Goddard Procedures and Guidelines

DIRECTIVE NO.	GPG 8700.1C	**APPROVED BY Signature:**	*Original Signed by*
EFFECTIVE DATE:	August 9, 1999	**NAME**:	A. V. Diaz
EXPIRATION DATE:	December 31, 2004	**TITLE:**	Director

Responsible Office: 500/Applied Engineering and Technology Directorate

Title: DESIGN PLANNING AND INTERFACE MANAGEMENT

Preface

P1. PURPOSE

This procedure defines the process for developing design plans and devising methods for managing organizational and technical interfaces.

P2. APPLICABILITY

This procedure applies to the development of all Goddard Space Flight Center (GSFC) products and processes covered by the scope of the GSFC Quality Management System.

P3. AUTHORITY

NPD 8730.3, NASA Quality Management System Policy (ISO 9000)

P4. REFERENCES

a. NPD 7500.1, Program and Project Logistics Policy
b. GPG 1310.1, Customer Commitments and Review
c. GPG 3410.2, Personnel Training and Qualification
d. GPG 5330.1, Product Processing, Inspection, and Test
e. GPG 6400.1, Handling, Storage, Packaging, Marking, Preservation, and Transportation
f. GPG 7120.2, Project Management
g. GPG 8700.2, Design Development
h. GPG 8700.3, Design Validation
i. GPG 8700.4, Technical Review Program

P5. CANCELLATION

GPG 8700.1B, Design Planning and Interface Management

P6. RECORDS

Quality Record Title	Record Custodian	Retention
Design Planning Documentation	Product Design Lead (PDL)	NASA Records Retention Schedule (NRRS) 1/22A Permanent. Retire to a Federal Records Center (FRC) when 5 years old. Transfer to NARA when 10 years old.

Procedure

1. DEFINITIONS

a. Product Design Lead (PDL) – The manager or leader with overall responsibility for managing the design activity, managing the technical and organizational interfaces identified during design planning, and where required, forming and leading the Product Design Team. The term refers to flight project managers, mission managers, instrument managers, subsystem technical managers, integrated product development team leaders, lead engineers, etc.

b. Design Plan – The documentation created as a result of executing this procedure. It may be gathered together as a single document, consist of multiple documents, or be a portion of a more comprehensive document, such as a Project Plan, Implementation Plan, or equivalent.

2. IMPLEMENTATION

Though this procedure and its accompanying flow chart identify a specific sequence for design planning, tailoring of the sequence may be appropriate. In addition to the possibility of some steps being done in parallel, there may be an iterative nature to many of the steps. For example, several steps may be completed to a preliminary level, and then executed again to finalize design plans. The approach used is at the discretion of the PDL.

2.1 Establish Goals and Objectives

The PDL shall establish the goals and objectives for the design process as a baseline for all subsequent planning activity. Where appropriate, this includes the development of requirements and/or

specifications for the product or service being designed. The design requirements shall be traceable to the customer requirements (see GPG 1310.1).

2.2 Establish the Basic Approach to Meeting Goals and Achieving Objectives

The PDL shall document the mode of implementation of the planned activities. Considerations include, but are not limited to, the following:

a. Make or buy – Project designs will typically involve hardware, software, and/or analysis requirements that can be met with in-house (make) or out-of-house (buy) resources. The PDL shall decide the manner in which each portion of the design will be accomplished. Though no standard exists that sets the ground rules for make-or-buy decisions, there are a number of factors that influence such decisions. Examples include length of the procurement cycle and contractor delivery date, cost to contract out versus cost of in-house development, best value to the Government, commercial availability, prior commitments by in-house organizations.

b. Using partnerships and agreements – The out-of-house portion of a project can be accomplished not only through the use of a contractual vehicle, but also by making use of (or creating) partnerships and/or agreements with other NASA Centers, other government agencies, industry, and universities, including such entities from other countries. The PDL shall identify what parts of the design will be achieved in this way, with whom each partnership or agreement is made, and obtain advice from procurement, legal, and other authorities concerning the proper means for establishing each partnership or agreement.

c. Using existing designs as-is, modifying existing designs, or creating new designs - The PDL shall weigh the various pros and cons associated with using existing designs (as-is or modified) versus creating new designs, and develop a strategy for the implementation of one, the other, or both. This can be done per subsystem or component, on a case-by-case basis.

2.3 Define an Organization and Its Responsibilities

The PDL shall define the Product Design Team structure and distribution of responsibilities.

2.3.1 When required by the quality planning activity, create a work breakdown structure (WBS) specific to the design activity, which identifies work packages, upon which the work is organized and managed. It provides a framework against which to report cost, schedule, and technical performance.

2.3.2 Establish a Product Design Team structure that supports the goals and objectives of the design activity. The structure should also consider the relationship with the customer, and possibly include a customer representative within the organization.

2.3.3 Define task descriptions for each element identified by the Product Design Team structure. The task description should clearly define the duties of the individual(s) that will be assigned for that project element. It should also assist the PDL, or his/her support organizations, with identifying appropriate personnel for each element.

