

REDLINE VERSION



HORIZONTAL STANDARD

Insulation co-ordination – Part 1: Definitions, principles and rules

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.080.30

ISBN 978-2-8322-7295-4

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	7
4 Abbreviated terms and symbols	10
4.1 General.....	15
4.2 Subscripts.....	15
4.3 Letter symbols	15
4.4 Abbreviations.....	16
5 Procedure for insulation co-ordination	16
5.1 General outline of the procedure.....	16
5.2 Determination of the representative voltages and overvoltages (U_{rp}).....	17
5.3 Determination of the co-ordination withstand voltages (U_{cw}).....	19
5.4 Determination of the required withstand voltage (U_{rw})	19
5.5 Selection of the rated insulation level.....	20
5.6 List of standard rated short-duration power frequency withstand voltages	21
5.7 List of standard rated impulse withstand voltages	21
5.8 Ranges for highest voltage for equipment	21
5.9 Environmental conditions	21
5.9.1 Normal environmental conditions	21
5.9.2 Standard reference atmospheric conditions	21
5.10 Selection of the standard insulation level	22
5.11 Background of the standard insulation level	26
5.11.1 General	26
5.11.2 Standard rated switching impulse withstand voltage	27
5.11.3 Standard rated lightning impulse withstand voltage.....	27
6 Requirements for standard withstand voltage tests	27
6.1 General requirements	27
6.2 Standard short-duration power-frequency withstand voltage tests	28
6.3 Standard impulse withstand voltage tests.....	28
6.4 Alternative test situation.....	29
6.5 Phase-to-phase and longitudinal insulation standard withstand voltage tests for equipment in range I	29
6.5.1 Power-frequency tests	29
6.5.2 Phase-to-phase (or longitudinal) insulation lightning impulse tests.....	30
6.6 Phase-to-phase and longitudinal insulation standard withstand voltage tests for equipment in range II	30
Annex A (normative) Clearances in air to assure a specified impulse withstand voltage installation	31
A.1 General.....	31
A.2 Range I Lightning impulse.....	32
A.3 Range II Switching impulse	34
Annex B (informative) Values of Rated insulation levels for 1 kV < U_m ≤ 245 kV for highest voltages for of equipment, U_m , not standardized by IEC based on current practice in some countries	36
Bibliography.....	37

Figure 1 – Flow chart for the determination of rated or standard insulation level	17
Table 1 – Classes and shapes of overvoltages, Standard voltage shapes and Standard withstand voltage tests	18
Table 2 – Standard insulation levels for range I ($1 \text{ kV} < U_m \leq 245 \text{ kV}$)	24
Table 3 – Standard insulation levels for range II ($U_m > 245 \text{ kV}$)	25
Table A.1 – Correlation between standard rated lightning impulse withstand voltages and minimum air clearances	33
Table A.2 – Correlation between standard rated switching impulse withstand voltages and minimum phase-to-earth air clearances	34
Table A.3 – Correlation between standard rated switching impulse withstand voltages and minimum phase-to-phase air clearances	35
Table B.1 – Values of rated insulation levels for $1 \text{ kV} < U_m \leq 245 \text{ kV}$ for highest voltages for equipment U_m not standardized by IEC based on current practice in some countries	36
Table B.1 – Rated insulation levels for highest voltages of equipment U_m not standardized by IEC	36

INTERNATIONAL ELECTROTECHNICAL COMMISSION

INSULATION CO-ORDINATION –

Part 1: Definitions, principles and rules

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

DISCLAIMER

This Redline version is not an official Standard and is intended to provide the user with an indication of what changes have been made to the previous version. Only the IEC International Standard provided in this package is to be considered the official Standard.

This Redline version provides you with a quick and easy way to compare all the changes between this standard and its previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 60071-1 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.

This ninth edition cancels and replaces the eighth edition published in 2006 and Amendment 1:2010. This edition constitutes a technical revision.

It has the status of a horizontal standard in accordance with IEC Guide 108.

The main changes from the previous edition are as follows:

- a) all references are updated to current IEC standards, and the bibliography is deleted;
- b) some definitions are clarified in order to avoid overlapping and ensure clear understanding;
- c) letter symbols are changed and corrected in order to keep the consistency with relevant IEC standards;
- d) some titles are changed to clarify understanding (see Clauses A.2, A.3 and Annex B).

The text of this International Standard is based on the following documents:

CDV	Report on voting
99/199/CDV	99/227/RVC

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

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

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 the base publication and its amendments will remain unchanged until the stability 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.

