



Goddard Procedural Requirements (GPR)

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| DIRECTIVE NO. | GPR 8070.4A | APPROVED BY Signature: | <i>Original Signed by Marcus Watkins for</i> |
| EFFECTIVE DATE: | June 21, 2007 | NAME: | Edward J. Weiler |
| EXPIRATION DATE: | March 22, 2010 | TITLE: | Director |

COMPLIANCE IS MANDATORY

Responsible Office: 302/Management System Office

Title: Administration and Application of Goddard Rules for the Design, Development, Verification and Operation of Flight Systems

PREFACE

P.1 PURPOSE

This directive defines the process for the administration and application of the Goddard Rules for the Design, Development, Verification and Operation of Flight Systems. This includes the control of changes, compliance verification and deviation/waiver management.

P.2 APPLICABILITY

This directive applies to all space flight products for which GSFC is responsible, including spacecraft, instruments, and subsystems. These requirements apply to ground support equipment where expressly stated in a rule. These requirements do not apply to sub-orbital projects. This directive applies to projects that will complete Mission Conformation Readiness Review (MCRR) on or after April 1, 2005. The GSFC Program Management Council (PMC) shall determine the scope of the application of this directive on all other space flight products.

P.3 AUTHORITY

NPD 8070.6, Technical Standards

P.4 REFERENCES

- a. GSFC-STD-1000, Rules for the Design, Development, Verification, and Operation of Flight Systems
- b. GPR 1060.2, Management Review and Reporting for Programs and Projects
- c. GPR 1410.2, Configuration Management
- d. GPR 8700.4, Integrated Independent Reviews

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- e. GPR 8700.6, Engineering Peer Reviews
- f. GPR 9980.1, Internal Audit System
- g. Form GSFC 4-38, GSFC-STD-1000 Change Request
- h. Form GSFC 4-39, Goddard Rules Compliance Matrix
- i. Form GSFC 4-42, GSFC Management System (MS) Requirement Deviation/Waiver Request

P.5 CANCELLATION

Not applicable.

P.6 SAFETY

Not applicable.

P.7 TRAINING

The Management System (MSO) shall provide training for GSFC project and technical personnel on these procedural requirements and the Rules for the Design, Development, Verification, and Operation of Flight Systems.

P.8 RECORDS

| Record Title | Record Custodian | Retention |
|--|-------------------------|--|
| Final Project Rules Compliance Matrix | MSO | NRRS 8/12A: * Permanent * Retire to Federal Records Center when no longer needed for reference. Transfer to NARA when 15 years old. |
| Approved Rules change requests, waivers and deviations | MSO | NRRS 8/12A |

NRRS – NASA Records Retention Schedule ([NPR 1441.1](#))

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P.9 METRICS

The MSO shall develop metrics from the rules compliance, change request, and deviation/waiver request data in order to baseline and improve process performance.

P.10 DEFINITIONS

- a. GSFC Rule – A GSFC rule has the following characteristics:
 - 1) it is a high-value principle to guide the methodology and thinking process necessary to consistently and efficiently achieve safety and mission success;
 - 2) it is important enough to require compliance, or formal deviations or waivers, for all GSFC projects;
 - 3) its rationale is based on sound engineering practice, systems management principles, or lessons learned; and
 - 4) a system engineering product or other objective verification method is identified at one or more milestones in the project life cycle
- b. Deviation – An allowance for a departure from a requirement or specification before the departure has occurred.
- c. Product Manager – The individual designated as having management responsibility for a product.
- d. Waiver – An allowance for a departure from a requirement or specification after the departure has occurred.

PROCEDURES

In this document, a requirement is identified by “shall,” a good practice by “should,” permission by “may” or “can,” expectation by “will,” and descriptive material by “is.”

1.0 Rules Administration

- 1.1 The MSO shall maintain the GSFC-STD-1000 (hereinafter “GSFC Rules”).
- 1.2 The baseline release of the GSFC Rules shall be approved by the PMC chairperson. Changes shall be approved as described in section 1.6.

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1.3 The GSFC Rules shall be configuration controlled as described herein and accessible to all GSFC employees.

1.4 A rule owner, designated by the MSO for each rule, shall be responsible for validating the principle, rationale, verification requirements, related guidance and lessons learned, and participating in the evaluation of proposed changes, deviations and waivers.

1.5 A standing Rules Review Team (RRT) shall review and recommend disposition of proposed changes, deviations and waivers. The RRT membership shall be:

- a. Center Chief Engineer (Chair)
- b. 302/Rules Manager (Process Owner and Executive Secretary)
- c. 302/Quality Management System Manager
- d. 302/Environmental Verification Specification Manager
- e. 200/MOD Representative
- f. 300/Senior Systems Safety and Mission Assurance Manager
- g. 400/Senior Program/Project Manager
- h. 500/AETD Chief Engineer
- i. 600/Science and Exploration Directorate (SED) Representative

1.6 Change Process

1.6.1 Additions, deletions and revisions to the GSFC Rules shall be initiated by submitting a form GSFC 4-38 to the RPO. NASA employees, contractors, or partners may submit a request form.

1.6.2 The MSO shall maintain a change request tracking system that records the progress and content of change requests from receipt through disposition.

1.6.3 The RRT shall meet for a detailed discussion of project compliance status and all change requests on at least a quarterly basis. The RRT shall, in advance of the quarterly meeting, review change requests and request additional reviewers as needed (including potential technical authorities for any new rules), or additional information from the change initiator or other sources, as needed to assure a thorough assessment. In the case of a proposed change to an existing rule, the rule owner for that rule shall be included in all RRT deliberations.

