

BS 8519:2010



BSI Standards Publication

Selection and installation of fire-resistant power and control cable systems for life safety and fire-fighting applications – Code of practice

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Foreword

Publishing information

This British Standard is published by BSI and came into effect on 28 February 2010. It was prepared by Technical Committee FSH/1, *Fire safety cables*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 7346-6:2005, which is withdrawn.

Information about this document

This is a full revision of BS 7346-6, and introduces the following principal changes:

- change of identifier;
- change of scope;
- change from a specification to a code of practice;
- removal of Annex B (now published separately as BS 8491);
- expansion of content to include all life safety/fire-fighting systems (not only smoke venting and fire-fighting cores as in the previous edition);
- inclusion of new and revised technical guidance relating to the selection and installation of fire-resistant cables and systems for life safety and fire-fighting applications.

Use of this document

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

Any user claiming compliance with this 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 experienced people, for whose use it has been produced.

Presentational conventions

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

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

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

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

Contractual and legal considerations

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

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

Introduction

High rise and complex buildings have developed in terms of increased size, height and complexity of active fire protection. This has allowed fire engineered solutions to be developed which require a high level of performance from the components of the building services, including the electrical supplies. This British Standard is primarily intended for designers, contractors, fire engineers, regulators and enforcers including building control bodies, fire authorities and health and safety inspectors.

This British Standard does not cover cables for property protection and business continuity, but its provisions might be of use when planning property protection and business continuity systems.

This British Standard identifies those electrical loads defined as life safety and fire-fighting loads. It lists the factors to be considered by the engineer when selecting and specifying the performance requirements of the electrical distribution system needed to maintain integrity under defined fire conditions for a specified period, referred to as the fire survival time.

It makes reference to the recommendations identified in BS 9999, with regard to the design and installation of the electrical distribution systems for life safety and fire-fighting equipment.

It also makes reference to three categories of circuits required to maintain their circuit integrity under defined fire conditions for varying fire survival times of 30 min, 60 min and 120 min. Appropriate cable tests are identified for each category derived from applicable British Standards that assess cable performance under conditions of fire as might be expected in an actual fire incident.

This British Standard aims to ensure that the level of circuit integrity is not compromised by other components of the whole electrical distribution system, including cable glands, terminations, joints and cable support systems.

It covers:

- the source of supply;
- the distribution voltage [high voltage (HV) or low voltage (LV)];
- the appropriate location of the main intake enclosures, HV switchrooms, LV switchrooms, transformer rooms, generator rooms, risers, fire life safety plant rooms and fire-fighting/evacuation lift motor rooms/shafts.

It also identifies the need for dual redundant electrical supplies run via diverse cable routes, installed within separate fire compartments, and the need to incorporate automatic changeover devices, located within the same fire compartment as the life safety and fire-fighting equipment.

1 Scope

This British Standard gives guidance and recommendations on the selection and installation of power and control cable systems which are required to maintain their circuit integrity for life safety and fire-fighting applications. It also gives specific recommendations for electrical system design for such applications, and recommended limits for survival times.

This British Standard does not give recommendations for those installations covered in BS 5839-1, BS 5839-8, BS 5839-9 and BS 5266-1, but makes reference to these standards in an informative capacity.

2 Normative references

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

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

BS 8434-2:2003+A2:2009, *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 930° flame and with water spray*

BS 8491, *Method for assessment of fire integrity of large diameter power cables for use as components for smoke and heat control systems and certain other active fire safety systems*

BS EN 1366-5:2003, *Fire resistance tests for service installations – Part 5: Service ducts and shafts*

BS EN 13501-2:2007+A1:2009, *Fire classification of construction products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services*

BS EN 50200:2006, *Method of test for resistance to fire of unprotected small cables for use in emergency circuits*

BS EN 60529:1992, *Specification for degrees of protection provided by enclosures (IP code)*

BS EN 60947 (all parts), *Low-voltage switchgear and controlgear*

3 Terms and definitions

For the purposes of this British Standard, the following terms and definitions apply.

3.1 fire-resistant cable

cable able to maintain circuit integrity for a stated period of time and under conditions as defined in a standard test

3.2 substation

subsidiary station of an electricity generation, transmission and distribution system where voltage is transformed from high to low or the reverse using transformers

4 General

The electrical distribution system should be designed and installed by a competent person as defined in BS 7671.

The electrical arrangements should conform to BS 7671 and the appropriate parts of BS EN 60947.

The type of electrical distribution system selected during the design phase should be derived from a detailed process of consultation with the relevant authorities having jurisdiction over the project in question. The design should be agreed at an early stage.

5 Fire survival times

The type of electrical distribution system used to supply life safety and fire-fighting systems should meet the following criteria.

