

# TECHNICAL REPORT



**Electromagnetic performance of high voltage direct current (HVDC) overhead transmission lines**



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**Electromagnetic performance of high voltage direct current (HVDC) overhead transmission lines**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

PRICE CODE **XD**

ICS 29.240.20

ISBN 978-2-8322-1780-1

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

## CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Terms and definitions .....	9
3 Electric field and ion current .....	10
3.1 Description of the physical phenomena .....	10
3.2 Calculation methods .....	13
3.2.1 General .....	13
3.2.2 Semi-analytic method .....	14
3.2.3 Finite element method .....	16
3.2.4 BPA method .....	17
3.2.5 Empirical methods of EPRI .....	18
3.2.6 Recent progress .....	18
3.3 Experimental data.....	19
3.3.1 General .....	19
3.3.2 Instrumentation and measurement methods.....	19
3.3.3 Experimental results for electric field and ion current.....	21
3.3.4 Discussion.....	21
3.4 Implication for human and natural environment.....	22
3.4.1 General .....	22
3.4.2 Static electric field .....	23
3.4.3 Research on space charge .....	23
3.4.4 Scientific review .....	28
3.5 Design practice of different countries .....	29
4 Magnetic field.....	30
4.1 Description of physical phenomena.....	30
4.2 Magnetic field of HVDC transmission lines .....	31
5 Radio interference (radio noise).....	32
5.1 Description of radio interference phenomena of HVDC transmission system .....	32
5.1.1 General .....	32
5.1.2 Physical aspects of d.c. corona .....	32
5.1.3 Mechanism of formation of a noise field of d.c. line.....	33
5.1.4 Characteristics of radio interference from d.c. line .....	33
5.1.5 Factors influencing the RI from d.c. line.....	34
5.2 Calculation methods .....	36
5.2.1 EPRI empirical formula .....	36
5.2.2 IREQ empirical method.....	37
5.2.3 CISPR bipolar line RI prediction formula.....	38
5.2.4 Comparison of different prediction formula.....	38
5.3 Experimental data.....	38
5.3.1 Measurement apparatus and methods .....	38
5.3.2 Experimental results for radio interference.....	39
5.4 Criteria of different countries.....	39
6 Audible noise.....	40
6.1 Basic principles of audible noise .....	40
6.2 Description of physical phenomena.....	41

6.2.1	Lateral profiles.....	42
6.2.2	Statistical distribution .....	44
6.2.3	Influencing factors .....	45
6.2.4	Effect of altitude above sea level .....	47
6.2.5	Concluding remarks.....	47
6.3	Calculation methods .....	48
6.3.1	General .....	48
6.3.2	Theoretical analysis of audible noise propagation.....	48
6.3.3	Empirical formulas of audible noise .....	49
6.3.4	Semi-empirical formulas of audible noise.....	49
6.3.5	CEPRI (China) research results .....	52
6.3.6	Concluding remarks.....	52
6.4	Experimental data.....	52
6.4.1	Measurement techniques and instrumentation .....	52
6.4.2	Experimental results for audible noise .....	53
6.5	Design practice of different countries .....	53
6.5.1	General .....	53
6.5.2	The effect of audible noise on people.....	53
6.5.3	The audible noise level and induced complaints .....	54
6.5.4	Limit values of audible noise of HVDC transmission lines in different countries .....	57
6.5.5	Recommended noise level limit.....	58
6.5.6	Main conclusion.....	58
Annex A (informative)	Experimental results for electric field and ion current.....	59
A.1	Bonneville Power Administration ±500 kV HVDC transmission line.....	59
A.2	FURNAS ±600 kV HVDC transmission line.....	59
A.3	Manitoba Hydro ±450 kV HVDC transmission line .....	60
A.4	Hydro-Québec – New England ±450 kV HVDC transmission line .....	62
A.5	IREQ test line study of ±450 kV HVDC line configuration .....	63
A.6	HVTRC test line study of ±400 kV HVDC line configuration .....	64
A.7	Test study in China.....	66
Annex B (informative)	Experimental results for radio interference .....	68
B.1	Bonneville power administration's 1 100 kV direct current test project.....	68
B.1.1	General .....	68
B.1.2	Lateral profile .....	68
B.1.3	Influence of conductor gradient.....	69
B.1.4	Percent cumulative distribution .....	70
B.1.5	Influence of wind .....	72
B.1.6	Spectrum.....	72
B.2	Hydro-Québec institute of research.....	74
B.2.1	General .....	74
B.2.2	Cumulative distribution .....	74
B.2.3	Spectrum.....	75
B.2.4	Lateral profiles.....	75
B.2.5	Cumulative distribution under different voltage .....	76
B.3	d.c. line of China.....	76
Annex C (informative)	Experimental results for audible noise .....	78
Bibliography	.....	81

