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TECHNICAL SPECIFICATION

Process management for avionics – Defining and performing highly accelerated tests in aerospace systems – Application guide

INTERNATIONAL
ELECTROTECHNICAL
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PROCESS MANAGEMENT FOR AVIONICS – DEFINING AND PERFORMING HIGHLY ACCELERATED TESTS IN AEROSPACE SYSTEMS – APPLICATION GUIDE

FOREWORD

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

IEC 62500, which is a technical specification, has been prepared by IEC technical committee 107: Process management for avionics.

This technical specification cancels and replaces IEC/PAS 62500 published in 2006. This first edition constitutes a technical revision.

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

Enquiry draft	Report on voting
107/79/DTS	107/90/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.

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- withdrawn,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.

INTRODUCTION

In an increasingly harsh economic context (tighter performance requirements, shorter development cycles, reduced cost of ownership, etc.), it is essential to ensure product maturity rapidly and, in any case, by the time of commissioning.

It is with a view to remedying shortcomings in traditional development methods that "highly accelerated" tests have been developed. The main underlying principle behind this new type of test strategy is as follows: rather than reasoning in terms of conformity with a specification and simply performing conventional tests, it is on the contrary attempted to push the product to its limits by applying environmental stresses and/or stimuli of levels higher than the specification. The aim is thus to take full advantage of current technologies, by eliminating defects which generate potential failures, as of the first prototypes.

A well-conducted accelerated test process should, in a relatively short time, lead to a significant increase in the robustness of a product, as early as the initial prototypes stage at the beginning of the development phase, thus accelerating early maturity of this product. Furthermore, identification of the margins available on a "mature" product helps to design and size its future environmental stress screening profile more accurately, by increasing the severity of the loadings applied to just what is needed, leading to a particularly significant boost in the efficiency of this environmental stress screening process.

PROCESS MANAGEMENT FOR AVIONICS – DEFINING AND PERFORMING HIGHLY ACCELERATED TESTS IN AEROSPACE SYSTEMS – APPLICATION GUIDE

1 Scope

This technical specification specifies the targets assigned to highly accelerated tests, their basic principles, their scope of application and their implementation procedures. It is primarily intended for programme managers, designers, test managers, and RAMS experts to facilitate the draft of the specification and execution of highly accelerated tests. This guide is applicable to all programmes and is of primary interest to the industrial firms in charge of designing, developing and producing equipment built for these programmes, and also their customers who, in drafting contractual clauses, may require that their suppliers implement highly accelerated tests.

NOTE This technical specification applies to all types of equipment used in systems developed in these programmes, whatever their nature (electronic, electromechanical, mechanical, electro-hydraulic, electro-pneumatic, etc.) and whatever their size, from "low-level" subassemblies (PCBs, mechanical assemblies, connectors, etc.), up to system level groups of equipment.