Critical Software

Test Case Specification

Spacecraft thermal control system

CONTRACT REFERENCE: n/a

Date: 2024-07-24

Project Code: N/A

Doc. Ref.: n/a

Status: DRAFT

Pages: 10

Information Classification: INTERNAL

Version: 01

|  |  |  |  |
| --- | --- | --- | --- |
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| Revision History | | | |
| Version | Date | Description | Author |
| 0.1 | 2024-07-24 | Initial draft of the document. | Tomás Silva |

Table of Contents

[1. Introduction 4](#_Toc173241171)

[1.1. Objective 4](#_Toc173241172)

[1.2. Scope 4](#_Toc173241173)

[1.3. Audience 4](#_Toc173241174)

[1.4. Document Structure 4](#_Toc173241175)

[1.5. Applicable Documents 4](#_Toc173241176)

[1.6. Reference Documents 4](#_Toc173241177)

[2. Test Plan 5](#_Toc173241178)

[2.1. Features to be Tested 5](#_Toc173241179)

[2.2. Features not to be Tested 5](#_Toc173241180)

[2.3. Approach 5](#_Toc173241181)

[2.4. Testing Tasks 5](#_Toc173241182)

[2.5. Environment Needs 5](#_Toc173241183)

[2.6. Test Case Identification 5](#_Toc173241184)

[3. Test Cases 7](#_Toc173241185)

[3.1. Usage Scneario <1..> - <Module name> 7](#_Toc173241186)

[3.1.1. <Test ID> - <Test Title> 7](#_Toc173241187)

[Annex A. Test Specification table format 9](#_Toc173241188)

Table of Tables

**No table of TABLES entries found.**

Table of Figures

**No table of figures entries found.**

# Introduction

## Objective

The objective of this Test Case Specification document is to define the detailed test cases that will be used to validate the functionality, performance, and reliability of the Spacecraft Thermal Control System. This document aims to ensure that all aspects of the system are thoroughly tested to meet the specified requirements and to identify any defects or issues that need to be addressed prior to deployment.

## Scope

This document covers all test cases related to the Spacecraft Thermal Control System, including but not limited to functional tests, performance tests, integration tests, and user interface tests. The scope includes test cases for the Temperature Simulation Library, Thermal Control Function, User Visualization Interface and the system integration. It encompasses both automated and manual testing procedures.

## Audience

The intended audience of this document is the team of Summer Camp interns responsible for the validation of the Spacecraft Thermal Control System modules.

## Document Structure

The Test Case Specification document is structured to provide a comprehensive framework for testing the Spacecraft Thermal Control System and is divided into the following sections:

* Section 1 (Introduction): This section provides an overview of the document, including its objective, scope, intended audience, and structure. It also lists applicable and reference documents that are relevant to the testing process.
* Section 2 (Test Plan): This section outlines the test plan for the Spacecraft Thermal Control System. It includes detailed descriptions of the features to be tested, features not to be tested, the testing approach, specific testing tasks, and the environmental needs required for testing.
* Section 3 (Test Cases): This section contains detailed test cases for various usage scenarios, starting with the Thermal Simulator Library. Each test case includes the necessary steps to validate the functionality and performance of different components of the system.

## Applicable Documents

There are no applicable documents for this document.

## Reference Documents

There are no reference documents for this document.

# Test Plan

## Features to be Tested

Identify all software features and combinations of software features to be tested.

## Features not to be Tested

Identify all features and significant combinations of features that will not be tested and the reasons.

## Approach

Describe the overall approach to testing. For each major group of features or combination of features, specify the approach that will ensure that these feature groups are adequately tested. Specify the major activities, techniques, and tools that are used to test the designated groups of features.

The approach should be described in sufficient detail to permit identification of the major testing tasks and estimation of the time required to do each one.

Specify the minimum degree of comprehensiveness desired. Identify the techniques that will be used to judge the comprehensiveness of the testing effort (e.g. determining which statements have been executed at least once). Specify any additional completion criteria (e.g. error frequency). The techniques to be used to trace requirements should be specified.

Identify significant constraints on testing such as test item availability, testing resource availability, and deadlines.

## Testing Tasks

Identify the set of tasks necessary to prepare for and perform testing. Identify all intertask dependencies and any special skills required.

## Environment Needs

Specify both the necessary and desired properties of the test environment. This specification should contain the physical characteristics of the facilities including the hardware, the communication and system software, the mode of usage (e.g. stand-alone), and any other software or supplies needed to support the test. Also specify the level of security that must be provided for the test facilities, system software, and proprietary components such as software, data, and hardware.

## Test Case Identification

Each test case within this specification is uniquely identified using a structured ID format to ensure clarity and consistency. The test case IDs follow the format **TC-<MODULE ACRONYM>-<XXXX>**, where:

* TC: Stands for "Test Case" indicating the nature of the document.
* <MODULE ACRONYM>: Represents a short, descriptive acronym of the module or component being tested
  + TSL – Thermal Simulator Library
  + TCF – Thermal Control Function
  + VUI – Visualization User Interface
* <XXXX>: A unique numerical identifier for each test case within the module, starting from 0010 and increasing in increments of 10 (e.g., 0010, 0020, 0030). This numbering scheme allows for easy identification and referencing of test cases, as well as the insertion of additional test cases in future updates without requiring a renumbering of existing ones.

# Test Cases

## Usage Scneario <1..> - <Module name>

### <Test ID> - <Test Title>

<Test Specification table>

**ANNEXES**

1. Test Specification table format

This is the template that needs to be followed when creating a new test specification table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **<Test Specification ID as defined in 2.6>** | | | |
| **Verification Method** | <Test/Inspection> | | | |
| **Objective** | <The feature that this test aims to check (e.g., “Verify that…)> | | | |
| **Procedure Description** | *<Explain how we can execute the verification of the requirement in case.>* | | | |
| **Requirement IDs** | **<ID of Requirement being tested>** <Requirement description> | | | |
| **Pass/Fail Criteria** | *<What is the pass/fail criteria applied for this test? What makes the test considered a success as a whole?>* | | | |
| **Test Step** | **Test Step Description** | **Expected Result** | **Test Result** | **Pass/Fail** |
| **001** | <Singular step to be executed #1> | <What is expected to happen when executing the specified in the test step 001 description column> | <What actually happened when executing the specified in the test step description column> | <Pass/Fail> |
| **002** | <Singular step to be executed #2> | <What is expected to happen when executing the specified in the test step 002 description column> | <What actually happened when executing the specified in the test step 002 description column> | <Pass/Fail> |
| **Test Status** | **<Passed/Failed/Qualified Pass>** | | | |
| **Date** | <YYYY-MM-DD> | | | |
| **Test Conductor** | <Your Name> | | | |

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Descrição gerada automaticamente