



**NID 8600.156**

Effective Date: December 8, 2025  
Expiration Date: December 8, 2026

**Subject: NASA Capability Portfolio Management Requirements**

**Responsible Office: Office of Strategic Infrastructure**

## **Table of Contents**

### **Preface**

- P.1 Purpose
- P.2 Applicability
- P.3 Authority
- P.4 Applicable Documents and Forms
- P.5 Measurement/Verification
- P.6 Cancellation

### **Chapter 1. Overview**

- 1.1 General
- 1.2 Capability Portfolios and Components
- 1.3 Lifecycle Stages – Establishment, Strategic Management, and Termination
- 1.4 Governing Documents

### **Chapter 2. Roles and Responsibilities**

- 2.1 Mission Support Council Chair
- 2.2 Assistant Administrator for Strategic Infrastructure
- 2.3 Sponsoring Mission Directorate Associate Administrators
- 2.4 Participating and Sponsoring Mission Directorate Associate Administrators
- 2.5 Chief Financial Officer
- 2.6 Chief Information Officer
- 2.7 Center Directors and Lab Director
- 2.8 Program and Project Managers
- 2.9 Capability Portfolio Managers
- 2.10 Governance and Authorities Summary
- 2.11 Governing Document Approval and Concurrence Summary

### **Chapter 3. Requirements**

- 3.1 Establishment Stage
- 3.2 Strategic Management Stage
- 3.3 Termination Stage

## **Chapter 4. Processes**

4.1 Formal Dissent

4.2 Tailoring Requirements

## **Appendix A. Definition of Terms**

## **Appendix B. Acronyms**

## **Appendix C. Capability Portfolio Commitment Agreement Template**

## **Appendix D. Capability Portfolio Management Plan Template**

## **Appendix E. NID 8600.1 Waiver Template**

## **Appendix F. Capability Operational Readiness Level**

## **Appendix G. Review Entrance and Success Criteria**

## **Appendix H. References**

## **Appendix I. Program Management and Capability Portfolio Management Crosswalk**

### **List of Tables**

Table 2-1 Capability Portfolio Governance and Authorities

Table 2-2 Approval and Concurrence for CPCA

Table 2-3 Approval and Concurrence for CPMP

Table 4-1 Waiver Approval for Capability Portfolios

Table C-1 Sample Capability Portfolio Commitment Agreement Activities Log

Table D-1 Sample Capability Portfolio Management Plan Activities Log

Table F-0 Capability Operational Readiness Level Summary

Table F-1 Capability Operational Readiness Level 1

Table F-2 Capability Operational Readiness Level 2

Table F-3 Capability Operational Readiness Level 3

Table F-4 Capability Operational Readiness Level 4

Table F-5 Capability Operational Readiness Level 5

Table F-6 Capability Operational Readiness Level 6

Table F-7 Capability Operational Readiness Level 7

Table G-1 Stage Transition Review for Strategic Management (STR-SM) Entrance and Success Criteria Table

Table G-2 Stage Transition Review for Termination (STR-T) Entrance and Success Criteria

Table G-3 Capability Implementation Review (CIR) Entrance and Success Criteria

Table G-4 Capability Change Review (CCR) Entrance and Success Criteria

Table H-1 Compliance Matrix

Table J-1 Program Management and CPM Crosswalk

### **List of Figures**

Figure 1-1 Capability Portfolio Management Stages

Figure C-1 Capability Portfolio Commitment Agreement Title Page

Figure D-1 Capability Portfolio Management Plan Title Page

Figure E-1 CPM Waiver Template

## **Preface**

### **P.1 Purpose**

This NASA Interim Directive (NID) establishes the Capability Portfolio Management (CPM) requirements by which NASA establishes, strategically and centrally manages, and terminates capability portfolios (CPs) consistent with the governance model defined in NASA Policy Directive (NPD) 1000.0, NASA Governance and Strategic Management Handbook.

### **P.2 Applicability**

- a. This NID is applicable to NASA Headquarters and NASA Centers including Component Facilities and Technical and Service Support Centers. This language applies to other contractors, recipients of grants, and cooperative agreements or other agreements only to the extent specified or referenced in the applicable contracts, grants, or agreements. Requirements in this NID – all, a portion, and/or tailored – are applicable to NASA’s sole Federally Funded Research and Development Center (FFRDC), Jet Propulsion Laboratory (JPL), as determined by the NASA Office of JPL Management and Oversight (NOJMO).
- b. This NID applies to CPs directed (i.e., those within the Establishment Stage) or approved by the Mission Support Council (MSC). MSC responsibilities related to CPM are provided in the MSC Charter (referenced under NPD 1000.3, The NASA Organization). The list of CPs is maintained by the Assistant Administrator for Strategic Infrastructure (AASI) and can be found in the NODIS Library ([https://nodis3.gsfc.nasa.gov/main\\_lib.cfm](https://nodis3.gsfc.nasa.gov/main_lib.cfm), OTHER NASA-LEVEL DOCUMENTS, Office of Strategic Infrastructure).
- c. In this NID, all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms: “may” or “can” denote discretionary privilege or permission, “should” denotes a good practice and is recommended but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.
- d. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

### **P.3 Authority**

- a. National Aeronautics and Space Act, 51 U.S.C. § 20113(a).
- b. NPD 8600.1, NASA Capability Portfolio Management.

### **P.4 Applicable Documents and Forms**

- a. NPD 1000.0, NASA Governance and Strategic Management Handbook.

- b. NPD 1000.3, The NASA Organization.
- c. NPD 1001.0, 2022 NASA Strategic Plan.
- d. NPR 1400.1, NASA Directives Procedural Requirements
- e. NPR 1441.1, NASA Records Management Program Requirements.

## **P.5 Measurement/Verification**

a. To determine if Responsible Offices follow the required processes specified in this NID, products identified in this document for Stage Transition Reviews (STRs) (Establishment to Strategic Management, Strategic Management to Termination) are submitted to stakeholders for review and concurrence. These stakeholders include Mission Directorate Associate Administrators (MDAAs), Center Directors, Chief Information Officer, and CP Managers who provide results of their reviews that include instances of noncompliance with required processes to the AASI. The CP manager provides summarized results to the MSC Executive as artifacts to support the Stage Transition Review at the MSC. The AASI and MSC Chair will ensure corrective actions are identified, implemented, and tracked to closure.

b. Between the Establishment and Termination Stages, the MSC determines if Responsible Offices follow the required processes specified in this NID through their assessment at the Capability Implementation Review (CIR) which occurs at the MSC at a cadence of five years or less. A compliance matrix is included in the CIR. Both the CP Manager and an independent assessment team provide results of the compliance matrix at this review with recommendations for corrective actions. The AASI tracks corrective actions to closure. The MSC will use compliance as one decision criterion at the CIR.

## **P.6 Cancellation**

None.

## Chapter 1. Overview

### 1.1 General

1.1.1 The purpose of this NID is to define, sustain, and ensure the effectiveness of the NASA capabilities needed to achieve NASA’s vision, mission, strategic goals, and objectives. This is achieved through strategic and centralized management that includes an Agency-wide strategy that is aligned with Agency needs and requirements aggregated across multiple Mission Directorates, Centers, programs, and projects.

1.1.2 CPM aims to identify and sustain an optimal mix of capabilities (e.g., in-house wind tunnels) suited to meet Agency requirements and constraints, determine the most effective and efficient way to manage these capabilities, and determine where these capabilities should be located within the Agency. A Capability Portfolio Manager leads this activity with decision-making authority for their capability portfolio (authority and thresholds are defined in the CP’s approved management documents).

1.1.3 CPM provides NASA with the ability to do the following:

- a. Identify and achieve overall capability, capacity, and quality (balanced given available resources) for a CP based on Agency needs and requirements.
- b. Evaluate, prioritize, and optimize a group of capability components within a CP.
- c. Perform Agency-level analysis, strategy development, decision making, and workforce planning.
- d. Make integrated decisions regarding investment, divestment, and overarching strategy for a capability that consider the entire Agency.
- e. Deliver portfolio services in a manner that balances the needs and requirements of programs and projects and other NASA stakeholders (e.g., facilities maintenance).
- f. Evaluate whether resources are best aligned with Agency strategy and priorities and apply resources appropriately.
- g. Analyze, characterize, and maintain cognizance of the capability domain.

1.1.4 A CP provides products and services to multiple programs and projects over a period that can span decades. A CP has no defined ending<sup>1</sup> and will typically change and adapt over time to

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<sup>1</sup> If NASA leadership determines that it is no longer in NASA’s best interest to strategically and centrally manage a capability portfolio in an integrated manner, the portfolio may be terminated. (See Sections 1.3 and 3.3)

achieve greatest value for the Agency based on current and future programmatic needs and requirements.

1.1.5 Requirements for new, enhanced, and augmented capabilities within a portfolio are developed in response to Agency requirements and strategic needs. Emerging technologies available from other agencies, industry, and academia represent opportunities that are considered.

1.1.6 This document establishes requirements by which NASA will strategically and centrally manage functionally similar capability components and enabling infrastructure through CPs in a manner consistent with Agency governance (defined in NPD 1000.0 and NPD 1000.3). The desired outcomes of CPM are to increase overall Agency efficiency and effectiveness, eliminate unneeded redundancy, and enable sustainment of capability components.

## **1.2 Capability Portfolios and Components**

1.2.1 Fundamental terms used throughout this NID include capability, capability portfolio, capability component, capability domain, and capability portfolio scope. Definitions are provided in Appendix A, Definitions.

1.2.2 Capability components compose the underlying structure for delivering products and services to customers. They are typically distributed geographically across multiple Centers (and may include external sources).

1.2.3 Each CP's boundaries or scope, identified capability components, and enabling infrastructure are defined in the Capability Portfolio Commitment Agreement (CPCA) and the Capability Portfolio Management Plan (CPMP) (templates for these management documents are in Appendices C and D).

1.2.4 Assets that may be excluded from the portfolio are described in the CPCA and CPMP. Examples of assets that may be excluded are those that:

- a. Do not meet the minimum thresholds for the portfolio (e.g., a minimum test section area for wind tunnels).
- b. Are "tools of the trade."
- c. Are used in specialized applications (e.g., low Technology Readiness Level (TRL) for research and development).

## **1.3 Lifecycle Stages - Establishment, Strategic Management, and Termination**

A CP goes through three main sets of activities or stages: Establishment, Strategic Management, and Termination.

### 1.3.1 Establishment Stage

When the MSC Chair, or a MDAA determines that it may be in NASA's best interest to strategically and centrally manage a group of functionally similar capabilities in an integrated manner, the Chair identifies a Mission Directorate to establish a CP or the self-selected MDAA initiates establishment. Activities within the Establishment Stage include scoping the portfolio, designating its sponsoring Mission Directorate, identifying the portfolio capability components, and enabling infrastructure, developing a management strategy and approach, designating a CP manager, and preparing the CPCA. The MSC holds a Stage Transition Review where the MSC Chair decides whether to formally establish a CP and transition to the Strategic Management Stage. When a MDAA self-initiates activities to establish a new CP, they provide a notification and discuss their intent with the MSC Chair early in the Establishment Stage.

### 1.3.2 Strategic Management Stage

The Strategic Management Stage of a portfolio comprises key CPM activities that repeat throughout the portfolio's lifespan. These activities include the following:

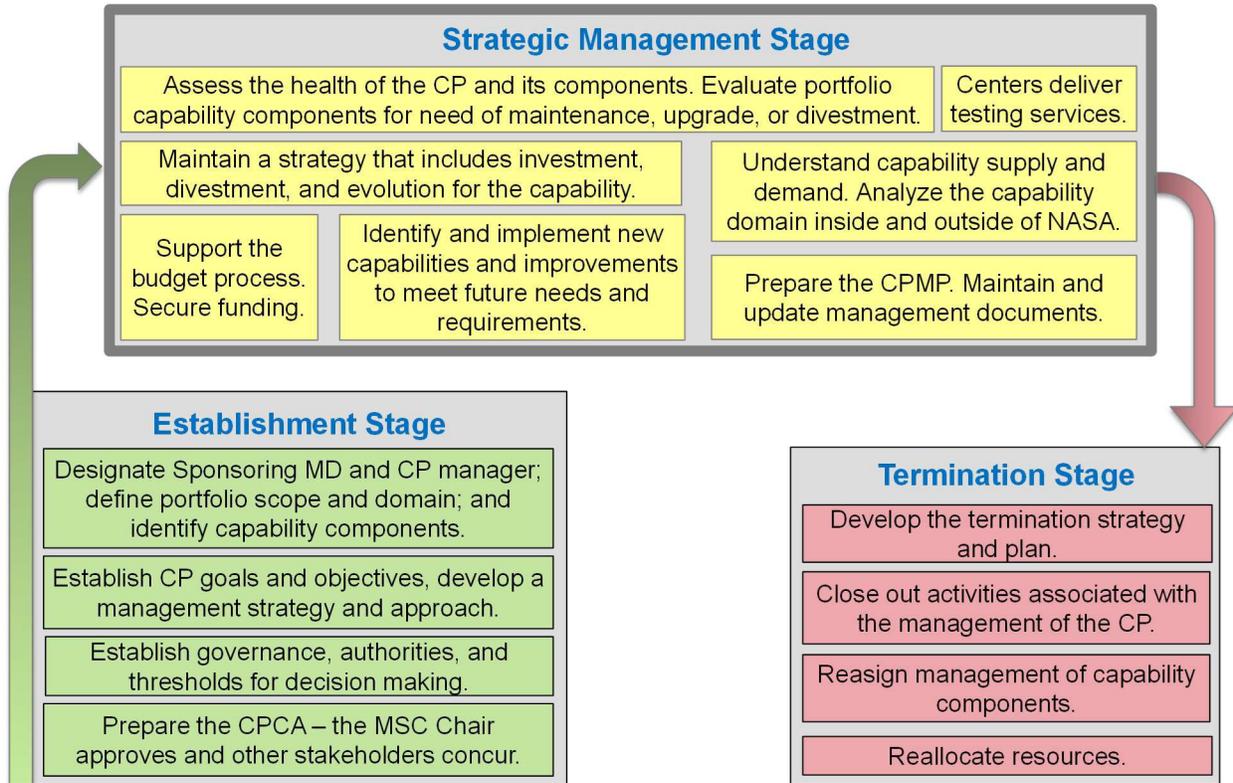
- a. Maintaining a strategy that includes investment, divestment, and evolution for the capability.
- b. Assessing the health of the CP and its components.
- c. Evaluating portfolio capability components and assets for need of maintenance, upgrade, or divestment.
- d. Understanding capability supply and demand.
- e. Supporting the budget process.
- f. Securing funding. This includes review of center charging practices for capability portfolio services to customers when sustaining a capability component that aligns with CP strategy.
- g. Assigning customer requirements to capability components that can deliver products and services in accordance with the approach for making sourcing decisions.
- h. Identifying and implementing new capabilities and improvements to the CP to meet future needs and requirements.
- i. Analyzing the capability domain inside and outside of NASA.
- j. Maintaining and updating management documents. This includes updating the CPCA and CPMP every five years or less.

### 1.3.3 Termination Stage

When the MSC Chair or a MDAA determines that it is no longer in NASA's best interest to manage a CP strategically and centrally, an MSC holds a STR where the MSC Chair decides to

either continue Strategic Management or terminate the portfolio and transition to the Termination Stage. Activities in this stage include the development of a termination strategy and plan; the closing out of all activities associated with the management of the CP; the reassignment of the portfolio’s capability components and enabling infrastructure; and the reallocation of resources (personnel and funding) directly managed by the CP.

