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GRAVITY PROBE B, RELATIVITY GYROSCOPE EXPERIMENT
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Discrepancy Reporting Instructions
P0855 Rev –

GP-B SCIENCE MISSION PROCEDURE

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1. Introduction

1.1 Scope

This procedure applies to all employees who are engaged in handling and testing of Gravity Probe B Systems and subsystems, and provides the step by step instructions necessary to successfully complete a Discrepancy Report.

All areas throughout the organization must follow recognized Discrepancy Reporting practices.

In order to ensure consistency in Discrepancy Reporting this document defines the required steps for opening, processing, tracking and effectively closing Discrepancy Reports.

The **System Effectiveness Manager** is authorized to and is responsible for ensuring that this document is necessary, that it reflects actual practice, and that it supports corporate policy.

1.2 Applicable Documents

P0108	Stanford University, Science Mission Quality Plan
P0098	Stanford University, Configuration Management Plan

1.3 Acronyms and Abbreviations

The following acronyms are used in this document

RE	Responsible Engineer
QA	Quality Assurance
QE	Quality Engineer
PO	Purchase Order
SEM	System Effectiveness Manager

2. Discrepancy Reporting Instructions

2.1 Purpose

This procedure provides a description of the Discrepancy Reporting (DR) system used by Gravity Probe B Relativity Mission personnel. It provides the instructions necessary to document and track nonconformance information related to the build and checkout of the Gravity Probe B Payload. The applications of this procedure encompass critical quality data related to the use of in-house as well as supplier-furnished hardware and material.

2.2 Applicability:

This document applies to all areas of the SU Gravity Probe B Mission.

2.3 Overview:

The DR is a tool designed to provide traceability for tracking a nonconformance discovered during the build and testing of the Gravity Probe B Relativity Mission Payload

and its' related Ground Test Equipment. When completed the DR will provide a flow of all actions taken by test team members involved in nonconformance processing. The completed DR will be a stand-alone document and will demonstrate to our customer our ability to successfully document and control discrepancy reporting.

2.4 General:

Opening a DR: The individual who discovered the discrepancy will document the nonconformance on a Discrepancy Report. The DR number will be automatically assigned by the database. A Discrepancy Report must be opened within 24 hours of the discrepancy.

Note: Some nonconformances can be documented on a Discrepancy Log form (D-Log). If the System Effectiveness Manager determines that the nonconformance can not be reworked to specification, the nonconformance will be transferred to a Discrepancy Report and dispositioned through the Material review Board.

Discrepancies that are not required to be reported:
- Discrepancy of hardware do to normal fabrication yields.
- Discrepancy of Non-Flight hardware, provided the discrepancy has no effect on flight design or test.
- Discrepancy or anomaly due to test equipment that was discovered during a test that is not Qualification or Acceptance. **NOTE: Any discrepancy discovered during acceptance testing must be reported.**

3. COMPLETING THE DR (ENTRY BY ENTRY INSTRUCTIONS)

a) Component Number: Enter the Part Number of the nonconforming part and the Revision Number.

b) Nomenclature: Enter the part number of the nonconforming part described in the nomenclature block.

c) Part Number: Enter the part number of the nonconforming part, at the lowest level assembly or piece part number. (There will be times when a discrepancy is a system-level issue)

d) Serial Number: Enter the serial number of the nonconforming part. (Must be the part described in the nomenclature and part number blocks)

e) Date of Event: Enter the date that the nonconformance was discovered.

f) Reported By: Enter the name of the individual opening the DR.

g) Disposition: This block will list the final disposition of the nonconformance, it will be the last block completed on the DR and the disposition will be the responsibility of the SEM to verify the correctness of the disposition.

Acceptable dispositions are as follows:

- **Rework:** Operation(s) that will bring a nonconforming item to full conformance with all specifications. A rework disposition cannot be used if any action taken does not fully meet the specifications in existence at the time of the nonconformance.

- **Repair:** The repair disposition describes the entire repair process including materials, parts, and process requirements. The purpose of repair is to bring nonconforming material/components into an acceptable condition. Repair is distinguished from Rework in that the item after Repair does not completely conform to the applicable Drawings, specifications, or contract requirements.

- **Use-As-Is:** A disposition of material/component with a minor nonconformance where the material/component has been determined to be satisfactory for its intended purpose without additional work.
Note: It is imperative that Systems Engineering be notified when a "Use as is" disposition is selected.

- **Scrap:** Nonconforming material that is not usable for the intended purpose or which cannot be economically reworked or repaired in a manner acceptable to the to the government, Customer Representative or Program standards.
Note: When the disposition of "Scrap" is selected, the part will normally be removed from the floor or MRB hold area and destroyed. If a "Scrapped" part is not to be destroyed, it must be placed on a "QA Hold" status.

