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TECHNICAL REPORT

colour inside

Assessment of contact current related to human exposure to electric, magnetic and electromagnetic fields

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ASSESSMENT OF CONTACT CURRENT RELATED TO HUMAN EXPOSURE TO ELECTRIC, MAGNETIC AND ELECTROMAGNETIC FIELDS

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IEC TR 63167 has been prepared by IEC technical committee 106: Methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure. It is a Technical Report.

This second edition cancels and replaces the first edition published in 2018. This edition constitutes a technical revision.

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

a) revised in accordance with the latest revision of international EMF guidelines;
b) revised in accordance with updates of relevant IEC standards on electrical safety.

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The text of this Technical Report is based on the following documents:

Draft	Report on voting
106/641/DTR	106/656/RVDTR

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 Technical Report 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/publications.

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INTRODUCTION

In the guidelines limiting human exposure to electric, magnetic and electromagnetic fields (EMF guidelines), limits or a guidance for the contact current are given to avoid adverse indirect effects, i.e. electric shocks and burn hazards caused by contact with a conductive object located in an electric field or magnetic field or both, when the object has an electric potential owing to electric or magnetic induction to the object.

At the moment, no standardized method for evaluating the contact current, in the context of human exposures to the above fields has been well established. On the other hand, there is a vast amount of knowledge, as well as many standards and regulations on the issue of electrical safety (i.e. direct contact with live part of conductive object) to avoid severe electric shock hazards. Therefore, the evaluation methods used in the field of electrical safety can be useful references. This document summarizes general information on the assessment of contact current related to human exposure to electric, magnetic and electromagnetic fields.

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ASSESSMENT OF CONTACT CURRENT RELATED TO HUMAN EXPOSURE TO ELECTRIC, MAGNETIC AND ELECTROMAGNETIC FIELDS

1 Scope

This document, which is a Technical Report, provides general information on the assessment of contact current related to human exposure to electric, magnetic and electromagnetic fields. The contact currents in this context occur when a human body comes into contact with a conductive object that is non-electrified but exposed to an electric field or magnetic field or both at a different electric potential owing to electric or magnetic induction to the object. This is distinguished from the issue of electrical safety where contact with live parts of a conductive object is dealt with.

In reference to the international EMF guidelines [1], [2], and [3][1], the frequency range of contact current covered in this document is DC to 110 MHz, and only steady-state (continuous) contact currents are covered. Transient contact currents (spark discharges) which can occur immediately before the contact with the object are not covered.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
contact current
<to human exposure> current flowing through the body resulting from contact with an insulated conductive object that has been energized in an electric, magnetic or electromagnetic field or from an insulated body that has been energized in an electric, magnetic or electromagnetic field and is in contact with a grounded conductive object

3.2
exposure
<to human> situation that occurs when a person is subjected to an electric, magnetic or electromagnetic field, or to a contact current other than those originating from physiological processes in the body and other natural phenomena

3.3
indirect effect
effect arising when an object present in an electromagnetic field becomes a cause of safety or health hazard

[1] Numbers in square brackets refer to the Bibliography.

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