



## Goddard Procedural Requirements (GPR)

<b>DIRECTIVE NO.</b>	<u>GPR 8070.4C</u>	<b>APPROVED BY Signature:</b>	<u>Original Signed By</u>
<b>EFFECTIVE DATE:</b>	<u>November 10, 2015</u>	<b>NAME:</b>	<u>Judith N. Bruner</u>
<b>EXPIRATION DATE:</b>	<u>November 10, 2020</u>	<b>TITLE:</b>	<u>Director, Safety and Mission Assurance</u>

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### COMPLIANCE IS MANDATORY

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**Responsible Office:** 300 / Safety and Mission Assurance Directorate

**Title:** Administration and Application of Goddard Open-Learning Design (GOLD) Rules for the Design, Development, Verification and Operation of Flight Systems

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## PREFACE

### P.1 PURPOSE

This directive defines the process for the administration and application of the GOLD Rules. This includes the control of changes, compliance verification, and waiver management.

### P.2 APPLICABILITY

This directive shall apply to all space flight projects for which GSFC has project management responsibility, including spacecraft, instruments, and subsystems that completed their Mission Confirmation Readiness Review (MCRR) on or after April 1, 2005 and within the scope of the GSFC Management System (MS). Note that this directive only applies to projects managed by organizations outside of GSFC but under a GSFC program office as agreed upon between the program office and the project office. These requirements apply to ground support equipment as expressly stated in a rule.

This directive will apply to GSFC vendors as specified in contracts. These requirements do not apply to sub-orbital projects. In the event of a conflict between the GOLD rules and other authorities, requirements from NASA policies or procedures, or applicable laws, shall take precedence.

### P.3 AUTHORITIES

NPD 8070.6, Technical Standards

### P.4 APPLICABLE DOCUMENTS

- GSFC-STD-1000, Rules for the Design, Development, Verification, and Operation of Flight Systems
- NPR 7120.5, NASA Space Flight Program and Project Management Requirements
- NPR 7120.8, NASA Research and Technology Program and Project Management Requirements
- GPR 1410.2, Configuration Management
- GPR 8070.5 GSFC Technical Standards

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- f. GPR 8700.4, Integrated Independent Reviews
- g. GPR 8700.6, Engineering Peer Reviews
- h. GSFC Form 4-38, GSFC-STD-1000 Change Request
- i. GSFC Form 4-39, Goddard Rules Compliance Matrix
- j. GSFC Form 4-42, GSFC GOLD Rules Waiver Request

**P.5 CANCELLATION**

GPR 8070.4B, Administration and Application of Goddard Open-Learning Design (GOLD) Rules for the Design, Development, Verification and Operation of Flight Systems

**P.6 SAFETY**

Not applicable.

**P.7 TRAINING**

Not applicable

**P.8 RECORDS**

<b>Record Title</b>	<b>Record Custodian</b>	<b>Retention</b>
GSFC Form 4-39 (GSFC Rules Compliance Matrix)	Project Office	NRRS 8/101: * Permanent * Retire to Federal Records Center when no longer needed for reference. Transfer to NARA when 15 years old.
Approved GSFC Form 4-38 (GSFC Rules Change Request)	Code 300 DM/CMO	NRRS 8/101
Approved GSFC Form 4-42 (GSFC GOLD Rules Waiver Request)	Original: Code 300 DM/CMO (Copy to: Project Office)	NRRS 8/101

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

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## **P.9 MEASUREMENT/VERIFICATION**

The time from receipt of a change and/or waiver requests to final disposition shall be tracked, along with the number of such requests, per rule and per project.

### **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 GOLD Rule Management Process**

- 1.1 The GOLD Rules shall be developed and maintained per the procedures outlined in GPR 8070.5.
- 1.2 GOLD Rule change requests shall be made using GSFC Form 4-38 (GSFC-STD-1000 Change Request).
- 1.3 Additionally, the following authority shall apply throughout the GOLD Rules management process:
  - a) Owner of GOLD Rule Content: Applied Engineering and Technology Directorate (Code 500).
  - b) Owner of GOLD Rule Configuration Management: Safety and Mission Assurance Directorate (Code 300).
  - c) Owner of GOLD Rule Implementation: Flight Projects Directorate (Code 400) or Suborbital and Special Orbital Projects Directorate (Code 800), as applicable.
  - d) Waiver review and concurrence: Code 300, Code 400 or Code 800 as applicable, Code 500 members of the Standards Review Committee (SRC) or designee of the respective Director Of, and GSFC Chief Engineer.
  - e) Waiver approval: Director of Safety and Mission Assurance or delegated appointee.

