Managing Spaceflight Programs and Projects
7120.5E Overview

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Topics

Key Principles

Tailoring

Governance Model and Checks and Balances

Separation of Authorities

Technical Authority

Categorization

Management Councils

Life Cycle

Independent Life Cycle Reviews

Standing Review Boards

Other 7120 Topics

Summary

Summary of Key Overarching Program/Project Management Principles

- Programs/projects are **managed based on a life-cycle** with **key decision points** before each phase supported by **life-cycle reviews** and evolving **principal documents** that govern the conduct of each phase
- Designated **Decision Authority** to decide transition through the life cycle with review by a **Governing Program Management Council**
- **Governance model provides** for **checks and balances** including**, separation of program and institutional authority, independent review,** and **dissenting opinion**

Tailoring is Expected

- It is NASA policy to **comply** with all prescribed requirements, directives, procedures, and processes **unless relief is** formally **granted** by the designated party.
- NASA policy also **recognizes the need to accommodate the unique aspects of each program or project** to achieve mission success in an efficient and economical manner.
- **Tailoring is the process used to adjust or seek relief** from a prescribed requirement to accommodate the specific needs of a task or activity (e.g., program or project).
- **Tailoring is both an expected and accepted** part of establishing the proper requirements for a program or project.

Examples of HEO Tailoring

OCE has collaborated with HEOMD programs to appropriately tailor, including:

- **LSP** – Program has been in implementation, operational phase for some time and tailored some control plans due to unique services contract nature of program. For example:
  - Schedule baseline - is the manifest approved by Flight Planning Board (FPP). The manifest serves as schedule baseline for mission development and launch support activities as well as the basis for detailed plans, schedules, and product deliveries by both the spacecraft developer and the launch services provider.

- **CCP** - Tailored Life Cycle Reviews to fit to nature of program and included several unique reviews scoped to the needs of CCP.

- **ESD -** Tailored life cycle definitions for GSDO, Orion, and SLS in Memorandum of Understanding; by clarifying that the analytical framework is through demonstration of first capability for each program.

Examples of Tailoring (continued)

- **SLS** - Leveraged JCL confidence level research for single project programs that are not managed as part of a portfolio, to inform decisions regarding appropriate baseline commitment thresholds in an evolving budget environment.

- **GSDO/SLS** - Combined SRR/SDR. Expedited overall review and KDP-B decision gate process by allowing for early technical review and integration into programmatic baseline informed by the most recent trade study and contractor information.

- **Orion** – Heritage products existed from CxP. Those products were mapped to 7120 product requirements eliminating duplicative documentation.

Agency Governance Model
Key Checks and Balances

- Separation of Authorities
- Technical Authority
- Dissenting Opinion Process
- Independent Life Cycle Review

Separation of Authorities

- NASA's separation of the roles for Programmatic and Institutional Authorities provides an organizational structure that emphasizes the Authorities' shared goal of mission success while taking advantage of the different perspectives each brings.

- The NASA governance structure is designed to provide organizational balances among these entities.

Separation of Authorities

Office of the Administrator

Programmatic Authority:

- Mission Directorates
- Programs
- Projects

Institutional Authority:

- Technical Authority:
  - Engineering
  - Safety & Mission Assurance
  - Health & Medical
- Mission Support:
  - Infrastructure
  - IT
  - Financial
  - Procurement
  - Etc.

Programmatic Authority resides with the Mission Directorates and their respective programs and projects

The Institutional Authority resides with Headquarters and associated Center organizations

Technical Authority

- Technical Authority is formally delegated and originates from the Administrator.
  - TA is delegated to the lowest level possible at the Centers
- Fundamental Aspects of Technical Authority
  - **Provide an independent view** of program/project activities.
  - Ensure **direction** to the program or **project reflects the view of the Center or**, where appropriate, **the view of the NASA Technical Authority community**
  - **Approve changes** to and **waivers** to all Technical Authority responsible requirements
  - The **Program/Project Manager remains responsible** for the safe conduct and successful outcome of the program/project in conformance with governing requirements.

