



PM and SRB Handbooks: A Hitchhiker's Guide to the Universe of NPR 7120.5E

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VPM Challenge - January 28, 2014



Introduction

- OCE requested NPR 7120.5E be streamlined to show “what” not “how”.
- Guidance for implementing NPR 7120.5E requirements (i.e., “the how”) was transitioned to the new NASA Space Flight Program and Project Management (PM) Handbook and an updated version of the Standing Review Board (SRB) Handbook.
 - New PM Handbook and updated SRB Handbook are currently on OCE Tab of NODIS: http://nodis3.gsfc.nasa.gov/OCE_rep/OCE_list.cfm
- This session will provide an overview of these Handbooks including Q&A time to address any questions.



NASA Space Flight Program and Project Management Handbook

Michael Blythe





PM Handbook Team

- **Core team members included:**
 - Michael Blythe, Team Lead
 - Linda Bromley, Robert Moreland, David Pye, Mark Saunders, Kathy Symons, and Linda Voss
- **OCE leadership provided by:**
 - Mike Ryschkewitsch, Sandra Smalley, Ellen Stigberg
- **Subject matter expertise contributed by:**
 - Sue Aleman, Omar Baez, Roger Galpin, Johanna Gunderson, Charles Hunt, Tupper Hyde, Ken Ledbetter, Jim Lawrence, David Liskowsky, Cynthia Lodge, John Lyver, Bryan O'Connor, James Ortiz, Eric Plumer, Anne Sweet, Richard Williams, Robert Woods, Mary Beth Zimmerman
- **Significant inputs and comments received from many others, including some of the best program and project managers, systems engineers, technical teams, procurement specialists, scientists, financial managers, and leadership within Agency.**



PM Handbook Contributors

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- **STI review and publication:** Darline Brown



Purpose of the PM Handbook

- PM Handbook envisioned as companion guidance document to support implementation of NPR 7120.5E requirements
 - Focus on what program or project manager needs to know
 - Provide context, rationale, and greater depth of detail
 - Provide guidance based on best practices, and concrete examples of successful approaches
 - Explore nuances and implications of requirements, for example, how Agency Baseline Commitment is developed and matured

PM handbook focuses on support to program and project managers in implementing requirements to enhance mission success



Our Approach

- PM Handbook structured as reference document to make it useful from perspective of practitioner.
- Rather than reading handbook as chronological narrative, program or project managers can go to specific chapter or section to learn about particular area of interest:
 - Chapter 3 focused on programs
 - Chapter 4 focused on projects
 - Each Chapter generally stands on its own
 - Some material common between programs and projects
 - Special topics covered in Chapter 5, e.g., Section 5.3 on the dissenting opinion process
- PM Handbook's goal - a balanced approach between incorporating everything program or project manager needs to know vs. referencing numerous other documents.



Value to Program/Project Manager

- Inclusive for program and project managers to go to one place to find (or find pointers to) what they need to implement NPR 7120.5E. For example:
 - Chapter 3 (programs) and Chapter 4 (projects) capture life cycle phase flow of activities including integrated perspective on what needs to be accomplished and which products are required when.
- Provides wealth of readily accessible information using over 160 figures, Tables, Highlight notes and Boxes that:
 - Provide content about fundamental principles
 - Illustrate complex concepts
 - Depict information in concise formats
- Contains some unique content, for example: the Roles and Responsibilities for PM Management in a table, NPR 7120.5E Requirements Rationale in a table, external reporting, the Federal budgeting cycle, and how to translate the WBS into the financial management system.
- Delves into greater levels of detail on 15 special topics important to program and project managers (Chapter 5).

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1.0 Introduction

- 2.0 High-Level Overview of Program and Project Management
- 3.0 Program Life Cycles, Oversight and Activities by Phase
- 4.0 Project Life Cycle, Oversight and Activities by Phase
- 5.0 Special Topics
 - 5.1 NASA Governance
 - 5.2 Technical Authority
 - 5.3 Dissenting Opinion Process
 - 5.4 Tailoring Requirements
 - 5.5 Maturing, Approving and Maintaining Program and Project Plans, Baselines and Commitments
 - 5.6 Cost and Schedule Analysis Work to Support Decisions
 - 5.7 Realistic Cost and Schedule Estimating and the JCL
 - 5.8 Federal Budgeting Process
 - 5.9 The WBS and Relationship to Agency Financial Processes
 - 5.10 Independent SRB and Life-Cycle Reviews
 - 5.11 Other Reviews
 - 5.12 External Reporting
 - 5.13 NASA Required and Recommended Leading Indicators
 - 5.14 EVM and Integrated Baseline Reviews
 - 5.15 Selecting and Certifying NASA Program and Project Managers

