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Electromagnetic compatibility (EMC) – Part 2-10: Environment – Description of HEMP environment – Conducted disturbance

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CONTENTS

FOREWORD	5
INTRODUCTION	7
1 Scope	8
2 Normative references	8
3 Terms and definitions	8
4 General	12
5 Description of HEMP environment, conducted parameters	13
5.1 Introductory remarks	13
5.2 Early-time HEMP external conducted environment	13
5.3 Intermediate-time HEMP external conducted environment	15
5.4 Late-time HEMP external conducted environment	15
5.5 Antenna currents	17
5.6 HEMP internal conducted environments	21
Annex A (informative) Discussion of early-time HEMP coupling for long lines	23
A.1 Elevated line coupling	23
A.2 Buried line coupling	24
Annex B (informative) Discussion of intermediate-time HEMP coupling for long lines	26
B.1 General	26
B.2 Elevated line coupling	26
B.3 Buried line coupling	26
Annex C (informative) Responses of simple linear antennas to the IEC early-time HEMP environment	28
C.1 Overview	28
C.2 IEC early-time HEMP environment	28
C.3 Evaluation of the antenna responses	31
C.3.1 General	31
C.3.2 Monopole antenna	31
C.3.3 Dipole antenna	32
C.4 Calculated results	33
C.5 Summary of results	34
Annex D (informative) Measured cable currents inside telephone buildings	43
Annex E (informative) Time waveform description for the responses of simple linear antennas to the early-time HEMP environment	44
E.1 General	44
E.2 Description of the recommended waveform	44
E.3 Procedure for determining the test waveform	46
Bibliography	47
Figure 1 – Geometry for the definition of polarization and of the angles of elevation ψ and azimuth ϕ	9
Figure 2 – Geometry for the definition of the plane wave	10
Figure 3 – Geomagnetic dip angle	11
Figure 4 – Three-phase line and equivalent circuit for computing late-time HEMP conducted current	16

Figure 5 – Centre-loaded dipole antenna of length l and radius a , excited by an incident early-time HEMP field	18
Figure A.1 – Variation of peak coupled cable current versus local geomagnetic dip angle	23
Figure C.1 – Illustration of the incident HEMP field	29
Figure C.2 – HEMP tangent radius R_t defining the illuminated region, shown as a function of burst height (HOB)	29
Figure C.3 – Geometry of the monopole antenna	32
Figure C.4 – Geometry of the dipole antenna	33
Figure C.5 – Cumulative probability distributions for the peak responses for the 1 m vertical monopole antenna load currents and voltages	34
Figure C.6 – Cumulative probability distributions for the peak responses for the 3 m vertical monopole antenna load currents and voltages	35
Figure C.7 – Cumulative probability distributions for the peak responses for the 10 m vertical monopole antenna load currents and voltages	36
Figure C.8 – Cumulative probability distributions for the peak responses for the 100 m vertical monopole antenna load currents and voltages	37
Figure C.9 – Cumulative probability distributions for the peak responses for the 1 m horizontal dipole antenna load currents and voltages	38
Figure C.10 – Cumulative probability distributions for the peak responses for the 3 m horizontal dipole antenna load currents and voltages	39
Figure C.11 – Cumulative probability distributions for the peak responses for the 10 m horizontal dipole antenna load currents and voltages	40
Figure C.12 – Cumulative probability distributions for the peak responses for the 100 m horizontal dipole antenna load current and voltages.....	41
Figure C.13 – Plot of multiplicative correction factors for correcting the values of V_{OC} , I_{SC} , I_L and V_L for antennas having other L/a ratios	42
Figure E.1 – Comparison of a computation and an analytic formula for a 1 m wire illuminated by the E_1 HEMP with the field parallel to the wire (and no ground present) [11] .	45
Figure E.2 – General waveform of the damped oscillatory waveform from IEC 61000-4-18 [14].....	45
Table 1 – Early-time HEMP conducted common-mode short-circuit currents including the time history and peak value I_{pk} as a function of severity level, length L (in metres) and ground conductivity σ_g	14
Table 2 – Intermediate-time HEMP conducted common-mode short-circuit currents including the time history and peak value I_{pk} as a function of length L (in metres) and ground conductivity σ_g	15
Table 3 – Maximum peak electric dipole antenna load current versus frequency for antenna principal frequencies	19
Table 4 – HEMP response levels for V_{OC} for the vertical monopole antenna.....	19
Table 5 – HEMP response levels for I_{SC} for the vertical monopole antenna.....	20
Table 6 – HEMP response levels for I_L for the loaded vertical monopole antenna ^a	20
Table 7 – HEMP response levels for V_{OC} for the horizontal dipole antenna	20
Table 8 – HEMP response levels for I_{SC} for the horizontal dipole antenna	21
Table 9 – HEMP response levels for I_L for the loaded horizontal dipole antenna ^a	21