Figure 1-1 depicts CP stages - Establishment, Strategic Management, and Termination.



**Figure 1-1 Capability Portfolio Management Stages**

## 1.4 Governing Documents

### 1.4.1 Capability Portfolio Commitment Agreement (CPCA)

Through the Establishment Stage, the identified CP manager, their team, and key stakeholders (e.g., Mission Directorate (MD) representatives, Center personnel, customers) identify goals and objectives and develop a strategy to achieve them. Other areas covered include documenting authorities’ structure, governance, management approach, sourcing of services, assets included in the capability portfolio, and dependencies (internal and external). This is all documented in the CPCA which becomes an agreement between the MSC Chair and the Sponsoring MDAA on the ongoing operation of the CP. A completed CPCA is reviewed by key stakeholders (MSC Chair, Sponsoring MDAA, Participating MDAs, Centers with components, and/or control or advisory boards if stood up) before the STR for transition to Strategic

Management can occur. At this STR, MSC members evaluate whether Agency goals and objectives are more likely to be successful through strategic and centralized management of the scoped capability (versus current Center management without a CP). (See Appendix A for a definition of CPCA.)

1.4.1.1 The CPCA may take the form shown in the template provided in Appendix C or any other form as appropriate for the type, size, and complexity of the CP.

1.4.1.2 The Sponsoring MDAA recommends the CPCA for approval to the MSC Chair. Center Directors<sup>2</sup> who host portfolio capability components at their Centers and participating MDAAs review the CPCA and provide their concurrence or non-concurrence.

#### 1.4.2 Capability Portfolio Management Plan (CPMP)

1.4.2.1 The CPMP is developed as the CP matures and further details content provided in the CPCA on the operation of the CP. Along with all content provided in the CPCA, the CPMP includes a schedule, description of aligning capacity with demand, details for a funding model, processes for controls and compliance, data management, risk management, and a plan for the evolution of the capability. The timeframe for developing the CPMP is provided in the CPCA (see Table 2-3). The Sponsoring MDAA uses this management document at the Performance Management Review (PMR) (at the Directorate Program Management Council (DPMC)) to evaluate if the CP is fulfilling its requirements. Once approved by the Sponsoring MDAA, the CPMP serves as an agreement between the Sponsoring MDAA and the CP manager on how the CP will strategically and centrally manage its capability components. (See Appendix A for a definition of CPMP.)

1.4.2.2 The CPMP may take the form shown in the template provided in Appendix D or any other form as appropriate for the type, size, and complexity of the CP.

1.4.2.3 Center Directors<sup>2</sup> who host CP capability components at their Centers and participating MDAAs review the CPMP and provide their concurrence or non-concurrence.

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<sup>2</sup> Consistent with roles, responsibilities, and governance described in NPD 1000.3, the Lab Director provides feedback and recommendations to the NOJMO Director who provides concurrence or non-concurrence for JPL.

## **Chapter 2. Roles and Responsibilities**

### **2.1 Mission Support Council Chair**

The MSC Chair:

- a. Initiates efforts to establish a CP and assigns CPs to sponsoring Mission Directorates. Approves delegation of CP management for MDs who choose to initiate establishment.
- b. Serves as the Decision Authority for CP Stage Transition Reviews for the transition from Establishment Stage to Strategic Management Stage and the transition from Strategic Management Stage to Termination Stage.
- c. Approves the initial CPCA at or soon after successful completion of the Establishment Stage and approves CPCA revalidation or update every five years or less.
- d. Approves significant changes in the composition, management, or funding of the CP that require a high degree of integration, are highly visible, or require a higher authority than the Sponsoring MDAA and CP Manager.<sup>3</sup> Thresholds for significant changes that require MSC Chair approval are defined in the CPCA and CPMP.
- e. Evaluates the CPs performance and approves either continued operation or a future STR for possible termination based on findings and recommendations at the Capability Implementation Review (CIR). The CIR is defined in Section 3.2.12.
- f. Obtains the CP manager's evaluation and recommendations for all proposed MSC decisions that involve changes to the capability domain.

### **2.2 Assistant Administrator for Strategic Infrastructure**

The AASI:

- a. Establishes and maintains processes that integrate CP assets and operations with OSI business processes (e.g., Agency Master Planning, facility maintenance).
- b. Maintains the official list of CPs. This list can be found in the NASA Online Directive Information System (NODIS) Library:  
([https://nodis3.gsfc.nasa.gov/main\\_lib.cfm](https://nodis3.gsfc.nasa.gov/main_lib.cfm), OTHER NASA-LEVEL DOCUMENTS, Office of Strategic Infrastructure).

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<sup>3</sup> Detail is provided in each CP's approved management documents – the CPCA and CPMP. These management documents include CP-specific goals and objectives, processes, governance, decision making-thresholds with identified decision authorities, scope, capability domain, periodic assessments and analyses, funding model, and funding sources. See Appendix C and Appendix D for a complete list of required and optional content to be included in the CPCA and CPMP.

## 2.3 Sponsoring Mission Directorate Associate Administrators

The Sponsoring Mission Directorate is the MD approved by the MSC Chair to provide management oversight with line authority for a CP. Sponsoring MDAAAs:

- a. May initiate efforts to establish a CP, in coordination with the MSC Chair.
- b. Select a CP manager for each sponsored CP.
- c. Establish the goals and objectives, capability domain and scope, and constraints (e.g., budget, center roles) of the sponsored CP as part of the Establishment Stage.<sup>3</sup>
- d. Establish a management and governance structure for each sponsored CP.<sup>3</sup>
- e. In coordination with the CP manager, establish and annually update a five-year CP budget commensurate with CP goals and objectives, CP operational norms, and funding responsibilities for each sponsored CP.<sup>4</sup>
- f. Develop the CPCA and recommend approval to the MSC Chair.
- g. Provide MDAA resources for the management and sustainment of each sponsored CP.<sup>3,4</sup>
- h. Provide direction for planning annual sustainment funding of the capability components that align with CP strategy. Key areas to address include 1) needed adjustments to stakeholder contributions, 2) funding model, and 3) charging practices.
- i. Support development of and approve the CPMP. Approve CPMP revalidation or update every five years or less.
- j. Approve significant changes in the composition, management, or funding of the CP that require a higher authority than the CP Manager, subject to thresholds for significant changes.<sup>3</sup> Thresholds for significant changes that require Sponsoring MDAA approval are defined in the CPMP.
- k. Conduct the PMR for the CP. This review is described in Section 3.2.12.1. Report the CP status to the MSC Chair and other Agency-level management.
- l. Determine the need for STR for Termination of the CP based upon consultation with the CP manager and other stakeholders and make recommendations to the MSC Chair.

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<sup>4</sup> This responsibility may not be fully applicable for CPs that do not manage sustainment funding for capability components.

- m. Serve as the selecting official for chairpersons for control and advisory boards<sup>5</sup> for the CP.<sup>3</sup> Approve charters for all sponsored boards.
- n. Establish the independent assessment team and approves the Terms of Reference (TOR) that outlines their role and responsibilities in the CIR.

## **2.4 Participating and Sponsoring Mission Directorate Associate Administrators**

A Participating Mission Directorate is a MD that has a stakeholder interest in a CP. Both participating and Sponsoring MDAAs:

- a. Collaborate with the CP manager to identify specific capability components (in-house or external) for products and services to meet Mission Directorate needs and requirements.
- b. Identify requirements for new or enhanced capabilities needed to resolve identified gaps. Inform the CP manager of these emerging requirements.
- c. Coordinate approval or concurrence from the CP manager on investments, divestments, acquisition strategies, procurements, agreements, and changes to a portfolio capability component.<sup>3</sup>
- d. Obtain CP manager's evaluation of and recommendations for proposals to be provided to Agency leadership that involve changes to the capability domain.<sup>3</sup>
- e. Concur or non-concur on a recommendation to terminate the CP.
- f. Participating MDAAs concur or non-concur on the CPCA and the CPMP for CP(s).
- g. Assign a Mission Directorate CP point of contact (POC) for the CP.
- h. Assign MD representatives to control and advisory boards, and teams as requested to address CP areas such as governance, policies, strategies, and implementation.
- i. Support CP assessments and analyses.<sup>3</sup>
- j. Support reviews required by this NID.
- k. Coordinate with CP manager and other key stakeholders to identify and plan for annual sustainment funding of capability components to achieve needed operational readiness. This includes 1) negotiating stakeholder contributions, 2) maintaining the funding model, and 3) adjusting charging practices

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<sup>5</sup> Advisory Board must include some decisional functions.

- l. Provide Mission Directorate funding in accordance with the funding model(s).<sup>3</sup>

m. Coordinate with the CP manager and other key stakeholders to establish cost elements when estimating the Total Cost of Ownership (TCO) for the portfolio and its components. As part of the PMR, review the TCO estimate developed by Centers for the capability domain.

## **2.5 Chief Financial Officer**

The Chief Financial Officer:

- a. Supports Sponsoring MDAA in resolving budget issues.
- b. Supports Sponsoring MDAA in establishing TCO for the CP and its capability components.

## **2.6 Chief Information Officer**

The Chief Information Officer (CIO):

- a. Concurs or non-concurs on the CPCA and CPMP.
- b. Concurs or non-concurs on CP investments and divestments in information technology capabilities.
- c. Appoints Office of the Chief Information Officer (OCIO) CP POCs for CPs as required/requested.
- d. Supports CP assessments and analyses as specified in the CPMP for CPs.
- e. Provides OCIO resources for the identification of solutions to meet IT requirements unique to the CP.

## **2.7 Center Directors and Lab Director**

Centers manage, maintain, and operate the portfolio capability components in accordance with the agreed-upon processes documented in the CPCA and CPMP. Center Directors and NASA's FFRDC Lab Director (hereby referred to as the Lab Director):

- a. Manage, operate, and maintain the Center's capability components and enabling infrastructure consistent with strategic guidance provided in agreed-upon CP management plans.<sup>3</sup>
- b. Provide Center resources in accordance with the established funding model(s).<sup>3</sup>
- c. Evaluate and assess all work related to CPs that operate at the Center and provide Center findings and recommendations to the CP manager in support of CP reviews.

- d. Coordinate with the CP manager and other key stakeholders to establish cost elements when estimating the TCO for the portfolio and its components. Annually develop a TCO estimate for all capability components in the domain at the Center. This estimate should include all sources of funding and their contribution.
- e. Coordinate with the CP manager and other key stakeholders to establish cost estimating processes and guidelines, and charging methodologies for the CP.<sup>3,6</sup> This includes coordination on the method for allocation and distribution of funds received from customers.
- f. Develop cost estimates for planned delivery of products and services.<sup>3</sup>
- g. Coordinate with CP manager and other key stakeholders to identify and plan for annual sustainment funding of capability components to achieve needed operational readiness. This includes 1) negotiating stakeholder contributions, 2) maintaining the funding model, and 3) adjusting charging practices.
- h. Support CP managers in establishing the metrics necessary for insight and management of the capability components at the Center.
- i. For efforts that affect the CP, either 1) oversee and manage projects and tasks assigned to the Center or 2) collaborate with the CP Manager. Efforts include improving capability components, developing new capability components for CPs, and divesting of capability components.
- j. Provide Center-level reports, assessments (e.g., CP impacts to programmatic risk, cost, schedule), and data for capability components that reside at the Center to support CP assessments and analyses.<sup>3</sup>
- k. Support CP managers in establishing key processes for strategically and centrally managing the CP(s) that include components at the Center.<sup>3</sup>
- l. Appoint Center CP POCs for the CP(s) that include components at the Center.
- m. Appoint Center representatives to control and advisory boards and teams for the CP(s).
- n. Assign Center representatives to CP reviews and other reviews as required (when the reviewer is not the Center CP POC).
- o. Concur or non-concur on the CPCA and the CPMP for CP(s) that include components at the Center.<sup>2</sup> Assists the CP manager in the development of the CPMA and CPMP by providing Center-specific content and data.

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<sup>6</sup> Elements to consider include labor, materials, annual operations, maintenance, and all other direct and indirect costs. The cost estimating and charging methodology should consider how cost recovery offsets are utilized (e.g., annual sustainment, investments).

- p. Concur or non-concur on a recommendation to terminate the CP.<sup>2</sup>
- q. Seek customers for the Center's capability components. Negotiate proposals with customers for products and services delivered.
- r. Obtain approval or concurrence from the CP manager on investments, divestments, acquisition strategies, procurements, agreements, and changes to a portfolio capability component.<sup>3</sup> CP Manager approval or concurrence is needed to terminate plans previously approved.
- s. Obtain the CP manager's evaluation and recommendations for proposals that involve changes to the capability domain at the Center.<sup>3</sup>
- t. Obtain approval for alternate uses of capability components.<sup>3</sup> Examples of alternative uses include 1) the use of a thermal vacuum chamber supporting integrated spacecraft testing for vacuum deposition coating, and 2) aircraft designated for parts in support of operational aircraft providing flight services.

## **2.8 Program and Project Managers<sup>7</sup>**

Program and project managers that utilize CP products and services:

- a. Obtain approval or concurrence from the CP manager on investments, divestments, acquisition strategies, procurements, agreements, and changes to a portfolio capability component.<sup>3</sup> CP Manager approval or concurrence is needed to terminate plans previously approved.
- b. Obtain the CP manager's evaluation and recommendations for proposals that involve changes to the capability domain at a Center.<sup>3</sup>
- c. Provide program and project resources in accordance with the defined customer charging methodologies.<sup>3</sup>

## **2.9 Capability Portfolio Managers**

2.9.1 The CP manager develops Agency strategy and plans for the capability portfolio and capability domain. These are aligned with the Agency Master Plan (AMP) (outlined in NID 8600.1). They work collaboratively with Centers with capability components, Mission Directorates, and other key stakeholders to develop and implement processes for strategically and centrally managing the CP and its components and to establish decision-making process that include identified decision authorities and thresholds. Most CP processes and thresholds are

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<sup>7</sup> Center Directors and the Lab Director may assume these responsibilities on behalf of program and project managers as described in the

approved CPMP.

unique to each CP and are documented in the CP governing documents, the CPCA and the CPMP. The CP manager develops planning products in support of AMP processes.

2.9.2 The CP manager ensures that Agency decisions that involve changes to the defined capability domain are consistent with established CP plans. This includes decisions such as investments and divestments that seek to either 1) build or develop new capabilities or 2) improve or divest existing capabilities. These changes can occur through an in-house investment or NASA investment in a non-NASA capability.<sup>8</sup> The CP manager ensures that all infrastructure investment and divestment decisions are consistent with approved AMP products for the capability domain.

2.9.3 CP managers are responsible for ensuring that acquisition strategies, procurements, or internal and external agreements that seek to obtain products and services from external capabilities or commit the use of capability components, are consistent with the established and approved plans and direction of the CP. (Products and services from external capabilities that are procurement line items included in a product delivery are excluded; e.g., a spacecraft build and test delivery.)

2.9.4 The CP manager works collaboratively with stakeholders and customers to understand current and future demand for portfolio products and services and to balance the portfolio capability components and available Agency resources with that demand.

2.9.5 CP managers<sup>9</sup>:

- a. Establish processes and conduct activities for each lifecycle stage of the CP – Establishment, Strategic Management, and Termination.
- b. Develop and implement the sourcing strategy and approach for making sourcing decisions for assigning customer requirements to capability components.
- c. Develop the CPCA and CPMP, by which the activities of the portfolio will be managed, and prepare required updates to both documents. This is achieved through consultation with and direction from the Sponsoring MDAA..
- d. Approve changes in the composition, management, or funding of the CP.
- e. Determine the metrics necessary for strategic insight and management of the capability components.