1.6.4 The RRT shall evaluate the merits and applicability of the change request against the criteria for a GSFC Rule (1.2) and other requirements of this directive. The RRT shall consider the suitability of the proposed rule, or change to an existing rule, relative to the full range of NASA, GSFC, Directorate and lower organizational level directives, standards, handbooks, guidelines, etc.

1.6.5 The RRT shall prepare a decision package including a recommendation and rationale for each change request. In the event of a recommendation to accept the change request, the RRT shall include the proposed text changes as "red lines" to the controlled version of the GSFC Rules. If the recommendation is to reject the change request, the RRT shall provide preliminary feedback to the change request initiator and offer the opportunity to attach a reclama. The package shall also include any alternative views of RRT members. The completed decision package, initialed by all

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RRT members, shall be forwarded to the Deputy Director of The Office of Systems Safety and Mission Assurance.

1.6.6 The Deputy Director of The Office of Systems Safety and Mission Assurance shall verify the completeness of the decision package and convene a meeting of the Directors of MOD, OSSMA, FPPD, AETD, and SED to disposition the decision package. Approval by this body shall be by unanimous consent and requires the concurrence of the PMC Chair. A disapproved decision package shall be forwarded to the Quality Management System Council for possible incorporation of the change into some other aspect of the management system.

1.6.7 The Deputy Director of The Office of Systems Safety and Mission Assurance shall provide the change request decision to the RRT and the change request initiator. The MSO shall incorporate approved changes to the GSFC Rules and notify active GSFC projects of the change within ten working days of the PMC decision.

2.0 Rules Application

2.1 All products within the scope of this directive shall be designed, developed, verified and operated in accordance with the GSFC Rules. Exceptions shall be permitted only by formal deviation or waiver, processed and approved in accordance with this directive (see 2.5), or by virtue of the requirement's non-applicability to the product, as explicitly stated in the rule.

2.2 Product Managers shall use form GSFC 4-39 to indicate the current status of compliance of their project with the GSFC Rules. Updates to the compliance matrix shall be prepared as changes in status occur and submitted to the RPO for review and concurrence. Product Managers shall internally control the GSFC Rules Compliance Matrix in accordance with the associated project configuration management procedure (GPR 1410.2).

2.3 The initial completed compliance matrix shall be available for independent review no later than the Mission Definition Review (MDR) (GPR 8700.4). Project presentations at the MDR and all subsequent Integrated Independent Reviews shall address the current GSFC Rules compliance status as well as rule compliance evidence and results relevant to that milestone in the project life cycle. The Integrated Independent Review (IIR) Team shall assess compliance with the GSFC Rules and specifically address that assessment in the IIR Report with emphasis on areas of potential non-compliance. Rules compliance shall also be independently assessed via engineering peer reviews (GPR 8700.6), project safety and mission assurance activities, and internal quality management system audits (GPR 9980.1).

2.4 The Product Manager shall address, and the Office of Systems Safety and Mission Assurance shall independently report, status of compliance to the GSFC Rules at the Mission Confirmation Readiness Review (MCRR) and Mission Readiness Review (MRR) (GPR 1060.2).

2.5 Deviation/Waiver Process

2.5.1 Upon determination of the need for such, deviation/waiver requests shall be documented on form GSFC 4-42, have concurrence of the applicable Product Manager and the applicable Director Of, and

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submitted to the MSO for review and approval. Deviations and waivers shall be reviewed collectively at the Initial Confirmation Readiness Review (ICRR) and the MCRR, and summarized at the MRR.

2.5.2 The MSO shall maintain a deviation/waiver request tracking system that records the progress and content of requests from receipt through disposition.

2.5.3 The Chair of the RRT shall distribute the deviation/waiver request to the RRT, the rule owner for the rule, and request additional reviewers or additional information from the Product Manager as needed. The RRT shall evaluate the request, supporting rationale, and expert opinions, and assess the acceptability of the risk of noncompliance to safety and mission success that would result from the requested noncompliance. For consistency, the RRT shall review the disposition of similar requests. The RRT shall develop and document a disposition recommendation and rationale, along with any alternative views within ten working days of receipt of the request. The RRT Chair shall advise the Product Manager of the RRT recommendation and rationale pending the decision meeting (see 2.5.4).

2.5.4 The Deputy Director of The Office of Systems Safety and Mission Assurance shall convene a meeting with the Product Manager, RRT and the Directors of MOD, OSSMA, FPPD, AETD, and SED to disposition the deviation/waiver request. Disposition shall be made within 15 working days of request receipt. The Product Manager shall introduce the deviation/waiver request and rationale. The RRT shall provide the disposition recommendation, rationale and any alternative views of the RRT. Approval of a waiver or deviation request shall be by unanimous decision. If the request is not approved, the Product Manager and applicable Director Of may appeal to the full PMC. The Office of Systems Safety and Mission Assurance shall notify the PMC of the disposition status of all deviation and waiver requests.

2.5.5 The Product Manager shall update the Rules Compliance Matrix to indicate deviation/waiver decisions and provide it to the MSO.

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CHANGE HISTORY LOG

| Revision | Effective Date | Description of Changes |
|-----------------|-----------------------|--|
| Baseline | 03/22/05 | Initial Release |
| A | 06/21/07 | Administrative changes from Form GSFC 4-40 to GSFC 4-42 and from ITA/SMO organization to Management System Office and Office of Systems Safety and Mission Assurance as appropriate. |
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