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BSI Standards Publication

Fire safety engineering — Selection of design occupant behavioural scenarios

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National foreword

This Draft for Development is the UK implementation of ISO/TS 29761:2015.

The UK participation in its preparation was entrusted to Technical Committee FSH/24, Fire safety engineering.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Fire safety engineering — Selection of design occupant behavioural scenarios

Ingénierie de la sécurité incendie — Sélection de scénarios de dimensionnement du comportement des occupants

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 92, *Fire safety*, Subcommittee SC 4, *Fire safety engineering*.

Introduction

In a fire safety engineering assessment, the ability of occupants to escape safely or find a designated place of refuge is evaluated for each design fire scenario, taking account of the occupants expected to be present in the building or other structure.

The purpose of this Technical Specification is to outline a general methodology for selecting design fire scenarios for the specific fire safety objective of life safety of the occupants, and then developing the occupant behavioural scenarios for which those design fire scenarios will be tested. ISO 16733-1 provides general guidance on the selection of design fire scenarios.

Since each design fire scenario might require several different occupant behavioural scenarios, the number of possible design occupant behavioural scenarios in any built environment (a building, structure or transportation vehicle) can be very large, and it is not possible to quantify them all. This large set of possibilities needs to be reduced to a manageably small set of occupant behavioural scenarios that are amenable to analysis. In a deterministic assessment, which is implicitly envisioned in this Technical Specification, a manageable number of design occupant behavioural scenarios is selected. For a full quantitative risk assessment, see ISO 16732-1.

The characterization of an occupant behavioural scenario involves a description of the initial occupant distribution and the number and other characteristics of the population, including their reaction and response capabilities. The occupant behavioural scenarios will be specifically determined for each design fire scenario, which itself includes the interaction with the proposed fire protection features for the built environment. The possible consequences of each fire scenario for each occupant behavioural scenario need to be considered.

Following selection of the design occupant behavioural scenarios, it is necessary to describe the assumed characteristics of the occupant behaviour on which the scenario quantification will be based. These assumed occupant behaviour characteristics are referred to as “the design occupant behaviour”. Design occupant behaviours are usually characterised in terms of pre-travel activity delay times (response and reaction times) and occupant movement speeds. The design occupant behaviour needs to be appropriate to the life safety objective of the fire safety engineering analysis and has to result in a design solution that is conservative.

TECHNICAL SPECIFICATION **ISO/TS 29761:2015(E)**

Fire safety engineering — Selection of design occupant behavioural scenarios

1 Scope

This Technical Specification describes a methodology for the selection of design occupant behavioural scenarios that are severe but credible for use in deterministic fire safety engineering analyses of any built environment including buildings, structures, or transportation vehicles.

Occupant behavioural scenarios are linked to design fire scenarios. Guidance on the selection of design fire scenarios and design fires is covered in ISO 16733-1. The steps in ISO 16733-1 are followed in this Technical Specification with life safety of the occupants as the single fire safety objective under consideration.

ISO/TR 16738 provides information on methods for the quantification of the different aspects of human evacuation behaviour in a design context. One part of that process involves the selection of occupant behavioural scenarios. This Technical Specification provides guidance for that aspect of the evaluation of an egress design.

This Technical Specification addresses behaviours that occur after fire ignition and does not deal with behaviours that influence fire ignition.

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.

ISO 13571:2012, *Life-threatening components of fire — Guidelines for the estimation of time to compromised tenability in fires*

ISO 13943, *Fire safety — Vocabulary*

ISO 16733-1:2015, *Fire safety engineering — Selection of design fire scenarios and design fires — Part 1: Selection of design fire scenarios*

ISO/TR 16738, *Fire-safety engineering — Technical information on methods for evaluating behaviour and movement of people.*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13943, ISO/TR 16738 and the following apply.

NOTE Some of the definitions have been updated to reflect the current understanding of the terms as employed in fire safety engineering. Some are duplicated here for the convenience of users of this document.