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<sup>8</sup> Changes to the capability domain can occur through acquisition strategies, procurements, or internal and external agreements.

<sup>9</sup> CP managers collaborate with Center Directors, MDAAAs, and in some cases program and project managers on responsibilities and may delegate specific responsibilities to them.

- f. Establish cost elements when estimating the TCO for the portfolio and its components. This is achieved through consultation with Center Directors and other key stakeholders.
- g. Determine the TCO estimate for the CP and its capability components and in-house domain. Support Center Directors in their annual development of the Center's TCO estimate.
- h. Coordinate formulation of the budget with key stakeholders (e.g., Center Directors, MDAA's). Coordinate with other Mission Directorates, Centers, and other key stakeholders to identify and plan for annual sustainment funding of capability components to achieve needed operational readiness. This includes 1) negotiating stakeholder contributions, 2) maintaining the funding model, and 3) adjusting charging practices. This includes annual adjustments to allocation and distribution of funds received from customers.
- i. Coordinate with customers and other stakeholders to identify sources of demand, demand characteristics (e.g., demand confidence), capability gaps, and strategic requirements to inform both CP strategy and operational plans.
- j. Establish thresholds for the portfolio and capability components.<sup>3</sup> This includes thresholds for concurrence and approval for investments and divestments for each identified decision maker (i.e., MSC Chair, Sponsoring MDAA, CP manager).
- k. Define the processes for obtaining approval and concurrence, and the processes for appealing decisions made by decision authorities (e.g., MSC Chair, MDAA, CP manager).<sup>3</sup>
- l. Establish charging methodologies for products and services.<sup>3</sup> This includes establishing the method for allocation and distribution of funds received from customers.
- m. Define the approach for adjusting the Capability Operational Readiness Levels (CORLs) of capability components and their level of service (LoS) to achieve targeted Agency capacity and demand.<sup>3</sup>
- n. Determine the need for and strategically manage investments, divestments, and the operational readiness of capability components.<sup>10</sup>
- o. Identify, prioritize, and allocate the resources controlled by the CP manager.
- p. Conduct oversight of financial resources.
- q. Recommend significant changes to the CP.
- r. Identify and resolve capability gaps for the portfolio.

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<sup>10</sup> CP manager led activities include periodic assessments of all capability components that are within the in-house domain.

s. Initiate projects and tasks associated with changes to the CP. Provide oversight for technical, cost, and schedule performance.

t. Approve or disapprove, concur or non-concur on:<sup>3</sup>

(1) Investments, divestments, acquisition strategies, procurements, agreements, and changes to a portfolio capability component.

(2) The termination of plans for investments, divestments, and improvements that previously received CP manager approval or concurrence.

u. Evaluate and make recommendations on proposals not initiated by the CP that involve changes to the capability domain.<sup>3</sup>

v. Approve or disapprove alternate uses of capability components.

w. Support and attend decisional reviews. Lead or support required CP reviews and other reviews.

## 2.10 Governance and Authorities Summary

Governance and authorities for managing a CP are summarized in Table 2-1.

**Table 2-1 Capability Portfolio Governance and Authorities**

<b>Role / Responsibility / Function</b>	<b>Title / Council</b>	<b>Comments</b>
Approving authority to initiate Establishment of a CP	MSC Chair, Sponsoring MDAA	
Decision Authority for Stage Transition Reviews – Strategic Management, Termination	MSC Chair	
Decisional Authority for Capability Implementation Review	MSC Chair	The outcome is either 1) continued operation (with recommended improvements) or 2) scheduling a STR for possible termination.
Reviewing official for Performance Management Review	Sponsoring MDAA	This is a periodic review (e.g., annual, quarterly) that focuses on management and technical performance. <sup>3</sup>
Governing council	MSC	Any authority delegated to the Sponsoring MDAA and DPMC is defined in the CPCA.
Governing documents		CPCA and CPMP

<b>Role / Responsibility / Function</b>	<b>Title / Council</b>	<b>Comments</b>
Approving authority for the CPCA	MSC Chair	Approval of the CPCA authorizes the transition to Strategic Management. The CPCA is revalidated or updated every five years or less.
Approving authority for the CPMP	Sponsoring MDAA	Timeframe for development of the CPMP is established in the CPCA. The CPMP is revalidated or updated every five years or less.
Decision Authority for significant changes to CP (Capability Change Review)	MSC Chair	Significant change is defined by threshold(s), criteria, and constraints established in the CPCA. The MSC Chair may delegate Decision Authority to the Sponsoring MDAA. <sup>3</sup>
Selecting official for control or advisory board chairperson	Sponsoring MDAA	MDAA may determine that existing board or council can perform the control or advisory function.
Manages the CP	CP Manager	The CP Manager has some decision-making authority for day-to-day operations and elevates decisions to their Sponsoring MDAA or the MSC Chair in accordance with thresholds. <sup>3</sup>

## 2.11 Governing Documents Approval and Concurrence Summary

2.11.1 A summary of the roles and responsibilities for CPCP approval is provided in Table 2-2.

**Table 2-2 Approval and Concurrence for CPCA**

MSC Chair	Approves
Sponsoring MDAA	Recommends
Participating MDAAs	Concur <sup>11</sup>

<sup>11</sup> Non-concurrences that cannot be resolved at the CP manager level are elevated to the Sponsoring MDAA level. Non-concurrences that cannot be resolved at the Sponsoring MDAA level are elevated to the MSC Chair.

Center Directors <sup>2</sup> with portfolio capability components	Concur
Center Directors <sup>2</sup> without portfolio capability components	Informed
Chief Information Officer	Concurs

2.11.2 A summary of the roles and responsibilities for CPMP approval are summaries in Table 2-3.

**Table 2-3 Approval and Concurrence for CPMP**

MSC Chair	Informed
Sponsoring MDAA	Approves
Participating MDAAs	Concur <sup>9</sup>
CP manager	Recommends
Center Directors <sup>3</sup> with CP capability components	Concur <sup>9</sup>
Center Directors <sup>3</sup> without CP capability components	Informed
Chief Information Officer	Concurs

### **3.1 Establishment Stage**

#### **3.1.1 Initiate Effort to Establish a Capability Portfolio**

The MSC Chair shall appoint the Sponsoring MDAA for the CP or approve delegation of CP management for MDs who choose to initiate establishment. This will be documented in an MSC decision memorandum.

#### **3.1.2 Establishment Stage**

3.1.2.1 The MSC Chair shall approve or disapprove the CPCA.

3.1.2.2 The Sponsoring MDAA shall:

- a. Select a CP manager to manage the effort to establish the CP. If the CP manager resides at a Center, the MDAA coordinates the selection of the CP manager with the Center Director.
- b. Provide to the CP manager the goals and objectives, the capability domain and preliminary scope, and the constraints of the CP as part of Establishment activities.
- c. Establish a management and governance structure for each CP sponsored by the Mission Directorate. This includes identification of existing and new MD councils, and control and advisory boards.
- d. Provide oversight and direction for CPCA development. The CPCA documents the results of the Establishment activities. Appendix C, Capability Portfolio Commitment Agreement Template, outlines all required and optional content.
- e. Coordinate with the CP manager to develop and annually update a five-year CP budget and establish a process to secure funding needed to operate and sustain the CP and its components.

3.1.2.3 The sponsoring and participating MDAA's shall assign a Mission Directorate CP POC for each CP.

3.1.2.4 The CIO shall appoint OCIO CP POCs for CP(s) that are inherently information technology.

3.1.2.5 Center Directors and the Lab Director:

- a. Shall appoint Center CP POCs for the CP(s) that include components at the Center.
- b. Will support CP managers to develop an initial strategy and management plan for the CP (that will be documented in the CPCA). This includes activities such as defining operational norms and establishing necessary thresholds, establishing metrics, developing financial and resource management processes, establishing charging methodologies, and developing the sourcing strategy and approach to making sourcing decisions.

3.1.2.6 The CP manager will conduct activities in the Establishment Stage working collaboratively with the Centers that operate components of the proposed portfolio and with the sponsoring and participating Mission Directorates to develop an initial strategy and management plan for the CP. The CP manager shall document the outcome of these activities within the CPCA (see Appendix C for CPCA template and required and optional content) that includes:

- a. Goals, objectives, and targets for the CP.
- b. Products and services and the level of services to be provided by the CP to NASA programs and projects and external customers.
- c. The CP's governance and management structure and approach. Typical governance includes MSC Chair (advised by the MSC); Sponsoring MDAA (advised by their DPMC); CP Manager (control or advisory board); Center CP POCs, OCIO CP POC; and Capability Component Managers.
- d. The organizational structure, roles, and responsibilities.
- e. How performance of the CP will be evaluated, including identifying performance metrics.
- f. Thresholds, criteria, and constraints that determine the need for a decisional review to approve CP significant changes or that determine the need for review by the Sponsoring MDAA to approve CP actions and changes.
- g. The review approach.
- h. The approach to data management at the CP level.
- i. Any documentation needed (such as a CP risk management plan).

3.1.2.7 The CP manager:

- a. Will develop financial and resource management processes.<sup>12</sup>
- b. Will establish a sourcing strategy and the approach for making sourcing decisions.<sup>11</sup> A sourcing strategy guides the acquisition of CP products and services through capabilities available in-house and through other agencies, vendors, partners, and academia.
- c. Will define the operational norms between the CP manager, programs and projects (as appropriate), and Centers and establish any necessary thresholds. This includes delineating

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<sup>12</sup> Developed collaboratively with the Centers that operate components of the proposed portfolio and with the sponsoring and participating Mission Directorates.

decision-making authority with associated thresholds for the CP manager, Sponsoring MDAA, and MSC Chair.<sup>3</sup>

d. Shall revalidate or update the CPCA every five years. Updates may occur more frequently if there are significant changes as defined in the CPCA and as determined by the CP manager or Sponsoring MDAA. The updated CPCA is reviewed and approved using the same process as the original.

### **3.1.3 Stage Transition Review to Approve Start of Strategic Management**

The MSC Chair shall conduct a Stage Transition Review to determine approval for a CP to transition to the Strategic Management Stage. See Appendix G, Table G-1 for entrance and success criteria for this review.

- a. If Establishment planning is not sufficient to approve the transition, the MSC Chair may direct the CP manager to continue the Establishment Stage or to modify the plans based on identified weaknesses.
- b. If the MSC Chair determines that concepts for the potential CP do not meet minimum requirements, a decision to discontinue the Establishment Stage may be made.
- c. If the Establishment planning is sufficient, the MSC Chair authorizes the CP to transition to Strategic Management Stage.

## **3.2 Strategic Management Stage**

### **3.2.1 Developing and Implementing Activities and Associated Processes**

The CP manager will develop processes and conduct Strategic Management activities for the CP.<sup>7</sup> Once developed; the CP manager shall document these activities and associated processes in the CPMP. Strategic Management activities include the following:

- a. Update, maintain, and implement processes developed as part of the Establishment activities:
  - (1) Maintain the overall CP strategy.
  - (2) Complete detailed plans for managing the portfolio.
  - (3) Update the scope of the portfolio, including updating capability inventories and catalogs, and maturing the understanding of customer requirements.
  - (4) Refine and maintain the estimated annual cost, funding models, and processes for securing funding.
  - (5) Mature, adjust, and implement the sourcing strategy, and the approach for making sourcing decisions.

b. Develop and implement processes for strategically and centrally managing and maintaining oversight of the CP's capability components; understanding and influencing current and future Agency demand; evaluating CP performance; and managing change, improvement, and evolution of the CP.

### **3.2.2 Understanding Customer Requirements**

The CP manager will develop and maintain a process for understanding and influencing current and future Agency demand for CP products and services to ensure the ability and capacity (through the in-house and external sources) to meet those demands.

### **3.2.3 Managing the Sourcing Strategy and Sourcing Decisions**

The CP manager will strategically and centrally manage the sourcing strategy and sourcing decisions<sup>13</sup> for assigning customer requests to capability components available in-house and through other agencies, vendors, partners, and academia. (See Appendix D for detailed information on the sourcing strategy and the approach for making sourcing decisions, including applicable considerations.)

### **3.2.4 Overseeing the Capability Portfolio and Its Components**

The CP manager will strategically and centrally manage and maintain oversight of the capability components within the portfolio. The overarching intent is 1) to achieve the right mix of capabilities, capacity, and LoS, and 2) to ensure that the CP achieves the capacity needed (for individual components and the entire portfolio) to meet customer needs and requirements in a cost-effective and timely manner.

### **3.2.5 Estimating the Annual Cost and Securing Funding**

The CP manager will refine and maintain the estimate of the TCO for the portfolio and its capability components, support the MDAA in updating the CP funding model(s), and coordinate efforts to secure the appropriate level of funding to operate and sustain the portfolio. (The initial annual cost estimate, funding model(s), and processes for securing funding are developed as part of the Establishment activities.)

### **3.2.6 Evaluating Capability Portfolio Performance**

The CP manager will assess the performance of the CP and its components and identify changes needed to CP strategy, objectives, processes, products, and services to improve reliability, quality, performance, and cost effectiveness.

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<sup>13</sup> Responsibilities for sourcing decisions may be delegated by the CP manager to Center Directors and the Lab Director, MDAA's, program managers, or project managers.

### 3.2.7 Managing Change, Improvement, and Evolution

The CP manager will strategically and centrally manage change, improvement, and evolution of the CP and its components. The overarching intent is 1) to continuously align products and services delivered by the CP with changing Agency needs and requirements and 2) to support established objectives and targets for the CP.

### 3.2.8 Providing Approval and Concurrence<sup>3</sup>

3.2.8.1 The MSC Chair shall obtain the CP manager's evaluation and recommendations for all proposed MSC decisions that involve changes to the capability domain.

3.2.8.2 The CIO shall review and concur (or non-concur) on CP investments and divestments in information technology capabilities.<sup>14</sup>

3.2.8.3 The CP manager shall approve (or non-approve) or concur (or non-concur):

a. On investments, divestments, acquisition strategies, procurements, or agreements that seek to either build or develop new capabilities or improve or divest of existing capabilities, whether NASA or NASA investment in a non-NASA capability. Various methodologies may be applied to adapt this policy to engagement points for CPM for ensuring consistency.<sup>15</sup>

b. On acquisition strategies, procurements, or agreements to obtain products and services from external capabilities that fall within the capability domain.<sup>16</sup> This may be done at the individual strategy, procurement, or agreement level or at an integrated Center-level on a periodic basis.

c. On internal (e.g., between a Center and programs, projects, and other Centers) or external (e.g., Space Act, international) implementation agreements that commit the use of CP capability components. This may be done at the individual strategy, procurement, or agreement level or at an integrated Center-level on a periodic basis.

d. On significant changes to the CP baseline plan to commit the use of CP capability components.

e. On operational changes to a capability component within the CP.

f. On terminating plans for investments, divestments, and improvements that previously received CP manager concurrence.

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<sup>14</sup> Specific information technology capabilities are governed under NPD 2800.1 and NPD 2810.1.

<sup>15</sup> For example, for competed missions a statement may be inserted into applicable NASA Announcements of Opportunity (AOs) covering the requirements of this policy.

<sup>16</sup> Products and services from external capabilities that are procurement line items included in a product delivery are excluded, e.g., a spacecraft build and test delivery.

g. On alternate uses of CP capability components.

### **3.2.9 Sponsoring Mission Directorate Activities**

The sponsoring Mission Directorate shall:

- a. In coordination with the CP manager, update funding model(s) as needed for each CP sponsored by their Mission Directorate.
- b. Provide MDAA resources for the strategic and centralized management of each CP sponsored by their Mission Directorate and its components and ensure that resources are sized to meet the established goals and objectives.
- c. Approve or disapprove the CPMP and provide rationale.

