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Gravity Probe B Relativity Mission

## **GRAVITY PROBE-B STANDARD OPERATING PROCEDURE**

### GP-B Test Template Guidelines

P0893 REV-

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## **Scope:**

Integration and test processes characteristically have been broken down into three major categories. The categories are Pre-Test Preparation/Planning, Test Conduct and Post-Test activities. These activities require a through test plan addressing each category with the same priority. A checklist of tasks are listed below for each category (Pre Test, Test Conduct and Post Test):

## **Purpose:**

The purpose of this Standard Operating Procedure is to provide an overview of the responsibilities that must be completed prior to, during and after performance of a test procedure.

## **Applicability:**

This procedure applies to all personnel involved in test procedure performance. The requirements outlined in this document are mandatory.

## **Responsibilities:**

The below listed activities are the responsibility of the Test Director/Team Lead.

## **Pre Test Preparation/Planning**

- A detailed Program plan that defines the day to day processes and includes for all three categories.
  - Resource allocation by name for all three categories
  - Test procedures/Operation orders requirements, definition, scope and success criteria.
  - Test procedures/Operation Orders preparation, review and release activities.
  - Test Data acquisition requirements including playback.
  - Test Data storage and archive requirements.
  - Detailed list of support equipment to include Mechanical GSE, Electrical GSE (BOB's, Cables, Meters, Scopes and Analyzers), Designated Gas supplies, Tools (Torque wrenches, other hand tools) and etc.
  - Facility availability and special requirements (Power, HVAC, Cleanliness, and facility support personnel).
  - Full equipment survey both electrical and mechanical to determine calibration certification due dates.
  - Detailed shipping and receiving documentation (Shippers, travelers and DD1149 forms as required)

- Test team certification verification (ESD, Fall Protection, Crane Operations and etc.)
- Transportation requirements (Accelerometers, Strain Gages and monitoring/playback equipment).
- Electronic Box ESD protection requirements.
- Crew briefings (Assignments, expectations and test rules).
- Designated test conductor with sole authority for test conduct.
- Preparations for extended testing (multi-shift) if required.
- Definition of test configuration (Safe state) during off hours (Power, Pressures and etc.)
- Pre-Test, Test Conduct and Post-Test Software definition and release.

### **Test Conduct**

- Ensure that all executable procedures/Operation orders are properly released.
- Verify that the procedure used is the latest Revision (also related engineering.
- Ensure that all executable software packages are properly released and configuration managed.
- Assure the Quality Assurance/Safety team members are present
- Crew briefing, with all team members present, defining the days planned activities, including constraints, warnings and restrictions. (See attachment #1 to P8075, Rev -)
- Prior to use, verify that all test equipment has the proper certifications/calibrations. (Record as required)
- Assure that all procedural requirements are met for data collections (Paper recordings, electronic recordings and etc.)
- Real time procedural redlines may only be executed with the concurrence of test conductor and quality assurance representative.
- Test article anomalies shall be reported by Discrepancy Report system (DR)
- Test support equipment anomalies shall be reported by the D-Log or appropriate system.
- Executable software anomalies shall be reported by Software Anomaly Report system.
- Ensure that personnel and test article safety requirements **are a priority** prior to testing, during testing and post testing.
- Test conductor coordination of lunch/dinner breaks with appropriate monitoring of test article and test equipment.

- End of shift briefing with clear understanding of test article safe configuration. If multi-shift, test article turn over to new test conductor and team. (See attachment #2 to P0875, Rev -)

### **Post Test**

- Assure that the test article and test equipment is in safe configuration.
- Assemble the test process paperwork and attach to the Procedures or Operation Orders, including, Discrepancy Reports, Software Anomaly Reports, D-Log reports, Manually recorded data, electronically recorded data (tapes, Zip's, CD's and etc.)
- Test team debriefing to assure all activities/events are recorded in the test records. (reference attachment #2 to P0875 Rev -)
- Prepare the test floor for the next testing event. Including, returning of test equipment to proper storage, returning flight articles to bonded stores, etc.

### **Summary**

The steps outlined in this standard procedure provide proven techniques for test procedure success. Combined the steps will lead to success, omitting any of the steps could lead to test failure or even a program failure.