IMPORTANT – The “colour inside” logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

INSULATION CO-ORDINATION –

Part 1: Definitions, principles and rules

1 Scope

This part of IEC 60071 applies to three-phase AC systems having a highest voltage for equipment above 1 kV. It specifies the procedure for the selection of the rated withstand voltages for the phase-to-earth, phase-to-phase and longitudinal insulation of the equipment and the installations of these systems. It also gives the lists of the standard withstand voltages from which the rated withstand voltages ~~should be~~ are selected.

This document ~~recommends~~ describes that the selected withstand voltages ~~should be~~ are associated with the highest voltage for equipment. This association is for insulation co-ordination purposes only. The requirements for human safety are not covered by this document.

Although the principles of this document also apply to transmission line insulation, the values of their withstand voltages ~~may~~ can be different from the standard rated withstand voltages.

The apparatus committees are responsible for specifying the rated withstand voltages and the test procedures suitable for the relevant equipment taking into consideration the recommendations of this document.

NOTE In IEC 60071-2, ~~Application Guide~~, all rules for insulation co-ordination given in this document are justified in detail, in particular the association of the standard rated withstand voltages with the highest voltage for equipment. When more than one set of standard rated withstand voltages is associated with the same highest voltage for equipment, guidance is provided for the selection of the most suitable set.

This horizontal standard is primarily intended for use by technical committees in the preparation of standards in accordance with the principles laid down in IEC Guide 108.

One of the responsibilities of a technical committee is, wherever applicable, to make use of horizontal standards in the preparation of its publications. The contents of this horizontal standard will not apply unless specifically referred to or included in the relevant publications.

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 60038:~~2002~~, *IEC standard voltages*

IEC 60060-1:~~1989~~, *High-voltage test techniques – Part 1: General definitions and test requirements*

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

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

~~IEC 60507, Artificial pollution tests on high-voltage insulators to be used on a.c. systems~~

~~IEC 60633, Terminology for high-voltage direct current (HVDC) transmission~~

INTERNATIONAL STANDARD

NORME INTERNATIONALE



HORIZONTAL STANDARD
NORME HORIZONTALE

**Insulation co-ordination –
Part 1: Definitions, principles and rules**

**Coordination de l'isolement –
Partie 1: Définitions, principes et règles**

CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	7
4 Abbreviated terms and symbols	14
4.1 General.....	14
4.2 Subscripts.....	14
4.3 Letter symbols	14
4.4 Abbreviations.....	15
5 Procedure for insulation co-ordination	15
5.1 General outline of the procedure.....	15
5.2 Determination of the representative voltages and overvoltages (U_{rp}).....	16
5.3 Determination of the co-ordination withstand voltages (U_{cw}).....	18
5.4 Determination of the required withstand voltage (U_{rw})	18
5.5 Selection of the rated insulation level.....	19
5.6 List of standard rated short-duration power frequency withstand voltages	20
5.7 List of standard rated impulse withstand voltages	20
5.8 Ranges for highest voltage for equipment	20
5.9 Environmental conditions	20
5.9.1 Normal environmental conditions	20
5.9.2 Standard reference atmospheric conditions	20
5.10 Selection of the standard insulation level	20
5.11 Background of the standard insulation level	24
5.11.1 General	24
5.11.2 Standard rated switching impulse withstand voltage	25
5.11.3 Standard rated lightning impulse withstand voltage.....	25
6 Requirements for standard withstand voltage tests	25
6.1 General requirements	25
6.2 Standard short-duration power-frequency withstand voltage tests	26
6.3 Standard impulse withstand voltage tests.....	26
6.4 Alternative test situation.....	27
6.5 Phase-to-phase and longitudinal insulation standard withstand voltage tests for equipment in range I	27
6.5.1 Power-frequency tests	27
6.5.2 Phase-to-phase (or longitudinal) insulation lightning impulse tests.....	28
6.6 Phase-to-phase and longitudinal insulation standard withstand voltage tests for equipment in range II	28
Annex A (normative) Clearances in air to assure a specified impulse withstand voltage installation	29
A.1 General.....	29
A.2 Lightning impulse.....	30
A.3 Switching impulse	31
Annex B (informative) Rated insulation levels for highest voltages of equipment U_m not standardized by IEC.....	33
Bibliography.....	34

