PD 7974-7:2019+A1:2021

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Application of fire safety engineering principles to the design of buildings

Part 7: Probabilistic risk assessment

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Contents

Summary of pages

This document comprises a front cover, and inside front cover, pages i to iv, pages 1 to 46, an inside back cover and a back cover.

Foreword

Publishing information

This Published Document is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 March 2019. It was prepared by Technical Committee FSH/24, *Fire safety engineering*. A list of organizations represented on this committee can be obtained on request to its committee manager.

Supersession

PD 7974-7:2019 superseded PD 7974-7:2003, which has been withdrawn.

PD 7974-7:2019+A1:2021 supersedes PD 7974-7:2019, which is withdrawn.

Relationship to other publications

The parts of PD 7974 are structured as follows:

- PD 7974-1, *Initiation and development of fire within the enclosure of origin (Sub-system 1);*
- PD 7974-2, *Spread of smoke and toxic gases within and beyond the enclosure of origin (Sub-system 2);*
- PD 7974-3, *Structural response and fire spread beyond the enclosure of origin (Sub-system 3);*
- PD 7974-4, *Detection of fire and activation of fire protection systems (Sub-system 4);*
- PD 7974-5, *Fire service intervention (Sub-system 5);*
- PD 7974-6, *Occupant evacuation, behaviour and condition (Sub-system 6);* and
- PD 7974-7, *Probabilistic fire risk assessment.*

This series of Published Documents are intended to be used in support of BS 7974, but do not represent the only means of satisfying the recommendations of the code of practice.

Where appropriate, references to relevant standards are provided in order to assist the reader in understanding the design methodologies presented and to compare different approaches or sources of data. It is therefore important that PD 7974-7 is not used in isolation and reference is made to the relevant standards, particularly in relation to additional notes and subclauses describing its application.

Information about this document

Text introduced or altered by Amendment No. 1 is indicated in the text by tags A1 A1. Minor editorial changes are not tagged.

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As a guide, this Published Document takes the form of guidance and recommendations. It should not be quoted as if it were a specification or a code of practice and claims of compliance cannot be made to it.

It has been assumed in the preparation of this Published Document 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 guidance in this Published Document is presented in roman (i.e. upright) type. Any 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.

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

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.

1 Scope

This Published Document provides guidance on probabilistic risk analysis in support of BS 7974. It sets out the situations in which a probabilistic risk assessment can add value to traditional deterministic analyses and outlines acceptance criteria for the assessment. Furthermore, common analysis techniques of probabilistic risk assessment are summarily discussed.

This Published Document also includes data for probabilistic risk assessment based on fire statistics, building characteristics and reliability of fire protection systems.

This Published Document does not contain guidance on techniques for hazard identification or qualitative risk analysis.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this Published Document, the following terms and definitions apply.

3.1 As Low As Reasonably Practicable (ALARP)

where all reasonable measures are taken in respect of risks to reduce them further until the cost of further risk reduction is grossly disproportionate to the benefit

3.2 assessment

undertaking of an investigation in order to arrive at a judgement based on evidence

3.3 availability

ability of a system to be in a state to perform a required function under given conditions at a given instant of time or over a given time interval, assuming that the required external resources are provided

3.4 conditional probability

probability of an event given the occurrence of a preceding event

3.5 consequences

severity of the outcome of an event

3.6 deterministic

based on physical relationships derived from scientific theories and empirical results that, for a given set of initial conditions, always produce the same outcome

3.7 event

something happening or that has happened that can be made up of several but mutually exclusive occurrences

3.8 failure mode

predicted or observed results of a failure cause on a stated item in relation to the operating conditions at the time of the failure

