

BS 8629:2019+A1:2023



BSI Standards Publication

**Design, installation, commissioning
and maintenance of evacuation alert
systems for use by fire and rescue
services in buildings containing flats –
Code of practice**

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Contents

	Page
Foreword	III
Introduction	1
1 Scope	4
2 Normative references	5
3 Terms and definitions	6
4 Need for an emergency evacuation alert system	9
4.1 Commentary	9
4.2 Recommendations	9
5 Consultation and definition of responsibilities	9
5.1 Commentary	9
5.2 Recommendations	10
6 Variations from the recommendations of this British Standard	11
6.1 Commentary	11
6.2 Recommendations	11
7 System components	11
7.1 Commentary	11
7.2 Recommendations	12
8 Monitoring, integrity and reliability of circuits external to the evacuation alert control and indicating equipment (EACIE)	13
8.1 Commentary	13
8.2 Recommendations	13
9 Evacuation alert zones	16
9.1 Commentary	16
9.2 Recommendations	17
10 Evacuation alert sounders and audibility	17
10.1 Commentary	17
10.2 Recommendations	19
11 Arrangements for disabled people	19
11.1 Commentary	19
11.2 Recommendations	20
12 Siting of evacuation alert devices	20
12.1 Commentary	20
12.2 Recommendations	21
13 Evacuation alert control and indicating equipment (EACIE)	21
13.1 Commentary	21
13.2 Recommendations	22
<i>Figure 1 — Suitable sign for EACIE cabinet</i>	24
<i>Figure 2 — Appropriate configuration and appearance of controls and indicators</i>	27
14 Networked systems	28
14.1 Commentary	28
14.2 Recommendations	28
15 Power supplies	29
15.1 Commentary	29
15.2 Recommendations for mains power supplies	30
15.3 Recommendations for evacuation alert system power supply units	31
15.4 Recommendations for standby supplies	31
16 Cables, wiring and other interconnections	32
16.1 Commentary	32

16.2	Recommendations	33
17	Radio-linked systems	35
17.1	Commentary	35
17.2	Recommendations	35
18	Electromagnetic compatibility	37
18.1	Commentary	37
18.2	Recommendations	37
19	Electrical safety	38
19.1	Commentary	38
19.2	Recommendations	38
20	Installation	39
20.1	Responsibility of the installer	39
20.2	Installation practices and workmanship	40
20.3	Inspection and testing of wiring	41
21	Commissioning and handover	42
21.1	Commissioning	42
21.2	Documentation	44
21.3	Certification	45
21.4	Acceptance	46
22	Maintenance	47
22.1	Inspection, testing and servicing	47
22.2	Non-routine attention	49
22.3	Modifications to the system	50
22.4	Inspection and test of the system following any fire	51
23	Premises management	52
23.1	Responsibilities	52
23.2	Log book	53
Annex A	(informative) Example wiring and equipment configuration	54
	<i>Figure A.1 — Example wiring of an evacuation alert device circuit</i>	54
Annex B	(normative) Method for calculating standby battery capacity for evacuation alert systems	56
Annex C	(informative) Model format for system log book	57
Annex D	(informative) Model certificates	59
	<i>Figure D.1 — Model design certificate</i>	59
	<i>Figure D.2 — Model installation certificate</i>	60
	<i>Figure D.3 — gives a model commissioning certificate.</i>	61
	<i>Figure D.4 — Model acceptance certificate</i>	62
	<i>Figure D.5 — Model inspection, testing and servicing certificate</i>	63
	<i>Figure D.6 — Model modification certificate</i>	64
	Bibliography	65

Summary of pages

This document comprises a front cover, an inside front cover, pages I to IV, pages 1 to 66, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 30 November 2019. It was prepared by Technical Committee FSH/17, *Fire & Rescue Services Equipment*. A list of organizations represented on this committee can be obtained on request to the committee manager.

Supersession

BS 8629:2019+A1:2023 supersedes [BS 8629:2019](#), which is withdrawn.

Information about this document

The recommendations given in this British Standard have been drawn up to encourage uniformity in systems installed to assist the fire and rescue service to initiate evacuation of residents of buildings containing flats or maisonettes.

Although this British Standard makes recommendations for the design, installation, commissioning and maintenance of such systems, it is not implied that there is a requirement in law for these systems to be installed in all blocks of flats. However, at the time of publication of this British Standard, Scottish Government guidance [\[1\]](#) on the Building (Scotland) Regulations 2004 [\[2\]](#) recommends that these systems are installed in all new blocks of flats with a storey more than 18 m above ground level. As a result of that guidance, the publication of this British Standard was appropriate.

Text introduced or altered by Amendment No. 1 is indicated in the text by tags  . Minor editorial changes are not tagged.

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As a code of practice, this British Standard takes the form of recommendations and guidance. It is not to be quoted as if it were a specification. Users are expected to ensure that claims of compliance are not misleading.

Users may substitute any of the recommendations in this British Standard with practices of equivalent or better outcome. Any user claiming compliance with this British Standard 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 competent people, for whose use it has been produced.

Presentational conventions

The provisions of this document 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 document. 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 document. Notes give references and additional information that are important but do not form part of the recommendations. Commentaries give background information.

Where words have alternative spellings, the preferred spelling of the *Shorter Oxford English Dictionary* is used (e.g. “organization” rather than “organisation”).

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Introduction

Modern, purpose-built blocks of flats in the UK are designed on the basis of a strategy that is commonly described as “stay put”. (In this British Standard, the term “flat” is generally used to describe dwellings that are either single-storey flats or maisonettes.) In this strategy, because of the compartmentation required for compliance with building regulations, if there is a fire in a flat, the fire will be contained within that flat. Therefore, occupants of all other flats are safe to remain within their own flat unless their flat is affected by fire or smoke, or unless they are instructed to evacuate by the fire and rescue service; they can also leave if they feel threatened and wish to do so. The success of this strategy is well-established. Every day, in England, around 20 to 30 fires occur in blocks of flats, but the need for occupants of flats, other than that in which the fire occurs, to evacuate is very uncommon.

