SLOVENSKI STANDARD
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Sistemi za odkrivanje in javljanje požara ter alarmiranje - 32. del: Načrtovanje, projektiranje, vgradnja, preverjanje, uporaba in vzdrževanje zvočnih sistemov za javljanje požara

Fire detection and fire alarm systems - Part 32: Planning, design, installation, commissioning, use and maintenance of voice alarm systems

Brandemeldanlagen - Teil 32: Projektierung, Montage, Inbetriebnahme, Betrieb und Instandhaltung von Sprachalarmsystemen

Systèmes de détection et d'alarme incendie - Partie 32 : Planification, conception, installation, mise en service, utilisation et maintenance des systèmes d'alarme vocale

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Fire detection and fire alarm systems - Part 32: Planning, design, installation, commissioning, use and maintenance of voice alarm systems

Systèmes de détection et d'alarme incendie - Partie 32 : Planification, conception, installation, mise en service, utilisation et maintenance des systèmes d'alarme vocale

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Foreword

This document (CEN/TS 54-32:2015) has been prepared by Technical Committee CEN/TC 72 “Fire detection and fire alarm systems”, the secretariat of which is held by BSI.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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Introduction

Guidelines covering sound systems for use during an emergency are published by different organizations within Europe. The intention of this Technical Specification is to draw together these documents and provide up-to-date guidelines for planning, design, installation, commissioning, use, maintenance and modification of emergency sound systems throughout Europe.

Sound systems for use in emergency, whether automatically triggered, manually triggered, or both, are commonly called voice alarm systems.

It is not intended that this Technical Specification should override existing local, regional or national regulations. It is expected for a considerable (and as yet unspecified) period that these guidelines will coexist with other codes. However, it is hoped that the availability of a common set of guidelines will assist in the harmonization of practice and standards for voice alarm systems throughout Europe.

This document gives recommendations. These recommendations can be made mandatory by being specified within other document(s). For example, an authority having jurisdiction empowered under local, regional or national legislation can require compliance with this document. Equally a contract between a purchaser and a supplier can specify compliance that may then become mandatory under contract law.

The purpose of a voice alarm system is to provide intelligible warning to person(s) within, or in the vicinity of, a building in which an emergency has occurred and to enable such person(s) to take appropriate measures according to an emergency management plan.

Voice alarm systems are often used instead of alarm sounders (see EN 54-3) because the meaning of an alarm signal may not be clear to untrained building occupants and so time may be spent deciding what it means and then further time may be spent deciding what to do.

This document contains specific recommendations for the design, installation, commissioning, use, and maintenance of voice alarm systems and is based on the format used in CEN/TS 54-14.

The main principles on which the guidelines are based are given in the body of this Technical Specification. Detailed recommendations by which these principles may be satisfied are given in annexes.

1 Scope

This Technical Specification provides guidelines for the planning, design, installation, commissioning, use, maintenance and modification of voice alarm systems in and around buildings that broadcast information for the protection of lives in a fire emergency. See EN 54-1:2011, Figure 1, item C and item M.

These guidelines cover voice alarm systems that are triggered automatically by a fire detection and fire alarm system or that are manually triggered, or both.

This Technical Specification does not apply to fire detection and fire alarm systems that only use voice sounders, bells or sounders or a combination of these.

NOTE 1 CEN/TS 54-14 provides guidelines for these systems.

This Technical Specification does not exclude the use of voice alarm systems for emergency purposes other than fire emergency.

NOTE 2 When used for emergencies other than those due to fire, it might be appropriate to modify the guidance in this Technical Specification.

This Technical Specification does not exclude the use of voice alarm systems for non-emergency purposes.

2 Normative references

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

EN 54-1:2011, *Fire detection and fire alarm systems - Part 1: Introduction*

3 Terms and definitions, symbols and abbreviations

For the purposes of this document, the definitions, symbols and abbreviations given in EN 54-1:2011 and the following apply.

3.1 Terms and definitions

3.1.1
acceptance
decision that the installed system meets the requirements of a previously agreed specification

3.1.2
acoustically different area
ADA
subdivision of a voice alarm zone, which may be an enclosed or otherwise physically defined space, characterized by an individual reverberation time and/or ambient noise level

Note 1 to entry: ADA is also known as an acoustically distinguishable area.

3.1.3
alarm signal
visual, audible or tactile indication of a fire or other emergency

EXAMPLES Fire, bomb alert, industrial accident, civil commotion, terrorist attack.

3.1.4
alarm load
maximum current required to operate the voice alarm system in the voice alarm condition

3.1.5
ambient noise level
ambient sound pressure normally present in an ADA in dB, normally measured using equivalent sound pressure level, L_{eqT} but may be measured using L_{10}, depending on the nature of the noise

Note 1 to entry: The level of ambient noise is measured across all the octave bands from 125 Hz to 8 kHz. The results can be used to correct STI calculations and to assist with electro-acoustic system design.

Note 2 to entry: L_{eqT} is the A-weighted sound pressure level of noise varying over a period of time, T (normally 10 min) expressed as the amount of average energy and is the measurement method normally used when there is long-term background noise, such as from extraction fans.