- a) For life safety systems, the system should be capable of remaining operational to allow the building occupants to be alerted, evacuated and protected in their escape from the building for:
 - 60 min for large and/or complex buildings;
 - 30 min for other buildings.
- b) For fire-fighting systems, the system should be capable of maintaining functionality to serve active systems for protecting and assisting fire-fighters in their role for 60 min or 120 min, depending on the specific fire-fighting application. The system would typically include pressure differential systems for fire-fighting, smoke and heat exhaust ventilation, sprinklers, fire-fighting lifts and wet fire main systems.

NOTE See also Clause 11.

6 Power supplies

Where electrical services in the building are essential to maintain the operation of the life safety and fire-fighting systems, a secondary power supply, e.g. an automatically started standby generator (see Figure 1) or an alternative utility supply (see Figure 2) from another external substation, should be provided which will, independently of the primary supply:

- a) be of sufficient capacity to maintain any system in operation for at least the fire survival time identified in Clause 5 for the appropriate system and type of building; and
- b) be capable of operating safely in fire conditions for the appropriate period of time.

Figure 1 Example of dual supply – Mains with standby LV generation

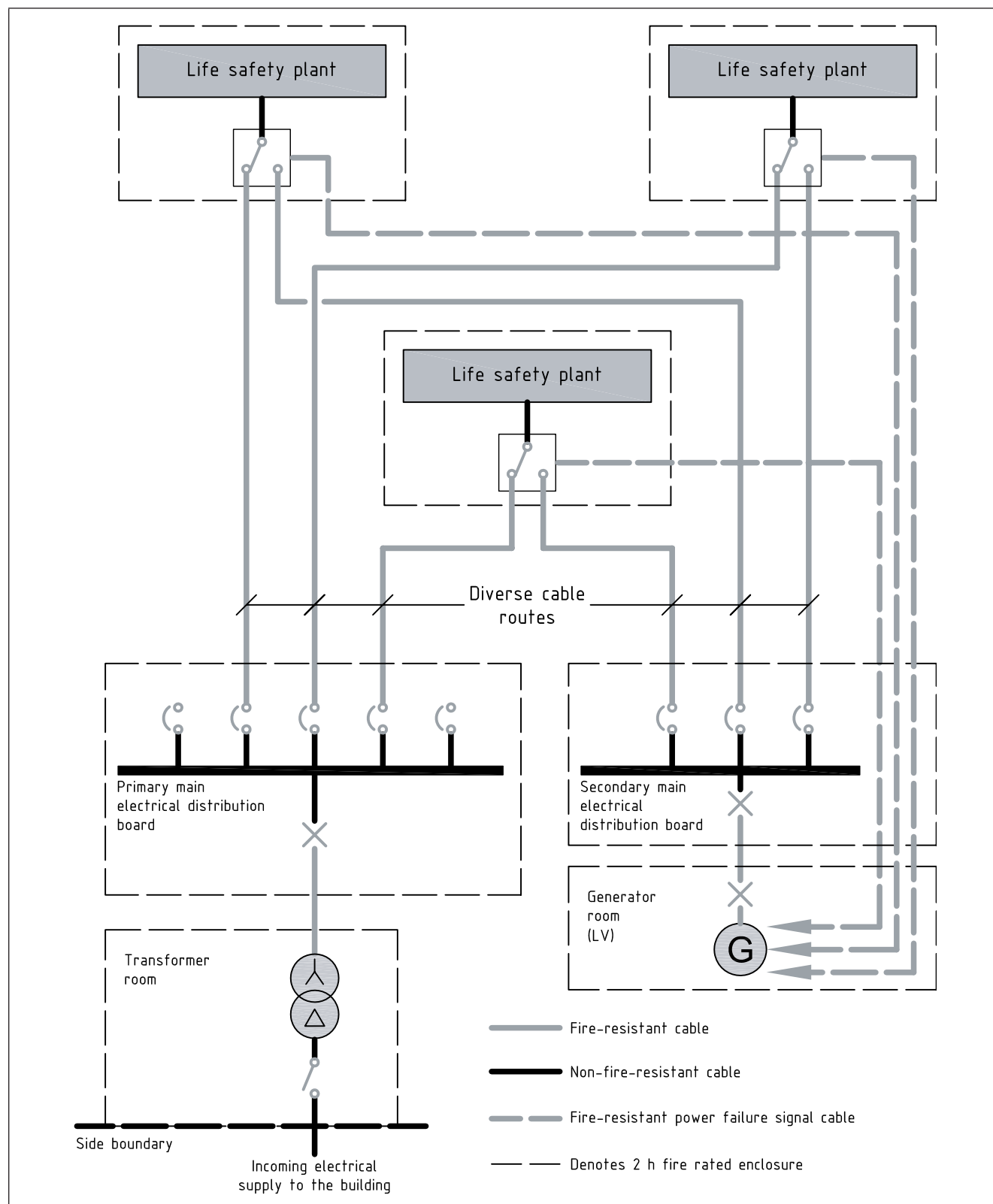


Figure 2 Example of dual supply – Mains with standby primary utility supply

