.24 wireless link budget

accounting of all the gains and losses through the transmitting medium to the receiver. It accounts for the attenuation of the transmitted signal due to propagation, as well as the antenna gains, feedlines and miscellaneous losses

#### 3.25 wireless repeater

device used to extend the coverage of a wireless-linked system

# 4 Need for an emergency voice communication system

#### COMMENTARY ON CLAUSE 4

An EVC system enables communication between strategic points throughout the building or site and the central control point(s). EVC systems are generally needed in the following situations:

- a) In any building or sports or similar venues where there are disabled people or people who may have difficulty negotiating the evacuation route.
- b) In buildings with phased evacuation and/or firefighting lifts where it facilitates secure communications for building managers, fire wardens and attending fire officers.

NOTE Installation of an EVC system might be appropriate for buildings without phased evacuation where the types, size and/or shape of the building necessitates communication between remote locations and a central control point, to facilitate evacuation or firefighting.

c) At sports venues and in similar complexes, where it will assist stewards in controlling the evacuation of the area in an emergency.