- **QA Hold:** This is a temporary disposition until a final disposition is made. QA Hold will primarily be used for articles normally designated scrap that can possibly be used as an engineering test items.

- **Other:** This disposition will only be used when the action is not described by any other dispositioned defined. For example; when the status of a DR is "Withdrawn" in the database or when a DR has multiple parts with multiple dispositions.

h) Severity: Entry in this block will be limited to Minor, Major or Critical

- **Minor:** A minor nonconformance is one that analysis indicates is significant to product Quality but is not likely to impair the mission performance of the part or item.

- **Major:** A major nonconformance is one that analysis is not critical but is likely to result in failure of an end item to perform a required mission. **Note: The Customer must be notified within 24 hours after opening a Major DR.**

- **Critical:** A critical nonconformance is one that analysis indicates is likely to create or increase a hazard to human safety, or to result in failure of a system or major product to perform a required mission. **Note: The Customer must be notified within 24 hours after opening a Critical DR.**

i) Status: Note: This block is completed by the appropriate Payload Manager or the Stanford SEM. Initial status will always be "Draft", the Stanford SEM will update all other entries. This block is used to provide information on the current status of a DR.

j) Discrepancy: This block is used to describe the nonconformance. Entries should have just enough detail to let the reader know the exact problem. Entries should be described in a manner reflecting the "is" condition and the "should be" condition (i.e. Power supply voltage Reading is 25.0 volts, should be 28.5 +/- 2 volts). Only describe the discrepancy in this block, do not try to troubleshoot the problem here. Reference should be made to the Travel Sheet and Procedure number in which the discrepancy occurred. This block should be limited to one discrepancy per DR. (exception would be closely related discrepancies on the same component such as surface measurements, holes drilled incorrectly, broken wires or solder joints).

Note 1: A condition in which there appears to be a nonconformance or a condition that exists for which there are no parameters defined will be entered as a "Suspect Discrepancy Report".

Note 2: Date and initial all entries in this block each time they are made.

k) Cause: This block must indicate the actual root cause of the nonconformance. It is imperative that the verbiage in this block clearly describes what led to the conclusion of the cause statement. Terms such as "most probable" are **not** acceptable, there must be a definite acceptable cause description. If no actual cause can be identified and the failure is not repeatable then an Unverified Failure condition exists.

Definition of Unverified Failure: A failure that disappears prior to conclusive determination of failure mechanism or software instruction error.

Note: Date and initial all entries in this block each time they are made.

l) Effect on Service: Information entered in this block should take into consideration all similar components that may be tested using the same test guidelines. Also it is important to consider the impact on related or future tests. If other components or tests are impacted describe the impact in this block.

Note: Date and initial all entries in this block each time they are made.

m) Recommended Corrective Action:

Information entered in this block should be directly related to the cause of the failure described in the cause block. Give enough detail to make the corrective action understandable to another individual who may have to take the corrective action.
(i.e. change procedure P0098, page 8, para. 4.1 to read "……". Rather than "Change to P0098" required. If a part must be modified/repaired clearly indicate what the modification/repair will be and include affected drawings and procedures.

Note: Date and initial all entries in this block each time they are made.

n) Repair Procedure:

This block is used to describe the steps to be taken to rework/repair the nonconformance. Enter the repair items on a step by step basis. If an item requires an action to be taken (i.e. change procedure #….) enter "completed" when the action is actually taken. All steps in the repair procedure block must be completed prior to closing the DR
.

Note 1: Do not use this block for troubleshooting.

Note 2: Date and initial all entries in this block each time they are made.

o) NASA Notification:

An entry in this block must be made for any "Critical" or "Major" DR that will require MRB action. Entry should include who was notified, time and date of notification.

p) Technical Investigation:

This block is used to describe the actions taken to determine the cause of the nonconformance or to develop a plan for rework or repair of the nonconforming item. This block is also the best place on the DR form for referencing similar nonconformances previously discovered and documented on other DR's.

Note: Date and initial all entries in this block each time they are made.

q) Status Notes: **QA USE ONLY.**

This block is used for determining the real time status of the DR. This block should indicate where the area of responsibility for the next required action is. (i.e. "An MRB meeting was held with (list attendees) John Doe is to determine if a drawing change is required anticipated completion date is ……" or, "Part is awaiting rework/repair by John Doe anticipated completion date is ……").

Note: Date and initial all entries in this block each time they are made.

s) Signoffs: Appropriate personnel will sign this block when all actions required in the DR have been successfully completed. It is recommended that Quality be the last approval signature obtained.

Minimum approvers are: Appropriate Manager, System Engineer, System Effectiveness Manager, and Government Representative. Additional approvers may be added at the discretion of the Appropriate Manager and/or System Effectiveness Manager.

Note: All "Major" and "Critical" DRs must be approved by both the Stanford Program Manager and the MSFC Program Manager.