#### **2.0 Product Manager and Review Team Responsibilities**

- 2.1 The Product Manager shall:
  - a) Ensure all products developed within the scope of this directive are managed, designed, developed, verified, and operated in accordance with GSFC-STD-1000. Exceptions to GOLD Rule requirements for NPR 7120.5 Class A, B, or C projects shall be permitted only by formal waivers that are processed and approved in accordance with this directive (see 3.0), or by virtue of a rule’s non-applicability to a product. For projects that are governed by NPR 7120.8, those not governed by any Project Management directive (also known as “Do No Harm” projects), and Class D projects governed by NPR 7120.5, in lieu of a waiver, a GOLD

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Rules Compliance Matrix may be reviewed at a single meeting, chaired by the AETD or GSFC Chief Engineer, including appropriate subject matter experts and a representative from the Code 300 Directorate Office. The compliance matrix should be held under configuration control within the owning directorate.

- b) For NPR 7120.5 Class A, B, or C projects, ensure GSFC Form 4-39 (GOLD Rules Compliance Matrix) is used to annotate each rule's applicability and their product's respective compliance. Product Managers will assess and maintain their product's compliance with the GOLD Rules in effect at the time of the Mission Definition Review (MDR), or equivalent timeframe for Announcement of Opportunity (AO) missions. Note: Product Managers may choose to submit a Mission Exceptions List (MEL) to the Engineering and Safety and Mission Assurance Directorates prior to spacecraft or instrument Preliminary Design Review (PDR) using a completed GSFC Form 4-39 that includes justifications for each rule assessed as non-applicable. MELs are submitted per procedures outlined in 3.0;
- c) Ensure their product's compliance is reassessed as GOLD Rule revisions are released. The product should comply with these later GOLD Rule modifications, whenever feasible;
- d) Assess and, at a minimum, report on the risk that is associated with each noncompliance incurred by such revisions, using the project's own risk management procedures;
- e) For NPR 7120.5 Class A, B, or C projects, ensure their product's GSFC Form 4-39 is updated with copies provided to the Code 300 DM/CMO and the project's Standing Review Board (SRB) chairperson no later than 30 days prior to each scheduled SRB milestone review;
- f) For NPR 7120.5 Class A, B, or C projects, ensure completed GSFC Form 4-39s are internally controlled in accordance with the project's configuration management procedure (GPR 1410.2);
- g) Address GOLD Rules applicability and compliance for the overall mission, including its various elements at the MDR; and
- h) Address the status of GOLD Rules compliance and associated risk(s), as appropriate.

2.2 GSFC System Review Teams and GSFC Project Standing Review Boards shall (per applicable requirements in P. 2 and Section 2.1):

- a) Assess GOLD Rule compliance at all Integrated Independent Reviews (IIR, GPR 8700.4) and Engineering Peer Reviews (EPR, GPR 8700.6); and
- b) Ensure review reports address the project's compliance, with emphasis on areas of potential or certain non-compliance and updated compliance information related to previously disapproved waiver requests.

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### 3.0 GOLD Rule Waiver Processing for NPR 7120.5 Class A, B, and C projects

#### 3.1 The Product Manager shall:

- a) Ensure waiver requests are documented on GSFC Form 4-42 (GOLD Rule Waiver Request), and indicate the concurrence or nonconcurrence of the GOLD Rule's Subject Matter Expert (SME). The concurrence, non-concurrence of the SME should be in the form of an email from that SME. NOTE: A rule's SME should come from within the organization identified as the rule's primary owner. If the owner organization has a named chief engineer, then the project should work with that chief engineer to assess the waiver. If the owner organization does not have a named chief engineer, then the project should work with the Branch/Division management of the owner organization to identify a SME;
- b) Sign and obtain the signature of the relevant Director of Code 400 or Code 800 as appropriate;
- c) Submit the request to the Code 300 DM/CMO for formal processing (draft /unsigned electronic copies should be provided to Code 300 DM/CMO, as soon as the need for a waiver has been established). NOTE: MELs shall use a single GSFC Form 4-42 with a completed GSFC Form 4-39;
- d) The waiver request to Code 300 DM/CMO for formal processing should not be submitted until the SME concurrence and relevant Director Of signature has been obtained;
- e) Update the project's GSFC Form 4-39 to indicate the final disposition of waivers and provide an updated copy to the Code 300 DM/CMO and the SRB chairperson; and
- f) Specifically address their strategy for achieving rule compliance for each disapproved waiver.

