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Protection against lightning -- Part 2: Risk management

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Titre : Protection contre la foudre - Partie 2:
Evaluation des risques

Title : Protection against lightning - Part 2: Risk
management

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Note d'introduction

Introductory note

This CDV is circulated in English only in the absence of a French version from the French national committee within two months from date of request.

ATTENTION VOTE PARALLÈLE CEI – CENELEC L'attention des Comités nationaux de la CEI, membres du CENELEC, est attirée sur le fait que ce projet de comité pour vote (CDV) de Norme internationale est soumis au vote parallèle. Les membres du CENELEC sont invités à voter via le système de vote en ligne du CENELEC.	ATTENTION IEC – CENELEC PARALLEL VOTING The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) for an International Standard is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.
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**IEC 62305-2, Ed.2: Protection against lightning –
Part 2: Risk Management**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PROTECTION AGAINST LIGHTNING –

Part 2: Risk management

FOREWORD

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International Standard IEC 62305-2 has been prepared by IEC technical committee 81: Lightning protection.

The text of this second edition of IEC 62305-2 is compiled from and replaces IEC 62305-2, first edition (2006).

The text of this standard is based on the following documents:

FDIS	Report on voting
81/xxx/FDIS	81/xxx/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted, as closely as possible, in accordance with the ISO/IEC Directives, Part 2.

IEC 62305 consists of the following parts, under the general title *Protection against lightning*:

Part 1: General principles

Part 2: Risk management

Part 3: Physical damage to structures and life hazard

Part 4: Electrical and electronic systems within structures

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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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.

The risk, defined in this standard as the probable average annual loss in a structure due to lightning flashes, depends on:

- 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.

NOTE 1 Malfunctioning of electrical and electronic systems is not covered by the IEC 62305 series. Reference should be made to IEC 61000-4-5 [1]¹.

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.

¹ Figures in square brackets refer to the bibliography.

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.

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PROTECTION AGAINST LIGHTNING

Part 2: Risk management

1 Scope

This part of IEC 62305 is applicable to risk assessment for a structure due to lightning flashes to earth. 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

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.

IEC 60079-10:2002, *Electrical apparatus for explosive gas atmosphere – Part 10: Classification of hazardous areas*

IEC 61241-10:2004, *Electrical apparatus for use in the presence of combustible dust – Part 10: Classification of areas where combustible dusts are or may be present*

IEC 62305-1, *Protection against lightning – Part 1: General principles*

IEC 62305-3, *Protection against lightning – Part 3: Physical damage to structures and life hazard*

IEC 62305-4, *Protection against lightning – Part 4: Electrical and electronic systems within structures*

3 Terms, definitions, symbols and abbreviations

For the purposes of this Standard, 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 IEC 62305, apply.

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 A structure to be protected may be a part of a larger structure.

3.1.2

structures with risk of explosion

structures containing solid explosives materials or hazardous zones as determined in accordance with IEC 60079-10 and IEC 61241-10

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 'Town centre' is an example of an urban environment.

3.1.5

suburban environment

area with a medium density of buildings

NOTE 'Town outskirts' is an example of a suburban environment.

3.1.6

rural environment

area with a low density of buildings.

NOTE 'Countryside' is an example of a rural environment.

3.1.7

rated impulse withstand voltage level

U_w

impulse withstand voltage assigned by the manufacturer to the equipment or to a part of it, characterizing the specified withstand capability of its insulation against overvoltages

NOTE For the purposes of this standard, only the withstand voltage between live conductors and earth is considered.

3.1.8

electrical system

system incorporating low voltage power supply components

3.1.9

electronic system

system incorporating sensitive electronic components such as telecommunication equipment, computer, control and instrumentation systems, radio systems, power electronic installations

3.1.10

internal systems

electrical and electronic systems within a structure

3.1.11

line

power line or telecommunication line connected to the structure to be protected