

NASA SLR Problem Reporting Analysis

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NASA SLR equipment obsolescence continues to pose system challenges, and implementation of new technologies will be needed to continue to support and maintain station operations. NASA SLR Engineering uses Mantis Bug Tracker, a customized and open source software, as the primary problem reporting repository for documenting and prioritizing operational problems. The Frequency of Incident: problems history description, timeframes, details on problem resolution, are used by NASA SLR Engineering personnel for trend and root cause analysis.

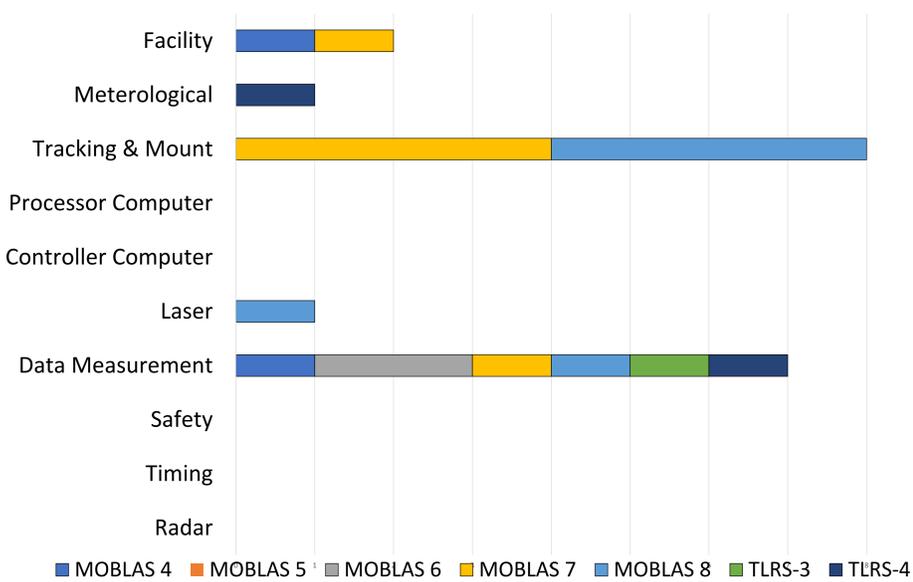
In addition to documenting, prioritizing issues via Mantis, the NASA SLR Laser Operation Report (LOR) is used to document station downtime due to weather or hardware malfunction. LOR data aids NASA SLR Engineering in understanding the direct causal effects on station tracking and missed passes.

NASA SLR Engineering combines data from the Mantis repository (Frequency of Incident) and LORs (Station Downtime) for determining how efficient stations are at repairing their issues.

What this presentation hopes to answer is whether problems reported have a great impact on particular station operations and if so how can NASA SLR Engineering aid in making stations more efficient at managing issues?

FREQUENCY OF INCIDENT (January 2019 – August 2019)

Problem reports from Mantis allow NASA SLR Engineering to see the frequency of occurrence of a particular issue.



ROOT CAUSE ANALYSIS

Tracking & Mount is the most reported sub-system issue



Component failures in the SERVO Controller system

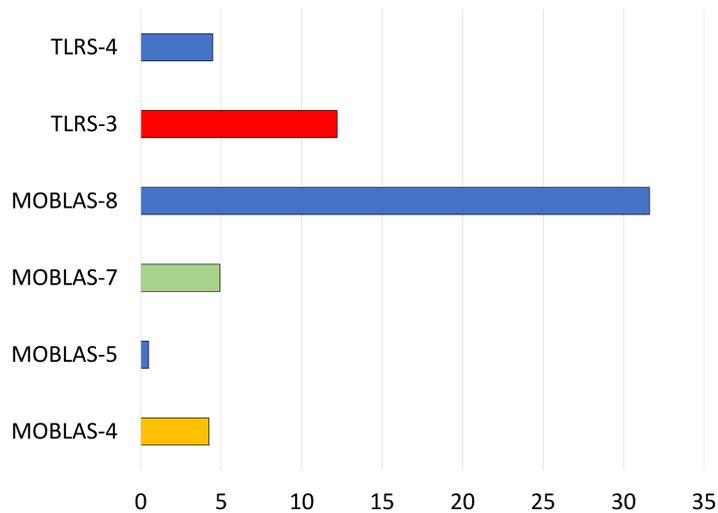


SERVO Controller system is obsolete and requires constant repair

CORRECTIVE ACTION: Replace Obsolete SERVO Controller System with a modern system.

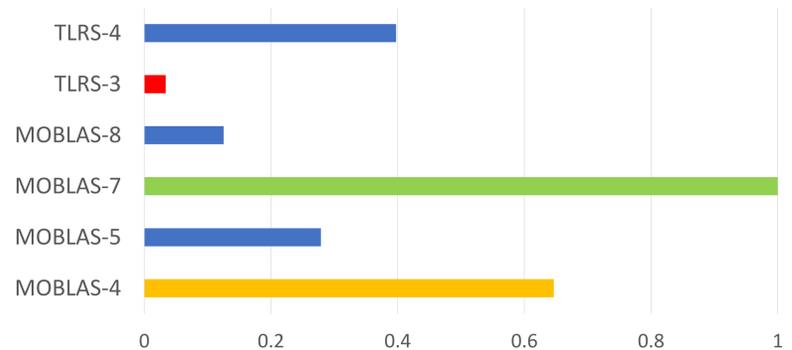
Station Downtime Percentage (January 2019 – August 2019)

LORs help NASA SLR Engineering to determine the impact of problems and how long stations are down due to hardware issues.



MOBLAS-8's incidents had the highest impact to station downtime. The station was down 31% of the time over a period of 8 months due to hardware issues. MOBLAS-5 had the lowest impact of incident with down time at 0.5%.

Relative Station Repair Efficiency (January 2019 – August 2019)



Station Repair Efficiency = Frequency of Incident / Station Downtime %.

MOBLAS-7 and MOBLAS-4 (based on above chart) are the most efficient stations within the NASA SLR Network.

Stations with more frequent contact with SLR Engineering tend to report problems more frequently, which may also lead to increased efficiency. The importance of reporting problems may be different among different nations and cultures.

Suggestions for improving station efficiency:

1. Communication: There needs to be more communication between NASA SLR Engineering and NASA SLR Stations, particularly those outside the United States. Virtual meetings (via Skype or other media) should take place on a regular basis. During these meetings NASA SLR Engineering should discuss current problems in mantis, problems not in mantis and any missed Preventive Maintenance procedures.
2. Onsite Knowledge Transfer: NASA SLR Engineering is currently in the process of setting more Subject Matter Expert interactions including travel dates to international stations. MOBLAS-7 greatly benefits from the proximity to NASA SLR's Engineering Staff.