### **3.2.10 Sponsoring and Participating Mission Directorate Activities**

In support of CPM, sponsoring and participating Mission Directorates:

- a. As an integral part of established timelines, review cycles, and decision-making processes, shall obtain approval or concurrence from the CP manager:
  - (1) On investments, divestments, acquisition strategies, procurements, or agreements that seek to either build or develop new capabilities or improve or divest of existing capabilities, whether NASA or NASA investment in a non-NASA capability, that fall within the capability domain.<sup>3</sup>
  - (2) On acquisition strategies, procurements, or agreements to obtain products and services from external capabilities.<sup>3, 16</sup>
  - (3) On operational changes to a capability component within the CP.<sup>3</sup>
- b. Will provide the MDAA's near and long-term strategic requirements associated with planned programs and projects that involve the capability domain.
- c. Will provide Mission Directorate funding in accordance with approved funding model(s).<sup>3</sup>

### **3.2.11 Center Director and Lab Director Activities**

In support of CPM, Center Directors, and the Lab Director:

- a. Shall obtain approval or concurrence from CP managers:<sup>2</sup>
  - (1) On investments, divestments, acquisition strategies, procurements, or agreements that seek to either build or develop new capabilities or improve or divest of existing capabilities, whether NASA or NASA investment in a non-NASA capability.<sup>3, 16</sup>
  - (2) On acquisition strategies, procurements, or agreements to obtain products and services from external capabilities.<sup>3</sup>

(3) When the Center proposes any significant changes to the CP baseline plan to commit the use of portfolio capability components or, if a CP baseline plan is not used, prior to formalizing internal or external implementation agreements that commit the use of portfolio capability components.<sup>3</sup>

(4) On operational changes to a capability component.<sup>3</sup>

b. Shall obtain and document CP manager's evaluation of and recommendations for proposals to be provided to Agency leadership that involve changes to the capability domain.<sup>3</sup>

c. Shall obtain approval or concurrence CP managers on the termination of plans for investments, divestments, and improvements that previously received CP manager concurrence.<sup>3</sup>

d. Will manage, operate, and maintain the Center's CP components and enabling infrastructure consistent with strategic guidance included in approved CPCAs and CPMPs.

e. Shall obtain approval from the CP manager for alternate uses of portfolio capability components.<sup>3</sup>

f. Will evaluate and assess all work related to the CP that operates at the Center. Work to be evaluated and assessed includes but is not limited to the following:

(1) Cost estimates for planned delivery of products and services.

(2) Technical, cost, and schedule performance metrics.

(3) The condition of portfolio capability components.

(4) Risks that have the potential to impact the CP and its constituent components.

(5) Planned improvements and investments.

(6) Planned divestments.

g. Will provide the Center evaluation and assessment findings and recommendations to the CP manager in support of CP manager, MSC, and MSC Chair reviews of the CP.

h. Will develop cost estimates for planned delivery of products and services in accordance with cost estimating processes and guidelines defined in the CPMP and CP baseline plan (if used).<sup>5</sup>

i. Will provide Center resources in accordance with the funding model(s).<sup>3</sup>

j. Will manage and implement investment projects at the Center that are intended to improve existing portfolio capability components or add new capability components to a CP. Oversee and manage projects and tasks assigned to the Center that affect the CP, improve portfolio capability components, develop new capability components for the CP, and divest of portfolio capability components.

k. Will provide Center-level reports, assessments, and data for portfolio capability components that reside at the Center to support CP assessments and analyses.<sup>3</sup>

l. Will support CP managers in establishing the metrics for each portfolio capability component at the Center.<sup>3</sup>

### 3.2.12 Program and Project Manager Activities<sup>17</sup>

In support of CPM, program and project managers:

a. As an integral part of established timelines, review cycles, and decision-making processes, shall obtain approval or concurrence from the CP manager:

(1) On investments, divestments, acquisition strategies, procurements, or agreements that seek to either build or develop new capabilities or improve or divest of existing capabilities or facilities, whether NASA or NASA investment in a non-NASA capability, that fall within the capability domain.<sup>3</sup>

(2) On acquisition strategies, procurements, or agreements to obtain products and services from external capabilities that fall within the capability.<sup>3</sup>

(3) When the program or project proposes any significant changes to the CP baseline plan to commit the use of portfolio capability components or, if a CP baseline plan is not used, prior to formalizing internal or external implementation agreements that commit the use of portfolio capability components.<sup>3</sup>

(4) On operational changes to a capability component within the CP.<sup>3</sup>

b. Shall obtain approval or concurrence from the CP manager on the termination of plans for investments, divestments, and improvements that previously received CP manager concurrence.<sup>3</sup>

c. Shall obtain and document CP leadership's evaluation of proposals to be provided to Agency leadership that involve changes to the capability domain.<sup>3</sup>

### 3.2.13 CP Manager Activities

3.2.13.1 The CP manager shall develop a CPMP. The CPMP documents the results of the Strategic Management activities. Appendix D, Capability Portfolio Management Plan Template, outlines all required and optional content to be included in the CPMP.

3.2.13.2 The CP manager shall revalidate or update the CPMP every five years. Updates may occur more frequently if there are significant changes as determined by the CP manager or

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<sup>17</sup> Center Directors and the Lab Director may assume these responsibilities on behalf of program and project managers as agreed to in the CPMP.

Sponsoring MDAA.<sup>3</sup> The updated CPMP is reviewed and approved using the same process as the original.

#### **3.2.14 Conduct Reviews**

- a. The MSC Chair or Sponsoring MDAA will conduct a decisional Capability Change Review (CCR) when significant changes are recommended for the CP. Thresholds for changes for the MSC Chair, Sponsoring MDAA, and CP manager, and their decision-making authorities are defined in the CPCA, and can include changes in the composition, management, or funding of the CP.<sup>3</sup> See Appendix G, Table G-4 for entrance and success criteria for this review.
- b. The MSC Chair shall conduct a Capability Implementation Review (CIR) for each CP at the MSC at a cadence of five years or less. An independent assessment that includes the compliance matrix is summarized in the CIR. Both the CP Manager and an independent assessment team provide results of the compliance matrix at this review with recommendations for corrective actions. See Appendix G, Table G-3 for entrance and success criteria for this review.
- c. If a need arises to evaluate a CP for either continuation or termination, the MSC Chair, Sponsoring MDAA, CP manager, or other key stakeholders (e.g., OIG) will recommend a Stage Transition Review for Termination to the MSC Chair. Center Directors and the Lab Director, the CIO, and participating MDAAAs are consulted.
- d. The MSC Chair shall conduct a decisional Stage Transition Review for Termination (STR-T) to approve either continued operation or termination of the CP. See Appendix G, Table G-2 for entrance and success criteria for this review.
- e. The Sponsoring MDAA shall conduct a PMR. This periodic review (e.g., annual, quarterly) focuses on management and technical performance.
- f. The sponsoring and participating MDAAAs, Center Directors and Lab Director, and the CP manager will support all CP reviews required by this NID, and additional reviews identified in the CPCA and CPMP.

### **3.3 Termination Stage**

3.3.1 The CP manager shall conduct Termination activities when the CP is approved by the MSC Chair for termination.

3.3.2 The CP manager will develop a final CP report documenting results of the portfolio, such as performance relative to goals, technologies developed, lessons learned, and recommendations from the Termination review. Recommendations will include an alternate management strategy and responsibilities. The final report is captured as part of the MSC retrievable records.

## Chapter 4. Processes

### 4.1 Formal Dissent

4.1.1 CPM follows the Formal Dissent process outlined in NPD 1000.0, NASA Governance and Strategic Management Handbook, Section 3.5.5.

4.1.2 A “Formal Dissent” is a substantive disagreement with a decision or action that an individual determines is not in the best interest of NASA and is of sufficient importance that it warrants a timely review and decision by higher-level management. An individual may be representing the consensus view of an office, organization, or team in which they are a member.

### 4.2 Tailoring Requirements

4.2.1 If the need arises to tailor a requirement, a waiver shall be processed in accordance with NPR 1400.1, Section 5.5, and approved by the requirements holder, OSI. The person requesting a waiver from a requirement of this NID shall:

- a. Document the request including the rationale, a risk evaluation, and reference to all materials that provide the justification for acceptance.
- b. Obtain concurrence from the CP manager and the Sponsoring MDAA.
- c. Submit the request to the AASI for approval and distribution in accordance with Table 4-1.

4.2.2 Appendix E provides a template for a waiver request.

4.2.3 The concurring and approving authorities shown in Table 4-1 shall adjudicate waivers from the requirements of this NID.

**Table 4-1 Waiver Approval for Capability Portfolios**

CP Manager	Concurs
Sponsoring MDAA	Concurs
AASI	Approves
Participating MDAAs	Concurs <sup>18</sup>
Center Directors <sup>2</sup>	Concurs <sup>18</sup>
CIO	Concurs

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<sup>18</sup> Concurrence is not needed if the CP Manager and the AASI determine that the party is not affected by the waiver.

## Appendix A. Definition of Terms

**Acquisition.** Obtaining or advancing the development of the systems, research, services, construction, and supplies needed to fulfill the Agency’s mission and other activities that advance the Agency’s statutory objectives. As used in this document, the term encompasses all NASA acquisition authorities and approaches needed for that purpose.

**Acquisition Strategy.** The plan or approach for using NASA’s acquisition authorities to achieve the mission of a program or project. It includes the recommendations from make/buy and competed/directed analyses, proposed partnerships and contributions, proposed infrastructure use and needs, budget, and other applicable considerations.

**Affordability.** Fitting within the Agency resources allocated to manage, operate, sustain, and evolve a CP to meet current and projected customer requirements.

**Agreement.** The statement (oral or written) of an exchange of promises. Parties to a binding agreement can be held accountable for its proper execution, and a change to the agreement requires a mutual modification or amendment to the agreement or a new agreement.

**Approval.** Authorization by a required management official to proceed with a proposed course of action. Approvals are documented in retrievable records.

**Asset.** Any item of economic value owned by NASA including facilities and equipment and excluding personnel.

**Capability.** The ability of a system comprising workforce (i.e., Full-Time Equivalent (FTE)/Work-Year Equivalent (WYE)), competencies, assets, equipment, processes, and technologies to provide products and services to achieve objectives or meet requirements. (See also “Technical Capability.”)

**Capability Component.** An individual capability within a CP or the larger capability domain. It is a system comprising workforce (i.e., civil servants and contractors), equipment, facilities, processes, resources, competencies, and technologies that delivers products and services; for example, a wind tunnel and the workforce that manages, operates, and maintains it or a complex dedicated to an end-to-end process. A capability component may reside in-house or be external (i.e., from other agencies, industry, or academia).

**Capability Domain.** The in-house and external capabilities that characterize the broad realm of technical activities and associated products and services within which a CP falls. For example, the Aero sciences Evaluation and Test Capabilities (AETC) portfolio falls within the domain of wind tunnel and aero-propulsion testing. The capability domain and the associated boundaries of CP manager responsibilities are defined in the CPCA when the portfolio is established and are maintained as configuration-managed elements within the CPMP.

**Capability Operational Readiness Levels.** A tool for describing the operational readiness of portfolio capability components consistently across CPs. Operational readiness is defined in

terms of ability and capacity to provide products and services to customers. (See Appendix F for additional information.)

**Capability Portfolio.** A specific collection of functionally similar site-specific capability components and enabling infrastructure strategically and centrally managed together to meet NASA's strategic goals and objectives. For example, the AETC portfolio includes selected NASA wind tunnels and aero-propulsion testing capability components. The CP is defined in the CPCA when the portfolio is established and is maintained as a configuration-managed element within the CPMP.

**Capability Portfolio Baseline Plan.** An optional plan developed by the CP manager that details how the CP will be operated. The CP baseline plan is updated more frequently than the CPCA and CPMP and includes more detailed processes and guidelines for operations and interactions between the CP manager, Centers, and programs and projects. It may document any delegations from the CP manager to Centers, programs and projects related to sourcing decisions and committing the use of portfolio capability components through internal and external agreements. The CP baseline plan may also include cost estimating processes and guidelines. The CP baseline plan may be scoped to a single year of operation.

**Capability Portfolio Commitment Agreement.** An agreement between the MSC Chair and the Sponsoring MDAA that is necessary for the CP to transition from Establishment Stage to Strategic Management Stage. The content of the initial CPCA reflects the maturity of the CP at the beginning of Strategic Management activities. Prior to approval of the CPCA, the Sponsoring MDAA coordinates with the MSC Chair, the participating MDAAs, the CIO, and the Center Directors and Lab Director that have portfolio capability components that reside at their Centers to ensure their commitment to support the CP. (See Appendix C for detailed information on the content of the CPCA.)

**Capability Portfolio Management.** The centralized and strategic management of CPs to achieve NASA strategic goals and objectives.

**Capability Portfolio Management Plan.** An agreement between the Sponsoring MDAA and the CP manager that details how the CP will be managed and is used by the governing council to determine if the CP is fulfilling its requirements. The CPMP is developed and approved within the timeframe specified in the CPCA. Prior to approval of the CPMP, the CP manager coordinates with the Sponsoring MDAA, the participating MDAAs, the CIO, and the Center Directors and the Lab Director that have portfolio capability components that reside at the Centers to ensure their concurrence.

**Capability Portfolio Manager.** The person assigned to strategically and centrally manage a CP.

**Capability Portfolio Scope.** The parameters that define the boundaries of a CP within a capability domain. For example, the scope of the AETC portfolio includes large and strategically important wind tunnels and aero-propulsion testing capability components. The scope of a CP and the associated boundaries of CP manager responsibilities are defined in the CPCA when the portfolio is established and are maintained as configuration-managed elements within the CPMP.

**Capability Portfolio Strategic Development Plan.** A detailed description of the needed future state for the capability components within a CP and the processes for delivering products and services. The plan may be included in the CPMP or may be a separate document. (See Appendix D for detailed information on the content.)

**Capacity.** The planned availability of a capability component for customer utilization over a period of time. For example, the capacity of a wind tunnel is the available testing hours per year based on a provided level of resources and associated maintenance and other scheduled downtime.

**Centralized Management.** A management, reporting, and communications approach led by a central authority to ensure tactical and strategic decisions are made at the appropriate levels and provide an integrated Agency perspective.

**Component Facilities.** Complexes that are geographically separated from the NASA Center or institution to which they are assigned but are still part of the Agency.

**Concurrence.** A documented agreement by a management official that a proposed course of action is acceptable.

**Core Capability.** The minimum workforce (civil servants and contractors), competencies, assets, equipment, processes, and technologies below which NASA will assume unacceptable risk to current and future missions.

**Customer.** The intended user of the CP results. Typically, a customer is a Mission Directorate, a NASA program or project, or a Center. Customers may also be external entities.

**Decision Authority.** The individual authorized by the Agency to make important decisions on matters under their authority. For CPs, the MSC Chair is the Decision Authority.

**Directorate Program Management Council.** The senior management group, chaired by an MDAA or designee, responsible for evaluating programs, projects, and CPs executed within that Mission Directorate and overseeing implementation according to Agency commitments, priorities, and policies.

**Divestment.** The permanent removal of a capability component from the responsibility of a federal entity through conveyance to another entity or destruction. Conveyance includes transfer of ownership or conversion to personal property. Destruction includes demolition, deconstruction, and natural or man-made events, such as fire, earthquake, flood, or explosion.

**Enabling Infrastructure.** Lesser facilities, structures, retention, supply, distribution, and control systems that are not directly part of a capability component or component facilities but are essential for its operations, such as gases and support fluids, propellants, high pressure water, steam, pumping stations, high voltage power systems, and equipment.

