



# TECHNICAL REPORT

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**Process management for avionics – Atmospheric radiation effects –  
Part 7: Management of single event effects (SEE) analysis process in avionics  
design**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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ICS 03.100.50; 31.020; 49.060

ISBN 978-2-8322-4456-2

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### **PROCESS MANAGEMENT FOR AVIONICS – ATMOSPHERIC RADIATION EFFECTS –**

#### **Part 7: Management of single event effects (SEE) analysis process in avionics design**

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IEC TR 62396-7, which is a technical report, has been prepared by IEC technical committee 107: Process management for avionics.

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

Enquiry draft	Report on voting
107/300/DTR	107/304/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 the parts in the IEC 62396 series, published under the general title *Process management for avionics – Atmospheric radiation effects*, 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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

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## **PROCESS MANAGEMENT FOR AVIONICS – ATMOSPHERIC RADIATION EFFECTS –**

### **Part 7: Management of single event effects (SEE) analysis process in avionics design**

#### **1 Scope**

This part of IEC 62396, which is a technical report, describes a process to account for the effects of atmospheric radiation on electronic equipment. Single event effects (SEE) due to atmospheric radiation are one class of possible failure mechanisms that are addressed in the safety and reliability analyses of electronic equipment and associated functions.

This document focuses on electronic components, electronic equipment and associated electronic functions. System level analysis is not addressed in this document.

This document is intended to describe an approach to accounting for SEE in electronic equipment design, design review, and it can provide aid in the aerospace certification process. This document establishes an example process for assessing electronic components in the atmospheric radiation environment, evaluating for mitigations/protections/utilizations, and addressing the electronic equipment impacts of the SEE. The process is intended to support an SEE analysis for electronic equipment.

It does not describe, in detail, methods used to mitigate the effects of SEE in the electronic equipment design.

NOTE 1 IEC 62396-3 provides further details for this process.

NOTE 2 IEC 62396-2 provides further details for SEE testing.

This document, by itself, is not a program requirements document, i.e. it does not contain the word “shall.” However it describes a process that can be used, for example, at the discretion and agreement of the users, to aid in the preparation and the maintenance of an electronic components management plan (see [1]<sup>1</sup> and [7]). The output of the process described in this document provides data as an input into the product safety and reliability analyses.

Although developed for the avionics industry, this document can be used by other industrial sectors at their discretion.

#### **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 62396-1:2016, *Process management for avionics – Atmospheric radiation effects – Part 1: Accommodation of atmospheric radiation effects via single event effects within avionics electronic equipment*

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<sup>1</sup> Numbers in square brackets refer to the Bibliography.