# NASA Procedural Requirements

**NPR 7120.5D**
Effective Date: March 06, 2007
Expiration Date: March 06, 2012

**COMPLIANCE IS MANDATORY**

Printable Format (PDF)

Request Notification of Change (NASA Only)

**Subject: NASA Space Flight Program and Project Management Requirements**

**Responsible Office: Office of the Chief Engineer**



# CHAPTER 1. Introduction

## 1.1 Background

1.1.1 This document establishes the process by which NASA will formulate and implement space flight programs and projects consistent with the governance model contained in NPD1000.0*NASA Strategic Management and Governance Handbook*. NASA space flight programs and projects develop and operate a wide variety of spacecraft, launch vehicles, in-space facilities, communications networks, instruments, and supporting ground systems[1]. This document is intended to establish a standard of uniformity in the management of such programs and projects.

[1] NASA space flight programs and projects often must mature technologies to meet mission goals. These enabling and/or enhancing technologies are also covered by this NPR.

1.1.2 Central to building this cohesive management process is the introduction of NASA space flight program and project life cycles, and the identification of the Key Decision Points (KDPs) within these life cycles. This document also outlines program/project decision processes and summarizes the roles and responsibilities of key personnel responsible for NASA program and project management: the Agency Program Management Council (PMC), the Mission Directorates, the Centers[2], program managers, and project managers. It further identifies and summarizes the technical authority process as it applies to program and project management[3] and codifies the top-level management requirements for safe and successful program/project formulation and implementation.

[2] The term *Center* here and throughout this document is meant to include NASA Component Facilities and JPL.
[3] The establishment of a technical authority process represents a direct response to the Columbia Accident Investigation Board (CAIB) recommendations? specifically, CAIB recommendation R7.5-1-and represents a critical shift in NASA's program and project management strategy relating to safety.

1.1.3 This document distinguishes between programmatic requirements, on the one hand, and management process requirements, on the other. Both categories of requirements must ultimately be satisfied in program and project formulation and implementation. *Programmatic requirements* focus on the space flight products to be developed and delivered, and specifically relate to the goals and objectives of a particular NASA program or project. These requirements flow down from the Agency's strategic planning process. Table 1-1 shows this flow-down from Agency needs, goals, and objectives, described in the NASA Strategic Plan, to programs and projects.

1.1.4 *Management process requirements* focus on how NASA does business and are independent of any particular program or project. These requirements are issued by NASA Headquarters, including the Office of the Administrator, Mission Directorates, and Mission Support Offices, and by Center organizations. Management process requirements may respond to Federal statute, regulation, treaty, or executive order. They are normally documented in the following:

a. NASA Policy Directive (NPD) - NPDs are policy statements that describe what is required by NASA management to achieve NASA's vision, mission, and external mandates and who is responsible for carrying out those requirements.

b. NASA Procedural Requirements (NPR) - NPRs provide Agency-mandatory instructions and requirements to implement NASA policy as delineated in an associated NPD.

c. Center Policy Directive (CPD) - CPDs define Center-specific policy requirements and responsibilities that apply only to the issuing Center and operations performed by NASA personnel at that Center (and must comply with requirements delineated in

associated NPDs and NPRs).

d. Center Procedural Requirements (CPR) - CPRs establish Center-specific procedural requirements and responsibilities to implement the policies and procedural requirements defined in related NPDs, NPRs, or CPDs. CPRs apply only to the issuing Center and operations performed by NASA personnel at that Center.

e. Mission Directorate Requirements - Programmatic requirements contained in Mission Directorate documentation that apply to program and project office personnel located at NASA Centers.

