Validation & Verification of Electrical Components B2 Test Facility

Tyler Bastian
Dillard University

The research focus of this project is to assist in the closure of Measurement, Monitoring and Control System (MMCS) and other electrical requirements in support of the B2 Space Launch System (SLS) Core Stage Green Run Test Project. Alongside this goal, I am to understand project management tools to analyze and control activities/tasks associated with those items. The project I am working on will assist electrical engineers in developing and or identifying closure rationale for the MMCS and electrical requirements. Also as serving the role of a training project manager, I am to develop and maintain a method for tracking progress with estimated completion dates specifically identifying those items during this performance window. The methods I used in order to perform the research consisted of word documents, excel sheets, and pdf documents needed for review. For example, documents consisted of a SLS Core Stage Green Run Facility Requirement Document (FRD) identifying the SSC MMCS and electrical requirements, a Stage Controller to SSC Interface Control Document (ICD) identifying the SSC requirements, and the B2 SLS Core Stage Green Run Test project System Requirements Document (SRD) which identifies the MMCS and electrical requirements. The files were sent to me by both mentors, Mr. Barry Robinson and Ms. Dawn Davis. Overall, the review process for the word documents and excel spreadsheets proved to be successful. The data for the electrical components were accurate and were consistent with the original recorded data. However, the consistency with the pdf documents did not follow up at all the way. Attention to this mistake was made and further revisions were done in order for the data to agree with each other. Furthermore, an itinerary was designed using Microsoft Outlook in order to track progress with estimated completion dates. This project contributes to NASA/Center Missions and Goals through the Waterfall Model. The Waterfall Model is a linear system used for engineering design. In the Waterfall Model, the fourth step is Verification and Validation. This involves installation, testing, and debugging of the B2 SLS Core Stage electrical components. For the B2 SLS Core Stage Green Run Test Project, each requirement contained in this approved requirements set will have at least one Verification Item (VI) assigned to it.

During the design phase, Vis will mostly consist of Analysis or Inspection types. Design phase Vis and closure information will be documented in Dynamics Data Management System (DDMS) in the form of analysis reports and design documentation.

Introduction

My internship project plan requires me to verify and validate the electrical components for the B2 Space Launch System (SLS) Core Stage Green Run Test Project. The document was sent to me by my alternate mentor, Ms. Dawn Davis. It gave me a better understanding of the requirements of the V&V matrix. For instance, I must verify the power requirements in the System Reference Document (SRD) and match the values in spreadsheets.

Objectives

1. Assist in the closure of Measurement, Monitoring and Control System (MMCS) and other electrical requirements in support of the B2 SLS Core Stage Green Run Test Project.
2. Understand project management tools to analyze and control activities/tasks associated with those items performed in support of Item #1.

Outcomes

Anticipated contributions to the project consist of successful verification and validation of the test stage and further progression in the overall Space Launch System. The timeline for the project completion will presumably last the entirety of the internship, since there are a numerous amount of components to look over. The expected project deliverables for my mentors is to come to a completion of the verification and validation for the project. The expected educational outcomes for me would be to achieve a greater understanding of NASA’s rocket testing, and the numerous steps and processes it takes in order to accomplish successful rocket launches.

Summary

1. Review the B2 SLS Core Stage Green Run Test Project System Requirements Document (SRD), identifying the MMCS and electrical requirements.
2. Review the Stage Controller to SSC Interface Control Document (ICD) identifying the SSC requirements.
3. Review the SLS Core Stage Green Run Facility Requirement Document (FRD) identifying the SSC MMCS and electrical requirements.
4. Perform a gap analysis of the SRD and identify any MMCS and electrical requirements contained in the ICD and FRD that are not in the SRD.
5. Assist electrical engineer in developing and or identifying closure rationale for the MMCS and electrical requirements.
6. Develop and maintain a method for tracking progress with estimated completion dates specifically identifying those items during this performance window.

Special Thanks to my mentors: Mr. Barry Robinson and Ms. Dawn Davis. Also, thanks to Ms. Joy Smith in the Office of STEM Management/Verification and Validation planning guidance is contained in NPR 7123.1, NASA Systems Engineering Processes and Requirements; the project System Engineering Management Plan (SEMP) included as Appendix D of the approved Project Management Plan; SOI-8080-0041, Systems and Test Integration; and SOI-8080-0027, E&TD Operations Work Control.