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INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

Radio interference characteristics of overhead power lines and high-voltage equipment – Part 3: Code of practice for minimizing the generation of radio noise

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

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RADIO INTERFERENCE CHARACTERISTICS OF OVERHEAD POWER LINES AND HIGH-VOLTAGE EQUIPMENT –

Part 3: Code of practice for minimizing the generation of radio noise

FOREWORD

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This Redline version is not an official IEC Standard and is intended only to provide the user with an indication of what changes have been made to the previous version. Only the current version of the standard is to be considered the official document.

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.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

CISPR 18-3, which is a technical report, has been prepared by CISPR subcommittee B: Interference relating to industrial, scientific and medical radio-frequency apparatus, to other (heavy) industrial equipment, to overhead power lines, to high voltage equipment and to electric traction.

This third edition cancels and replaces the second edition published in 2010. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) localisation system of spark discharges which might contain frequency components up to 3 GHz;
b) information regarding equations for predetermination of the radio noise level from HVDC overhead power lines.

The text of this technical report is based on the following documents:

DTR	Report on voting
CIS/B/655/DTR	CIS/B/676/RVDTR

Full information on the voting for the approval of this technical report 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 of the CISPR 18 series can be found under the general title *Radio interference characteristics of overhead power lines and high-voltage equipment*, on the IEC website.

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

- reconfirmed,
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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 document using a colour printer.

INTRODUCTION

This Technical Report is the third of a three-part series dealing with radio noise generated by electrical power transmission and distribution facilities (overhead lines and substations). It contains recommendations for minimizing the generation of radio noise emanating from high-voltage (HV) power systems which include, but are not restricted to, HVAC or HVDC overhead power lines, HVAC substations and HVDC converter stations, hardware, etc., in order to promoting protection of radio reception.

The recommendations given in this Part 3 of the CISPR 18 series are intended to be a useful aid to engineers involved in design, erection and maintenance of overhead lines and HV stations and also to anyone concerned with checking the radio noise performance of a line to ensure satisfactory protection of radio reception. Information on the physical phenomena involved in the generation of electromagnetic noise fields is found in CISPR TR 18-1. It also includes the main properties of such fields and their numerical values. CISPR TR 18-2 contains recommendations for methods of measurement for use on-site or in a laboratory. It furthermore recommends procedures for determination of limits for the radio noise from HV power systems.

~~This second edition of CISPR 18-3 was adapted to the modern structure and content of technical reports issued by IEC. The first edition of CISPR 18-3 underwent thorough edition and adaptation to modern terminology. Furthermore its content was adjusted such as to allow for use of the lateral distance *y* for the conduction of measurements in the field.~~

The second editions of CISPR 18-1, -2, -3 underwent thorough edition in the maintenance work. The purpose of the maintenance work was to review for update in the measurement conditions, terminology, and the lateral profiles of radio noise, etc. Other updates belonged to the description of HVDC systems and to the upper edge measurement frequency.

The review for this third edition of CISPR 18-3 focused on the following issues:

a) description on gap noise locating system involved in the expansion of upper measuring frequency from 300 MHz to 3 GHz;

b) collation of predetermination formulae of radio noise level for DC power lines involved in update on DC description.

The CISPR 18 series does not deal with biological effects on living matter or any issues related to exposure to electromagnetic fields.

~~The main content of this technical report is based on CISPR Rec. No. 57 given below:~~

~~CISPR RECOMMENDATION No. 57~~

~~CODE OF PRACTICE FOR MINIMIZING THE GENERATION OF RADIO NOISE~~

Considering

a) that the radiation of electromagnetic energy from overhead power lines causes interference ~~to sound and television broadcasting~~,

b) that the level of this noise may be reduced by the design and lay-out of a line,

c) that when defects cause unusually high levels of interference there is need to detect and locate these faults,

this document recommends as CODE OF PRACTICE for minimizing the generation of radio noise, that the latest edition of CISPR Publication 18-3, including amendments, be used as guide for minimizing the generation of ~~radio~~ such noise caused by overhead power lines.

CISPR TR 18-1 describes the main properties of the physical phenomena involved in the production of 123 disturbing electromagnetic fields by overhead lines and provides numerical values of such fields.

In CISPR TR 18-2 methods of measurement and procedures for determining limits of such radio 125 interference are recommended.

This CISPR TR 18-3 forms a "Code of Practice" to reduce to a minimum the production of radio noise by power lines and equipment.

~~It provides information which is advisable to follow both when designing various fittings and components and when stringing the conductors and installing the hardware of the line.~~

~~It also describes methods of detecting and locating defects resulting in unusually high interference levels, and provides prevention and correction procedures that are generally simple to implement.~~

~~Lastly, this Part 3 provides formulae for predicting the most probable radio noise field of a line for various weather conditions, insofar as radio noise is caused by conductor corona.~~

NOTE The recommendation above is based on CISPR RECOMMENDATION No. 57.

RADIO INTERFERENCE CHARACTERISTICS OF OVERHEAD POWER LINES AND HIGH-VOLTAGE EQUIPMENT –

Part 3: Code of practice for minimizing the generation of radio noise

1 Scope

This part of CISPR 18, which is a technical report, applies to radio noise from overhead power lines and high-voltage equipment which may cause interference to radio reception, excluding the fields from power line carrier signals.

The frequency range covered is 0,15 MHz to ~~300 MHz~~ 3 GHz.

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 60050-161, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

CISPR TR 18-1:~~2010~~ [1], *Radio interference characteristics of overhead power lines and high-voltage equipment – Part 1: Description of phenomena*

CISPR TR 18-2:~~2010~~ [2], *Radio interference characteristics of overhead power lines and high-voltage equipment – Part 2: Methods of measurement and procedure for determining limits*

ISO IEC Guide 99, *International vocabulary of metrology – Basic and general concepts and associated terms (VIM)*

NOTE Informative references are listed in the Bibliography.

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TECHNICAL REPORT

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INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

Radio interference characteristics of overhead power lines and high-voltage equipment – Part 3: Code of practice for minimizing the generation of radio noise



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