| Direction | Content | Governing Document | Approver | Originator |
|---|---|---|---|---|
| Needs, Goals, Objectives | Agency strategic direction based on higher-level direction | Strategic Plan and Strategic Planning Guidance | Administrator | Support Organizations |
| Agency Requirements | Structure, relationships, principles governing design and evolution of cross-Agency/Mission Directorate systems linked in accomplishing Agency needs, goals, and objectives | Architectural Control Document (ACD) | Administrator | Host MDAA with Inputs from Other Affected MDAAs |
| Mission Directorate Requirements | High-level requirements levied on a Program to carry out strategic and architectural direction including programmatic direction for initiating specific projects | Program Commitment Agreement (PCA) | AA | MDAA |
| Program Requirements | Detailed requirements levied on a Program to implement the PCA and high-level programmatic requirements allocated from the Program to its projects | Program Plan | MDAA | Program Manager |
| Project Requirements | Detailed requirements levied on a Project to implement the Program Plan and flow-down programmatic requirements allocated from the Program to the Project | Project Plan | Program Manager | Project Manager |
| System Requirements | Detailed requirements allocated from the Project to the next lower level of the Project | System Requirements Documentation | Project Manager | Responsible System Lead |

MDAA = Mission Directorate Associate Administrator
AA = NASA Associate Administrator

Table 1-1 Programmatic Requirements Hierarchy

1.1.5 This revision of NPR 7120.5 is part of a realignment of governing documents within NASA designed to increase accountability and general clarity in the flow-down of management process requirements. Figure 1-1 shows the document hierarchy from NPD 1000.0 through program and project plans. The figure identifies the four types of management process requirements that flow down to these plans: *engineering*, *program/project management*, *safety and mission assurance (SMA)*, and *Mission Support Office (MSO) functional* requirements. These terms are defined in Appendix A.

## 1.2 Overview of Management Process

1.2.1 Although program and project management based on life cycles, KDPs, and evolving products during each life-cycle phase are emphasized in this document, these are embedded in NASA's four-part process for managing programs and projects consisting of:

a. **Formulation** - the identification of how the program or project supports the Agency's strategic needs, goals, and objectives; the assessment of feasibility, technology and concepts; risk assessment, team building, development of operations concepts and acquisition strategies; establishment of high-level requirements and success criteria; the preparation of plans, budgets, and schedules essential to the success of a program or project; and the establishment of control systems to ensure performance to those plans and alignment with current Agency strategies.

b. **Approval (for Implementation)** - the acknowledgment by the Decision Authority that the program/project has met stakeholder expectations and formulation requirements and is ready to proceed to implementation. By approving a program/project, the Decision Authority commits the budget resources necessary to continue into implementation.

c. **Implementation** - the execution of approved plans for the development and operation of the program/project, and the use of control systems to ensure performance to approved plans and continued alignment with the Agency's strategic needs, goals, and objectives.

d. **Evaluation** - the continual, independent (i.e., unbiased and outside the advocacy chain of the program/project) evaluation of the performance of a program or project and incorporation of the evaluation findings to ensure adequacy of planning and execution according to approved plans.