There is normally no need for any form of communal fire alarm system in a modern block of flats; all that is required is the provision of smoke and heat alarms within each flat to warn residents of a fire in their own flat. Indeed, recognized guidance (e.g. in [BS 5839-6](#) and guidance in England produced by the Local Government Association [\[3\]](#)) is that communal fire alarm systems are not only unnecessary, but also undesirable and might even result in risk to residents. They might result in exposure of residents to smoke that enters the common parts during fire-fighting operations, when the residents would have been safer to remain within their own flats.

If, on rare occasions, the fire and rescue service consider that occupants of other flats do need to evacuate, they will alert these occupants simply by knocking on the doors of their flats. This is only likely to apply to a small number of flats, and so is, normally, readily manageable. On even rarer occasions when more widespread evacuation is necessary, particularly if this is in the early stages of fire-fighting operations, when available resources are limited, there will tend to be a focus on fire-fighting. Accordingly, an evacuation alert system that enables occupants of flats to be alerted by the incident commander can support the operations of the fire and rescue service; the decision to use the evacuation alert system for this purpose will only be made after consideration of the tenability of escape routes, particularly the stairway(s), for use by occupants of flats.

However, in the UK, the total evacuation of a modern, high-rise block of flats as a result of a fire that started in one flat is extremely rare and, inevitably, poses significant logistical problems for the fire and rescue service. Nevertheless, the Scottish Government formed an expert Review Panel to examine building regulations in Scotland, and guidance thereunder, with a view to advising Scottish Ministers on any need for changes to the Building (Scotland) Regulations 2004, as amended [\[2\]](#), or the Technical Handbooks that support the Regulations [\[1\]](#). The Review Panel advised Ministers that the Domestic Technical Handbook ought to be amended to advocate that, in new blocks of flats with a storey located at a height of more than 18 m above ground level, facilities have to be provided for use by the fire and rescue service to initiate an evacuation alert signal within flats by means of evacuation alert sounders within the flats, so obviating the need for fire-fighters to manually alert the occupants of the flats.

This recommendation was accepted by Scottish Ministers (along with recommendations for other changes in the guidance that supports the Building (Scotland) Regulations 2004, as amended [\[2\]](#)). The Domestic Technical Handbook [\[1\]](#) was amended accordingly in 2019. The Technical Handbook advocates the provision of such evacuation alert systems for use by the fire and rescue service for compliance with Mandatory Building Standard 2.14 (Fire and Rescue Service Facilities) under the Building (Scotland) Regulations [\[2\]](#), which requires that every building is designed and constructed in such a way that facilities are provided to assist fire-fighting or rescue operations.

The evacuation alert systems are not required for compliance with Mandatory Building Standard 2.11 (Communication), which requires that buildings are designed and constructed in such a way

that, in the event of an outbreak of fire within the building, the occupants are alerted to the outbreak of fire. Evacuation alert systems for use by the fire and rescue service are not to be regarded as a fire detection and fire alarm system; their function is solely to assist the fire and rescue service in the management of a fire incident.

The Scottish Government Technical Handbooks [1], [4] provide guidance on compliance with the Building (Scotland) Regulations, but do not constitute the Regulations themselves, which are set out in functional form (i.e. specified objectives) and do not make prescriptive requirements as to the measures that need to be incorporated within buildings for compliance with the Mandatory Building Standards imposed by the Regulations. However, in Scotland, if the guidance in the Technical Handbooks is followed in full, then this can be accepted by the building control verifier as indicating compliance with the Building (Scotland) Regulations 2004 [2]. Accordingly, proof of compliance with the Technical Handbooks may be relied on in any proceedings as tending to negative liability for an alleged contravention of the Building (Scotland) Regulations 2004 [2].

A1 At the time of publication of this British Standard, legislation and guidance elsewhere in the United Kingdom made no reference to the systems to which this standard applies. However, it was anticipated that the systems might sometimes be specified as part of fire strategies for new blocks of flats.

Subsequently, in England, Approved Document B [2A] (the equivalent Government guidance to the Technical Handbooks in Scotland [1], [4]) has been amended, and now includes the provision of an evacuation alert system conforming to BS 8629 for compliance with Requirement B5 of the Building Regulations 2010 [2B]. Requirement B5 relates to the provision of reasonable facilities to assist fire-fighters in the protection of life; again, as in Scotland, the evacuation alert system is not regarded as a fire detection and fire alarm system. **A1**

It is considered by the Technical Committee responsible for this British Standard, and by the UK Fire and Rescue Service, that critical design features of such systems are that they are totally consistent in visual appearance, functionality and method of operation in all buildings in which they are installed, and that they are both simple and intuitive to operate by fire-fighters, who might be unfamiliar with the building and its fire safety measures. Confusion, and consequent risk to both residents and fire-fighters, could result from a need for fire-fighters to learn the operation of non-standard systems under emergency conditions. This British Standard has been produced in pursuance of the consistency required for all systems.

Systems that enable evacuation of flats by the fire and rescue service are not entirely new. On very rare occasions, in England, such systems have been installed (though sometimes in combination with a fire detection and fire alarm system, which is outside the scope of this standard) in blocks of flats, sometimes retrospectively for compliance with the Regulatory Reform (Fire Safety) Order 2005 [5]. This could, for example, be in circumstances in which the possible need for a simultaneous evacuation of a block of flats was anticipated (e.g. as a result of significant departures from the provisions for means of escape or compartmentation required under modern building regulations).