Appendices

- A Definitions
- B Acronyms
- C NPR 7120.5E Requirements Rationale
- D Roles and Responsibilities
- E Addressing the Six Assessment Criteria
- F Control Plan Description and Information Sources
- G References

- **Purpose of Handbook:**
 - Companion to NPR 7120.5E
 - Document Structure
 - How to use the Handbook

Additional margin text contains content about key concepts, including points of elucidation or emphasis on best practices as well as rationales or principles behind some of the requirements. In addition, can be

How to Use This Handbook

This handbook was structured as a reference document to make it useful from the perspective of the practitioner. The focus is on the activities a program or project manager needs to perform with context and explanation for the requirements. Rather than reading the handbook as a chronological narrative, the program or project manager can go to a specific section to learn about a particular area of interest, i.e., Section 5.3 on Dissenting Opinion...

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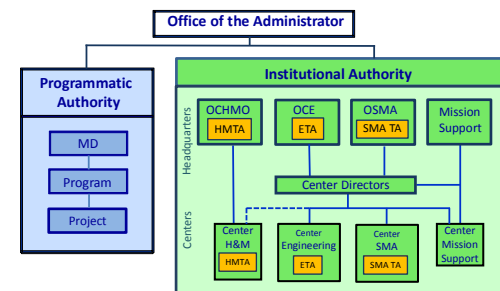
D Roles and Responsibilities

E Addressing the Six Assessment Criteria

F Control Plan Description and Information Sources

G References

- Definitions of program and project
- Project Life Cycle description
- Decision Authorities, Management Council, KDP Governance



TA = Technical Authority
OSMA = Office of Safety and Mission Assurance
OCE = Office of the Chief Engineer
OCHMO = Office of the Chief Health and Medical Officer

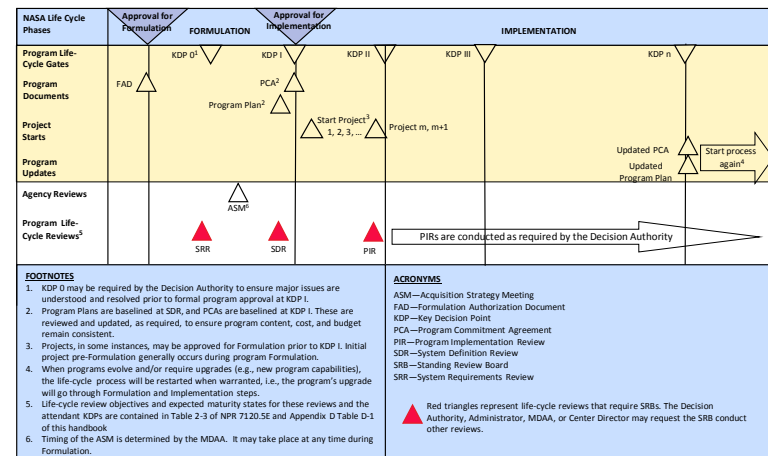
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- For **Programs** – Uncoupled, Loosely Coupled, Tightly Coupled and Single-Project
 - Life Cycle Figures
 - Reviews
 - Oversight and approval
 - DA and Management Councils
 - KDPs and BPRs
 - Decision Memorandum, Management Agreement and ABC
 - Activities during Formulation and Implementation
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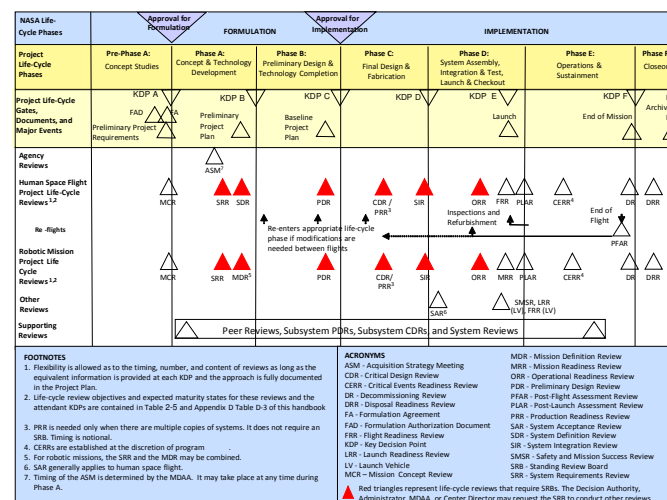
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- For Projects
 - Categorization
 - Life Cycle Figures
 - Reviews
 - Tailoring
 - Oversight and approval
 - DA and Management Councils
 - KDPs and BPRs
 - Activities during Pre-Phase A through Phase F
 - Documentation