**Establishment.** The first of three stages characterizing the lifespan of a CP. When leadership determines that it may be in NASA's best interest to strategically and centrally manage a group

of functionally similar capabilities in an integrated manner, it initiates the Establishment of a CP of capability components. Establishment activities include the following:

- a. Scoping and defining the portfolio.
- b. Designating its sponsoring Mission Directorate.
- c. Identifying the capability components of the portfolio.
- d. Developing a management strategy and approach.
- e. Selecting a CP manager.
- f. Preparing the CPCA.

A decisional review is held at the MSC to determine whether to formally establish a CP and transition to active strategic management status, i.e., to transition to Strategic Management Stage.

**Evaluation.** The continual, self-, and independent (i.e., outside the advocacy chain of the CP) assessment of the performance of a CP and incorporation of the evaluation findings to ensure adequacy of planning and execution according to plan.

**Facility.** Land, buildings, structures, and other real property improvements including utility systems and related personal property/collateral equipment. The term does not include operating materials, supplies, special tooling, special test equipment, or noncapitalized equipment.

**Funding Model.** An approach for obtaining the needed level of funding to operate and sustain the CP and its components. Funding models are based on the estimated cost for the operations and sustainment of the CP at a defined capacity. Customer charging methodologies may or may not be included in the funding model. Funding models are defined in the CPCA and CPMP and reflect the Agency direction for the CP. (See the CPCA and CPMP for more details.)

*Note: One or more funding models may be included in a CP; for example, different funding models for portfolio capability components or groups of components.*

**Information Technology.** Any equipment or interconnected system or subsystem of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by an executive agency. It also includes computers, ancillary equipment (including imaging peripherals, input, output, and storage devices necessary for security and surveillance), peripheral equipment designed to be controlled by the central processing unit of a computer, software, firmware and similar procedures, services (including support services), and related resources.

**Investment.** A resource and financial commitment made by the Agency, Mission Directorate, program, project, or Center.

**Lab Director** (also, NASA's FFRDC Lab Director). For NASA's sole FFRDC, JPL, this is the senior executive officer of the contractor organization and authorized representative responsible for day-to-day operations and management of JPL and contract compliance; therefore, responsible for identifying, allocating, and dispersing resources, including overseeing the assignment of the contractor workforce and facilities, and managing the JPL's assigned operations to facilitate program and project execution. NASA mission activities are assigned to and performed by the JPL contractor in accordance with the contract and various discrete task orders administered by the NOJMO. The Lab Director is neither a civil servant nor an agent of the Government.

**Level of Service.** The LoS establishes attributes related to the delivery of services by a CP, such as the scope of services, timeliness, times of operation, recovery from unplanned downtime, and service performance. The LoS may identify customer costs for different tiers of service performance and/or enhanced performance.

**Metric.** A measurement taken over a period of time that communicates vital information about the status or performance of a system, process, or activity.

**Mission Support Council.** The Agency's senior decision-making body for the integrated Agency mission support portfolio. The council members are advisors to the MSC Chair. The MSC assesses and determines mission support requirements to enable the successful accomplishment of the Agency's mission. The MSC is the governing council for CPs, initiates efforts to establish CPs, and assigns CPs to sponsoring Mission Directorates. It is the senior management group responsible for providing management oversight of a CP, its capability components, and related projects. The council has the responsibility of periodically evaluating the cost, schedule, risk, and performance of CPs under its purview. The evaluation focuses on whether the CP is meeting its commitments to the Agency and is following appropriate management processes.

**Partner.** An entity external to NASA with which NASA enters into an agreement. The entity may be a domestic non-governmental entity (i.e., academia, non-profits, commercial); a state, local, or Federal Government entity; or a foreign entity (i.e., foreign governments, foreign academia, and foreign commercial).

**Participating Mission Directorate.** A Mission Directorate that has a stakeholder interest in a CP.

**Portfolio.** A collection of projects, programs, capability components, sub-portfolios, and/or activities managed as a group to meet NASA's strategic needs, goals, and objectives.

**Procurement.** The acquiring by contract, with appropriated funds, of supplies or services (including construction) by and for the use of the Federal Government through purchase or lease, whether the supplies or services are already in existence or need to be created, developed, demonstrated, and evaluated.

**Resource.** Budget, workforce, schedule, and other infrastructure elements that support NASA assets and can be used by individuals or organizations to facilitate effective functioning.

**Significant Change.** The types of change considered ‘significant’ for a CP are specified through thresholds, circumstances, criteria, and constraints in the CPCA. These may include the following:

- a. Changes in the composition (i.e., the scope including the addition of new portfolio capability components, important or major enhancements to existing portfolio capability components, or divestment of portfolio capability components).
- b. Management (strategy).
- c. Funding (total annual cost estimate and funding model(s)).
- d. Sourcing strategy of the CP.
- e. Approach for making sourcing decisions.

**Sourcing Decisions.** The assignment of customer requests to capability components.

**Sourcing Strategy.** A strategy for acquiring CP products and services through capabilities available in-house and through other agencies, vendors, partners, and academia. The sourcing strategy goal is to achieve an optimized portfolio that addresses Agency goals and objectives, supports the CP strategy, enables the CP’s strategic direction, and satisfies customer requirements.

**Sponsoring Mission Directorate.** The Mission Directorate approved by the MSC Chair to provide management and oversight of a CP. The Sponsoring Mission Directorate has line authority for the Capability Portfolio Manager. Along with Mission Directorates with programmatic authority, the Mission Support Directorate (MSD) may be assigned a CP.

**Stakeholder.** An individual or organization that is materially affected by the outcome or the deliverables of a CP but is outside the organization doing the work or making the decision, e.g., customers, beneficiaries, and organizations that work on or provide support to the CP.)

**Strategic Management (function).** A series of integrated efforts that enable the Agency to establish and execute strategy, make decisions, allocate resources, develop and implement plans, and measure performance of the CP.

**Strategic Management (set of activities).** The second of three stages characterizing the lifespan of a CP. These activities include key CM management processes associated with both the strategic and centralized management aspects of CPM that repeat as long as the portfolio is active. They include the following:

- a. Maintaining a strategy.

- b. Supporting the budget process.
- c. Securing funding.
- d. Evaluating component capabilities and assets for need of maintenance, upgrade, or divestment.
- e. Analyzing the capability domain inside and outside of NASA.
- f. Understanding CP supply and demand.
- g. Assigning customer requirements to capability components that can deliver products and services in accordance with the approach for making sourcing decisions.
- h. Assessing the health of the CP and its component parts.
- i. Identifying and implementing new capabilities and improvements to the CP to meet future needs.

**Tools of the Trade.** Assets that 1) are core to the business of the Center, 2) are in regular use by the Center, and 3) may be commonly found in industry.

**System.** The combination of elements that function together to produce the capability required to meet a need. The elements include all hardware, software, equipment, facilities, personnel, processes, and procedures needed for this purpose.

**Tailoring.** The process used to adjust or seek relief from a prescribed requirement to accommodate the needs of a specific task or activity. The tailoring process results in the generation of waivers.

**Technical Capability.** The equipment, facilities, infrastructure, property, support, and workforce required to accomplish a program or project. Technical capabilities are categorized into four types – discipline, system, research, and service.

**Termination.** The third of three stages characterizing the life span of a CP. When NASA leadership determines it is no longer in the Agency’s best interest to strategically and centrally manage a CP in an integrated manner, it initiates Termination of the portfolio. A Termination decision triggers activities including developing a Termination strategy and plan, and closing out all strategic and centralized management activities associated with the CP.

**Threshold.** A level (magnitude or intensity) specified in the CPCA or CPMP. Certain conditions occur with respect to a CP when thresholds are exceeded. Thresholds are used to enable the effective strategic and centralized management of the portfolio (CP level) and the efficient operation of portfolio capability components (Center-level). For example, thresholds are established to identify significant changes that require decisional reviews, assets to be included in a CP, and activities that require CP manager concurrence.

**Total Cost of Ownership.** A financial estimate intended to establish the full (direct and indirect) annual costs of operating and sustaining a CP and its capability components. The TCO is determined through processes established by the CP manager to support the need for differentiated understanding of costs in support of decision making to achieve CP efficiency and alignment. The TCO processes are documented in the CPMP.

**Waiver.** A written authorization granting relief from a requirement that results in more risk than is inherent in the original requirement. Waivers grant permanent or temporary relief after the original requirement is baselined for the specific product or process.

## Appendix B. Acronyms

AASI	Assistant Administrator for Strategic Infrastructure
AMP	Agency Master Plan
AO	NASA Announcement of Opportunity
CIO	Chief Information Officer
CIR	Capability Implementation Review
CMC	Center Management Council
CORL	Capability Operational Readiness Level
CP	Capability Portfolio
CPCA	Capability Portfolio Commitment Agreement
CPM	NASA Capability Portfolio Management
CPMP	Capability Portfolio Management Plan
CPSDP	Capability Portfolio Strategic Development Plan
DPMC	Directorate Program Management Council
FFRDC	Federally Funded Research and Development Center
FTE	Full-Time Equivalent
JPL	Jet Propulsion Laboratory
LoS	Level of Service
MD	Mission Directorate
MDAA	Mission Directorate Associate Administrator
MSC	Mission Support Council
MSD	Mission Support Directorate
NASA	National Aeronautics and Space Administration
NOA	New Obligation Authority
NODIS	NASA Online Directives Information System
NOJMO	NASA Office of JPL Management and Oversight
NID	NASA Interim Directive
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
OCHMO	Office of the Chief Health and Medical Officer
OCIO	Office of the Chief Information Officer
OSI	Office of Strategic Infrastructure
OSMA	Office of Safety and Mission Assurance
PMR	Performance Management Review
POC	Point of Contact
RPT	Rocket Propulsion Testing
STR	Stage Transition Review
TCO	Total Cost of Ownership
TRL	Technology Readiness Level
U.S.C.	United States Code
WYE	Work-Year Equivalent

## Appendix C. Capability Portfolio Commitment Agreement Template

### C.1 CPCA Title Page

<b>Capability Portfolio Commitment Agreement</b>	
<p>(Provide a title for the CP and designate a short title or proposed acronym in parentheses if appropriate.)</p> <p>It is the responsibility of each of the signing parties to notify the others in the event that a commitment cannot be met and to initiate the timely renegotiation of the terms of this agreement.</p>	
_____	_____
Sponsoring Mission Directorate Associate Administrator	Date
_____	_____
Participating MDAA(s)	Date
_____	_____
Center Director(s) and the NOJMO Director	Date
_____	_____
Mission Support Council Chair	Date

**Figure C-1 Capability Portfolio Commitment Agreement Title Page**

## **C.2 CPCA Template**

### **CAPABILITY PORTFOLIO COMMITMENT AGREEMENT (CAPABILITY PORTFOLIO TITLE)**

Required content is annotated by “Required.” Optional content is annotated by “Optional.” Optional content is recommended, if applicable. For information within the CPCA that changes frequently (e.g., schedules), the information within the document could simply be a pointer to where the authoritative current information resides.

#### **1.0 GOALS AND OBJECTIVES**

Required: Identify the relevant goals and objectives for the CP. Describe the CP’s relationship to the Agency’s vision and mission, as defined by NPD 1001.0, NASA Strategic Plan.

Required: Describe the CP’s relationship to the sponsoring Mission Directorate’s goals and objectives as documented in their strategic plan.

Required: Describe why the CP is required – describe customer needs and requirements that can be met through products and services provided by the CP.

Optional: Convey the public good of the CP to the taxpayer, stated in a way that can be understood by the average citizen.

#### **2.0 DOMAIN, SCOPE, PRODUCTS, AND SERVICES DEFINITION**

Required: Describe the capability domain, i.e., the in-house and external capabilities that characterize the broad realm of technical activities and associated products and services within which the CP falls.

Required: Describe the CP scope (in as much detail as possible), i.e., the parameters that define the boundaries of the CP within the capability domain.

Required: Define the CP (in as much detail as possible), including the capability components and enabling infrastructure to be strategically and centrally managed together in an integrated manner to meet NASA’s strategic goals and objectives.

Required: Provide a list or catalog of the capability components included in the CP including the facilities and enabling infrastructure at the NASA Centers.

Required: Identify capability components at NASA Centers that are within the capability domain of the CP but not included in the CP.

Required: Describe the planned products and services to be provided by the CP.

Optional: Describe the planned LoS within the CP necessary to deliver products and services to NASA’s programs and projects and external customers.

Optional: If applicable, provide a list or catalog of external sources – other agencies, industry, and academia.

Detailed lists and catalogs will be provided in the NODIS Library ([https://nodis3.gsfc.nasa.gov/main\\_lib.cfm](https://nodis3.gsfc.nasa.gov/main_lib.cfm), OTHER NASA-LEVEL DOCUMENTS, Office of Strategic Infrastructure)..

### **3.0 STRATEGY**

Required: Describe the plan for how the CP will achieve its goals and objectives, including strategic themes and focus areas.

Required: Identify customers, stakeholders, and partners.

Required: Describe constraints on the CP and any opportunities.

Required: Describe the strategic direction for the evolution of the CP addressing strengths, weaknesses, capability gaps, investment priorities, risks, and risk mitigation.

Required: Identify the timeframe for completion of detailed planning and approval of the CPMP.

Required: Identify other documentation needed, such as a CP risk management plan. (Refer to NPR 8000.4.)

### **4.0 AUTHORITY, GOVERNANCE, AND MANAGEMENT**

Required: Describe the NASA organizational structure, roles, and responsibilities for managing the CP and components from the MSC Chair and MSC to the Sponsoring MDAA and DPMC to the Centers and Center Management Councils (CMCs) involved. Include lines of authority and reporting for oversight of the CP.

Required: Identify the CP manager.

Required: Characterize the key CP parameters (e.g., cost, technical, products and services delivered, new capability components) that will require MSC Chair approval to change. Define the thresholds, criteria, and constraints that determine the need for a decisional review to approve CP actions and significant changes.

Optional: Define the operational norms (in as much detail as possible) between the CP manager and Centers, programs, and projects (as appropriate).

Optional: Define the thresholds and/or circumstances (in as much detail as possible) necessary to enable effective strategic and centralized management of the portfolio (CP level) and enable efficient operations of capability components (Center-level).

(For detailed information on operational norms and thresholds, see Appendix D, Section 3.1.)

Required: Describe the approach for disagreement resolution.

## **5.0 PERFORMANCE**

Required: Document how performance of the capability of the portfolio will be evaluated, including identification of performance metrics with goals and targets needed to achieve the CP objectives.

## **6.0 BUDGET DEVELOPMENT AND INTEGRATED FUNDING**

Required: Identify the Sponsoring MDAA resources for the strategic and centralized management of the CP and its components.

Required: Describe the estimated cost for the CP to operate.

Required: For the CP content, define annual budgetary estimates in support of a five-year budget, including specific estimates for operations, maintenance, and refurbishment and funding estimates for any planned strategic initiatives, renewals, or upgrades, including human resources and procurements.

Optional: Describe the budget contingency strategy.

Optional: Describe how the appropriate level of funding is secured to operate and sustain the CP and its components.

Required: Describe the funding model(s) specific to the CP in as much detail as possible and the cases of usage. (Funding models may vary from CP to CP and within a CP. For additional information on funding model(s), see Appendix D, Section 3.4.)

Required: Describe the funding elements necessary for the CP to achieve its strategic objectives that are budgeted outside of the CP budget, appearing instead as line items in the budgets of other areas of the Agency. Describe the CP's need for reimbursable income and the estimated reimbursable funding from outside the Agency.