Figure 1 – Flow chart for the determination of rated or standard insulation level	16
Table 1 – Classes and shapes of overvoltages, Standard voltage shapes and Standard withstand voltage tests	17
Table 2 – Standard insulation levels for range I ($1 \text{ kV} < U_m \leq 245 \text{ kV}$)	22
Table 3 – Standard insulation levels for range II ($U_m > 245 \text{ kV}$)	23
Table A.1 – Correlation between standard rated lightning impulse withstand voltages and minimum air clearances	30
Table A.2 – Correlation between standard rated switching impulse withstand voltages and minimum phase-to-earth air clearances	31
Table A.3 – Correlation between standard rated switching impulse withstand voltages and minimum phase-to-phase air clearances	32
Table B.1 – Rated insulation levels for highest voltages of equipment U_m not standardized by IEC	33

INTERNATIONAL ELECTROTECHNICAL COMMISSION

INSULATION CO-ORDINATION –**Part 1: Definitions, principles and rules**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60071-1 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.

This ninth edition cancels and replaces the eighth edition published in 2006 and Amendment 1:2010. This edition constitutes a technical revision.

It has the status of a horizontal standard in accordance with IEC Guide 108.

The main changes from the previous edition are as follows:

- a) all references are updated to current IEC standards, and the bibliography is deleted;
- b) some definitions are clarified in order to avoid overlapping and ensure clear understanding;
- c) letter symbols are changed and corrected in order to keep the consistency with relevant IEC standards;
- d) some titles are changed to clarify understanding (see Clauses A.2, A.3 and Annex B).

The text of this International Standard is based on the following documents:

CDV	Report on voting
99/199/CDV	99/227/RVC

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

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

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 the base publication and its amendments will remain unchanged until the stability 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.

IMPORTANT – The “colour inside” logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

INSULATION CO-ORDINATION –

Part 1: Definitions, principles and rules

1 Scope

This part of IEC 60071 applies to three-phase AC systems having a highest voltage for equipment above 1 kV. It specifies the procedure for the selection of the rated withstand voltages for the phase-to-earth, phase-to-phase and longitudinal insulation of the equipment and the installations of these systems. It also gives the lists of the standard withstand voltages from which the rated withstand voltages are selected.

This document describes that the selected withstand voltages are associated with the highest voltage for equipment. This association is for insulation co-ordination purposes only. The requirements for human safety are not covered by this document.

Although the principles of this document also apply to transmission line insulation, the values of their withstand voltages can be different from the standard rated withstand voltages.

The apparatus committees are responsible for specifying the rated withstand voltages and the test procedures suitable for the relevant equipment taking into consideration the recommendations of this document.

NOTE In IEC 60071-2, all rules for insulation co-ordination given in this document are justified in detail, in particular the association of the standard rated withstand voltages with the highest voltage for equipment. When more than one set of standard rated withstand voltages is associated with the same highest voltage for equipment, guidance is provided for the selection of the most suitable set.

This horizontal standard is primarily intended for use by technical committees in the preparation of standards in accordance with the principles laid down in IEC Guide 108.

One of the responsibilities of a technical committee is, wherever applicable, to make use of horizontal standards in the preparation of its publications. The contents of this horizontal standard will not apply unless specifically referred to or included in the relevant publications.

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 60038, *IEC standard voltages*

IEC 60060-1, *High-voltage test techniques – Part 1: General definitions and test requirements*

