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Edition 4.1 2016-07

FINAL VERSION

BASIC SAFETY PUBLICATION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

EFFECTS OF CURRENT ON HUMAN BEINGS AND LIVESTOCK –

Part 1: General aspects

FOREWORD

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This Consolidated version of IEC TS 60479-1 bears the edition number 4.1. It consists of the fourth edition (2005-07) [documents 64/1427/DTS and 64/1463/RVC] and its amendment 1 (2016-07) [documents 64/2095/DTS and 64/2113/RVC]. The technical content is identical to the base edition and its amendment.

This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.

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- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 60479-1, which is a technical specification, has been prepared by IEC technical committee 64: Electrical installations and protection against electric shock.

This fourth edition cancels and replaces the third edition, published as a technical report in 1994, and constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

– Dependence of the total body impedance Z_T for 50th percentile rank of a population of living human beings for large, average and small surface areas of a contact in dry, water-wet and saltwater-wet conditions at touch voltage U_T = 25 V to 200 V a.c. 50/60 Hz.
– Oscillograms of touch voltages U_T and touch currents I_T for a.c., current path hand-to-hand, large surface areas of contact in dry condition taken from measurements given in Figure 16 with the relevant explanations in the main text.
– Fibrillation data for dogs, pigs and sheep obtained from experiments and for persons calculated from statistics of electrical accidents with transversal direction of current flow, hand-to-hand and touch voltages U_T = 220 V to 380 V a.c.with body impedances Z_T (5%) given in Figure 19 with the relevant explanations in the main text.
– Change of Curve B in Figure 20 from 10 mA to 5 mA: conventional time/current zones of effects of a.c. current (15 Hz to 100 Hz) on persons with the relevant explanations in themain text.
– Let-go currents for 60 Hz sinusoidal current given in Figure 23 with the relevant explanations in the main text.
– new structure to the body of the standard.
– Extension of the applicability of the total body impedance to a frequency range up to 150 kHz;
– Clarification of the difference in anodic versus cathodic d.c. pulses;
– Extension of the ventricular fibrillation threshold of single pulses down to 1 μs pulse width;
– Addition of informative annexes:

  Annex E: Theories of ventricular fibrillation;

  Annex F: Quantities ULV and LLV;

  Annex G: Circuit simulation methods in electric shock evaluation.

This technical specification has the status of a basic safety publication in accordance with IEC Guide 104.

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