## **7.0 SOURCING STRATEGY AND SOURCING DECISIONS**

Required: Describe the high-level sourcing strategy and the approach to making sourcing decisions in as much detail as possible. Details of the sourcing strategy and approach for making decisions are documented in the CPMP.

## **8.0 HIGH-RISK AREAS**

Required: Identify the areas of highest risk for the CP (covering safety, technical, institutional, funding, cost, or schedule issues) in which failure may result in changes to the CP's cost, schedule, or performance.

Optional: Identify, where possible, the specific risk drivers (e.g., unfunded mandates or an external facility or capability does not provide the agreed-upon level of access to NASA. Refer to NPR 8000.4.)

## **9.0 INTERNAL DEPENDENCIES AND AGREEMENTS**

Required: Identify the NASA support from other Mission Directorates and Centers and the formal agreements necessary for the CP to meet its objectives.

## **10.0 EXTERNAL DEPENDENCIES AND AGREEMENTS**

Required: Explain the partner support necessary to meet the CP's objectives. Include a brief overview of relationships with each partner.

Optional: Identify the commitments being made by each partner and list the specific agreements to be entered into.

Optional: Clearly identify any unique considerations affecting the implementation of required NASA policies and processes that are necessitated by the external involvement.

## **11.0 REVIEWS**

Required: Specify the type of CP reviews that are planned during Strategic Management to ensure the continued relevance (alignment with Agency vision and mission), performance, effectiveness, and affordability of the portfolio. Types of CP reviews include internal reviews conducted by the CP manager, sponsoring Mission Directorate reviews, control or advisory board reviews (if applicable), stakeholder reviews, and external reviews independently performed by outside organizations.

Optional: Provide the frequency and approximate timeframes for these reviews.

Required: Identify other reviews that the CP will support, such as the PMR.

Required: Identify any decisional reviews required by the MSC Chair during the Strategic Management Stage in addition to the CIR.

## **12.0 WAIVERS**

Required: Identify known waivers that will be sought for the CP. Provide rationale consistent with CP characteristics, such as scope, complexity, visibility, cost, safety, and acceptable risk.

## **13.0 CPCA ACTIVITIES LOG**

Required: Provide and maintain a log of all CPCA activities, including revisions that reflect all changes and waivers to the original CPCA. This log includes the information shown in Table C-1 and may be supplemented with an attached addendum for each change that describes the change.

Required: The CPCA should be revalidated or updated every five years. Updates may occur more frequently if there are significant changes.

**Table C-1 Sample Capability Portfolio Commitment Agreement Activities Log**

<b>Date</b>	<b>Event</b>	<b>Change</b>	<b>Addendum</b>	<b>Term Review</b>	<b>Sponsoring MDAA Sign</b>	<b>Participating MDAA Sign</b>	<b>Center Director(s) and the Lab Director Sign</b>	<b>MSC Chair Sign</b>	<b>CIO Sign when req'd</b>
dd/mm/yy	Initial Signatures	None		No					
dd/mm/yy	Revalidation	None	N/A	No					
dd/mm/yy	Revalidation	None	N/A	No					
dd/mm/yy	Approval of significant change	Addition of change N	Ref. #1	No					

## Appendix D. Capability Portfolio Management Plan Template

The MDAA may authorize use of an alternative format with compatible content.

### D.1 Capability Portfolio Management Plan Title Page

<h2>Capability Portfolio Management Plan</h2>	
<p>(Provide a title for the candidate CP and designate a short title or proposed acronym in parentheses, if appropriate.)</p>	
<p>It is the responsibility of each of the signing parties to notify the others in the event that a commitment cannot be met and to initiate the timely renegotiation of the terms of this agreement.</p>	
_____	_____
Capability Portfolio Manager	Date
_____	_____
Participating MDAA(s)	Date
_____	_____
Center Director(s) and the NOJMO Director	Date
_____	_____
Sponsoring Mission Directorate Associate Administrator	Date

**Figure D-1 Capability Portfolio Management Plan Title Page**

## **D.2 Capability Portfolio Management Plan Template**

### **CAPABILITY PORTFOLIO MANAGEMENT PLAN**

(CAPABILITY PORTFOLIO TITLE)

Required content is annotated by “Required.” Optional content is annotated by “Optional.” Optional content is recommended, if applicable. For information within the CPMP that changes frequently (e.g., schedules), the information within the document could simply be a pointer to where the authoritative current information resides.

#### **1.0 CAPABILITY PORTFOLIO OVERVIEW**

##### **1.1 Introduction**

Optional: Briefly state the background of the CP and its current state including the results of establishing the portfolio, decisions, and documentation. If applicable, provide a brief description of intended future states and desired enhancements to address identified capability gaps.

##### **1.2 Goals and Objectives**

Required: State the goals and specific objectives of the CP with clear traceability to the Agency’s vision and mission as defined by NPD 1001.0. Goals and objectives should include commitment to safety and mission success. Describe high-level objectives and how these objectives flow down from the CP to components.

##### **1.3 Customers, Beneficiaries, and Stakeholders Identification and Advocacy**

Required: Identify the main customers, beneficiaries, and stakeholders of the CP and the process to be used to ensure customer and stakeholder advocacy.

##### **1.4 Domain, Scope, Products, and Services**

Required: Describe the capability domain, i.e., the in-house and external capabilities that characterize the broad realm of technical activities and associated products and services within which the CP falls.

Required: Describe the CP scope, i.e., the parameters that define the boundaries of the CP within the capability domain.

Required: Define the CP, including the capability components and enabling infrastructure to be strategically and centrally managed together in an integrated manner to meet NASA’s strategic goals and objectives.

Required: Provide a list or catalog of the capability components included in the CP, including the facilities and enabling infrastructure at the NASA Centers.

Required: Describe the products and services to be provided by the CP.

Required: Describe the LoS within the CP necessary to deliver products and services to NASA's programs and projects and external customers.

Required: Establish a description of the "core capability" of the portfolio, i.e., the minimum workforce (FTE/WYE), competencies, assets, equipment, processes, and technologies below which NASA will assume unacceptable risk to current and future missions.

Required: Identify and describe the insight needed into capability components that are within the capability domain of the CP but not included in the CP.

Detailed lists and catalogs will be provided in the NODIS Library ([https://nodis3.gsfc.nasa.gov/main\\_lib.cfm](https://nodis3.gsfc.nasa.gov/main_lib.cfm), OTHER NASA-LEVEL DOCUMENTS, Office of Strategic Infrastructure). and may also be provided as separate documents or appendices as needed.

Optional: If applicable, provide a list or catalog of external sources – other agencies, industry, and academia.

## **2.0 AUTHORITY, GOVERNANCE, AND MANAGEMENT**

Required: Identify the CP manager and the organization (Headquarters or Center) to which the CP manager reports.

Required: Describe the NASA organizational structure and detailed management roles and responsibilities for managing the CP from the MSC Chair and MSC to the Sponsoring MDAA and DPMC to the Centers and CMCs involved including centralized management roles and responsibilities, lines of authority, and reporting.

Optional: Briefly describe the respective roles, responsibilities, and relationships between all parties involved in portfolio capability component operations and sustainment.

Required: Identify the responsibilities of each NASA Center as they relate to CP goals and objectives.

Optional: Illustrate the organization graphically.

## **3.0 STRATEGIC MANAGEMENT**

### **3.1 Activities**

Required: Briefly describe the scheme for classification and decomposition of the CP.

Optional: Describe the way the CP will relate to other institutions within NASA as well as outside of NASA.

Optional: Establish a consensus with Center Directors and the Lab Director and other key stakeholders on cost elements that will meet the needs of the CP in developing the TCO for the portfolio and its components.

Optional: Describe the process for estimating the TCO for the CP and its components.

Required: Describe the analytical process used to identify and prioritize investments and divestments to the CP to continuously align products and services with changing Agency needs and requirements and to support established objectives and targets for the CP.

Required: Describe the process by which projects initiated by the CP are approved and implemented.

Optional: Briefly discuss how policy and design and development efforts are coordinated to facilitate value-added consistency and standardization across capability components and investments in and divestments of systems, architectures, and technologies.

Optional: Briefly discuss how processes for providing products and services (e.g., customer service agreements, training procedures) are coordinated to facilitate value-added consistency and standardization.

Required: Define the operational norms between the CP manager and Centers, programs, and projects:

a. Establish the thresholds and/or circumstances necessary to enable effective strategic and centralized management of the portfolio (CP-level) and enable efficient operations of capability components (Center-level). Examples include thresholds and/or circumstances for concurrence from the CP manager for:

- (1) Investments, improvements, and divestments of capability components.
- (2) Internal and external implementation agreements for use of capability components.
- (3) Obtaining products and services external to the CP.
- (4) Proposed operational changes to a capability component.
- (5) Significant changes to the CP baseline plan.

b. Describe the process and engagement points used to review and concur or non-concur. Examples include:

- (1) Internal (e.g., between a Center and programs, projects, and other Centers) or external (e.g., Space Act, International) implementation agreements that commit the use of capability components.
- (2) Proposed changes to the CP baseline plan.

(3) Investments, divestments, acquisition strategies, procurements, or agreements that seek to either build or develop new capabilities or improve or divest of existing capabilities that fall within the capability domain. Identify methodologies used to adapt concurrence processes to engagement points.

(4) Acquisition strategies, procurements, or agreements to obtain products and services from external capabilities that fall within the capability domain. Identify whether these concurrences are done at the individual acquisition strategy, procurement, or agreement level or at an integrated Center-level and any applicable periodicity.

(5) Operational changes to a capability component within the CP.

(6) Termination of plans for investments, divestments, and improvements that previously received CP manager concurrence.

c. Describe the appeal approach for Centers, programs, and projects for non-concurrence decisions by the CP manager.

d. Describe the approach for disagreement resolution.

e. Describe the approach for obtaining the CP manager's evaluation of and recommendation for proposals to be provided to Agency leadership that involve changes to the capability domain.

f. Identify whether a CP baseline plan will be used and if so, how it will be used.

g. Describe any delegations of sourcing decisions to Center Directors and the Lab Director, MDAs, programs, or projects.

h. Describe any assumption of program and project manager responsibilities by Center Directors and the Lab Director.

i. Describe CP scheduled meetings needed for centralized and strategic management (both informational and decisional).

j. Describe the approach for adjusting the CORLs of portfolio capability components and their LoS.

k. Describe the approach for approving alternate uses of portfolio capability components.

### **3.2 Schedule**

Required: Provide a schedule of CP strategic activities and events and capability component utilization and CORL covering the next five years of the CP. The schedule may include applicable events, such as delivery dates for significant enhancements, major customer-scheduled milestones, scheduled reviews, and updates to the CPCA and CPMP.

The schedule may be provided as a separate document or appendix.

### **3.3 Alignment of Capacity with Demand**

Required: Describe the current Agency and customer demand for the CP's products and services.

Optional: When possible, provide a demand forecast for the next five years.

Required: Discuss how current and future Agency and customer demand for products and services is determined to ensure the CP's ability and capacity (in-house and external) to meet that demand including any assumptions and data sources.

Optional: Describe how current available capacity (i.e., a combination of in-house and external) is matched to meet this demand.

Optional: Describe how significant discrepancies between capacity and demand will be resolved (e.g., changing the operational readiness of capability components or changing access to services from external sources).

### **3.4 Funding Model(s)**

Required: Describe the process of developing the annual budget for the CP.

Required: Identify the TCO of the CP. Include all elements (such as operations, maintenance, and refurbishment) and funding estimates for any planned strategic initiatives, renewals, or upgrades; including workforce and procurements.

Required: Identify yearly New Obligation Authority (NOA) full-cost estimates for operations, facility construction, institutional support (maintenance), enhancements, technology, management, and reserves in support of a five-year CP budget.

Required: Identify annual civil-service and contractor workforce levels that are funded with CP resources.

Required: Describe the funding model(s) specific to the CP and the cases of usage.

Required: Identify the Sponsoring MDAA resources for the strategic and centralized management of the CP and its components. Describe CP funding model responsibilities levied on Centers, participating Mission Directorates, and other customers to support both fixed and variable costs (e.g., direct labor, consumables, materials, program-unique facility modernizations).

Required: Describe the approach for securing the appropriate level of funding to operate and sustain the CP and its components. Include a description of the different sources of funding and their approximate annual percentage (e.g., center operations 15 percent, CP direct 55 percent, program direct 25 percent, reimbursable five percent).

Required: Include a description of the customer charging methodologies for products and services. This includes the principles and rules for customer charging that are used for detailed

cost estimation. How different customers are charged is included within the principles and rules. This includes the method for allocation and distribution of funds received from internal and external customers. The charging methodology for NASA program and project customers may differ from the charging methodology for various external customers. For example, the charging methodology for the Rocket Propulsion Testing (RPT) CP may include charging the customer for all resources required to bring a chemical propulsion test stand out of mothball status (CORL 6) to operational status (CORL 1 to 3), supplement the test stand staff for test activities, provide the consumables needed to support the test activities, and return the test stand to mothball status (CORL 6) once test activities are completed. The RPT CP manager is responsible for funding maintenance of all test stands in standby or mothball status (CORL 4, 5, and 6) as appropriate between tests.

Optional: Include a description of the cost estimating processes and guidelines<sup>19</sup> used to develop detailed cost estimates for products and services.

### **3.5 Controls and Compliance**

Optional: Describe the process by which the CP ensures compliance with NASA policies and directives, as well as other applicable requirements.

Required: Describe the process for controlling, tracking, and documenting changes.

Required: Characterize the key CP parameters (e.g., cost, technical, products and services delivered, new capability components) that will require Sponsoring MDAA approval to change. Define the thresholds, criteria, and constraints that determine the need for Sponsoring MDAA approval of CP actions and significant changes.

### **3.6 Relationships**

#### **3.6.1 Internal**

Required: Identify the NASA support from other Mission Directorates, Offices (e.g., OCIO, Office of the Chief Health and Medical Officer (OCHMO), Office of Safety and Mission Assurance (OSMA)), and Centers.

Required: Identify formal agreements necessary for the CP to meet objectives.

Lists of agreements can be provided as separate documents or appendices as needed.

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<sup>19</sup> Guidelines may also be detailed in the baseline plan for the capability portfolio.

### **3.6.2 External**

Required: Describe the external partner support necessary to meet CP objectives. Include a brief overview of relationships with each partner.

Required: Identify the commitments being made by each partner and list the specific agreements to be entered into.

Lists can be provided as separate documents or appendices as needed.

Optional: Clearly identify any unique considerations affecting implementation of required NASA policies and processes necessitated by the external involvement.

### **3.7 Sourcing Strategy and Sourcing Decisions**

Required: Describe the sourcing strategy for acquiring CP products and services through capabilities available in-house and through other agencies, vendors, partners, and academia. Sourcing strategy considerations may include but are not limited to the following:

- a. Mission Directorate acquisition strategies.
- b. Mission risks.
- c. Center roles and responsibilities.
- d. Agency workforce priorities, including maintenance of internal competencies.
- e. Financial and schedule factors.
- f. In-house and external capacity.
- g. Maturity and availability of the capabilities of external sources.
- h. Specialized capability.
- i. Customer impacts.
- j. CP transformational objectives.

Optional: Describe the rationale for sustaining in-house capabilities, civil-service workforce, contractor workforce, and NASA facilities.

Optional: Describe how the appropriate balance between NASA sources and external sources is determined.

Optional: Provide a high-level evaluation of opportunities to leverage the expertise and capabilities of external sources.

Optional: Discuss how the CP periodically reevaluates the sourcing strategy to achieve an optimized portfolio including adjustments in response to changes in the products and services required by customers and changes in internal and external capabilities.