It is important that evacuation alert systems for use by the fire and rescue service are not confused with (or integrated with) fire detection and fire alarm systems. It is acknowledged that the technology exists to provide the evacuation alert systems to which this British Standard refers within a fire detection and alarm system which might be present to support other safety functions, such as smoke control. However, the reason for the avoidance of such an integrated arrangement within the recommendations of this British Standard is to avoid confusion between fire and rescue service evacuation alert systems and fire detection and alarm systems until the concept, use and management of the former systems is well established and understood. Such confusion could result in inappropriate use of fire detection systems in blocks of flats, so undermining a stay put strategy and resulting in incorrect programming of integrated systems. **A1** Text deleted. **A1**

A1 At the time this British Standard was originally drafted, evacuation alert systems, in the form described herein, were a new innovation, which had not, previously, been installed in blocks of flats within the UK. For this reason, and to avoid confusion with communal fire detection and fire alarm systems in purpose-built blocks of flats (the latter of which [BS 5839-6:2019](#) warns can even lead to risk to occupants), the previous version of this British Standard recommended against any integration of evacuation alert systems with other systems. However, it was noted in the standard that this would be subject to review after a further two years. In drafting this current version, the recommendation was reconsidered. The consensus view of the Technical Committee responsible for this current version remains that, until there is greater experience and practical understanding of the design, installation and use of these systems, the risks of integrating evacuation alert systems with other systems outweigh the benefits of integration. This will continue to be reviewed in future versions of this British Standard. **A1**

Communal fire detection and fire alarm systems are sometimes installed in old blocks of flats, particularly those converted from original private, single family dwellings before modern building regulations required the compartmentation necessary to support a “stay put” strategy. Where, in these circumstances, a communal fire detection and fire alarm system is provided to support a simultaneous evacuation strategy, rather than a “stay put” strategy, a separate evacuation alert system for use by the fire and rescue service is not normally necessary, as simultaneous evacuation can be initiated automatically, and the system will also incorporate manual controls that could be used to initiate an evacuation. A correctly designed system normally also includes fire detection and sounders within each flat, incorporated within the communal fire detection and fire alarm system.

In preparing this British Standard, it has been assumed that all fire protection measures in the building, normally provided for compliance with building regulations, are correctly designed, correctly installed and properly maintained. It is not appropriate for the provision of an evacuation alert system for use by the fire and rescue service to be regarded as any form of compensation for reduction in fire protection measures, or as mitigation for defects in construction (such as poor installation of compartmentation).

Designs that support a “stay put” strategy are beneficial to persons with certain disabilities (such as mobility impairment), as they are able to safely remain in their flat. While evacuation arrangements for buildings containing flats are outside the scope of this British Standard, attention is drawn to the benefits of **A1** social alarm systems **A1** for disabled people. These systems enable two-way speech communication between disabled occupants of a flat and a social alarm monitoring centre, to be triggered by use of a pendant worn by a disabled person, or a pull cord, so that the monitoring centre can inform the fire and rescue service of the presence of disabled people, who might need to be rescued by the fire and rescue service.

Nothing in this British Standard is intended to imply that the “stay put” strategy normally adopted in new blocks of flats is inappropriate. On the contrary, the Technical Committee responsible for this British Standard acknowledges that “stay put” remains the appropriate strategy for such blocks of flats. The purpose of the systems described in this British Standard is to provide facilities that can, on occasions, support operational fire-fighting and rescue by the fire and rescue service in blocks of flats that are designed on the basis of a “stay put” strategy; these systems enable fire and rescue service operational commanders to initiate an evacuation alert signal in flats, particularly those on a floor(s) other than the floor of fire origin, e.g. a floor(s) above the level of the fire.

Throughout this British Standard, there are recommendations for consultation with the fire and rescue service in respect of various matters at different stages in the planning, design and commissioning of an evacuation alert system. The importance of this cannot be over-stressed, as such consultation is essential to ensure that the system is fit for purpose in relation to use by fire and rescue service crews. It is also essential that fire and rescue service crews are aware of the existence of the system and are afforded the opportunity to make themselves familiar with its access and use.

1 Scope

This British Standard gives recommendations for the design, installation, commissioning and maintenance of evacuation alert systems for use by the fire and rescue service in buildings containing flats. Within this British Standard, both single-storey flats and maisonettes are described by the generic term “flats”, other than when, for the purpose of a specific recommendation, the term maisonette is used. This British Standard does not recommend whether or not an evacuation alert system is to be installed in any given building. Typically, the application for these systems are high-rise blocks of flats, but the scope of this British Standard includes systems installed in any building containing flats, regardless of height.

The evacuation alert systems covered by this British Standard comprise evacuation alert control and indicating equipment (EACIE), which incorporates manual controls by which evacuation alert sounders within each flat can be operated by the fire and rescue service. These systems are not to be regarded as fire detection and fire alarm systems, and the systems do not incorporate automatic fire detectors or manual call points. Recommendations for fire detection and fire alarm systems in non-domestic premises are given in [BS 5839-1](#). Recommendations for such systems in domestic premises are given in [BS 5839-6](#). Use of evacuation alert systems by the fire and rescue service in emergencies, other than fire incidents, is not precluded, but is not addressed in detail.

This British Standard does not cover systems in which there are facilities to operate systems or equipment other than evacuation alert devices (such as smoke control systems, automatic door release equipment, fire extinguishing systems, facilities for closing of oil or gas valves or grounding of lifts). Such systems normally include automatic fire detection conforming to the relevant part of [BS 5839](#), in conjunction with an interface with ancillary systems and equipment conforming to the recommendations of BS 7273-6.

This British Standard only covers systems that are intended for use by the fire and rescue service and not by any other party. This British Standard does not cover portable, manually operated devices, such as air horns, hand bells or similar devices.

 Text deleted. 

This British Standard does not address operational fire-fighting or, therefore,  decision-making in  the use of evacuation alert systems by the fire and rescue service. The objective of this British Standard is to provide a reliable and effective tool to assist in the evacuation of a building containing flats in whatever manner is considered appropriate by fire and rescue service operational commanders.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions of this document¹⁾. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Standards publications

 Text deleted. 

