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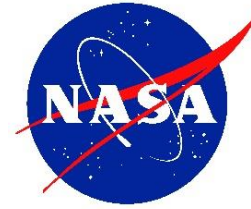
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Mentors: Roger Boyer and Mark Valentine

Department: NC4 (Space Exploration: Safety and Mission Assurance)

Subject: Internship Abstract

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MaRS Database: Continuation and Updates

Purpose: Here at the Johnson Space Center (JSC) I worked on the Mass and Reliability Source (MaRS) database in the Safety and Mission Assurance (S&MA) directorate while also touring and experiencing the many buildings and projects JSC is working on. This abstract is an overview of my tour here at JSC including what I accomplished, things I learned, and the impact for my future career.

Index	Address	Part Number	Part Name	MADS ID
1	1	683-61592-3	ACTUATOR ASSEMBLY	2088 2089 2090
2	1.1	683-61593-1	PIVOT ARM ASSEMBLY	
3	1.1.1	683-61593-13	PIVOT ARM	
4	1.1.2	MS21209C0210	INSERT, SCREW THREAD, COARSE AND FINE, SCREW LOCKING, HELICAL COIL	
5	1.1.3	MS21209C0410	INSERT, SCREW THREAD, COARSE AND FINE, SCREW LOCKING, HELICAL COIL	
6	1.2	683-61593-10	THERMAL SPACER, SHIM	
7	1.3	683-61593-11	THERMAL SPACER, BUSHING	
8	1.4	683-61593-12	STOP, OVER TRAVEL	
9	1.5	683-61593-17	THERMAL SPACER, LIGHT EMITTING DIODE	
10	1.6	683-61593-2	SIDE ARM ASSEMBLY	
11	1.6.1	683-61593-16	SIDE ARM	
12	1.6.2	CA2210-0GR	RETAINING RING	
13	1.6.3	CA2261-06-3-7	SCREW	
14	1.6.4	MS21209C0615	INSERT, SCREW THREAD, COARSE AND FINE, SCREW LOCKING, HELICAL COIL	
15	1.6.5	MS35338-13G	WASHER, LOCK-SPRING, HELICAL, REGULAR (MEDIUM) SERIES	
16	1.6.6	NAS1149EN632R	WASHER	
17	1.7	683-61593-3	BRACKET, FLEXURE ASSEMBLY	
18	1.7.1	683-61593-14	BRACKET	

Figure 1: MaRS Database

Project Description: My Co-Intern Karl and I are working on a project to create the MaRS database by pulling data from Space Station and doing analysis on the failures. This project is a continuation of the work done by many previous interns to create the MaRS database for the space exploration branch of S&MA. The MaRS database will be used to help predict failures during long term missions such as Mars. MaRS is designed to track the failures of all the components that make up relevant Orbital Replacement Units (ORU's). Relevant ORU's are the ones currently tracked in the Maintenance and Analysis Data Set (MADS) database. The MADS database tracks operating hours, failures, and much more for a given ORU. The relevant ORU's and data from MADS is then placed into the MaRS database. Next, the Indentured Parts List (IPL) for each ORU is found from the Vehicle Master Database (VMDB). The IPL for each ORU found in MADS is then placed with the relevant ORU in MaRS. Lastly, failure data is recorded. Often the failure data is associated with the ORU itself, but there is also a lot of failure data for

components that are a part of an ORU. This data is pulled from PRACA reports on the ISS Problem Reporting Analysis tool (PART). All these databases come together to make the MaRS database.

Project Goals: This summer we began by reviewing the current database. We found a lot of issues with the current database since it had never been reviewed before. We decided to make a lot of major changes and get rid of a lot of unneeded things in the database. We also had to add a lot of ORU's that were in MADS but not in MaRS.

Project Accomplishments:

- We downloaded a master spreadsheet from online for: MADS, ISS PART (PRACA's), and all relevant IPL's.
- We verified the current components list in MaRS to check if the data was in MADS and had a correct IPL. To do this we used the downloaded IPL's and wrote a program to see if they matched. If they didn't match then the program would edit the line to match.
- We redefined the columns in the components list and merged metadata sheet into the components sheet. We also filled the columns with identifiers to relevant MADS ID's, PRACA report ID's, and filled in data from both sources into the new columns.
- We added all the missing ORU's and the associated IPL's that are in MADS: Total ~120,000 rows.
- We created a failure list spreadsheet from the PowerPoint data that was used to fill the failure data in MADS. The Next step will be to cross reference this data with the PRACA's in ISS-PART for all parts in MaRS.



Figure 2: Me touring the floor of MCC

Things I learned: Here at NASA I learned many things through my experiences. One in particular is the communication required to work on one document. The MaRS database is a single excel workbook which means that two people can't work on it at once, so we had to figure out how to split it up. Typically it ended up being split up with one of us editing the workbook while the other one researched other information for it. This taught me a lot about the importance of teamwork. Furthermore, the MaRS database is a complex set of data, therefore we cannot make any assumptions about the data. Many previous assumptions made caused us a lot of effort to sort out and fix. We figured out the errors and solutions by communicating with the manager for each database that MaRS references. This experience helped teach me how important communication is to help you work on a complex project.

Additionally, I learned a lot about NASA outside of my project. Our S&MA intern group got to tour many buildings and see many projects other departments are working on. These tours showed me the diversity of NASA projects and helped continue my interest of pursuing a career at NASA. Lastly, the brown bag lunches we went too had a variety of important figures at NASA. Each of these people had a unique story to share about their time at NASA. They helped explain what it is like to work at NASA and the importance of their work here.

Impact and Future Goals: I had a great experience here at NASA. S&MA is a great department with many good people and has taught me a lot of valuable information about the importance of S&MA. I will take

the lessons learned from here in my future endeavors in the space industry, and I believe this internship is the beginning of my pursuit of a career in the space industry. In my future, I am planning to apply and attend graduate school, and try to apply again for a Pathways or Internship opportunity. I plan to apply again for next summer with the internship program and also apply for the Pathways program either before I graduate or during graduate school. This was a great internship and I choose to come again, not because it is easy, but because it is hard!