Required: Describe the approach for making sourcing decisions, i.e., assigning customer requests to capability components. Sourcing decision considerations may include but are not limited to the following:

- a. The CP sourcing strategy.
- b. Alignment of capability component capabilities, capacity, availability, and constraints with customer requirements.
- c. Impact of using a non-local capability on customers and other stakeholders.
- d. Customer and other stakeholder.
- e. Need for product and service delivery at specific locations.
- f. Priorities for optimizing critical resources.

Required: Identify any delegation of responsibilities for sourcing decisions to Center Directors and the Lab Director, MDAAs, program managers, or project managers.

### **3.8 Performance**

Required: Describe how performance of the CP will be evaluated, including identification of performance metrics with goals and targets needed to achieve the CP objectives. Identify performance metrics in an objective, quantifiable, and measurable form.

### **3.9 Capability Portfolio Strategic Development Plan**

Required: Describe the approach and timeframe for developing and maintaining a CP Strategic Development Plan (CPSDP). CPSDP content may include but is not limited to:

- a. The needed future state (combination of workforce (FTE/WYE), competencies, assets, equipment, processes, and technologies) for the capability components and the processes for delivering required products and services.
- b. How the CP evolves to achieve alternative methods and processes for delivery of products and services and alternative approaches to sourcing (i.e., balance of in-house and external).
- c. The alignment of the CPSDP with Agency and Center Master Plans.
- d. Principles and guidance for design and development of the CP and its components.
- e. How services, systems, architectures, technologies, processes, and metrics are consistent or standardized within the CP and among its components when it adds value.

f. How future needs and requirements, capability gaps, technology trends, opportunities, threats, and changes to internal and external environment are identified, prioritized, and planned.

The CPSDP may be provided as a separate document or appendix.

### **3.10 Data Management**

Required: Describe the approach to CP data management including what data will be captured, how the data will be collected, stored, described, organized, accessed, and archived; plans for data rights; plans for data services, and alignment with Agency information management and information technology security policies, standards, procedures, and waivers. Include documentation of changes.

Required: Describe the archival method for information used in support of decisional reviews and out-of-board decisions (decisions made by the MSC Chair or Sponsoring MDAA without a council meeting) related to the CP.

### **3.11 Risk Management**

Required: Summarize the risk management process used for the CP, including appropriate actions to mitigate risk to the CP and actions to mitigate risks to customers as defined in NPR 8000.4.

## **4.0 REVIEWS**

Required: Specify the approach, criteria, and review team structure for planned CP reviews. Provide the frequency and approximate timeframes for these reviews.

Optional: Describe how the CP manager selects review team members for internal reviews and coordinates selection of review team members with the Sponsoring MDAA for stakeholder reviews and external reviews.

Optional: Describe the approach to support other reviews, such as the PMR.

Required: Identify any decisional reviews required by the MSC Chair during the Strategic Management Stage in addition to the CIR.

## **5.0 RECORDS MANAGEMENT**

Required: Describe how CP records will be managed as defined in NPR 1441.1.

## **6.0 WAIVERS**

Required: Identify known waivers that the CP has obtained or will obtain against NASA policies, directives, or applicable external requirements. Waivers will be archived consistent with Section 3.10, Data Management above.

## 7.0 FORMAL DISSENT PROCESS

Required: Briefly discuss the process used by the Sponsoring MDAA and CP manager for handling formal dissent.

## 8.0 CPMP ACTIVITIES LOG

Required: Provide and maintain a log of all CPMP activities, including revisions that reflect all changes to the original CPMP. This log includes the information shown in Table D-1 and may be supplemented with an attached addendum for each change that describes the change. The CPMP should be revalidated or updated every five years. Updates may occur more frequently if there are significant changes.

**Table D-1 Sample Capability Portfolio Management Plan Activities Log**

<b>Date</b>	<b>Event</b>	<b>Change</b>	<b>Addendum</b>	<b>Decision Review</b>	<b>Sponsoring MDAA Sign</b>	<b>Participating MDAA(s) Sign</b>	<b>Center Director(s) and the Lab Director Sign</b>	<b>CP Mgr . Sign</b>	<b>CIO Sign when req'd</b>
dd/mm/yy	Initial signatures	None		No					
dd/mm/yy	Revalidation	None	N/A	No					
dd/mm/yy	Approval of significant change	Addition of change	Ref. #1	Yes					

**Appendix E. NID 8600.1 Waiver Template**

Name of Organization Requesting Waiver:	Date of Request:	Date Waiver is Needed:	
Name and Organization of Initiator:	Requirement to be Waived:		
Specific Deliverable Affected:	Waiver To:		
	<input type="checkbox"/> Policy <input type="checkbox"/> Procedure <input type="checkbox"/> Requirement <input type="checkbox"/> Other <input type="checkbox"/> Additional information is attached		
Original Requirement of Document to be Waived (list Appropriate Sections or Text):			
Waiver Requested:			
Reason/Justification (Attach additional information, if necessary):			
Risk Assessment of the CP if Waiver is Approved:			
Signatures	Signature	Date	Approve/Concur (Yes/No)
CP Manager (concur)			
Sponsoring MDAA (concur)			
Participating MDAA's (concur*)			
Center Directors and the Lab Director (concur*)			
CIO (concur*)			
AASI (approves)			

\*In accordance with Section 5.2.

**Figure E-1 CPM Waiver Template**

## **Appendix F. Capability Operational Readiness Level**

### **F.1 CORL OVERVIEW**

#### **F.1.1 Introduction**

F.1.1.1 The CORL is a tool for describing the operational readiness of capability components consistently across CPs. Operational readiness is defined in terms of ability and capacity to provide products and services to customers. This ability and capacity are based on the Asset/Facility Status and Personnel Status of the capability component:

- a. The Asset/Facility Status is the operational state of equipment and systems that comprise the capability component (e.g., active, inactive, mothballed) and current utilization (e.g., by a specific current program). Facility status and utilization categories are described in NPR 8800.15.
- b. The Personnel Status is the type of work that assigned personnel are able to perform and their expertise and skill levels (e.g., perform test and operations; perform preventive and corrective maintenance).

F.1.1.2 There are seven levels of capability operational readiness. A summary of the seven CORLs, including the Asset/Facility Status and Personnel Status associated with each level, is provided in Table F-0. Detailed information for each CORL is provided in Tables F-1 through F-7.

#### **F.1.2 Potential Uses of CORL**

Mission Directorates, CP managers, and Centers use the CORL to:

- a. Provide information on resources required to sustain a specific CORL for capability components.
- b. Provide information on resources required to transition a capability component from one CORL to another.
- c. Perform trades to determine the resources that could be saved by transitioning a capability component to a lower CORL.
- d. Effectively communicate to Agency management and stakeholders the implications of reduced budgets in terms of reduced CORLs for capability components.

### F.1.3 CORL Summary

Table F-0 provides a summary of each CORL in terms of Facility Status and Personnel Status.

**Table F-0 Capability Operational Readiness Level Summary**

#	Capability Operational Readiness Level	Asset/Facility Status	Personnel Status
1	Production Maximum Or Maximum Capacity (1)	Active	Multiple Shift Operation – Able to Meet Unique Requirements or Staffing to Meet Maximum Production for Capability (2)
2	Intermediate/Extended Production or Intermediate/Extended Capacity (1)		Two-Shift Operation or Staffing to Meet Intermediate Production Level (3)
3	Production Minimum Or Minimal Capacity (1)		Single-Shift Operation – Able to Meet Typical Requirements or Staffing to Meet Minimum Production Capability
4	Standby – Core Test and Maintenance Crew Only	Inactive - Standby	Core Test and Maintenance Personnel Only
5	Standby – Core Maintenance Crew Only		Core Maintenance Personnel Only
6	Dormant or Mothballed	Inactive - Mothballed	No Dedicated Personnel – Keeping Track of Core Personnel
7	Dispositioned or Divested	Inactive - Abandoned	No Dedicated Personnel
		Dispositioned	

(1) CORL names are synonymous.

(2) May be less than three-shift operation.

(3) Approximate midpoint between CORL 1 and CORL 3.

## F.2 CORL DETAILED DEFINITIONS

Tables F-1 through F-7 provide detailed information for CORLs 1 through 7, respectively.

**Table F-1 Capability Operational Readiness Level 1**

#	Capability Operational Readiness Level		Asset/Facility Status		Personnel Status	
1	Production Maximum or Maximum Capacity	Ability to (one or more may apply): - Prepare, test, and operate at maximum capacity. - Provide multiple shift operations (up to three). - Utilize multiple test positions simultaneously at different stages of preparation and testing.	Active	Utilization: - For specific current program, near-term program, or institutional requirement. - For reimbursable work as part of an agreement (e.g., Interagency, Space Act).  Maintenance: - Fully maintained operational and safe; all preventive maintenance is performed. - Corrective maintenance is performed for safety.  Storage: - Equipment not prepared for long-term storage.	Multiple Shift Operation – Able to Meet Unique Requirements or Staffing to Meet Maximum Production for Capability	Sufficient personnel (e.g., test crew) available to: - Prepare for and perform tests and operations. - Perform preventive and corrective maintenance. - Support up to three shifts and/or multiple test positions OR support maximum production for capability.  Training and Certification: - Assigned personnel adequately trained and possess required certifications.

**Table F-2 Capability Operational Readiness Level 2**

#	Capability Operational Readiness Level		Asset/Facility Status		Personnel Status	
2	Intermediate /Extended Production or Intermediate /Extended Capacity	Ability to (one or more may apply): - Prepare, test, and operate. - Provide multiple shift operations (up to two). - Utilize multiple test positions simultaneously at different stages of preparation and testing.	Active	<p>Utilization:</p> <ul style="list-style-type: none"> <li>- For specific current program, near-term program, or institutional requirement.</li> <li>- For reimbursable work as part of an agreement (e.g., Interagency, Space Act).</li> </ul> <p>Maintenance:</p> <ul style="list-style-type: none"> <li>- Fully maintained operational and safe; all preventive maintenance is performed.</li> <li>- Corrective maintenance is performed for safety.</li> </ul> <p>Storage:</p> <ul style="list-style-type: none"> <li>- Equipment not prepared for long-term storage.</li> </ul>	Two-Shift Operation or Staffing to Meet Intermediate Production Level (3)	<p>Sufficient personnel available to:</p> <ul style="list-style-type: none"> <li>- Prepare and perform test and operations.</li> <li>- Perform preventive and corrective maintenance.</li> <li>- Support up to two shifts and/or multiple test positions OR support intermediate production level.</li> </ul> <p>Training and Certification:</p> <ul style="list-style-type: none"> <li>- Assigned personnel trained and possess required certifications.</li> </ul>

**Table F-3 Capability Operational Readiness Level 3**

#	Capability Operational Readiness Level		Asset/Facility Status		Personnel Status	
3	Production Minimum or Minimal Capacity	Ability to (one or more may apply): - Prepare, test, and operate using minimally required resources. - Provide one shift operation only with routine hardware/configuration. - Utilize only one test position when it is possible to simultaneously use several (possibly at different stages of preparation and testing).	Active	Utilization: - For a specific current program, near-term program, or institutional requirement. - For reimbursable work as part of an agreement (e.g., Interagency, Space Act).  Maintenance: - Fully maintained operational and safe; all preventive maintenance is performed. - Corrective maintenance is performed for safety.  Storage: - Equipment not prepared for long-term storage.	Single Shift Operation – Able to Meet Typical Requirements  or  Staffing to Meet Minimum Production Capability	Sufficient personnel available to: - Perform minimal test and operations. - Prepare for typical/routine tests or operations. - Perform preventive and corrective maintenance. - Ability to augment and train staff to achieve higher CORL. - Support one shift and/or one test position OR support minimum production for capability.  Training and Certification: - Assigned personnel trained and possess required certifications.

**Table F-4 Capability Operational Readiness Level 4**

#	Capability Operational Readiness Level		Asset/Facility Status		Personnel Status	
4	Standby – Core Test and Maintenance Crew Only	<p>Personnel able to:</p> <ul style="list-style-type: none"> <li>- Perform preventive and corrective maintenance (personnel may be assigned to maintain multiple assets/facilities).</li> <li>- Augment and train additional personnel to achieve sufficient staff for operations and testing (CORL 1, 2, 3).</li> </ul> <p>Personnel unable to:</p> <ul style="list-style-type: none"> <li>- Prepare, test, and operate due to insufficient staff.</li> <li>- Personnel with “core” operational knowledge have primary duty to perform preventive and corrective maintenance.</li> </ul>	Inactive - Standby	<p>Utilization:</p> <ul style="list-style-type: none"> <li>- Temporarily not in use.</li> <li>- Will potentially be used to meet specific near-term or future program and/or institutional requirements.</li> </ul> <p>Maintenance:</p> <ul style="list-style-type: none"> <li>- Minimal preventive maintenance performed to maintain availability for test and/or operations.</li> <li>- Center or CP manager approved preventive maintenance to maintain essential systems in a state of availability for future use.</li> <li>- Minimal corrective maintenance performed for safety.</li> </ul> <p>Storage:</p> <ul style="list-style-type: none"> <li>- Equipment not prepared for long-term storage.</li> </ul>	Core Test and Maintenance Personnel Only	<p>Minimal “core” personnel available to:</p> <ul style="list-style-type: none"> <li>- Perform required approved preventive and corrective maintenance.</li> <li>- Maintain sufficient knowledge and experience to maintain and operate.</li> <li>- Augment and train staff to achieve CORL 1, 2, 3.</li> <li>- Maintain and utilize equipment to ensure continued operability and ability to return to “Active” status (CORL 1, 2, 3).</li> </ul>

**Table F-5 Capability Operational Readiness Level 5**

#	Capability Operational Readiness Level		Asset/Facility Status		Personnel Status	
5	Standby – Core Maintenance Crew Only	<p>Personnel able to:</p> <ul style="list-style-type: none"> <li>- Perform preventive and corrective maintenance (personnel may be assigned to maintain multiple assets/facilities).</li> </ul> <p>Personnel unable to:</p> <ul style="list-style-type: none"> <li>- Prepare, test, and operate due to insufficient staff.</li> <li>- Train additional personnel for higher CORLs.</li> <li>- Staff may not possess right mix of “core” operational knowledge.</li> </ul>	Inactive - Standby	<p>Utilization:</p> <ul style="list-style-type: none"> <li>- Temporarily not in use.</li> <li>- Will potentially be used to meet specific near-term or future program and/or institutional requirements.</li> </ul> <p>Maintenance:</p> <ul style="list-style-type: none"> <li>- Minimal preventive maintenance performed to maintain availability for testing and/or operations.</li> <li>- Center or CP manager approved preventive maintenance measures to maintain essential systems in a state of availability for future use.</li> <li>- Minimal corrective maintenance performed for safety.</li> </ul> <p>Storage:</p> <ul style="list-style-type: none"> <li>- Equipment not prepared for long-term storage.</li> </ul>	Core Maintenance Personnel Only	<p>Minimal “core” personnel available to:</p> <ul style="list-style-type: none"> <li>- Perform approved preventive and corrective maintenance.</li> <li>- Maintain and utilize equipment to ensure continued operability and ability to return to “Active” status (CORL 1, 2, 3).</li> </ul>