[BS 5446-3:2015](#), *Detection and alarm devices for dwellings – Part 3: Specification for fire alarm and carbon monoxide alarm systems for deaf and hard of hearing people*

[BS 5499-10](#), *Guidance for the selection and use of safety signs and fire safety notices*

[BS 7629-1](#), *Electric cables – Specification for 300/500 V fire resistant, screened, fixed installation cables having low emission of smoke and corrosive gases when affected by fire – Part 1: Multicore cables*

[BS 7671](#), *Requirements for Electrical Installations – IET Wiring Regulations (Eighteenth edition)*

[BS 7846](#), *Electric cables – Thermosetting insulated, armoured, fire-resistant cables of rated voltage 600/1 000 V for fixed installations, having low emission of smoke and corrosive gases when affected by fire – Specification*

[BS 8434-2](#), *Methods of test for assessment of the fire integrity of electric cables – Part 2: Test for unprotected small cables for use in emergency circuits – BS EN 50200 with a 930° flame and with water spray*

BS EN 54-2, *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, *Fire detection and fire alarm systems – Part 4: Power supply equipment*

BS EN 54-17, *Fire detection and fire alarm systems – Part 17: Short circuit isolators*

 BS EN 54-25:2008 , *Fire detection and fire alarm systems – Part 25: Components using radio links*

 BS EN 1303:2015 , *Building hardware – Cylinders for locks – Requirements and test methods*

 BS EN 50085-1, *Cable trunking systems and cable ducting systems for electrical installations – Part 1: General requirements* 

BS EN 50200:2015, *Method of test for resistance to fire of unprotected small cables for use in emergency circuits*

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

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

BS EN 61386 (all parts), *Conduit systems for cable management*

BS EN ISO 13943, *Fire safety – Vocabulary*

¹⁾ Documents that are referred to solely in an informative manner are listed in the Bibliography.

Other publications

[N1] LPS 1175: Issue 8.0:2018, *Requirements and testing procedures for the LPCB certification and listing of intruder resistant building components, strongpoints, security enclosures and free-standing barriers*.²⁾

[N2]  STS 205: Issue 7:2021 , *Burglary resistance requirements of security cabinets, security enclosures and safe-deposit boxes*.³⁾

3 Terms and definitions

For the purposes of this British Standard, the terms and definitions in BS EN ISO 13943 and the following apply.

3.1 audibility

property of a sound which allows it to be heard among other sounds

NOTE Audibility depends upon the relative loudness and frequency content of the sound in comparison with other sounds which are present at the same time.

3.2 circuit

assembly of evacuation alert system components supplied from the same evacuation alert control and indicating equipment (EACIE) (see 3.7) and protected against overcurrent by the same protective device(s) or current limitation arrangements

3.3 commissioning

process by which it is determined that the installed system meets the defined requirements

3.4 competent person

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

3.5 critical signal path

components and interconnections between the EACIE (see 3.7) and each evacuation alert device

NOTE In the case of interconnections comprising wiring, the critical signal path ends at the input terminals on, or within, each evacuation alert device.

3.6 designer

person or organization taking responsibility for design considerations

3.7 evacuation alert control and indicating equipment (EACIE)

component of an evacuation alert system through which evacuation alert sounders can be controlled, and that is used to monitor the correct functioning of the system and give audible and visible warning of any faults (e.g. short circuit or open circuit of evacuation alert device circuits, or a fault in the power supply)

3.8 evacuation alert device

component of the evacuation alert system, not incorporated in the EACIE (see 3.7), which is used to signal to the occupants of a flat that evacuation is required by the fire and rescue service

NOTE For example, a sounder or visual evacuation alert device.

²⁾ Available from <https://www.redbooklive.com/download/pdf/LPS1175.pdf>.

³⁾ Available from https://www.warringtoncertification.com/technical-information/7/ewc-qu-sts205_issue_7_-_22.11.2021_.pdf.

3.9 evacuation alert signal

audible (and sometimes visual) signal given in flats by an evacuation alert system, and manually initiated from the EACIE (see [3.7](#))

3.10 evacuation alert sounder

audible evacuation alert device

3.11 evacuation alert system for use by the fire and rescue service

system intended for installation in a building containing flats or maisonettes to enable the fire and rescue service to initiate an evacuation alert signal by means of evacuation alert devices within the flats or maisonettes, using manual controls incorporated within the EACIE (see [3.7](#))

3.12 evacuation alert zone

geographical subdivision of the protected premises, in which the evacuation alert signal can be given separately, and independently, of an evacuation alert signal in any other evacuation alert zone

3.13 habitable room

any room in a dwelling other than a bathroom, dressing room or WC

3.14 installation

work of fixing and interconnecting the components and elements of a system

NOTE Installation can be carried out by one or more parties.

3.15 installer

person or organization having responsibility for all or part of the process of installation

3.16 maintenance

work of inspection, servicing and repair necessary in order to maintain the efficient operation of the installed system

3.17 maisonette

dwelling, forming part of a larger building, which includes rooms on two or more storeys that are more than half a storey height apart

NOTE 1 Also known as multi-storey flats.

NOTE 2 In this British Standard the term "flat" is used to describe both single-storey flats (see [3.26](#)) and maisonettes.

3.18 maximum alert load

maximum load imposed on an evacuation alert system power supply under total evacuation conditions, comprising the power required for simultaneous operation of all evacuation alert devices and operation of the EACIE (see [3.7](#))

3.19 mimic diagram

topographic representation of the premises and their subdivisions, using light-emitting indicators for each subdivision such that the indications of operation of evacuation alert devices by the evacuation alert system can be rapidly related to the layout of the premises

3.20 normal supply

electrical supply from which the evacuation alert system is expected to obtain its power under normal conditions

NOTE The normal supply is usually derived from the public electricity supply system.

3.21 premises management

persons having day-to-day control of the building and the evacuation alert system

NOTE In large premises, a single person with specialist knowledge is often delegated the responsibility for fire safety measures, including the evacuation alert system. In small premises, a person with specialist knowledge is unlikely to be present, but responsibility for the evacuation alert system can still be delegated to a specific person.

3.22 principal habitable room

habitable room (see [3.13](#)) that is normally the most frequently used room for general daytime living purposes

3.23 purchaser

person or organization taking primary responsibility for acceptance of and payment for the installed system

3.24 repair

non-routine work necessary to restore the efficient operation of the installed system

3.25 servicing

routine process of work on the system carried out at predetermined intervals

3.26 single-storey flat

dwelling, forming part of a larger building, that has all its rooms on a single storey or not more than half a storey height apart

NOTE In this British Standard the term “flat” is used to describe both single-storey flats and maisonettes (see [3.17](#)).

3.27 special tool

tool not likely to be carried by a member of the general public

NOTE Where this British Standard recommends that a special tool is necessary to remove a device, securing the device with slot-headed screws would not be acceptable since various articles can be used as screwdrivers.