Note 3 to entry: L_{10} is the sound pressure level exceeded for 10 % of the measurement period calculated by statistical analysis over a specified time period, T and is the measurement method normally used when background noise varies significantly.

Note 4 to entry: Where the ambient noise level exceeds 90 dB, satisfactory speech intelligibility becomes increasingly difficult to achieve because of the auditory-masking effect.

3.1.6
approval
agreement by a third-party that the installed system satisfies the requirements of the third-party

3.1.7
approval body
body accepted by an authority having jurisdiction or other competent organization as having the expertise necessary to assess the compliance of the installed system with this Technical Specification

3.1.8
area of coverage
area inside or outside a building where the voice alarm system should meet the recommendations of this Technical Specification

3.1.9
arithmetic mean
l_{av}
value obtained by dividing the sum of a set of quantities by the number of quantities in the set

Note 1 to entry: The arithmetic mean l_{av} is given by the following formula:

$$l_{av} = \frac{1}{N}\left(a_1 + a_2 + a_3 + \ldots + a_N\right)$$

where

a_N is a real number (measurement value), and

N is the number of measurement values.

3.1.10
attention-drawing signal
tone that is broadcast to attract attention at the start of an emergency message

Note 1 to entry: The level of the attention-drawing signal is measured using the A-weighted equivalent continuous sound pressure level method, L_{AeqT}.

3.1.11
audibility
property of a sound that allows it to be heard among other sounds

Note 1 to entry: The fact that a message is audible does not mean that it is intelligible.

3.1.12
auditory masking
process by which the threshold of hearing (audibility) of one sound is increased by the presence of another (masking) sound

Note 1 to entry: In the STI method, auditory masking is also referred to as the upward spread of masking.

3.1.13
authority having jurisdiction
AHJ
body having powers to approve the voice alarm system provided under local, regional, national or European legislation

3.1.14
automatic mode
mode of operation of a voice alarm system such that it can be put into the voice alarm condition by a fire detection and fire alarm system without human intervention in a way that is pre-set according to an agreed emergency management plan

3.1.15
auxiliary mains power supply
locally provided mains power supply used to provide power to a VAS so that the quiescent condition can be maintained during a mains power supply failure without compromising the duration of operation of a VAS

EXAMPLE Uninterruptable power supply, automatically started generator.

Note 1 to entry: Auxiliary mains power supplies are also called essential power supplies.

3.1.16
cabinet
housing that affords a degree of mechanical protection and robustness to its constituent parts and subassemblies

3.1.17
coded message
emergency message intended to inform trained staff of an incident without alerting untrained occupants

Note 1 to entry: Messages that are not coded, and whose meaning is therefore clear, are known as clear messages.

3.1.18
PA/VA system
voice alarm system in which emergency audio functions are combined with non-emergency audio functions

3.1.19
commissioning
process for managing the delivery of a voice alarm system by verifying that it is designed, installed, and tested to meet the project specification

3.1.20
competent person
person who, in relation to the work undertaken, has the necessary knowledge, skill and experience to complete the work satisfactorily and safely

3.1.21
control centre
location containing an emergency microphone that is occupied by trained operators during periods of risk, such as during public access times in a shopping centre or during an event in a sports venue

Note 1 to entry: If access to a control centre is restricted, the emergency microphone may be considered to be at access level 2 as defined in EN 54-2.

3.1.22
control point
location containing an emergency microphone for the use of trained operators during an emergency

3.1.23
emergency message
broadcast comprising an attention-drawing signal followed by a pre-recorded or live emergency announcement

3.1.24
emergency microphone
microphone for use by the fire service or trained operators as part of a voice alarm system

Note 1 to entry: The emergency microphone may have status indicators and manual controls for the selection and broadcast of live and/or pre-recorded announcements.

Note 2 to entry: In order to achieve the best possible intelligibility, it is essential that operators of emergency microphones are trained to use microphones correctly.

3.1.25
emergency speech level
A-weighted sound pressure level of the speech signal that will be broadcast in the voice alarm condition measured in dB

Note 1 to entry: To determine the emergency speech level the A-weighted equivalent continuous sound pressure level L_{AeqT} is measured and 6 dB added to the result (see EN 60268-16).

3.1.26
equivalent continuous sound pressure level
L_{eqT}
twenty-fold decimal logarithm of the ratio of the RMS sound pressure level for a given time interval, T, to the reference sound pressure, where the RMS sound pressure may be determined with a standardized frequency weighting

Note 1 to entry: EN 61672 (all parts) gives further information regarding the requirements for sound pressure measurements.

3.1.27
fault
equipment failure within the voice alarm system that jeopardises the correct functioning of part or all of the system

3.1.28
fire compartment
building compartment whose boundaries have a defined fire resistance

3.1.29
functional condition
condition of the VACIE characterized by its indication at the VACIE

Note 1 to entry: The functional conditions recognized in this Technical Specification are:

— the voice alarm condition, when any emergency message or fire alarm signal, recorded or live, is broadcast in at least one voice alarm zone,

— the fault warning condition, when a fault is indicated,

— the disabled condition, when the disablement of a function is indicated,

— the quiescent condition, when no other functional condition listed above is indicated.