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Table A.1 – Rectified impulse (RI) and computed effective pulse widths for vertical polarization of the early-time HEMP for an elevated conductor ($h = 10$ m).....	24
Table A.2 – Coupled early-time HEMP currents for a buried conductor ($z = -1$ m).....	25
Table A.3 – Waveform parameters for early-time HEMP buried conductor coupling ($z = -1$ m)	25
Table A.4 –Average waveform parameters for early-time HEMP buried conductor currents	25
Table B.1 – Coupled HEMP intermediate-time short-circuit currents for an elevated conductor ($h = 10$ m).....	26
Table B.2 – Coupled HEMP intermediate-time short-circuit currents for a buried conductor ($h = -1$ m).....	26
Table D.1 – Estimated internal peak-to-peak cable currents (I_{PP}) from direct HEMP illumination (from [8])	43
Table D.2 – Damped sinusoid waveform characteristics for internal cable currents (measured) (from [8]).....	43
Table E.1 – Waveform parameters to be used in Formula (E.1).....	46

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROMAGNETIC COMPATIBILITY (EMC) –

**Part 2-10: Environment – Description of HEMP environment –
Conducted disturbance**

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.
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IEC 61000-2-10 has been prepared by subcommittee 77C: High power transient phenomena, of IEC technical committee 77: Electromagnetic compatibility. It is an International Standard.

It forms Part 2-10 of IEC 61000. It has the status of a basic EMC publication in accordance with IEC Guide 107.

This second edition cancels and replaces the first edition published in 1998. This edition constitutes a technical revision.

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

- a) a new Annex E has been added to describe the time waveform characteristics of the response of simple linear antennas to aid in the development of test methods;
- b) technical support for this waveform is provided in Annex E.

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c) a procedure to use the waveforms presented in Annex E along with the peak values previously provided in Annex C is provided.

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

Draft	Report on voting
77C/318/FDIS	77C/321/RVD

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 International Standard 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/standardsdev/publications.

A list of all parts in the IEC 61000 series, published under the general title *Electromagnetic compatibility*, 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,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

IEC 61000 is published in separate parts according to the following structure:

Part 1: General

General considerations (introduction, fundamental principles)

Definitions, terminology

Part 2: Environment

Description of the environment

Classification of the environment

Compatibility levels

Part 3: Limits

Emission limits

Immunity limits (insofar as these limits do not fall under the responsibility of the product committees)

Part 4: Testing and measurement techniques

Measurement techniques

Testing techniques

Part 5: Installation and mitigation guidelines

Installation guidelines

Mitigation methods and devices

Part 6: Generic standards

Part 9: Miscellaneous

Each part is further subdivided into several parts, published either as international standards or as technical specifications or technical reports, some of which have already been published as sections. Others will be published with the part number followed by a dash and a second number identifying the subdivision (example: IEC 61000-6-1).

The IEC has initiated the preparation of standardized methods to protect civilian society from the effects of high-power electromagnetic environments including the high-altitude electromagnetic pulse. Such environments could disrupt systems for communications, electric power, information technology, etc.

This part of IEC 61000 is an international standard that establishes the HEMP conducted disturbances that are the result of coupling by the radiated HEMP disturbances.

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 2-10: Environment – Description of HEMP environment – Conducted disturbance

1 Scope

This part of IEC 61000 defines the high-altitude electromagnetic pulse (HEMP) conducted environment that is one of the consequences of a high-altitude nuclear explosion.

Those dealing with this subject consider two cases:

- high-altitude nuclear explosions;
- low-altitude nuclear explosions.

For civil systems the most important case is the high-altitude nuclear explosion. In this case, the other effects of the nuclear explosion such as blast, ground shock, thermal and nuclear ionizing radiation are not present at the ground level.

However, the electromagnetic pulse associated with the explosion can cause disruption of, and damage to, communication, electronic and electric power systems thereby upsetting the stability of modern society.

The object of this document is to establish a common reference for the conducted HEMP environment in order to select realistic stresses to apply to victim equipment to evaluate their performance.

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 61000-2-9, *Electromagnetic compatibility (EMC) – Part 2: Environment – Section 9: Description of HEMP environment – Radiated disturbance*

IEC 61000-4-24, *Electromagnetic compatibility (EMC) – Part 4-24: Testing and measurement techniques – Test methods for protective devices for HEMP conducted disturbance*