3.28 standby supply

electricity supply, normally from a rechargeable battery, which is automatically connected to the evacuation alert system when the normal supply fails

A1 Text deleted. **A1**

3.29 visual evacuation alert device

evacuation alert device that generates a flashing light

4 Need for an emergency evacuation alert system

4.1 Commentary

The need for an evacuation alert system in any specific building that contains flats is normally determined in the course of preparation of the fire strategy for the building, which is produced at the design stage for the purpose of approval of a proposed design under building regulations. In Scotland, for compliance with the Building (Scotland) Regulations 2004 [2], the Domestic Technical Handbook [1] that supports the Regulations recommends the installation of evacuation alert systems for use by the Scottish Fire and Rescue Service in the case of buildings in which there is one or more storeys at a height of more than 18 m above ground level.

Where there is no legislative requirement to install an evacuation alert system for use by the fire and rescue service in a building containing flats, but, nevertheless, the provision of such a system is proposed at the design stage of the building, the fire and rescue service and relevant building control body can advise as to whether the system would be of benefit.

4.2 Recommendations

- a) In Scotland, if there is uncertainty regarding the need for an evacuation alert system for use by the fire and rescue service, reference should be made to the Domestic Technical Handbook [1] that supports the Building (Scotland) Regulations 2004 [2].

NOTE 1 Advice can also be obtained from the building standards department of the relevant local authority, and from the Scottish Fire and Rescue Service.

- b) In other regions of the United Kingdom, any proposal to install an evacuation alert system for use by the fire and rescue service should be subject to consultation with the fire and rescue service before proceeding with the design of the system.

NOTE 2 This is to ensure that the system will be of benefit and that the fire and rescue service are satisfied with the proposed design.

5 Consultation and definition of responsibilities

5.1 Commentary

The purpose of the evacuation alert systems to which this British Standard refers is to support the fire and rescue service during fire-fighting and rescue operations in (normally high-rise) blocks of flats. It is therefore important that the system design suitably supports any anticipated fire-fighting and rescue strategy. In particular, it is essential that, if a fire and rescue service incident commander makes a decision to evacuate a number of flats using the evacuation alert system, the system design suitably supports the required evacuation strategy, rather than the evacuation strategy being designed around, or restricted by, the system design. If an evacuation alert system cannot support the evacuation strategy adopted by the fire and rescue service at the time of a fire, the system might not be used, so negating the benefits to the fire and rescue service of its provision.

The system requirements, including those imposed by all reasonably foreseeable evacuation strategies that might be adopted by the fire and rescue service, and by the configuration of the building, need to be ascertained as accurately as possible by consultation between the designer and the fire and rescue service.

It is likely that a fire and rescue service will only use the evacuation alert system if the required evacuation of residents extends to, at least, one entire storey of the building; where a smaller number of

flats needs to be evacuated, it is likely that the traditional technique involving fire-fighters knocking on residents' flat entrance doors will be adopted.

Equally, even if a more widespread evacuation is considered necessary, in the vast majority of cases, it is unlikely that the evacuation will comprise a greater number of storeys than those comprising the floor of fire origin, the floor above that floor and the floor below the floor of fire origin.

On this basis, it is likely that the appropriate extent of each evacuation alert zone (see 3.12) will comprise an entire storey of the building, within which a simultaneous evacuation alert signal will be given within all flats. However, there might be circumstances in which, in a large, complex, high-rise block of flats, the subdivision of storeys into two or more evacuation alert zones is appropriate.

The design can be undertaken by the supplier, the installer, representatives of the A1 premises management A1 or purchaser (including consultants), or by any combination of these parties. It is desirable that, at the contract stage, a single organization takes responsibility for the design of the system, a single organization takes responsibility for the installation work, including compliance with the design, and a single organization takes responsibility for commissioning of the system. Any two, or all three, of these parties can take the form of one single organization. The responsibility for each of these three stages needs to be clearly defined and documented.

It is essential that, at the design stage, the need to avoid the potential for malicious false alarms is considered, as residents could be placed at risk by such actions (see Clause 13).

A1 *With the introduction of BS 8644-1, the design, installation, commissioning and handover of the system need to form part of the building information pack. A1*

5.2 Recommendations

The following recommendations should be met.

- a) The A1 premises management A1 or purchaser of the system (or an appointed representative of these parties, such as a consultant) should ensure that, there is consultation with the fire and rescue service at, or prior to, the system design stage.

NOTE Where any variations from the recommendations of this British Standard are proposed, they need to be agreed with the fire and rescue service, and, if relevant, the body responsible for approval of the fire strategy under building regulations.

- b) The installer of the system should ensure that there is consultation with all relevant interested parties who might include the following:
 - 1) the designer;
 - 2) the A1 premises management A1 or purchaser;
 - 3) the supplier of the system; and
 - 4) consultants (including architects, mechanical and electrical consultants and fire engineering consultants).
- c) Before an order is placed for the system, the responsibility for each of the following stages should be clearly defined and documented:
 - 1) system design;
 - 2) installation; and
 - 3) commissioning.

6 Variations from the recommendations of this British Standard

6.1 Commentary

This British Standard is a code of practice and, as such, its contents take the form of recommendations, rather than requirements. The recommendations are based on anticipated good practice in the design, installation, commissioning and maintenance of evacuation alert systems for use by the fire and rescue service. Accordingly, they are likely to be suitable for the majority of normal applications.

There might, however, be applications in which the recommendations are unsuitable. In these circumstances, variations from the recommendations might be appropriate, even if, in general, the A1 premises management A1, purchaser, fire and rescue service and, where relevant, a building control/standards body require strict compliance with this British Standard.

This does not, however, imply that the designer or installer has freedom to ignore the recommendations of this British Standard under circumstances in which A1 the premises management A1, purchaser, fire and rescue service or building control/standards body seeks compliance with it. Variations always need to be the subject of specific agreement amongst all interested parties and need to be clearly identified in all relevant system documentation.

6.2 Recommendations

The following recommendations should be met.

- a) Any variations from the recommendations of this British Standard incorporated within a specification or design proposal should be clearly identified so that they are obvious to any party from whom approval of the specification or design proposal might be sought, particularly the fire and rescue service and, where relevant, a building control/standards body. A1 Any variation should not impact on the operational functionality or visual appearance of the system. A1
- b) Any variations from the recommendations of this British Standard identified or proposed during installation or commissioning, but not clearly identified in the specified design, should be documented (other than in the case of errors or “snags” for which rectification is proposed), A1 with justification, A1 for subsequent approval.