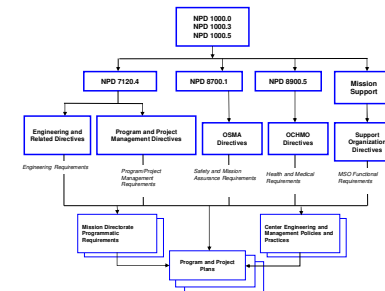
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- Requirements Hierarchy
- Programmatic Authority
- Institutional Authority



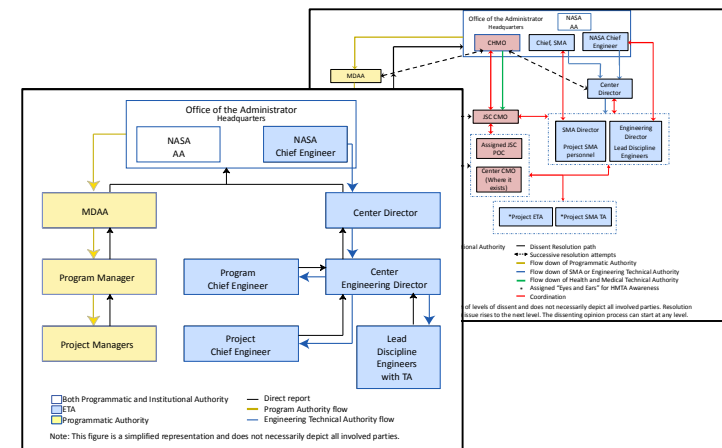
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- Technical Authority – Engineering, SMA and Health & Medical
- Origin
- Governance
- Roles and Responsibilities



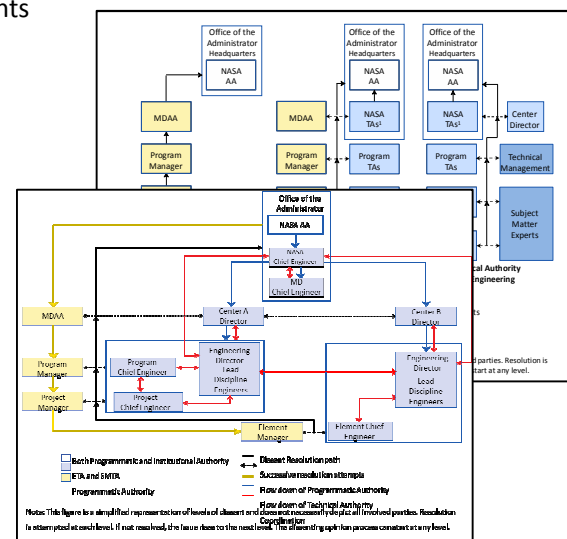
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- Definition
- Process
- Case Studies
- Responsibilities
- Notifications



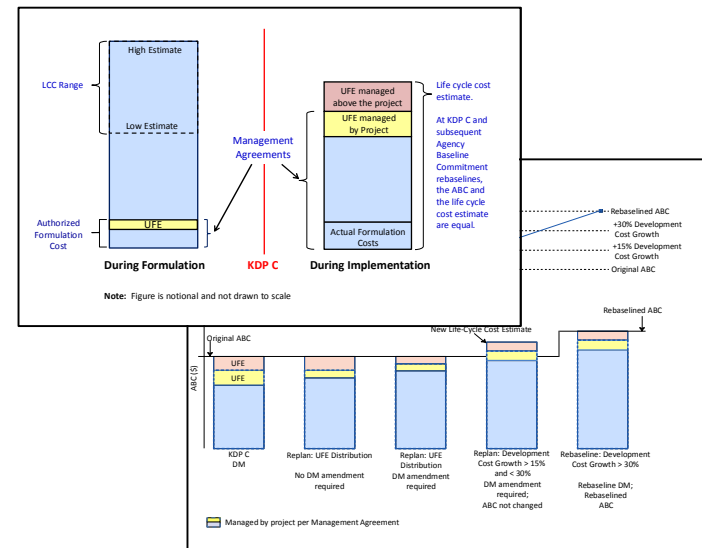
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- ABC
- Maturing LCC and schedule estimates
- Replanning and Rebaselining
- Decision memorandum
- Management Agreement
- Relationships of LCC, ABC, UFE and Management Agreement

