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Instructions for simulation-based insulation coordination and modelling of electrical networks

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Instructions for simulation-based insulation coordination and modelling of electrical networks

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IEC TS 60071-4 has been prepared by IEC technical committee 99: Insulation co-ordination and system engineering of high voltage electrical power installations above 1,0 kV AC and 1,5 kV DC. It is a Technical Specification.

This edition cancels and replaces IEC TR 60071-4, published in 2004. This edition constitutes a technical revision

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
99/535/DTS	99/548/RVDTS

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

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60071 series, published under the general title *Insulation co-ordination*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,

– withdrawn, or

– revised.

1 Scope

This technical specification gives guidance on conducting insulation co-ordination studies which propose internationally recognized recommendations:

– for the computational modelling of electrical systems, and
– for the implementation of deterministic and probabilistic methods adapted to the use of numerical programmes.

Its object is to give information in terms of methods, modelling and examples that support the application of the approaches presented in IEC 60071-2:2023, and for the selection of insulation levels of equipment or installations, as defined in IEC 60071-1:2019.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60060-1:2025, *High-voltage test techniques - Part 1: General terminology and test requirements*

IEC 60071-1:2019, *Insulation co-ordination - Part 1: Definitions, principles and rules*

IEC 60071-2:2023, *Insulation co-ordination - Part 2: Application guidelines*

IEC 60071-11:2022, *Insulation co-ordination - Part 11 : Definitions, principles and rules for HVDC system*

IEC 60071-12:2022, *Insulation co-ordination - Part 12: Application guidelines for LCC HVDC converter stations*

IEC 60099-4:2014, *Surge arresters - Part 4: Metal-oxide surge arresters without gaps for a.c. systems*

IEC 62271-100:2021, *High-voltage switchgear and controlgear - Part 100: Alternating-current circuit-breakers*

3 Terms and definitions, symbols and acronyms

For the purposes of this document, the terms and definitions given in IEC 60071-1:2019 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

– IEC Electropedia: available at https://www.electropedia.org/
– ISO Online browsing platform: available at https://www.iso.org/obp

NOTE Certain references are taken from the IEC Electrotechnical Vocabulary (https://www.electropedia.org).

3.1 Terms and definitions

3.1.1
back-feeding
conditions of supplying a high-voltage overhead line or cable through a transformer from the low-voltage side