

TECHNICAL REPORT

INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

**Radio interference characteristics of overhead power lines and high-voltage
equipment –
Part 1: Description of phenomena**



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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE **XB**

ICS 33.100.01

ISBN 978-2-88912-016-1

CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references.....	8
3 Terms and definitions.....	8
4 Radio noise from power lines.....	9
4.1 General.....	9
4.2 Physical aspects of radio noise.....	9
4.2.1 Mechanism of formation of a noise field.....	9
4.2.2 Definition of noise.....	12
4.2.3 Influence of external parameters.....	12
4.3 Main characteristics of the noise field resulting from conductor corona.....	13
4.3.1 General.....	13
4.3.2 Frequency spectrum.....	13
4.3.3 Lateral profile.....	14
4.3.4 Statistical distribution with varying seasons and weather conditions.....	16
5 Effects of corona from conductors.....	17
5.1 Physical aspects of corona from conductors.....	17
5.1.1 General.....	17
5.1.2 Factors in corona generation.....	17
5.2 Methods of investigation of corona by cages and test lines.....	19
5.2.1 General.....	19
5.2.2 Test cages.....	19
5.2.3 Test lines.....	20
5.3 Methods of predetermination.....	20
5.3.1 General.....	20
5.3.2 Analytical methods.....	20
5.3.3 CIGRÉ method.....	21
5.4 Catalogue of standard profiles.....	21
5.4.1 General.....	21
5.4.2 Principle of catalogue presentation.....	21
6 Radio noise levels due to insulators, hardware and substation equipment (excluding bad contacts).....	23
6.1 Physical aspects of radio noise sources.....	23
6.1.1 General.....	23
6.1.2 Radio noise due to corona discharges at hardware.....	23
6.1.3 Radio noise due to insulators.....	23
6.2 Correlation between radio noise voltage and the corresponding field strength for distributed and individual sources.....	25
6.2.1 General.....	25
6.2.2 Semi-empirical approach and formula.....	25
6.2.3 Analytical methods.....	27
6.2.4 Example of application.....	28
6.3 Influence of ambient conditions.....	28
7 Sparking due to bad contacts.....	28
7.1 Physical aspects of the radio noise phenomenon.....	28

7.2	Example of gap sources	29
8	Special d.c. effects	30
8.1	General	30
8.2	Effects of corona from conductors	30
8.3	Radio noise due to insulators, hardware and substation equipment	34
8.4	Valve firing effects.....	34
9	Figures	36
	Annex A (informative) Calculation of the voltage gradient at the surface of a conductor of an overhead line	46
	Annex B (informative) Catalogue of profiles of radio noise field due to conductor corona for certain types of power line	50
	Annex C (informative) Summary of the catalogue of radio noise profiles according to the recommendations of the CISPR	66
	Bibliography.....	68
	Figure 1 – Typical lateral attenuation curves for high voltage lines, normalized to a lateral distance of $y_0 = 15$ m, distance in linear scale.....	36
	Figure 2 – Typical lateral attenuation curves for high voltage lines, normalized to a direct distance of $D_0 = 20$ m, distance in logarithmic scale.....	37
	Figure 3 – Examples of statistical yearly distributions of radio-noise levels recorded continuously under various overhead lines.....	38
	Figure 4 – Examples of statistical yearly distributions of radio-noise levels recorded continuously under various overhead lines.....	39
	Figure 5 – Example of statistical yearly distributions of radio-noise levels recorded continuously under various overhead lines.....	40
	Figure 6 – Examples of statistical yearly distributions of radio-noise levels recorded continuously under various overhead lines.....	41
	Figure 7 – Equipotential lines for clean and dry insulation units	42
	Figure 8 – Determination of the magnetic field strength from a perpendicular to a section of a line, at a distance x from the point of injection of noise current I	43
	Figure 9 – Longitudinal noise attenuation versus distance from noise source (from test results of various experiments frequencies around 0,5 MHz).....	43
	Figure 10 – Lateral profile of the radio noise field strength produced by distributed discrete sources on a 420 kV line of infinite length.....	44
	Figure 11 – Example of relative strength of radio noise field as a function of frequency	45
	Figure 12 – Example of relative strength of radio noise field as a function of the distance from the line.....	45
	Figure B.1 – Triangular formation (1)	51
	Figure B.2 – Triangular formation (2)	52
	Figure B.3 – Flat formation	53
	Figure B.4 – Arched formation	54
	Figure B.5 – Flat wide formation	55
	Figure B.6 – Vertical formation (480 (Rail) X 4B)	56
	Figure B.7 – Flat formation	57
	Figure B.8 – Flat formation	58
	Figure B.9 – Arched formation	59
	Figure B.10 – Flat formation	60
	Figure B.11 – Arched formation	61