Three Technical Authorities: Engineering, Safety and Mission Assurance, and Health and Medical

Space Flight Project Categorization

Priority Level	LCC < $250M	LCC from $250M to $1B	LCC > $1B, significant radioactive material, or human space flight
High	Category 2	Category 2	Category 1
Medium	Category 3	Category 2	Category 1
Low	Category 3	Category 2	Category 1

- Projects vary in scope and complexity and require varying levels of management requirements and Agency oversight.
- Project categorization defines Agency expectations of project managers by determining both the oversight council and the specific approval requirements.
- Provides guidance to tailor requirements to align with scope of project

Decision Authority and Governing Program Management Council

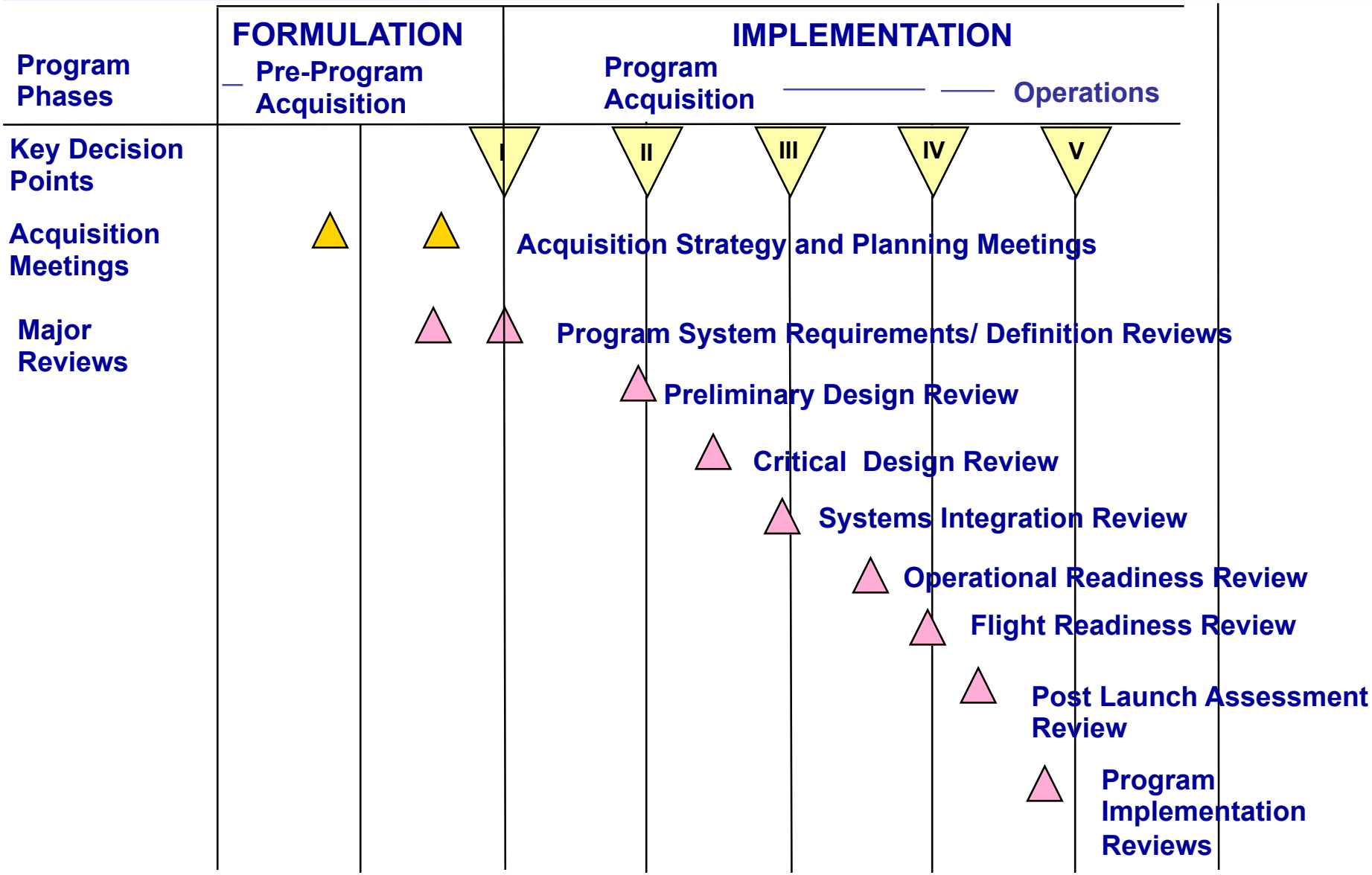
Program/Project	Decision Authority	Governing Program Management Council
Programs	NASA Associate Administrator	Agency Program Management Council
Category 1 Projects		
Category 2 Projects	Mission Directorate Associate Administrator	Mission Directorate Program Management Council
Category 3 Projects		

- Governing Program Management Council reviews programs/projects and provides Agency oversight
- Decision Authority decides on the readiness for next phase of the life cycle at Key Decision Points (KDPs).
- Center Management Council (CMC) has role in reviewing the programs/projects executed at their Center