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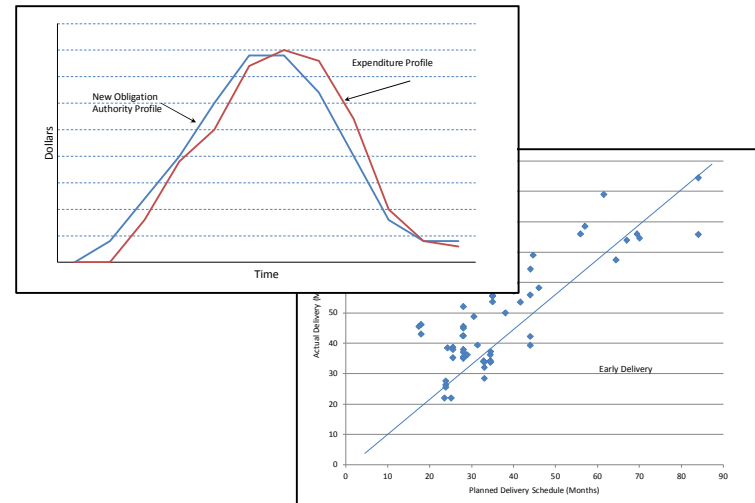
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- Cost and Schedule Estimates
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- CADRe
- Probabilistic Analysis of Cost and Schedule

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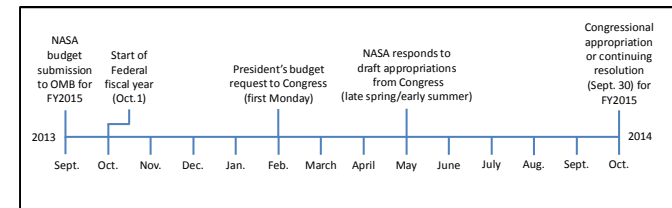
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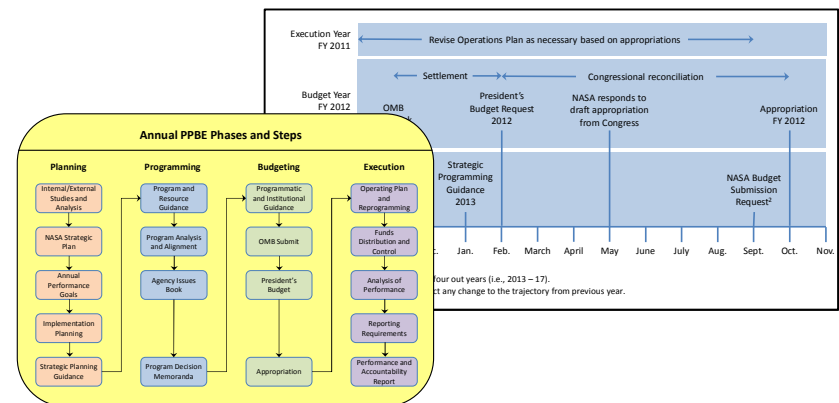
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- Federal Process
- NASA Interface
- OMB Passback
- PPBE Process
 - Planning
 - Programming
 - Budgeting
 - Execution
- Linkage to Life cycle
- Program/Project Involvement



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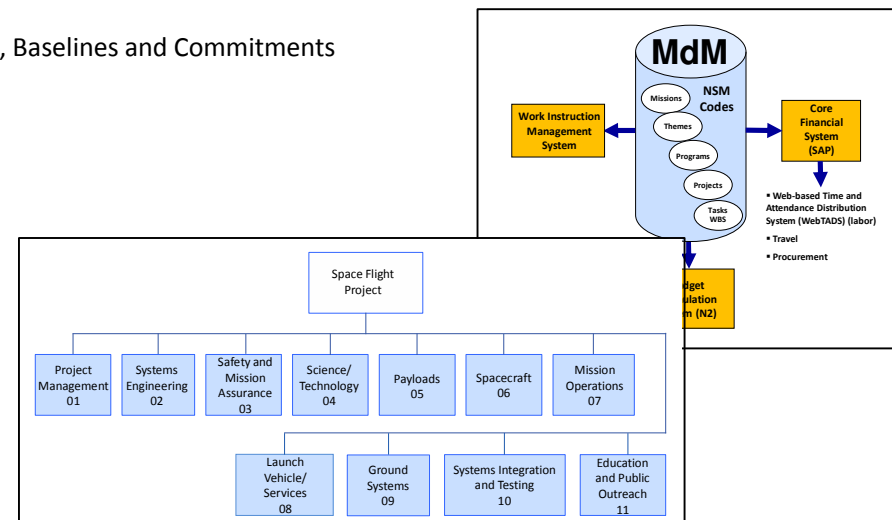
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- Standard WBS
- Standard WBS Dictionary
- Developing a Program WBS
- Developing a Project WBS
- The Metadata Manager System
- Examples



