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Process management for avionics — Atmospheric radiation effects

Part 6: Extreme space weather and potential impact on the avionics environment and electronics

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The UK participation in its preparation was entrusted to Technical Committee GEL/107, Process management for avionics.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Part 6: Extreme space weather and potential impact on the avionics environment and electronics**

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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PROCESS MANAGEMENT FOR AVIONICS – ATMOSPHERIC RADIATION EFFECTS –

Part 6: Extreme space weather and potential impact on the avionics environment and electronics

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The document "Extreme Space Weather: impacts on engineered systems and infrastructure" from the Royal Academy of Engineering (United Kingdom, London) has served as a basis for the development of this publicity available specification.

The permission from the Royal Academy of Engineering (United Kingdom, London) to include the report within this PAS is gratefully acknowledged by the IEC.

IEC PAS 62396-6 has been processed by IEC technical committee 107: Process management for avionics.

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The text of this PAS is based on the following document:

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PROCESS MANAGEMENT FOR AVIONICS – ATMOSPHERIC RADIATION EFFECTS –

Part 6: Extreme space weather and potential impact on the avionics environment and electronics

1 Scope

This PAS details the mechanisms and conditions that produce "extreme space weather" (ESW) and the changes within the avionics environment under such conditions. Consideration is given to the impact and risks of ESW on passengers and crew travelling on aircraft in flight and the option for in flight monitoring of the environment. Avionics electronics and systems operating during flight can be affected under such conditions and these are reviewed. By testing of complete equipment for extreme space weather tolerance, the degree of robustness to ESW can be assessed. In the PAS, flight related infrastructure (not the aircraft itself) that can be affected or disabled by an extreme space weather event is identified; such infrastructure can be in the local "space" environment or on the ground.

This PAS is identical to the "Extreme Space Weather: impacts on engineered systems and infrastructure" document from the Royal Academy of Engineering (United Kingdom, London) which is included in Annex A.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this PAS and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62396-1:2012, *Process management for avionics – Atmospheric radiation effects – Part 1: Accommodation of atmospheric radiation effects via single event effects within avionics electronic equipment*

3 Terms, definitions and abbreviations

For the purposes of this PAS, the following terms, definitions and abbreviations apply.

3.1 Terms and definitions

For the purposes of this PAS the terms and definitions given in IEC 62396-1:2012 apply.

3.2 Abbreviations and acronyms

For the purposes of this PAS the abbreviations and acronyms given in IEC 62396-1:2012 and in Clause 15 of Annex A, as well as the following, apply.

CAA	Civil Aviation Authority
CME	Coronal mass ejections
EASA	European Aviation Safety Agency
EMC	Electromagnetic compatibility
ESD	Electrostatic discharge

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