Figure B.12 – Flat formation 62

Figure B.13 – Vertical formation (480 (Cardinal) X 6B)..... 63

Figure B.14 – Typical frequency spectra for the radio noise fields of high voltage power lines 64

Figure B.15 – Prediction of radio noise level of a transmission line for various types of weather 65

Figure C.1 – Examples of transformations of the profiles of Figures B.1 to B.13 using the direct distance of 20 m as reference 67

Table B.1 – List of profiles 50

Withdrawing

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INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

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

Part 1: Description of phenomena

FOREWORD

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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 18-1, 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 second edition cancels and replaces the first edition published in 1982. It is a technical revision.

This edition includes the following significant technical changes with respect to the previous edition: while the first edition of CISPR 18-1 only covered the direct distance D_0 for the establishment of standard profiles for the lateral radio noise field emanating from HV overhead power lines, this second edition now also allows for use of the lateral distance y_0 for these purposes. This way it allows for the establishment of standard profiles for the lateral radio noise field also from modern HV overhead power line constructions with tall suspension towers.

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

DTR	Report on voting
CISPR/B/493/DTR	CISPR/B/501/RVC

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 technical report 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 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.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

This technical report forms the first of a three-part publication dealing with radio noise generated by electrical power transmission and distribution facilities (overhead lines and substations). It contains information in relation of the physical phenomena involved in the generation of electromagnetic noise fields. It also includes the main properties of such fields and their numerical values. Its content was adjusted such as to allow for use of the lateral distance y for the establishment of standard profiles for the lateral radio noise field emanating from HV overhead power lines.

The technical data given in this part 1 of the CISPR 18 series are intended to be a useful aid to overhead line designers and also to anyone concerned with checking the radio noise performance of a line to ensure satisfactory protection of wanted radio signals. The data should facilitate the use of the recommendations given in its parts 2 and 3 dealing with

- methods of measurement and procedures for determining limits, and a
- code of practice for minimizing the generation of radio noise.

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

This technical report has been prepared in order to provide information on the many factors involved in protecting the reception of radio and television broadcasting from interference due to high voltage overhead power lines and associated equipment. The information given should be of assistance when means of avoiding or abating radio noise are being considered.

Information is mainly given on the generation and characteristics of radio noise from a.c. power lines and equipment operating at 1 kV and above, in the frequency ranges 0,15 MHz to 30 MHz (a.m. sound broadcasting) and 30 MHz to 300 MHz (f.m. sound broadcasting and television broadcasting). The special aspect of spark discharges due to bad contacts is taken into account. Some information is also given on interference due to d.c. overhead lines for which corona and interference conditions are different from those of a.c. power lines.

The general procedure for establishing the limits of the radio noise from the power lines and equipment is given, together with typical values as examples, and methods of measurement.

The clause on limits concentrates on the low frequency and medium frequency bands as it is only in these where ample evidence, based on established practice, is available. No examples of limits to protect reception in the frequency band 30 MHz to 300 MHz have been given, as measuring methods and certain other aspects of the problems in this band have not yet been fully resolved. Site measurements and service experience have shown that levels of noise from power lines at frequencies higher than 300 MHz are so low that interference is unlikely to be caused to television reception.

The values of limits given as examples are calculated to provide a reasonable degree of protection to the reception of broadcasting at the edges of the recognized service areas of the appropriate transmitters in the a.m. radio frequency bands, in the least favourable conditions likely to be generally encountered. These limits are intended to provide guidance at the planning stage of the line and national standards or other specifications against which the performance of the line may be checked after construction and during its useful life.

Recommendations are made on the design, routing, construction and maintenance of the lines and equipment forming part of the power distribution system to minimize interference and it is hoped that this publication will aid other radio services in the consideration of the problems of interference.