NOTE This recommendation is not intended to imply that it is the responsibility of the installer or commissioning engineer to verify or certificate conformity of the system design with this British Standard. However, if variations are identified by an installer or commissioning engineer, they ought to be documented for referral to the designer, A1 premises management A1 or purchaser for agreement or action.

- c) All variations, whether of the type described in a) or b), should be agreed with the fire and rescue service and, where relevant, the appropriate building control/standards body.
- d) All variations should be A1 recorded A1 in the relevant system certificate and in the log book (see [23.2](#)).

7 System components

7.1 Commentary

The reliability of the system to perform its functions on demand is, to a significant degree, governed by the reliability of individual components. Under the Construction Products Regulations 2013 [\[6\]](#), certain components, such as sounders and power supply units, are required to conform to relevant harmonized European Standards, and need to have undergone type testing to these standards. Users of this British Standard are advised to consider the desirability of using components having certification under a recognized product certification scheme (comprising third-party certification of product conformity

against a relevant standard based on testing and continuing surveillance together with assessment of the manufacturer's quality assurance systems against BS EN ISO 9001).

Although there is no relevant British, European or International Standard for the evacuation alert system control and indicating equipment (EACIE) specified in this British Standard, it is advisable that care is taken to ensure, as far as practicable, that the equipment is fit for its purpose. Third-party approval against an appropriate specification can provide assurance of this. In addition, the EACIE is likely to be based on fire detection and fire alarm system control and indicating equipment, and so it is expected that it will conform to certain clauses of BS EN 54-2.

Conformity of an individual component to a recognized standard does not necessarily ensure that it will operate satisfactorily in conjunction with another component that conforms to the relevant standard for that component. It is essential that compatibility between components is taken into account by the designer of the system. **A1** Conforming to BS EN 54-13 is one way of demonstrating compatibility between components. The standard is intended for fire detection and fire alarm system components, but it would be appropriate for evacuation alert systems with minimal adjustments (such as component descriptions). **A1**

7.2 Recommendations

The following recommendations should be met.

- a) The evacuation alert control and indicating equipment (EACIE) should conform to the following clauses of BS EN 54-2, except where otherwise recommended in this British Standard:
 - 1) Clause 4;
 - 2) Clause 5 (excluding references to the fire alarm condition, disablement condition and test condition, and excluding 5.5);
 - 3) Clause 6 (excluding references to the fire alarm condition, disablement condition and test condition);
 - 4) Subclause 7.8 (relating to manual operation of the system);
 - 5) Clause 8 [excluding 8.1.2, 8.2.4a), 8.2.4f), 8.2.5b), 8.2.6, 8.3 and 8.4)];
 - 6) Clause 12 (excluding 12.6.1 to 12.6.4). In the case of 12.11, the lamp test should only be accessible at Access Level 3 (i.e. for use by maintenance technicians);
 - 7) Clause 13 (excluding 13.7);
 - 8) Clause 15 [excluding 15a)]; and
 - 9) Clause 16 [excluding 16.1.2, 16.2.2.1, 16.2.2.2b), 16.2.2.2c) and 16.2.2.3].

- b) Audible evacuation alert devices should conform to BS EN 54-3.

NOTE 1 Audible evacuation alert devices may incorporate visual evacuation alert devices.

*NOTE 2 Wireless audible devices are outside the scope of BS EN 54-3 but this does not preclude their use in a system that conforms to this British Standard, provided the devices satisfy the relevant performance requirements of BS EN 54-3 and the relevant recommendations of **A1** BS 5839-1 **A1**.*

- c) Visual evacuation alert devices (if provided **A1**) as part of the evacuation alert system **A1**), whether incorporated within audible evacuation alert devices or discrete devices, should conform to BS 5446-3:2015, 6.3.

*NOTE 3 Visual **A1** alarm **A1** devices that conform to BS EN 54-23 satisfy recommendation 7.2c).*

- d) **A1** Visual evacuation alert devices (if provided as part of the evacuation alert system) should be clearly distinguishable from any other visual alarm system in the flat.

NOTE 4 This need not involve a different colour. The distinction could be made by location or some other means. 

- e) Power supply equipment should conform to BS EN 54-4.
- f) Short circuit isolators should conform to BS EN 54-17.
- g) Cables should conform to the recommendations of [Clause 16](#) of this British Standard.
- h) Those functions of the system that are recommended in this British Standard, for which the storage of programs and data are necessary (e.g. within interface devices) should conform to the additional design requirements for software-controlled control and indicating equipment in BS EN 54-2.

8 Monitoring, integrity and reliability of circuits external to the evacuation alert control and indicating equipment (EACIE)

8.1 Commentary

External circuits need to be arranged such that the probability of faults that could prevent the system from giving an evacuation alert signal is minimized. However, such faults occur occasionally. Work on the system, for the purpose of modification, repair or routine attention, can also cause an impairment of the system to operate as designed in the event of fire.

Measures are incorporated within this British Standard to limit the probability of impairments, whether as a result of faults or work on the system, and to limit the duration of any impairment. The wiring of the critical signal paths (see [3.5](#)) is protected against mechanical damage and damage by fire. The critical signal paths are monitored, so that faults are identified quickly. Compliance with the recommendations for maintenance arrangements assists in ensuring that any such fault is quickly repaired. The probability that a fault would exist at the time of a fire is, therefore, considered to be extremely low. In the event of a fire, fire damage to wiring during the period required for evacuation is unlikely to occur in view of the recommendations of this British Standard for the fire resistance of cables.

However, system design needs to be arranged to limit the extent of impairments, whether as a result of faults or work on the system. Care needs to be taken to ensure that damage to the cable of an evacuation alert device circuit in one flat does not disable evacuation alert devices in any other flat. In addition, a fault signal needs to be given at the EACIE in the event of any failure in the critical signal path.

Care needs to be taken in the use of multicore cable for the wiring of more than one circuit. It needs to be assumed that any fault that affects a multicore cable affects all conductors of the cable; this precludes the use of multicore cable for certain applications in which the failure of more than one circuit as a result of a single fault is precluded by the recommendations of this British Standard.