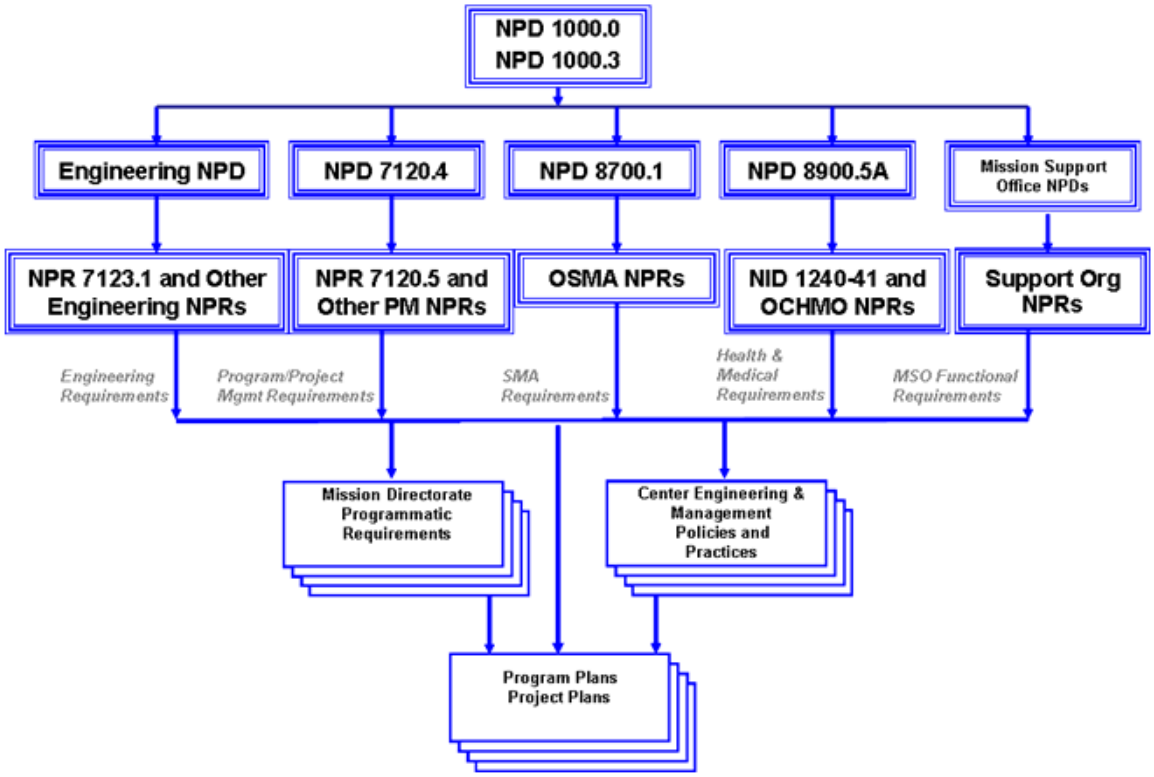


Figure 1-1 Program/Project Management Document Hierarchy

1.2.2 The management process at NASA reflects NASA's core values, which are Safety, Teamwork, Integrity, and Mission Success. NASA Mission Directorates, Centers, and program/project managers, in conceiving and executing their projects, must adhere to these core values, which are illustrated here for emphasis:

a. NASA's constant attention to safety is the cornerstone upon which we build mission success. We are committed, individually and as a team, to protecting the safety and health of the public, our team members, and those assets that the Nation entrusts to us.

b. NASA's most powerful tool for achieving mission success is a multi-disciplinary team of competent people who employ best-practice processes. The Agency will build high-performing teams that are committed to continuous learning, trust, and openness to innovation and new ideas.

c. NASA is committed to an environment of trust, built upon honesty, ethical behavior, respect, and candor. Building trust through ethical conduct as individuals and as an organization is a necessary component of mission success.

d. NASA's reason for being is to conduct successful space missions on behalf of this Nation. We undertake missions to explore, discover, and learn. And, we believe that mission success is the natural consequence of an uncompromising commitment to safety, teamwork, and integrity.

## 1.3 Document Structure

1.3.1 The remainder of this document is organized as follows: Chapter 2 defines the life cycles for NASA space flight programs and projects; Chapter 3 defines the roles and responsibilities of program/project team members and their interrelationships; and Chapter 4 provides the management requirements on programs and projects by life-cycle phase and specifies the gate products required to transition between phases. Chapters 2 and 3 are written in the indicative mood (to affirm statements of fact) because they describe how NASA does program/project work. Chapter 4 is written using verifiable "*shall*" statements that define the requirements that the program/project must meet.

1.3.2 Appendices C through G contain templates for key management documents and additional information regarding specific management products, e.g., the WBS. See NASA's POLARIS website at https://polaris.nasa.gov for an electronic version of the NPR 7120.5D templates. POLARIS also provides a searchable and sortable database of NPR 7120.5 requirements, and interactive program and project life-cycle charts with links to guidance on reviews.[4]

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[4] The POLARIS website also provides the list of NASA programs and projects from the Meta-Data Manager (MDM) and links to general information useful to program and project managers.

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1.3.3 Reference documents relevant to program and project management activities are cited in Appendix H. A limited index to subjects in this document appears as Appendix I.

1.3.4 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.*"

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