2.4 Determine Logistics Support

The PDL shall determine logistics support planning requirements in accordance with NPD 7500.1. Logistics support interfaces for product handling, storage, packaging, marking, preservation, and transportation shall also be determined in accordance with GPG 7120.2 and GPG 6400.1.

2.5 Assign Duties and Responsibilities to Qualified Personnel

Using the WBS, organizational structure, and task descriptions as tools, the PDL shall identify the appropriate support organizations from which the appropriate support organization manager assigns personnel. As needed, the support organization manager gets clarification from the PDL on the personnel qualifications and certifications required. Procedures for determining training and certification needs can be found in GPG 3410.2.

2.6 Develop a Schedule

The PDL shall generate a schedule that lays out the design activities.

Considerations for developing a schedule should include availability of funding, lead times for parts and equipment, design verification/validation points, design reviews, staffing constraints, logistics-related activities, delivery dates, as well as contingency time for unexpected events. For information on verification, validation, and reviews, see GPG 8700.2 , GPG 8700.3, and GPG 8700.4.

2.7 Develop a Budget

The PDL shall establish a baseline resource plan by developing a phased budget for manpower and dollars.

Estimates for civil service and/or contractor staffing, as well as for parts and material purchases, can be accomplished through the use of the WBS. Working with appropriate lead engineers, support organization managers, and/or resource analysts, as needed, the PDL can arrive at an estimate for the staffing and dollar needs for each element of the WBS. The WBS, schedule, and budget should be viewed as mutually dependent, reflecting the technical content, time, and cost of meeting the project's goals and objectives.

2.8 Establish Paths of Communication Among Organizations

The PDL shall define each required or anticipated communication path, and the specific interaction required along each of these paths, such as:

a. Technical interchanges - The PDL shall ensure that communication of technical requirements and information among the organizational elements is planned and managed.

b. Status reporting - The PDL shall ensure that a communication system is in place that will allow the flow of information throughout the design activity.

Communication shall be maintained with the customer throughout the life of the activity.

2.9 Establish a Method for Defining and Documenting Technical Design Interfaces

The definition of technical design interfaces is accomplished by ensuring that each interface is the responsibility of one member of the project team. The PDL shall ensure that the communication paths defined in 2.8 are fully utilized in this process.

The PDL shall establish a method for documenting each technical design interface. The accepted method for documenting a technical design interface is through the use of an Interface Control Document (ICD). ICD's are used to document and control interfaces such as mechanical, electrical, thermal, and optical.

2.10 Develop a Product Validation Plan

The PDL shall develop a preliminary Product Validation Plan which identifies acceptance criteria for product validation, plus those characteristics that are essential to the safe and proper functioning of the product (see GPG 8700.3). Contents should address such things as functional tests, environmental tests, final analyses, and reviews.

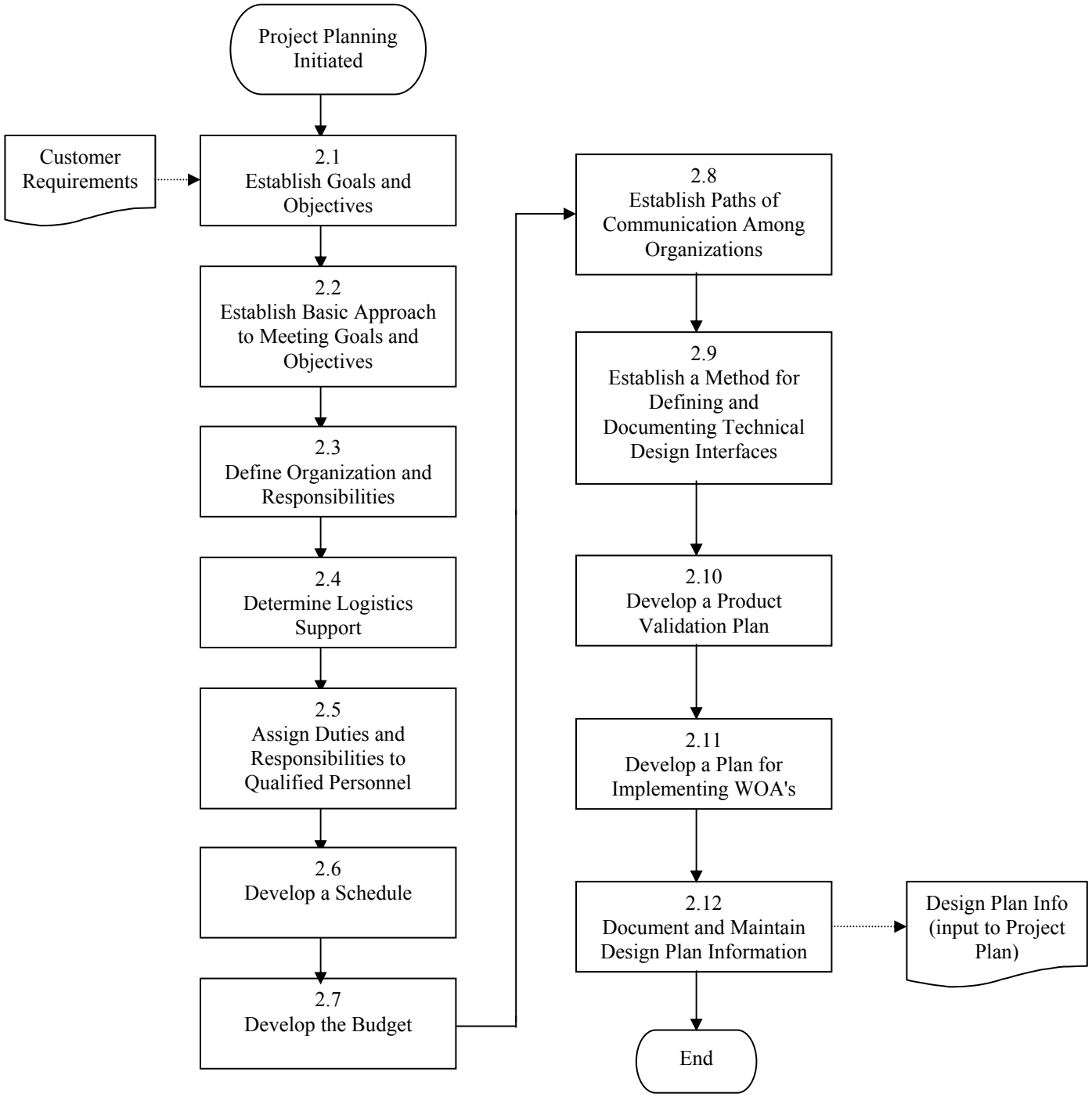
2.11 Develop a Plan for Implementation of Work Order Authorizations