8.2 Recommendations

8.2.1 Fault monitoring

The following recommendations should be met.

- a) A fault indication should be given at the EACIE within 100 s of the occurrence of any of the following conditions:
 - 1) short circuit or open circuit of any circuits serving evacuation alert devices;
 - 2) short circuit or open circuit of any wiring between any power supply that is in a separate enclosure and the equipment to which it supplies power;
 - 3) any earth fault that is capable of preventing the system from performing in accordance with the recommendations of this British Standard;

- 4) the rupture of any fuse, or the operation of any other protective device, that affects the ability of the system to perform as recommended in this British Standard; and
 - 5) removal from its circuit of an evacuation alert device that is designed to be detachable.
- b) A fault indication should be given, within the times indicated in 1) to 4), in the event of any of the following:
- 1) failure of the main power supply to any part of the system (within 30 min of occurrence);
 - 2) failure of the standby power supply (within 15 min of occurrence);
 - 3) failure of the battery charger (within 30 min of occurrence);
 - 4) reduction of the battery voltage to less than the voltage specified in BS EN 54-4 at which a fault warning should be given (within 30 min of occurrence); and
 - 5) A1 failure of a radio evacuation alert device to confirm that it is capable of responding to a signal from the EACIE (within 400 s of occurrence).

NOTE 1 This does not imply that the evacuate alert device has confirmed that it has produced an evacuate alert audible or visual signal, rather that the device is connected to the system and that it is communicating normally. A1

NOTE 2 In buildings in which staff (e.g. a concierge) are not continuously present on a 24 h basis, fault signals may, in addition or alternatively, be transmitted to an alarm receiving centre or other remote control room.

- c) Visual indications of the fault identified in a) 1) A1 and b) 5) A1 should continue to be given at the EACIE during an evacuation condition.

NOTE 3 Other fault indications may be suppressed during the evacuation condition.

NOTE 4 The recommendations of a), b) and c) can be satisfied by the use of EACIE and power supply equipment conforming to the relevant requirements of BS EN 54-2, and to BS EN 54-4, respectively, provided the system installation complies with the recommendations of the manufacturer, on which conformity might be reliant.

- d) Where any standby power supply comprises a number of batteries connected in parallel, a fault indication should be given in the event of disconnection of any one battery (within 15 min of occurrence).

8.2.2 System integrity

The following recommendations should be met.

- a) A fault on one circuit containing evacuation alert devices should not affect any other circuit.
- b) In the event of an open or short circuit fault on an evacuation alert device circuit in any flat, or the simultaneous occurrence of an unlimited number of such faults in an unlimited number of flats, evacuation alert sounders should not be disabled in any flats other than those in which the open or short circuit fault(s) exists.

NOTE 1 The intention of this recommendation is to ensure that, if a fire in one flat spreads to another flat(s), causing faults in the evacuation alert system circuits within the flats (e.g. at the terminals of evacuation alert devices), it will still be possible for the fire and rescue service to trigger operation of evacuation alert sounders in any flats in which there is no fire. It is assumed that operation of evacuation alert sounders will not be required in the flat of fire origin, or those flats to which the fire has spread, because occupants of these flats will observe the fire or be warned by the fire detection (typically, smoke alarms) in their flats.

NOTE 2 Possible means of satisfying the recommendation of 8.2.2b) are shown in Annex A, but other means are not precluded.

NOTE 3 In the event of fire, the most likely location of such faults is at the terminals within devices. Care might be necessary in the siting of devices, such as short circuit isolators or interface devices, to ensure that,

in the event of a serious fire within a flat, a short circuit at the terminals of any device within the flat does not preclude compliance with 8.2.2b).

- c) With the exception of short connections (e.g. between a corridor and a flat), all wiring of evacuation alert device circuits should be separated from any possible fire within a flat by fire-resisting construction.

NOTE 4 For example, evacuation alert device circuits could be routed through corridors, stairways and risers, from which short spur connections are run into flats. For compliance with 8.2.2b), short circuit isolators and interface devices might also be sited in these common parts or risers. See Annex A.

NOTE 5 A minimum period of fire resistance for this construction is not specified, because fire resistance of existing walls, doors, etc. can be difficult to determine.

- d) In the event of any open or short circuit faults within one evacuation alert zone, no evacuation alert devices should be disabled in other evacuation alert zones.

NOTE 6 The objective of this recommendation is to ensure that, if wiring in, for example, the common corridor in one evacuation alert zone (e.g. a single storey) is subject to mechanical damage, no evacuation alert devices in other evacuation alert zones (e.g. those within flats on another storey) are disabled.

NOTE 7 For example, this recommendation can be satisfied by locating short circuit isolators on an evacuation alert device loop close to (within 1 m of) the point at which the loop enters, and leaves, the evacuation alert zone.

- e) In buildings within which flats are located on not more than 10 storeys, two simultaneous faults on an evacuation alert device circuit should not disable evacuation alert devices within more than one half of the number of storeys on which flats are located, rounded up to the nearest whole number of storeys (i.e. in a building with flats on nine or ten storeys, two simultaneous faults should not disable evacuation alert devices within more than five storeys containing flats). In buildings within which flats are located on more than 10 storeys, two simultaneous faults on an evacuation alert device circuit should not disable evacuation alert devices within more than one third of the number of storeys on which flats are located, rounded up to the nearest whole number (i.e. in buildings containing 11 or 12 storeys, two simultaneous faults should not disable evacuation alert devices within more than four storeys containing flats).

NOTE 8 The objective of this recommendation is to limit the extent of disablement in the event of, for example, a fault in the EACIE.

NOTE 9 The recommendations of 8.2.2e) need not be applied to evacuation alert systems in buildings with no more than three storeys above the ground floor.

NOTE 10 The maximum extent of disablement quoted in 8.2.2e) is relatively arbitrary. Engineering judgment might determine that, in a given system, a minor departure from the number of storeys quoted in 8.2.2e) does not significantly impede the system integrity, but this ought then to be regarded as a variation from the recommendations of this British Standard.