Figure 1 – Unipolar and bipolar space charge regions of a HVDC transmission line [1] ..... 11

Figure 2 – Lateral profile of magnetic field on the ground of ±800 kV HVDC lines ..... 32

Figure 3 – The corona current and radio interference field ..... 33

Figure 4 – RI tolerance tests: reception quality as a function of signal-to-noise ratio ..... 40

Figure 5 – Attenuation of different weighting networks used in audible-noise measurements [14] ..... 41

Figure 6 – Comparison of typical audible noise frequency spectra [129]..... 42

Figure 7 – Lateral profiles of the AN ..... 43

Figure 8 – Lateral profiles of the AN from a bipolar HVDC-line equipped with 8 × 4,6 cm (8 × 1,8 in) conductor bundles energized with ±1 050 kV [32] ..... 43

Figure 9 – Lateral profiles of fair-weather A-weighted sound level..... 44

Figure 10 – All weather distribution of AN and RI at +15 m lateral distance of the positive pole from the upgraded Pacific NW/SW HVDC Intertie [32] ..... 45

Figure 11 – Statistical distributions of fair weather Aweighted sound level measured at 27 m lateral distance from the line center during spring 1980..... 45

Figure 12 – Audible noise complaint guidelines [12]..... 54

Figure 13 – Measured lateral profile of audible noise on a 330 kV AC transmission line [149]..... 55

Figure 14 – Subjective evaluation of d.c. transmission line audible noise; EPRI test center study 1974 [31] ..... 55

Figure 15 – Subjective evaluation of d.c. transmission line audible noise; OSU study 1975 [31] ..... 56

Figure 16 – Results of the operators’ subjective evaluation of AN from HVDC lines ..... 57

Figure 17 – Results of subjective evaluation of AN from d.c. lines..... 57

Figure A.1 – Electric field and ion current distributions for Manitoba Hydro ±450 kV Line [37] ..... 61

Figure A.2 – Cumulative distribution of electric field for Manitoba Hydro ±450 kV Line [37] 62

Figure A.3 – Cumulative distribution of ion current density for Manitoba Hydro ±450 kV line [37] ..... 62

Figure A.4 – Test result for total electric field at different humidity [117] ..... 67

Figure A.5 – Comparison between the calculation result and test result for the total electric field (minimum conductor height is 18 m) [117]..... 67

Figure B.1 – Connection for 3-section d.c. test line [121] ..... 68

Figure B.2 – Typical RI lateral profile at ±600kV, 4 × 30,5 mm conductor, 11,2 m pole spacing, 15,2 m average height [12] ..... 69

Figure B.3 – Simultaneous RI lateral, midspan, in clear weather and light wind for three configurations, bipolar ±400 kV [121] ..... 69

Figure B.4 – RI at 834kHz as a function of bipolar line voltage 4 × 30,5 mm conductor, 11,2 m pole spacing, 15,2 m average height ..... 70

Figure B.5 – Percent cumulative distribution for fair weather, 2 × 46 mm, 18,3 m pole spacing, ±600 kV ..... 70

Figure B.6 – Percent cumulative distribution for rain weather, 2 × 46 mm, 18,3 m pole spacing, ±600 kV ..... 71

Figure B.7 – Percent cumulative distribution for fair weather, 4 × 30,5 mm, 13,2 m pole spacing, ±600 kV ..... 71