The PDL shall define specific plans for implementing the Work Order Authorization (WOA) form (see GPG 5330.1). At a minimum, such plans must address approval authorities and processes, a numbering scheme, and a revision/change management process for WOA's.

2.12 Document and Maintain Design Plan Information

The PDL shall document the design plan information created through the use of this procedure, and update it, as the design evolves, in accordance with the applicable configuration management plan (see GPG 8700.2). Note that it may be appropriate to document design plan information as a portion of the Project Plan per GPG 7120.2.

Design Planning and Interface Management Flowchart



GODDARD DIRECTIVE NO. : GPG 8700.1C
EFFECTIVE DATE: August 9, 1999
EXPIRATION DATE: December 31, 2004

CHANGE HISTORY LOG

Revision	Date	Description of Changes
Baseline	8/12/98	
A	10/6/98	Header and footer format change. Title change of GPG 1310.1 reference. Indicated responsibility for maintenance of quality records. Incorporated reference to GPG 1310.1 in paragraph 2.1.
B	5/7/99	Added definition for Design Plan. Moved section on records as per new format. Modified paragraph 2.4. Corrected step reference in step 2.9. Added steps for developing a product validation plan (2.10), and specific WOA implementation plans (2.11). Deleted reference to GPG 8730.4 (cancelled). Added references to NPD 7500.1, GPG 5330.1, and GPG 7120.2.
B	6/24/99	Fixed typo in P6 under Retention to reflect … Transfer to **NARA** when 10 years old.
C	08/09/99	This is an ADMINISTRATIVE REVISION only. The revision is required to bring document in line with GPG 1410.1, **2.7 Revising Directives**, that states: "When a revision is necessary, substantive or non-substantive, the entire directive must be reissued in accordance with the process for issuing new directives described in this GPG."
C	08/20/04	• The expiration date was extended until December 31, 2004 per the enclosed memo.

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230 August 20, 2004

TO: 230/Center Directives Manager

FROM: 100/Director

SUBJECT: Authority to Administratively Extend Expiration Dates for Select Goddard Space Flight Center (GSFC) Directives

Pursuant to my authority under the Goddard Procedures and Guidelines (GPG) 1410.1D.1.3(a), Directives Management, to maintain the currency of GSFC directives used to record and communicate internal requirements and responsibilities, the following directives are hereby extended until December 31, 2004.

GPG 3511.1	Career Promotion Process at GSFC
GPG 5100.2A	Supplier Performance Evaluations
GPG 5310.4C	Identification and Traceability of Products
GPG 8070.2B	Identification and Application of Statistical Techniques
GPG 8072.1C	Process Control
GPG 8700.1C	Design Planning and Interface Management
GPG 8700.3A	Design Validation

Please ensure that the expiration dates for the documents listed above are updated in the Goddard Directives Management System accordingly.

Original Signed by

Edward J. Weiler

cc:
110/Ms. Letellier
140/Mr. Stephens
140/Ms. Thompson
200/Ms. Jones
200/Mr. White
300/Mr. Mitchell
300/Mr. Day
500/Mr. Brown