

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Protection against lightning –
Part 2: Risk management**

**Protection contre la foudre –
Partie 2: Evaluation des risques**

WITHDRAWN

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Partie 2: Evaluation des risques**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PROTECTION AGAINST LIGHTNING –**Part 2: Risk management**

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The text of this first edition of IEC 62305-2 is compiled from and replaces

- IEC 61662, first edition (1995) and its Amendment (1996).

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

FDIS	Report on voting
81/263/FDIS	81/268/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 close 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

Part 5: Services¹

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

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¹ To be published

INTRODUCTION

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

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.

The hazard to services can result in

- damage to the service itself,
- failure of associated electrical and electronic equipment.

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 and in a service due to lightning flashes, depends on:

- the annual number of lightning flashes influencing the structure and the service;
- 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 services (power, telecommunication lines, other services) or near the services.

Lightning flashes influencing the service may be divided into

- flashes terminating on the service,
- flashes terminating near the service or direct to a structure connected to the service.

Flashes to the structure or a connected service may cause physical damage and life hazards. Flashes near the structure or service as well as flashes to the structure or service 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]².

NOTE 2 Information on assessment of the risk due to switching overvoltages is given in Annex F.

² Figures in square brackets refer to the bibliography.

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

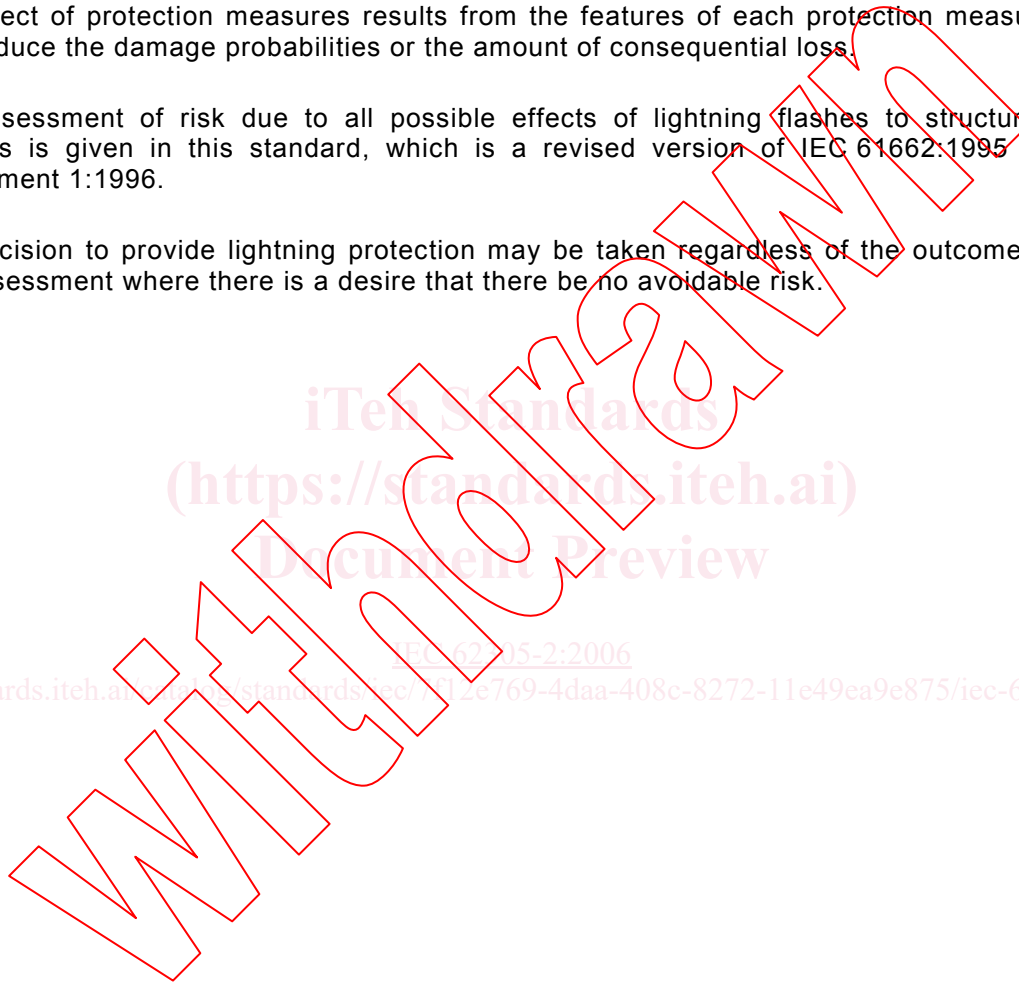
The probability of lightning damage depends on the structure, the services, and the lightning current characteristics; as well as on the type and efficiency of applied protection measures.

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 assessment of risk due to all possible effects of lightning flashes to structures and services is given in this standard, which is a revised version of IEC 61662:1995 and its Amendment 1:1996.

The decision to provide lightning protection may be taken regardless of the outcome of any 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 or for a service 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*

IEC 62305-5, *Protection against lightning – Part 5: Services³*

ITU-T Recommendation K.46:2000, *Protection of telecommunication lines using metallic symmetric conductors against lightning induced surges*

ITU-T Recommendation K.47:2000, *Protection of telecommunication lines using metallic conductors against direct lightning discharges*

3 Terms, definitions, symbols and abbreviations

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 IEC 62305, apply.

³ To be published

3.1 Terms and definitions

3.1.1

object to be protected

structure or service to be protected against the effects of lightning

3.1.2

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.

3.1.3

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

NOTE For the purposes of this standard, only structures with hazardous zones type 0 or containing solid explosive materials are considered.

3.1.4

structures dangerous to the environment

structures which may cause biological, chemical and radioactive emission as a consequence of lightning (such as chemical, petrochemical, nuclear plants, etc).

3.1.5

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.

3.1.6

suburban environment

area with a medium density of buildings

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

3.1.7

rural environment

area with a low density of buildings.

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

3.1.8

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 withstand voltage between live conductors and earth is considered.

3.1.9

electrical system

system incorporating low voltage power supply components