



EPS Test Plan Guidelines

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SpaceLab, Universidade Federal de Santa Catarina, Florianópolis - Brazil

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Project Chief:
Eduardo Augusto Bezerra

Authors:
Ramon de Araujo Borba

Contributing Authors:

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CHAPTER 1

Introduction

This document contains a series of guidelines and recommendations regarding the preparation of test plans for CubeSat Electrical Power Systems.

This guidelines are based on the ECSS Standards ECSS-E-ST-10-02 [1] and ECSS-E-ST-10-03 [2] and are intended to be applicable to different EPS topologies and architectures.

Testing is considered part of the verification process outlined in the standards, this means that many of the concepts and considerations presented in this guidelines are derived from concepts related to this process. With this in mind, a basic review of the verification process main concepts is advised before implementing the test plan.

This document will cover: test plan structure, objectives, associated documentation, general requirements and provide a baseline test matrix.

CHAPTER 2

Test Plan Structure

According to the standards, the test plan document should contain the following information...

Regarding the structure of the document, the following organization is proposed...

CHAPTER 3

Documentation

Besides the main test plan document, some additional documents are defined in the ECSS standards.

- Test specification document...

- Test procedures document...

- Test reports document...

Regarding the application of this documentation structure, its recommended that...

CHAPTER 4

General Requirements

Requirements regarding test conditions, input tolerances and measurement uncertainties should be referenced directly from the standards, since no specific adjustments need to be made regarding their application to the EPS module testing. These requirements are mostly applicable to the environmental tests.

CHAPTER 5

Test Objectives

There are three main objectives for the testing process, qualification testing, acceptance testing and proto-flight testing.

This objectives are directly related to the verification stages and model philosophy concepts of the verification process.

Qualification testing...

Acceptance testing...

Proto-flight testing...

CHAPTER 6

Baseline Test Matrix

Regarding the test programme, the following test matrix is proposed as a baseline. It is intended to be applicable to different EPS architectures and cover most of the necessary tests. When writing the specific test plan, the relevant test activities applicable to the architecture as well as to the requirements of the EPS being tested should be selected.

This test matrix is organized in test block and test activities...

Bibliography

- [1] ECSS Secretariat. ECSS-E-ST-10-02 - Verification. Technical Report Rev.1, ECSS-ESTEC, 2 2018.
- [2] ECSS Secretariat. ECSS-E-ST-10-03 - Testing. Technical Report Rev.1, ECSS-ESTEC, 5 2022.