**Table F-6 Capability Operational Readiness Level 6**

#	Capability Operational Readiness Level		Asset/Facility Status		Personnel Status	
6	Dormant or Mothballed	<ul style="list-style-type: none"> <li>- Asset/facility deactivated, personnel reassigned.</li> <li>- No near-term program requirements.</li> <li>- Future requirements identified and/or capability retained to mitigate national and Agency-level risks.</li> </ul>	Inactive - Mothballed	<p>Utilization:</p> <ul style="list-style-type: none"> <li>- Deactivated.</li> <li>- No near-term program requirements.</li> <li>- Future requirements identified and/or the asset/facility maintained to mitigate national and Agency-level risks.</li> </ul> <p>Maintenance:</p> <ul style="list-style-type: none"> <li>- Center or CP manager approved preventive maintenance to prevent deterioration of essential systems or placed in protective storage.</li> <li>- Minimal corrective maintenance performed for safety.</li> <li>- Other corrective maintenance performed with Center approval.</li> </ul> <p>Storage:</p> <ul style="list-style-type: none"> <li>- Utility systems, collateral equipment shut down and prepared for long-term inactivity to prevent significant deterioration.</li> <li>- Selected systems (e.g., cathodic protection systems) kept in operation and inspected.</li> </ul>	No Dedicated Personnel – Keeping Track of Core Personnel	<p>No Dedicated Personnel:</p> <ul style="list-style-type: none"> <li>- All personnel reassigned.</li> <li>- Personnel available only on part-time basis for preventive and corrective maintenance.</li> <li>- Center management tracks core personnel to reconstitute capability when and if needed.</li> </ul>

			<ul style="list-style-type: none"><li>- Interior environmental controls operating to prevent significant deterioration.</li><li>- Exterior envelope inspected on planned basis, work performed as needed to maintain integrity of exterior shell.</li><li>- In consultation with Center Environmental staff, hazardous materials identified and removed where appropriate.</li></ul>	
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**Table F-7 Capability Operational Readiness Level 7**

#	Capability Operational Readiness Level		Asset/Facility Status		Personnel Status	
7	Dispositioned or Divested	<ul style="list-style-type: none"> <li>- Deactivated, personnel are reassigned.</li> <li>- No near-term and future program requirements.</li> </ul>	<p>Inactive - Abandoned</p> <hr style="border-top: 1px dashed black;"/> <p>Dispositioned</p>	<p>Utilization:</p> <ul style="list-style-type: none"> <li>- Deactivated.</li> <li>- No plans for future reactivation.</li> <li>- No near-term and future program requirements.</li> </ul> <p>General:</p> <ul style="list-style-type: none"> <li>- Asset/facility systems and collateral equipment considered for excess and/or identified for use at other NASA locations.</li> <li>- Abandoned is an interim, temporary state used when it is not possible (e.g., resources not available, asset/facility integrated into a larger complex) or advantageous to “disposition” the asset/facility via the following - public benefit conveyance, Federal transfer, sale, lease termination, lease expiration, and demolition.</li> </ul> <p>Maintenance:</p>	No Dedicated Personnel	<p>No Dedicated Personnel:</p> <ul style="list-style-type: none"> <li>- All personnel reassigned.</li> <li>- Personnel available only on task-order basis for preventive and corrective maintenance (for safety only).</li> </ul>

			<ul style="list-style-type: none"> <li>- Asset/facility is in condition in which it has been “walked away from.”</li> <li>- Preventive and corrective maintenance ceased for all asset/facility systems, subsystems, equipment, and components (except for safety).</li> </ul> <p>Storage:</p> <ul style="list-style-type: none"> <li>- Utilities secured and disconnected at first service equipment location outside facility.</li> <li>- Asset/facility secured to prevent pilfering of economically salvageable materials.</li> <li>- In consultation with Center Environmental staff, hazardous materials identified and removed where appropriate.</li> </ul>	
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## Appendix G. Review Entrance and Success Criteria

**Table G-1 Stage Transition Review for Strategic Management (STR-SM) Entrance and Success Criteria**

Entrance Criteria	Success Criteria
<ol style="list-style-type: none"> <li>1. The CP has successfully completed all establishment activities which have been documented in the CPCA. The CPCA is at an acceptable level of maturity and has been distributed to key stakeholders (Sponsoring MDAA, Participating MDAA's, Centers with components, and/or control or advisory boards if stood up) with adequate time to review. All stakeholder-identified gaps and areas needing further detail have a plan to address them in a timely manner.</li> <li>2. A preliminary STR-SM agenda, success criteria, and instructions have been agreed to by the Sponsoring MDAA, CP Manager, and control or advisory board (if stood up) prior to the STR-SM.</li> <li>3. All planned reviews prior to STR-Strategic Management have been conducted. Examples include MD-sponsored review (e.g., DPMC) and control or advisory board reviews. All identified actions have been addressed or there is a plan to address them.</li> </ol>	<ol style="list-style-type: none"> <li>1. The CP goals, objectives and their linkage with Agency and MD goals and objectives have been defined. Sufficient rational and evidence is provided that Agency goals and objectives are more likely to be successful through strategic and centralized management of the scoped capability. (CPCA, Section 1)</li> <li>2. The CP domain, parameters defining the CP scope, and list of products and services to be delivered by the CP have been adequately defined. A list of capability components and enabling infrastructure is defined that includes participating Centers and external partners. (CPCA, Section 2)</li> <li>3. An initial strategy for achieving the CP's goals and objectives is defined. An initial direction and approach for evolving the CP is defined. (CPCA, Section 3)</li> <li>4. The CP's governance and management structure is defined. The decision-making authority and thresholds are defined for different roles (MSC Chair, Sponsoring MDAA, CP Manager, CD). (CPCA, Section 4)</li> <li>5. Initial CP performance metrics with goals and targets needed to achieve the objectives are defined. (CPCA, Section 5)</li> <li>6. An approach to annually secure funding for the CP and its capability components is defined. (CPCA, Section 6)</li> <li>7. An approach for continuous evaluation of CP performance, effectiveness, and alignment with Agency goals and objectives is defined. (CPCA, Section 11)</li> <li>8. To-be-determined (TBD) and to-be-resolved (TBR) items are clearly</li> </ol>

	<p>identified with acceptable plans and schedules for their disposition.</p> <p>9. An initial approach for verifying compliance with Agency decision-making processes related to the CP is defined. Examples of decision-making processes include investments to existing capabilities and developing new capability components.</p> <p>10. Lessons Learned from other CPs have been identified and leveraged.</p>
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**Table G-2 Stage Transition Review for Termination (STR-T) Entrance and Success Criteria**

<b>Entrance Criteria</b>	<b>Success Criteria</b>
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<ol style="list-style-type: none"> <li>1. A preliminary STR-T agenda, success criteria, and instructions have been agreed to by the Sponsoring MDAA, CP Manager, and control or advisory board prior to the STR.</li> <li>2. A summary that includes the triggers and circumstances for possible CP termination is available for review. This could include 1) inability to meet CP goals and objectives, 2) insufficient value achieved through CP activities, and 3) changes in program/project needs for products and services.</li> <li>3. An analysis of the options for continued operation and termination is available for review. The analysis includes costs, benefits, risks, and other elements based on the CP.</li> <li>4. A preliminary list of corrective actions if the CP is approved for continued operation is available for review. Draft plans and schedules are provided with each corrective action.</li> <li>5. A draft termination strategy and plan is available for review. This includes recommendations for an alternate management strategy and responsibilities, and recommendations for reallocation of</li> </ol>	<ol style="list-style-type: none"> <li>1. If determined that the CP meets Agency needs and should continue: <ol style="list-style-type: none"> <li>a. Sufficient rational and evidence is provided that Agency goals and objectives are more likely to be successful through continued operation.</li> <li>b. Corrective actions are clearly identified with acceptable plans and schedules.</li> <li>c. Sufficient evidence is provided that once corrective actions are completed the CP will deliver greater value, quality, and/or timeliness (than if it did not exist) to programs and projects for needed testing services.</li> <li>d. Sufficient evidence is provided that if the CP were terminated there would be a significant impact on delivery of testing services.</li> </ol> </li> <li>2. If determined that the CP does not meet Agency needs and should not continue: <ol style="list-style-type: none"> <li>a. There is an approach and schedule for finalizing the termination strategy and plan.</li> <li>b. A date is established for the Sponsoring MDAA to provide a closeout summary to the MSC Chair.</li> </ol> </li> </ol>
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<p>resources (personnel and funding) directly managed by the CP.</p> <ol style="list-style-type: none"> <li>6. A summary is available and ready to be reviewed that includes 1) progress in achieving CP goals and objectives, 2) programs/projects supported through delivered products and services, 3) effectiveness of Agency decision making processes that evolve Agency capability (scope and domain), and 4) progress (against established plan) in evolving capability to align with current and future needs and requirements (domain).</li> <li>7. Existing CP management documents (CPCA, CPMP, CPSDP, and AMP Framework Plan) are available for review.</li> <li>8. The total cost for sustaining the capability portfolio is available for previous years and an estimate is provided for future years. This includes a breakdown for CP office and capability components. Contribution by funding source is provided to achieve annual sustainment.</li> <li>9. A summary of past utilization and future demand is available for review.</li> <li>10. Trending of performance is available.</li> </ol>	
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**Table G-3 Capability Implementation Review (CIR) Entrance and Success Criteria**

Entrance Criteria	Success Criteria <sup>20</sup>
<ol style="list-style-type: none"> <li>1. A preliminary CIR agenda, success criteria, and instructions have been agreed to by the Sponsoring MDAA, CP Manager, and control or advisory board (if stood up) prior to the CIR.</li> <li>2. A summary is available and ready to be reviewed that includes 1) progress in achieving CP goals and objectives, 2) programs/projects supported through delivered products and services, 3)</li> </ol>	<ol style="list-style-type: none"> <li>1. The CP meets Agency needs and should continue. Sufficient rationale and evidence is provided that Agency goals and objectives are more likely to be successful through strategic and centralized management of the scoped capability.</li> <li>2. The continued operation of the CP provided greater value, quality, and/or timeliness to programs and projects for needed testing services. If the CP were</li> </ol>

<sup>20</sup> The MSC Chair determines if a STR-T is warranted when success criteria is not sufficiently met.

<p>effectiveness of agency decision making processes that evolve agency capability (scope and domain), and 4) progress (against established plan) in evolving capability to align with current and future needs and requirements (domain). The timeframe for this summary is since STR for establishment or the last CIR.</p> <ol style="list-style-type: none"> <li>3. The CPCA, CPMP, CPSDP, and AMP Framework Plan are at an acceptable level of maturity and ready for review.</li> <li>4. The total cost for sustaining the capability portfolio is available for previous years and an estimate is provided for future years. This includes a breakdown for CP office and capability components. Contribution by funding source is provided to achieve annual sustainment.</li> <li>5. A summary of past utilization and future demand is available for review.</li> <li>6. Trending of performance is available.</li> <li>7. A summary of technical and managerial trends in government, industry, and academia is available for review. This includes risks and opportunities for NASA programs and projects in acquiring needed products and services.</li> </ol>	<p>terminated, there would be a significant impact on delivery of testing services.</p> <ol style="list-style-type: none"> <li>3. The CP strategy and approach align with and leverages trends in government, industry, and academia.</li> <li>4. Adequate progress has been made relative to plans.</li> <li>5. The CP has a plan to actively manage the portfolio to meet future demand from programs and projects at an acceptable level of Agency capacity.</li> </ol>
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**Table G-4 Capability Change Review (CCR) Entrance and Success Criteria**

Entrance Criteria	Success Criteria
<ol style="list-style-type: none"> <li>1. A preliminary CCR agenda, success criteria, and instructions have been agreed to by the Sponsoring MDAA, CP Manager, and control or advisory board prior to the CCR.</li> <li>2. A summary of proposed changes and the rationale is available for review.</li> <li>3. An analysis of the options (change, status quo) is available for review. The analysis includes costs, benefits, risks, and other elements based on the CP.</li> </ol>	<ol style="list-style-type: none"> <li>1. Sufficient rationale and evidence is provided that Agency goals and objectives are more likely to be successful through the recommended change.</li> <li>2. There is an approach for finalizing the change. Key actions are clearly identified with acceptable plans and schedules.</li> </ol>

## **Appendix H. References**

### **G.1 Compliance**

NASA Mission Directorates and Centers are required to comply with all applicable Agency directives, including but not limited to those listed in this appendix.

- a. The documents listed in this appendix are provided as a guide to help determine the requirements for CPM that are imposed outside this document.
- b. Relevant directives not cited in this document should be identified in Center processes and practices.
- c. Similarly, not all related references or other resources for CPM are identified.

### **G.2 NASA Policy Documents**

- a. NPD 1000.5, Policy for NASA Acquisition.
- b. NAII 1050.1, Space Act Agreements Guide.
- c. NPD 1200.1, NASA Internal Control.
- d. NPD 2800.1, Managing Information Technology.
- e. NPD 2810.1, NASA Information Security Policy.
- f. NPR 7120 .5, NASA Space Flight Program and Project Management Requirements.
- g. NPR 7120.7, NASA Information Technology and Institutional Infrastructure Program and Project Management Requirements.
- h. NPR 7120.8, NASA Research and Technology Program and Project Management Requirements.
- i. NPR 8000.4, Agency Risk Management Procedural Requirements.
- j. NPR 8800.15, Real Estate Management Program.
- k. NPR 8810.1, Center Master Planning.
- l. NPR 8820.2, Facility Project Requirements (FPR).
- m. NPR 8831.2, Facilities Maintenance and Operations Management.
- n. NPR 9090.1, Partnership Agreements – Financial Requirements and Administration.
- o. NPR 9420.1, Budget Formulation.

p. NPR 9470.1, Budget Execution.

### **G.3 NASA Handbooks**

a. NASA/SP-2014-3705, NASA Space Flight Program and Project Management Handbook.

## Appendix I. Program Management and Capability Portfolio Management Crosswalk

**Table J-1 Program Management and CPM Crosswalk**

<b>Crosswalk Item</b>	<b>NPR 7120.5</b>	<b>NID 8600.1</b>
<b>Decisional Meetings and Reviews</b>		
Significant Event with Decision	Key Decision Point (KDP)	Stage Transition Review (STR)
-	KDP 0 and KDP I	STR-Strategic Management (STR-SM)
-	Program Implementation Review (PIR) / KDP II to KDP n	Capability Implementation Review (CIR)
-	Termination Review	STR-Termination (STR-T)
<b>Management Documents</b>		
Authorization to Initiate Planning	Formulation Authorization Document (FAD)	No equivalent document; email record from the MSC Chair to Sponsoring MDAA approving the start of Establishment.
Governing Document / High-level Description	Program Commitment Agreement (PCA)	CP Commitment Agreement (CPCA)
Governing Document / Detailed Description	Program Plan	CP Management Plan (CPMP)
<b>Life Cycle</b>		
Life-cycle Delineation	Phase	Stage
-	Formulation	Establishment
-	Implementation	Strategic Management
-	Decommissioning/Disposal	Termination
<b>Organizational Construct</b>		
Portfolio of Agency Investments	Program	Capability Portfolio (CP)
Agency Investment	Project	Capability Components
Set of Processes and Tools	Program Management	Capability Portfolio Management
<b>Governance Councils</b>		
Agency Council	Agency Program Management Council (APMC)	Mission Support Council (MSC)
Directorate Council	Directorate Program Management Council (DPMC)	Directorate Program Management Council (DPMC) and Mission Support Program Management Council (MS-PMC)
<b>Management Hierarchy</b>		
Decision Authority	APMC Chair	MSC Chair

Agency Lead (multiple programs and multiple capability portfolios)	Mission Directorate Associate Administrator (MDAA)	Sponsoring MDAA
Lead	Program Manager	CP manager
Organizational Hierarchy	Mission Directorates (MDs)->Programs->Projects	Sponsoring MDs->CPs->Capability Components