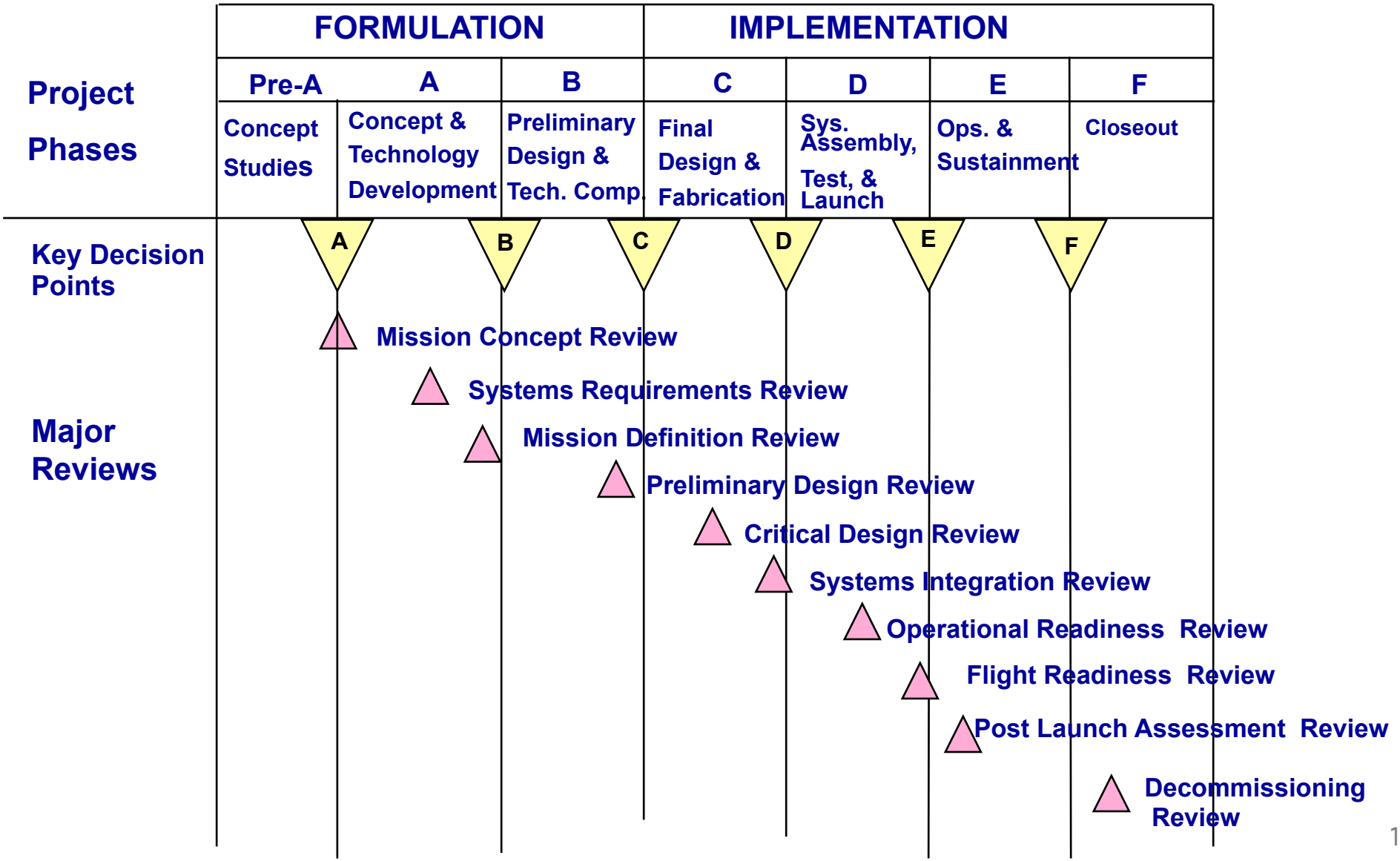
Program and Project Life Cycle

- Provides a uniform life cycle for human and robotic missions
  - Common process flow, uniform phases, and KDPs
  - Disciplined review structure for technical requirements and implementation plans
- 5 key elements in execution of the life cycle:
  - Key Decision Points
  - Required independent reviews
  - Required life cycle review gate products
  - GPMC and CMC roles in life cycle process
  - Decision Authority role as gatekeeper

