TECHNICAL SPECIFICATION

IEC TS 62396-1

First edition
2006-03

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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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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- 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 62396-1, which is a technical specification, has been prepared by IEC technical committee 107: Process management for avionics.

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

Enquiry draft	Report on voting
107/41/DTS	107/46/RVC

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

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

IEC 62396, as currently conceived, consists of the following parts, under the general title *Process management for avionics – Atmospheric radiation effects:*

Part 1: Accommodation of atmospheric radiation effects via single event effects within avionics electronic equipment

Part 2: Guidelines for single event effects testing for avionics systems[1]

Part 3: Guidelines to optimize avionics system design to reduce single event effects rates[1]

Part 4: Guidelines for designing with high voltage aircraft electronics and potential single event effects[1]

Part 5: Guidelines for assessing thermal neutron fluxes and effects in avionics systems[1]

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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

1 Under consideration.

INTRODUCTION

This industry-wide technical specification informs avionics systems designers, electronic equipment, component manufacturers and their customers of the kind of ionising radiation environment that their devices will be subjected to in aircraft, the potential effects this radiation environment can have on those devices, and some general approaches for dealing with these effects.

The same atmospheric radiation (neutrons) that is responsible for the radiation exposure that crew and passengers acquire while flying is also responsible for causing the Single Event Effects (SEE) in the avionics electronic equipment. There has been much work carried out over the last few years related to the radiation exposure of aircraft passengers and crew. A standardised industry approach on the effect of the atmospheric neutrons on electronics should be viewed as consistent with and an extension of the on-going activities related to the radiation exposure of aircraft passengers and crew.

Atmospheric radiation effects are one factor that could contribute to equipment hard and soft fault rates. From a system safety perspective, using derived fault rate values, the existing methodology described in ARP4754 (accommodation of hard and soft fault rates in general) will also accommodate atmospheric radiation effect rates.

In addition, this technical specification is related to the JEDEC Standard JESD89, which relates to soft errors in electronics by atmospheric radiation at ground level (at altitudes less than 10 000 feet (3 040 m)).