Figure B.8 – Percent cumulative distribution for rain weather, 4 × 30,5 mm, 13,2 m pole spacing, ±600 kV .....	72
Figure B.9 – Radio interference frequency spectrum .....	73
Figure B.10 – RI vs. frequency at ±400 kV [121] .....	73
Figure B.11 – Cumulative distribution of RI measured at 15 m from the positive pole [122] .....	74
Figure B.12 – Conducted RI frequency spectrum measured with the line terminated at one end [122] .....	75
Figure B.13 – Lateral profile of RI [122] .....	76
Figure B.14 – Annual cumulative distribution of RI measured at 15 m from the positive pole [122] .....	76
Figure B.15 – Comparison between calculation result and test result for RI lateral profile [117] .....	77
Figure C.1 – Examples of statistical distributions of fair weather audible noise, dB(A) measured at 27 m from line center of a bipolar HVDC test line [14] .....	79
Table 1 – Electric field and ion current limits of ±800 kV d.c. lines in China .....	30
Table 2 – Electric field limits of d.c. lines in United States of America [119] .....	30
Table 3 – Electric field and ion current limits of d.c. lines in Canada .....	30
Table 4 – Electric field limits of d.c. lines in Brazil .....	30
Table 5 – Parameters of the IREQ excitation function [120] .....	38
Table 6 – Comparison of the EPRI and CISPR formula .....	38
Table 7 – Parameters defining regression equation for generated acoustic power density .....	51
Table 8 – Typical sound attenuation (in decibels) provided by buildings [155] .....	58
Table A.1 – BPA ±500 kV line: statistical summary of all-weather ground-level electric field intensity and ion current density [32] .....	59
Table A.2 – FURNAS ±600 kV line: statistical summary of ground-level electric field intensity and ion current density [36] .....	60
Table A.3 – Hydro-Québec–New England ±450 kV HVDC transmission line. Bath, NH; 1990-1992 (fair weather), 1992 (rain), All-season measurements of static electric E-field in kV/m [39] .....	63
Table A.4 – Hydro-Québec – New England ±450 kV HVDC Transmission Line. Bath, NH; 1990-1992, All-season fair-weather measurements of ion concentrations in kions/cm <sup>3</sup> [39] .....	63
Table A.5 – IREQ ± 450 kV test line: statistical summary of ground-level electric field intensity and ion current density [41] .....	64
Table A.6 – HVTRC ±400 kV test line: statistical summary of peak electric field and ion currents [42] .....	65
Table A.7 – Statistic results for the test data of total electric field at ground (50 % value) [117] .....	66
Table B.1 – Influence of wind on RI .....	72
Table B.2 – Statistical representation of the long term RI performance of the tested conductor bundle [122] .....	75
Table B.3 – RI at 0,5 MHz at lateral 20m from positive pole (fair weather) .....	77
Table C.1 – Audible Noise Levels of HVDC Lines according to [119] and [150] .....	80

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTROMAGNETIC PERFORMANCE OF HIGH VOLTAGE DIRECT CURRENT (HVDC) OVERHEAD TRANSMISSION LINES**

FOREWORD

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IEC TR 62681, which is a technical report, has been prepared by IEC technical committee 115: High Voltage Direct Current (HVDC) transmission for d.c. voltages above 100 kV.

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

Enquiry draft	Report on voting
115/71/DTR	115/84/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.

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## INTRODUCTION

Electric fields and magnetic fields are produced in the vicinity of an HVDC transmission line. When the electric field at the conductor surface exceeds a critical value, known as the corona onset gradient, positive or negative free charges leave the conductor and interact with the surrounding air and ionization takes place in the layer of surrounding air, leading to the formation of corona discharges. The corona discharge will not only bring out corona loss but also produce electromagnetic environment problems.

The parameters used to describe the electromagnetic environment of an HVDC transmission line mainly include the:

- 1) electric field,
- 2) ion current,
- 3) magnetic field,
- 4) radio interference,
- 5) audible noise.

To control these parameters in a reasonable and acceptable range, for years, a great deal of theoretical and experimental research was conducted in many countries, and relevant national standards or enterprise standards were developed. This Technical Report collects and records the status of study and progress of electric fields, ion current, magnetic fields, radio interference, and audible noise of HVDC transmission lines.

Withhold