3.1.1 The GSFC Program Office shall serve as the Product Manager for projects under GSFC programs, respectively, but managed by organizations outside of GSFC. Hence waivers will be submitted by the program office for such projects, and not by the outside organizations.

#### 3.2 The Code 300 DM/CMO shall:

- a) Maintain a waiver request tracking system;
- b) Record and distribute the waiver request to the waiver review and concurrence authorities (refer to Section 1.2.d) and request additional information from the Product Manager and/or SME(s), as needed (again, electronic copies should be made available as soon as possible in order to streamline the review process);
- c) Forward recommendations of waiver review authorities to the Director of Code 300 and, if so directed, the Deputy Director and/or Center Director for review and concurrence/nonconcurrence; and

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d) Receive and record the final disposition and notify the project.

3.3 The Waiver Review and Concurrence Authorities shall:

a) Evaluate requests to assess the acceptability of the associated risk to safety and mission success; and

b) Provide a written recommendation regarding final disposition and forward to the Code 300 DM/CMO.

3.4 The Director of Code 300 or delegated appointee shall:

a) Receive and review waiver requests with reviewers' recommendations and sign signifying his/her concurrence/nonconcurrence.

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## Appendix A – Definitions

- A.1 GOLD Rule** – A requirement, either stated as a general principle or in a more quantitative form, contained in GSFC-STD-1000. For the purposes of GOLD Rules tracking and management, a rule that is specified as a general principle may be absent any additional references, whereas a rule that is more quantitative includes additional references.
- A.2 Product Manager** – The manager or leader designated as having overall management responsibility for a product, including the successful implementation of the product’s design, development, delivery, integration onto spacecraft, and on-orbit verification.
- A.3 Product** – Any deliverable in scope and subject to the GSFC MS, including all hardware, software, ground support equipment, mission data, science, and technology output to customers. A product is an element of a project in general, but the product may constitute the entire deliverable item from a project.

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## Appendix B – Acronyms

<b>AETD</b>	Applied Engineering and Technology Directorate
<b>AO</b>	Announcement of Opportunity
<b>DM/CMO</b>	Directives Manager/Configuration Management Officer
<b>EPR</b>	Engineering Peer Review
<b>GOLD</b>	Goddard Open Learning Design
<b>GPR</b>	Goddard Procedural Requirement
<b>GSFC</b>	Goddard Space Flight Center
<b>IIR</b>	Integrated Independent Review
<b>MCRR</b>	Mission Confirmation Readiness Review
<b>MDR</b>	Mission Definition Review
<b>MEL</b>	Mission Exceptions List
<b>MS</b>	Management System
<b>NASA</b>	National Aeronautics and Space Administration
<b>NPD</b>	NASA Policy Directive
<b>NPR</b>	NASA Procedural Requirements
<b>NRRS</b>	NASA Records Retention Schedule
<b>PDR</b>	Preliminary Design Review
<b>SME</b>	Subject Matter Expert
<b>SRB</b>	Standing Review Board
<b>SRC</b>	Standards Review Committee

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**CHANGE HISTORY LOG**

<b>Revision</b>	<b>Effective Date</b>	<b>Description of Changes</b>
Baseline	03/22/05	Initial Release
A	06/21/07	Administrative changes from GSFC Form 4-40 to GSFC Form 4-42 and from ITA/SMO organization to Institutional Support Office and Safety and Mission Assurance Office
B	08/25/09	Revised for alignment with GPR 8070.5 and clarification of management, application, and waiver processes, without any significant changes to overall policy.
B	08/08/14	Administratively extended for 1 year.
C	11/10/15	Removed double-shall statements. Included explicit relief for higher risk posture projects. Clarified the process for projects that are outside of GSFC, under a GSFC program office.

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