3.1.30
hierarchical VAS

voice alarm system comprising more than one VACIE in which one VACIE is designated as the main VACIE and in which the main VACIE is able to:

a) receive signals from and/or transmit signals to any subsidiary VACIE;

b) indicate the status of any subsidiary VACIE

Note 1 to entry: It may be necessary to ensure that the transmission paths between VACIE are able to continue to operate correctly in case of a single fault.

3.1.31
intelligibility
measure of the proportion of the content of a message that can be correctly understood by listeners

3.1.32
listener
person of normal hearing in the voice alarm system's area of coverage who is able to understand the language used

3.1.33
loudspeaker transmission path
transmission path to one or more loudspeakers

Note 1 to entry: A loudspeaker transmission path may have more than one link to the VACIE, such as a loop connected at both ends.

Note 2 to entry: If two or more cables are directly linked without a method of isolation by a fuse, relay or similar device, they are part of the same loudspeaker transmission path.

Note 3 to entry: Loudspeaker transmission paths are often referred to as loudspeaker circuits – see EN 54-1.

3.1.34
maintenance
routine process of inspection, testing and work on the voice alarm system (including cleaning, re-alignment, adjustment and replacement) carried out at pre-determined intervals in order to maintain correct operation

Note 1 to entry: Maintenance may also be referred to as servicing.

3.1.35
manual mode
mode of operation where a trained operator is directly in control of the broadcast of live or pre-recorded emergency messages

3.1.36
multi-lingual emergency message
emergency message comprising multi-lingual content with the same meaning

3.1.37
distributed VAS
distributed VAS normally transports audio signals, control data and fault monitoring data over a transmission path and may comprise one or more VACIE that communicate with each other or may be one VACIE distributed over several locations

3.1.38
operator
person who is trained to an agreed level of proficiency in tasks relating to the operation and use of the voice alarm system

Note 1 to entry: Tasks relating to the operation and use of the voice alarm system include interpret indications and warnings, operating the VAS controls and microphones, reporting issues to the responsible person and recording relevant events in the logbook.

3.1.39
phased evacuation
system of evacuation in which different parts of the building are evacuated in a controlled sequence of phases, those parts of the building expected to be at greatest risk being evacuated first

EXAMPLE A typical two-phase system will be capable of broadcasting “alert” and “evacuate” signals in different parts of the building. A typical three-phase system will be capable of giving “staff alarm”, “alert” or “evacuate” signals in different parts of the building.

Note 1 to entry: Phased evacuation is normally used where evacuation routes are restricted, such as in high-rise buildings, or where total evacuation may be dangerous or unnecessary.

Note 2 to entry: The normal condition, under which no alarm is given in a voice alarm zone, is not counted as a phase of alarm.

3.1.40
pre-recorded message
pre-recorded emergency message stored in the VACIE

3.1.41
purchaser
person or organization or their appointed representative responsible for the contract to purchase a voice alarm system

Note 1 to entry: The purchaser is often referred to as the client, customer, end-user or owner.

Note 2 to entry: Representatives of the purchaser can include members of the design team or a contractor.

3.1.42
quiescent condition
condition of the voice alarm system characterized by the absence of the voice alarm condition, fault warning condition, or disabled conditions

Note 1 to entry: If the voice alarm system is also used for non-emergency purposes, these functions are considered to be part of the quiescent condition.

3.1.43
responsible person
person appointed by the user who is responsible for ensuring that the voice alarm system operates properly, that operators are trained and competent, and that the system is correctly maintained

Note 1 to entry: In buildings with large numbers of occupants this responsibility may also be delegated so that someone with appropriate knowledge is always present.

3.1.44
reverberation time
RT
time in seconds required for the average sound-energy to decay by 60 dB after the sound source has stopped broadcasting

3.1.45
speech transmission index
STI
Speech Transmission Index (STI) is an objective measure between 0 (no intelligibility) and 1 (perfect intelligibility) used to predict the intelligibility of speech transmitted to listeners via a transmission channel

Note 1 to entry: Guidance on STI is given in EN 60268-16.

3.1.46
speech transmission index for public address systems
STIPA
method obtained by using a condensed version of the STI method but still responsive to distortions found in room acoustics and/or public address systems

Note 1 to entry: Guidance on STIPA is given in EN 60268-16.

3.1.47
system designer
technically competent person or organization that takes responsibility for the specification and adequacy of the design of the voice alarm system

3.1.48
transmission path
physical connection, external to the cabinet(s) of the VACIE, for the transmission of information, emergency messages and/or power between the VACIE and other components of the voice alarm system and/or parts of the VACIE contained in different cabinets

3.1.49
user
person or organization having day-to-day responsibility for the building and for implementation of fire-safety procedures

3.1.50
verification
process by which the installer or other contractor satisfies the purchaser that the voice alarm system meets the defined requirements