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

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

SOMMAIRE

AVANT-PROPOS	38
1 Domaine d'application	40
2 Références normatives	40
3 Termes et définitions	41
4 Termes abrégés et symboles	49
4.1 Généralités	49
4.2 Indices	49
4.3 Symboles littéraux	49
4.4 Abréviations	49
5 Procédure pour la coordination de l'isolement	50
5.1 Généralités sur la procédure	50
5.2 Détermination des tensions et surtensions représentatives (U_{rp})	51
5.3 Détermination des tensions de tenue de coordination (U_{cw})	53
5.4 Détermination des tensions de tenue exigées (U_{rw})	53
5.5 Choix du niveau d'isolement assigné	54
5.6 Liste des tensions de tenue assignées normalisées de courte durée à fréquence industrielle	55
5.7 Liste des tensions de tenue assignées normalisées aux chocs	55
5.8 Plages de la tension la plus élevée pour le matériel	55
5.9 Conditions d'environnement	55
5.9.1 Conditions environnementales normales	55
5.9.2 Conditions atmosphériques normalisées de référence	56
5.10 Choix du niveau d'isolement normalisé	56
5.11 Origine du niveau d'isolement normalisé	60
5.11.1 Généralités	60
5.11.2 Tension de tenue assignée normalisée au choc de manœuvre	61
5.11.3 Tension de tenue assignée normalisée au choc de foudre	61
6 Exigences pour les essais de tension de tenue normalisée	61
6.1 Exigences générales	61
6.2 Essais de tension de tenue normalisée de courte durée à fréquence industrielle	62
6.3 Essais de tension de tenue normalisée aux chocs	62
6.4 Situation d'essai alternative	63
6.5 Essais de tension de tenue normalisée de l'isolation entre phases et de l'isolation longitudinale pour le matériel de la plage I	63
6.5.1 Essais à fréquence industrielle	63
6.5.2 Essais au choc de foudre de l'isolation entre phases (ou longitudinale)	64
6.6 Essais de tension de tenue normalisée de l'isolation entre phases et de l'isolation longitudinale pour le matériel de la plage II	64
Annexe A (normative) Distances dans l'air pour installation garantissant une tension de tenue aux chocs spécifiée	65
A.1 Généralités	65
A.2 Choc de foudre	66
A.3 Choc de manœuvre	67
Annexe B (informative) Niveaux d'isolement assignés pour les tensions les plus élevées pour le matériel U_m non normalisées par l'IEC	69
Bibliographie	70

Figure 1 – Organigramme de détermination du niveau d'isolement assigné ou normalisé	51
Tableau 1 – Classes et formes des surtensions, des formes de tension normalisées et des essais de tension de tenue normalisée	52
Tableau 2 – Niveaux d'isolement normalisés pour la plage I ($1 \text{ kV} < U_m \leq 245 \text{ kV}$)	58
Tableau 3 – Niveaux d'isolement normalisés pour la plage II ($U_m > 245 \text{ kV}$)	59
Tableau A.1 – Correspondance entre les tensions de tenue assignées normalisées au choc de foudre et les distances dans l'air minimales	66
Tableau A.2 – Correspondance entre les tensions de tenue assignées normalisées au choc de manœuvre et les distances dans l'air minimales phase-terre.....	68
Tableau A.3 – Correspondance entre les tensions de tenue assignées normalisées au choc de manœuvre et les distances dans l'air minimales entre phases	68
Tableau B.1 – Niveaux d'isolement assignés pour les tensions les plus élevées pour le matériel U_m non normalisées par l'IEC	69

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

COORDINATION DE L'ISOLEMENT –

Partie 1: Définitions, principes et règles

AVANT-PROPOS

- 1) La Commission Electrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. A cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
- 2) Les décisions ou accords officiels de l'IEC concernant les questions techniques représentent, dans la mesure du possible, un accord international sur les sujets étudiés, étant donné que les Comités nationaux de l'IEC intéressés sont représentés dans chaque comité d'études.
- 3) Les Publications de l'IEC se présentent sous la forme de recommandations internationales et sont agréées comme telles par les Comités nationaux de l'IEC. Tous les efforts raisonnables sont entrepris afin que l'IEC s'assure de l'exactitude du contenu technique de ses publications; l'IEC ne peut pas être tenue responsable de l'éventuelle mauvaise utilisation ou interprétation qui en est faite par un quelconque utilisateur final.
- 4) Dans le but d'encourager l'uniformité internationale, les Comités nationaux de l'IEC s'engagent, dans toute la mesure possible, à appliquer de façon transparente les Publications de l'IEC dans leurs publications nationales et régionales. Toutes divergences entre toutes Publications de l'IEC et toutes publications nationales ou régionales correspondantes doivent être indiquées en termes clairs dans ces dernières.
- 5) L'IEC elle-même ne fournit aucune attestation de conformité. Des organismes de certification indépendants fournissent des services d'évaluation de conformité et, dans certains secteurs, accèdent aux marques de conformité de l'IEC. L'IEC n'est responsable d'aucun des services effectués par les organismes de certification indépendants.
- 6) Tous les utilisateurs doivent s'assurer qu'ils sont en possession de la dernière édition de cette publication.
- 7) Aucune responsabilité ne doit être imputée à l'IEC, à ses administrateurs, employés, auxiliaires ou mandataires, y compris ses experts particuliers et les membres de ses comités d'études et des Comités nationaux de l'IEC, pour tout préjudice causé en cas de dommages corporels et matériels, ou de tout autre dommage de quelque nature que ce soit, directe ou indirecte, ou pour supporter les coûts (y compris les frais de justice) et les dépenses découlant de la publication ou de l'utilisation de cette Publication de l'IEC ou de toute autre Publication de l'IEC, ou au crédit qui lui est accordé.
- 8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
- 9) L'attention est attirée sur le fait que certains des éléments de la présente Publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets et de ne pas avoir signalé leur existence.

