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TECHNICAL REPORT

colour inside

Effects of current on human beings and livestock – Part 4: Effects of lightning strokes

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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EFFECTS OF CURRENT ON HUMAN BEINGS AND LIVESTOCK –

Part 4: Effects of lightning strokes

FOREWORD

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IEC TR 60479-4, which is a Technical Report, has been prepared by IEC technical committee 64: Electrical installations and protection against electric shock.

This third edition cancels and replaces the second edition published in 2011. This edition constitutes a technical revision.

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

a) lightning occurence and climatory effects around the world are depicted;
b) direct strike description is extended;
c) step voltage effects are expanded;
d) upward streamer explanation is enhanced;

e) other direct or indirect related effects to lightning injuries to the human body are specified;

f) various safety procedures and related possibilities with respect to the personsal danger of lightning are presented.

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

Draft TR	Report on voting
64/2369/DTR	64/2398/RVDTR

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 document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60479 series, published under the general title *Effects of current on human beings and livestock*, 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 "http://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- withdrawn,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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

IEC 60479-1 and IEC 60479-2 deal with the effect of electric shock derived from electrical systems on the bodies of human beings and livestock. This document describes the influence and effect of electricity in the form of lightning strikes. Lightning current can consist of several uni-polar and/or bi-polar impulses with different peak values and durations; IEC 60479-2:2019, Clause 6 does not cover these effects.

The interaction of a lightning stroke with the body is often different from that of electric shock derived from electrical systems. If the head is struck, the electrical path may include the brain stem, which includes the respiratory centre.

IEC 60479-2 includes information related to the effects of short duration impulses which extend to the magnitude and duration of lightning impulses.

It is accepted that more than 70 % of lightning accidents involving humans are not fatal [36], [47][1]. Corresponding reliable data for livestock is not known. There is a large variation in outcome due to different environments, different activities of people and knowledge of first aid and quality of medical care [40],[47].

It has been necessary, therefore, to create a separate document concerning the special effects of lightning strokes. The physical behaviour of lightning is shown as a basis. The interaction with a living body is then described, followed by the ongoing life consequences.

1 Numbers in square brackets refer to the bibliography.