- f) Evacuation alert devices should be capable of being removed only by the use of a special tool (see 3.27).
- g) Where two (or more) evacuation alert device circuits are necessary in order to satisfy the recommendations of 8.2.2a) or 8.2.2e), the circuits should not be contained within a common cable sheath. For example, two circuits intended to satisfy these recommendations should not be served by a common four core cable, as this would not adequately protect against the simultaneous loss of both circuits.
- h) If the EACIE is supplied with power from power supply equipment contained in a separate enclosure, the cables between the equipment should be duplicated such that a single open or short circuit in the connections does not completely remove power from the EACIE. The duplicate cables should be separated by at least 300 mm where practical.

NOTE 11 Where the enclosure is located immediately adjacent to, and in contact with, the EACIE, such that cables run directly between the enclosure and the EACIE, the enclosure need not be regarded as separate from the EACIE. The recommendations of 8.2.2h) do not then apply.

- i) Where a power supply unit or a standby battery(ies) is housed in a separate enclosure from the EACIE, any cable between that enclosure and the EACIE should be suitably protected against overcurrent in accordance with BS 7671.
- j)  If an enclosure for a power supply unit or a standby battery(ies) is sited within an area that is accessible to unauthorized persons, the enclosure should satisfy the recommendations of 13.2.1h). A voltage warning sign, as shown in BS EN ISO 7010:2011, sign W012, should be attached to the exterior door of the cabinet. The sign should be of metal or traffolyte construction and should be fixed to the door of the cabinet by rivets or by at least four security screws.
- k) Any cables connecting the EACIE to a separate enclosure housing a power supply unit or a standby battery(ies) that run through any area in which they are subject to the potential for physical damage (such as vandalism) or rodent attack should comprise the cables described in 16.2g) or be protected by metal conduit or trunking. 

9 Evacuation alert zones

9.1 Commentary

As a result of the “stay put” strategy adopted in modern blocks of flats in the UK, in the vast majority of cases in which a fire occurs within a single flat, the use of the evacuation alert system by the fire and rescue service will be unnecessary; in only a small minority of cases will the fire and rescue service take the decision to evacuate all of the flats on one (or more) storey(s) and it is for these cases that the evacuation alert systems are provided. In large complex buildings, where the number of flats on each storey is large, an evacuation alert system might also be used to evacuate only one part of a single storey that contains many flats.

In order to support such arrangements, it is necessary for the building to be divided into a number of individual evacuation alert zones, such that the operating state of evacuation alert devices in any evacuation alert zone is independent of the operating state of evacuation alert devices in all other evacuation alert zones. The evacuation alert devices in the building are thus grouped so that, at any point in time, all evacuation alert devices within any given evacuation alert zone are in the same state (i.e. silent or giving an evacuation alert signal).

Since it is the case that, when occupants of one evacuation alert zone are required to evacuate, occupants of other evacuation alert zones will be expected to remain within their flats, there is a need to ensure, so far as practicable, that the evacuation alert signal in one evacuation alert zone is not readily audible in any other evacuation alert zone. Such overlap of sound between evacuation alert zones will normally be minimized by the fire-resisting construction that separates flats from each other and from the common parts, and, other than in small buildings, by the provision of lobbies between flats and stairways.

In most buildings in which evacuation alert systems for use by the fire and rescue service are appropriate, the fire and rescue service will normally have pre-planned for operational fire-fighting. Accordingly, the extent of the evacuation alert zones needs to be determined by consultation with the fire and rescue service.

Care needs to be taken in the designation of evacuation alert zones in the case of buildings containing maisonettes; the evacuation alert zone normally includes only entrance levels of all maisonettes on a particular storey in conjunction with the upper (or lower) storey of these maisonettes.

Additional zones might be required for common use facilities, such as a communal roof garden and any areas put to commercial use.

9.2 Recommendations

The following recommendations should be met.

- a) The boundaries of every evacuation alert zone should, so far as practicable, be selected such as to minimize the overlap of the evacuation alert signal in any evacuation alert zone into other evacuation alert zones.
- b) The extent of any overlap of evacuation alert signals between evacuation alert zones should not result in confusion of occupants of any flat.
- c) No evacuation alert zone should extend beyond a single storey of the building.
- d) In the case of maisonettes, the evacuation alert zone should normally include only the entrance levels of maisonettes. The interior levels of the maisonettes should all be considered to be part of the zone which includes the entrance level.
- e) A common evacuation alert signal should be used throughout all evacuation alert zones to convey the need for evacuation.
- f) In evacuation alert zones other than that in which an evacuation alert signal is given, no other form of signal should be given by the evacuation alert system (e.g. an “Alert” signal, of the type given by two-stage fire detection and fire alarm systems in non-domestic premises).
- g) The  premises management  or purchaser should ensure that the configuration of evacuation alert zones is agreed by the fire and rescue service and, where relevant, by the appropriate building control body.

10 Evacuation alert sounders and audibility

10.1 Commentary

10.1.1 Audible evacuation alert devices

It is essential that evacuation alert signals are sufficient in nature and extent to warn occupants of all flats within the relevant evacuation alert zone. The sound pressure level and frequency of evacuation alert signals need to be adequate to provide unambiguous warning of the need to evacuate.

It is necessary for evacuation alert sounders such as bells or electronic sounders to be reliable. Many commercially available electronic sounders produce a greater sound output than a bell. Although the sound output of electronic sounders tends to be more direction-dependent than that of a bell, such that the high output on the axis of the electronic sounder is not always achieved at right angles to the axis, this is unlikely to be a significant disadvantage in the case of flats. Whatever the audible alarm device used, the evacuation alert signals need to be clearly distinguishable from any other alarm signals, such as those given by smoke or heat alarms within the flat.

 *It is not recommended that voice messages, rather than audible alert tones, be used, because it is not always appropriate to give a definitive verbal instruction to evacuate (e.g. it might be inappropriate for residents to evacuate if the common parts are untenable for escape).* 

10.1.2 Audibility

An evacuation alert system only provides adequate enhancement to the safety of occupants of the flats if it is capable of rousing the principal occupants of the flats from sleep (e.g. the adult occupants in typical flats). No particular sound pressure level is certain to rouse all occupants in all circumstances. Depth of sleep varies during the course of the sleep period and also varies from one person to another.