BS EN 62305-2:2012

BSI Standards Publication

Protection against lightning

Part 2: Risk management

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National foreword

This British Standard is the UK implementation of EN 62305-2:2012. It was derived from IEC 62305-2:2010. It supersedes BS EN 62305-2:2006, which will be withdrawn on 31 January 2014.

The CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by tags ▌C〉 〈C▐.

The UK participation in its preparation was entrusted to Technical Committee GEL/81, Protection against lightning.

The values assigned for certain parameters used as part of the risk evaluation process in this British Standard, are values proposed by IEC (specifically in Annexes B, C and the case studies in Annex E). It is recognized by IEC that these identified values may not be appropriate for application in all the countries that utilize this standard. Different values may be assigned by each national committee based upon each country's perception and importance they attribute to the relevant risk category.

The UK committee has reviewed the relevant parts of this standard and have provided appropriate UK interpretations which can be found in national annexes at the end of this standard. National Annex NF contains interpretations relating to Table 4 and reproduces the lightning flash density map for the British Isles together with the table and map showing the thunderstorm days throughout the world. Annexes B, C and E have been reproduced as National Annexes NB, NC and NE. The revised versions contain appropriate UK interpretations and in Annex NE two further examples, namely a heritage building and a bank computer centre, in order to provide a full representation of the four categories of risk and associated loss. These National Annexes should be used wherever and whenever the British Standard is adopted for designing lightning protection systems.

Due to the specific UK values outlined above, it is important to ensure that any software package used in conjunction with this standard is specifically designed to use the National Annexes in this document.

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

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

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

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Date	Text affected

EUROPEAN STANDARD

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EN 62305-2

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English version

Protection against lightning - Part 2: Risk management

(IEC 62305-2:2010, modified)

Protection contre la foudre -
Partie 2: Evaluation des risques
(CEI 62305-2:2010, modifiée)

Blitzschutz -
Teil 2: Risiko-Management
(IEC 62305-2:2010, modifiziert)

CENELEC

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Europäisches Komitee für Elektrotechnische Normung

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Foreword

This document (EN 62305-2:2012) consists of the text of IEC 62305-2:2010 prepared by IEC/TC 81, "Lightning protection", together with the common modifications prepared by CLC/TC 81X, "Lightning protection".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2013-03-19
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2014-01-13

This document supersedes EN 62305-2:2006 + corrigendum November 2006.

EN 62305-2:2012 includes the following significant technical changes with respect to EN 62305-2:2006:

1) risk assessment for services connected to structures is excluded from the scope;
2) injuries of living beings caused by electric shock inside the structure are considered;
3) tolerable risk of loss of cultural heritage is lowered from 10^{-3} to 10^{-4};
4) extended damage to surroundings structures or to the environment is considered;
5) improved formulas are provided for evaluation of
   - collection areas relevant to flashes nearby a structure,
   - collection areas relevant to flashes to and nearby a line,
   - probabilities that a flash can cause damage,
   - loss factors even in structures with risk of explosion,
   - risk relevant to a zone of a structure,
   - cost of loss.
6) tables are provided to select the relative amount of loss in all cases;
7) impulse withstand voltage level of equipments was extended down to 1 kV.

Notes and tables, which are additional to those in IEC 62305-2:2010 are prefixed “Z”.

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

Introduction

Lightning flashes to earth may be hazardous to structures and to lines.

The hazard to a structure can result in

– damage to the structure and to its contents,
– failure of associated electrical and electronic systems,
– injury to living beings in or close to the structure.

Consequential effects of the damage and failures may be extended to the surroundings of the structure or may involve its environment.

To reduce the loss due to lightning, protection measures may be required. Whether they are needed, and to what extent, should be determined by risk assessment.

〈C〉 The risk, defined in this part of EN 62305 as the probable average annual loss in a structure due to lightning flashes, depends on 〈C〉

– the annual number of lightning flashes influencing the structure,
– the probability of damage by one of the influencing lightning flashes,
– the mean amount of consequential loss.

Lightning flashes influencing the structure may be divided into

– flashes terminating on the structure,
– flashes terminating near the structure, direct to connected lines (power, telecommunication lines,) or near the lines.

Flashes to the structure or a connected line may cause physical damage and life hazards. Flashes near the structure or line as well as flashes to the structure or line may cause failure of electrical and electronic systems due to overvoltages resulting from resistive and inductive coupling of these systems with the lightning current.

Moreover, failures caused by lightning overvoltages in users' installations and in power supply lines may also generate switching type overvoltages in the installations.

〈C〉 NOTE Malfunctioning of electrical and electronic systems is not covered by the EN 62305 series. Reference should be made to EN 61000-4-5 [2]1). 〈C〉

The number of lightning flashes influencing the structure depends on the dimensions and the characteristics of the structure and of the connected lines, on the environmental characteristics of the structure and the lines, as well as on lightning ground flash density in the region where the structure and the lines are located.

The probability of lightning damage depends on the structure, the connected lines, and the lightning current characteristics, as well as on the type and efficiency of applied protection measures.

The annual mean amount of the consequential loss depends on the extent of damage and the consequential effects which may occur as result of a lightning flash.

The effect of protection measures results from the features of each protection measure and may reduce the damage probabilities or the amount of consequential loss.

The decision to provide lightning protection may be taken regardless of the outcome of risk assessment where there is a desire that there be no avoidable risk.

1) Figures in square brackets refer to the bibliography.

1 Scope

〈C〉 This part of EN 62305 is applicable to risk assessment for a structure due to lightning flashes to earth. 〈C〉

Its purpose is to provide a procedure for the evaluation of such a risk. Once an upper tolerable limit for the risk has been selected, this procedure allows the selection of appropriate protection measures to be adopted to reduce the risk to or below the tolerable limit.

2 Normative references

〈C〉 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 62305-1:2011, *Protection against lightning – Part 1: General principles* (IEC 62305-1:2010, mod.)

EN 62305-3:2011, *Protection against lightning – Part 3: Physical damage to structures and life hazard* (IEC 62305-3:2010, mod.)

EN 62305-4:2011, *Protection against lightning – Part 4: Electrical and electronic systems within structures* (IEC 62305-4:2010, mod.) 〈C〉

3 Terms, definitions, symbols and abbreviations

〈C〉 For the purposes of this document, the following terms, definitions, symbols and abbreviations, some of which have already been cited in Part 1 but are repeated here for ease of reading, as well as those given in other parts of EN 62305, apply. 〈C〉

3.1 Terms and definitions

3.1.1
structure to be protected
structure for which protection is required against the effects of lightning in accordance with this standard

Note 1 to entry: A structure to be protected may be part of a larger structure.

〈C〉 **3.1.2**
structures with risk of explosion
structures containing solid explosives materials or hazardous zones as determined in accordance with EN 60079-10-1[3] and EN 60079-10-2[4] 〈C〉

3.1.3
structures dangerous to the environment
structures which may cause biological, chemical or radioactive emission as a consequence of lightning (such as chemical, petrochemical, nuclear plants, etc.)

3.1.4
urban environment
area with a high density of buildings or densely populated communities with tall buildings

Note 1 to entry: 'Town centre' is an example of an urban environment.

3.1.5
suburban environment
area with a medium density of buildings