Program Life Cycle Simplified

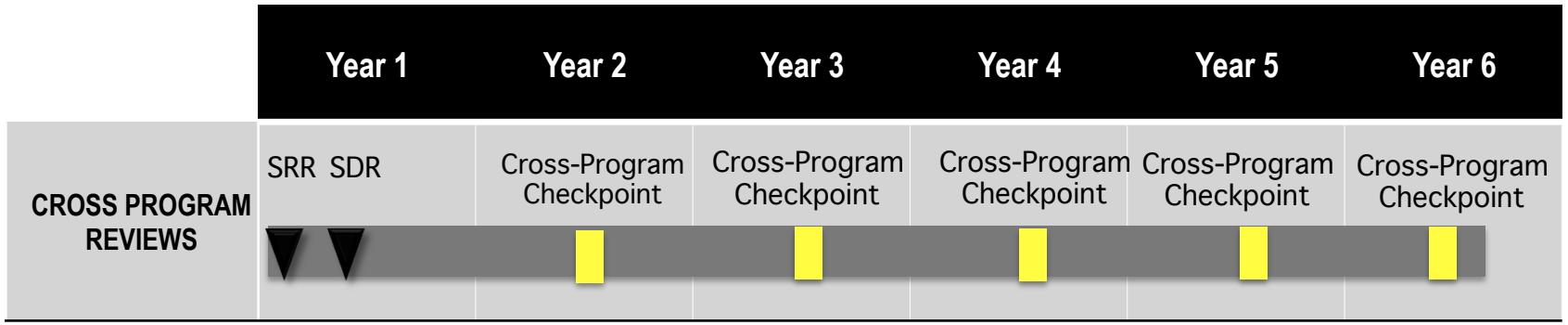


Space Flight Project Life Cycle Simplified



Examples of HEO ESD Tailored Life Cycle

- ESD has simplified the review process by conducting concurrent Programmatic and SRB reviews
- ESD has implemented Programs and over-laid a cross program function
- The cross program function has tailored 7120



Independent Life Cycle Review Process

- Convened by the Decision Authority, Mission Directorate Associate Administrator, Chief Engineer, Center Director, & Director Office of Evaluation
- Conducted by the Standing Review Board (SRB) – members independent of program/project
- Resulting recommendation presented to the Decision Authority
- Decision on readiness for next phase is made by the Decision Authority

Why Independent Life Cycle Reviews?

Provides:

- The program/project with a credible, objective assessment of how they are doing
- NASA senior management with an understanding of whether
  - The program/project is on the right track,
  - Is performing according to plan, and
  - Externally-imposed impediments to the program/project's success are being removed
- A credible basis for a decision to proceed into the next phase
  - Independent review also provides additional assurance to external stakeholders that NASA's basis for proceeding is sound.

Life Cycle Reviews and Standing Review Boards

- **NPR 7120.5 requires the use of a single, independent review team** called the Standing Review Board (SRB) to conduct certain LCRs
- The SRB process **integrates** the review requirements of **NPR 7120.5, NPR 7123.1**, NASA Systems Engineering Processes and Requirements, the Mission Directorate, and the Center into a single LCR set of requirements.
- The standing nature of SRBs (**SRBs stay with project thru lifecycle**) provides a strong advantage in terms of continuity and familiarity with the program's or project's purpose, history, programmatic and technical approach, challenges, risks, and issues.
- NASA accords special importance to maintaining the integrity of its independent review process.
  - **SRBs must conduct assessments free of bias** through a membership balanced in terms of knowledge, experience, and perspectives.
- SRBs are **not a substitution for proper oversight** by the project, program, MD and Center.

SRB Composition and Balance

- Factors considered for SRB membership are competency, currency, and independence (appropriately balanced)
  - **Competence.** Depth of knowledge in a particular discipline area. Includes project management, systems engineering, safety and mission assurance.
  - **Currency.** Recent discipline knowledge and experience including current policies and practices.
  - **Independence**. SRB members must be free of personal, organizational and positional conflicts of interest.
- SRB **members and consultants** to the board **can be selected from within the Agency and from external sources** including such communities as the Department of Defense, industry, academia, and other government agencies.
  - Balance in membership between NASA and external members important for quality of the assessment
- SRB **membership is approved by the Convening Authorities** for the LCR.

7120.5 Topics

- Introduction & Background
- Programmatic Hierarchy
- Types of Programs
- Project Categories
- Program and Project Life Cycles
- Key Decision Points and Decision Authority
- Governing and Center Management Councils
- Planning Templates
- Independent Life Cycle Reviews
- Seperation of Authorities
- Technical Authority
- Role of Center Director
- Dissenting Opinion
- Tailoring of Requirements and the Compliance Matrix
- Baseline Policy
- Joint Confidence Level
- Earned Value Management
- Formulation Agreement
- Maturity Matrix
- Threat Assessments
- Concluding Remarks

Summary

- 7120 establishes the requirements by which NASA formulates and implements space flight programs and projects
- 7120 provides consistency in requirements and is also designed to be tailored to the unique needs of NASA's programs and projects
- 7120 facilitates common understanding of how projects are implemented in a multi-center environment
- Tailoring is expected and encouraged
- Independent assessment of Life Cycle Reviews is an essential part of NASA's system of checks and balances
- Standing Review Boards are established to provide independent assessment throughout the life cycle of a program or a project
- Selecting competent, current, and independent membership is key to providing programs and projects with constructive recommendations