La Norme internationale IEC 60071-1 a été établie par le comité d'études 99: Installations électriques de tension supérieure à 1,0 kV en courant alternatif et 1,5 kV en courant continu: Coordination de l'isolement et conception.

Cette neuvième édition annule et remplace la huitième édition parue en 2006 et son Amendement 1:2010. Cette édition constitue une révision technique.

Elle a le statut d'une norme horizontale conformément au Guide 108 de l'IEC.

Les principales modifications par rapport à l'édition précédente sont les suivantes:

- a) toutes les références ont été mises à jour en faveur des normes IEC actuelles et la bibliographie est supprimée;

- b) certaines définitions ont été modifiées afin d'éviter les chevauchements et de favoriser une bonne compréhension;
- c) les symboles littéraux ont été modifiés et corrigés afin de garantir la cohérence avec les normes IEC concernées;
- d) plusieurs titres ont été modifiés en vue d'une meilleure compréhension (voir les Articles A.2 et A.3, ainsi que l'Annexe B).

Le texte de cette Norme internationale est issu des documents suivants:

CDV	Rapport de vote
99/199/CDV	99/227/RVC

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette Norme internationale.

Cette publication a été rédigée selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 60071, publiées sous le titre général *Coordination de l'isolement*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de la publication de base et de ses amendements ne serait pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "<http://webstore.iec.ch>" dans les données relatives à la publication recherchée. A cette date, la publication sera

- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

IMPORTANT – Le logo "*colour inside*" qui se trouve sur la page de couverture de cette publication indique qu'elle contient des couleurs qui sont considérées comme utiles à une bonne compréhension de son contenu. Les utilisateurs devraient, par conséquent, imprimer cette publication en utilisant une imprimante couleur.

COORDINATION DE L'ISOLEMENT –

Partie 1: Définitions, principes et règles

1 Domaine d'application

La présente partie de l'IEC 60071 s'applique aux réseaux à tension alternative triphasée dont la tension la plus élevée pour le matériel est supérieure à 1 kV. Elle spécifie la procédure à suivre pour le choix des tensions de tenue assignées normalisées pour l'isolation phase-terre, l'isolation entre phases et l'isolation longitudinale du matériel et des installations de ces réseaux. Elle donne également les listes des valeurs normalisées parmi lesquelles les tensions de tenue assignées normalisées sont choisies.

Le présent document décrit que les tensions de tenue choisies sont associées aux tensions les plus élevées pour le matériel. Cette association est destinée aux seules fins de la coordination de l'isolement. Les exigences concernant la sécurité des personnes ne sont pas couvertes par le présent document.

Bien que les principes du présent document s'appliquent également à l'isolation des lignes de transport d'énergie, les valeurs des tensions de tenue peuvent être différentes des tensions de tenue assignées normalisées.

Il appartient aux comités de produits de spécifier les tensions de tenue et les procédures d'essai appropriées aux matériels correspondants, en prenant les recommandations du présent document en considération.

NOTE Toutes les règles relatives à la coordination de l'isolement données dans le présent document sont justifiées en détail dans l'IEC 60071-2, en particulier en ce qui concerne l'association des tensions de tenue assignées normalisées avec les tensions les plus élevées pour le matériel. Lorsque plusieurs séries de tensions de tenue assignées normalisées sont associées à la même valeur de la tension la plus élevée pour le matériel, une ligne directrice est donnée pour le choix de la série la plus appropriée.

Cette norme horizontale est essentiellement destinée à l'usage des comités d'études dans la préparation des normes, conformément aux principes établis dans le Guide 108 de l'IEC.

Une des responsabilités d'un comité d'études est, partout où cela est possible, de se servir des normes horizontales lors de la préparation de ses publications. Le contenu de cette norme horizontale ne s'appliquera pas, à moins qu'il ne soit spécifiquement désigné ou inclus dans les publications concernées.

2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60038, *Tensions normales de l'IEC*

IEC 60060-1, *Technique des essais à haute tension – Partie 1: Définitions et exigences générales*

IEC 60071-2, *Coordination de l'isolement – Partie 2: Lignes directrices en matière d'application*

IEC 60099-4, *Parafoudres – Partie 4: Parafoudres à oxyde métallique sans éclateur pour réseaux à courant alternatif*