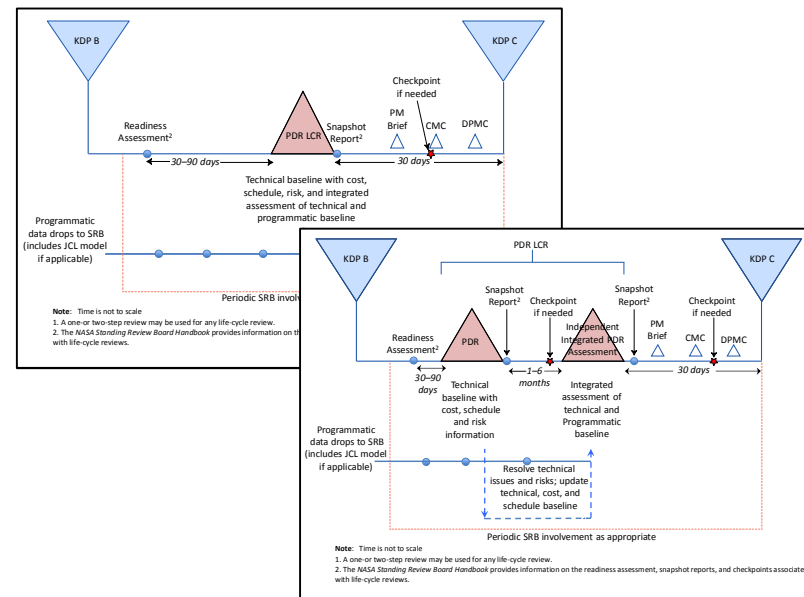
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- Overview
- SRB Role and Responsibilities
- TOR
- Life-cycle Reviews and Independent Assessment
- Type of Review: one- or two-Step
- Conducting and reporting results of Life-Cycle Reviews



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- Termination Review
- SMA Compliance/Verification Reviews
- PIR Guidance

Quality Audit, Assessment, and Review—This audit provides independent verification that each NASA Center, program, and

Safety and Mission Success Review (SMSR)—This review prepares Agency safety and engineering management to

Termination Review

There are a number of different ways a program or project can come to an end, but if a Decision Authority, MDAA, or Program Executive believes it may not be in the Government's best interest to continue funding a program or project, he or she can recommend a special Termination Review (presented to the governing PMC) to the Decision Authority. ...

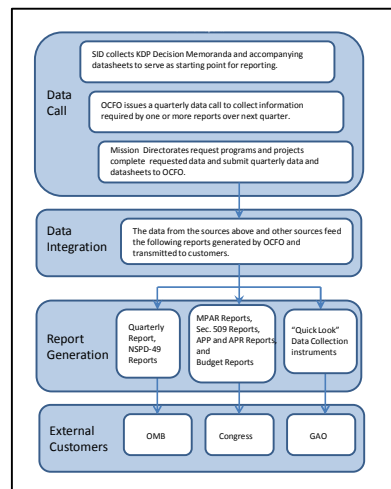
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- Conditions Leading to External Reporting
- Integrated Technical, Cost and Schedule data Collection and Reporting
- Major Cost and Schedule reports provided to Congress
- NASA Management and Use of Data
- Documentation

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Report Name	Report Component	Cost and Schedule Content	Technical Content	Sources of Data	Congress	OMB
Major Program Annual Report (MPAR) (Applicable to projects in Development with LCC > \$250 million)	Current Estimate (Annually with budget submission)	Current estimated cost and schedule after KDP C, with changes to baselines for LCC, development costs, key life cycle milestones and risks	Project purpose, major systems, contributions from participating partners, Center project management roles, acquisition strategy, risk management, with changes to risks and technical parameters	Datasheet, Quarterly Data Call	Annually (included in NASA's annual budget to Congress)	Review by OMB
	Baseline (KDP C)	(1) ABC at KDP C	Project purpose, major systems, contributions from participating partners, Center project management roles, acquisition strategy, risk management	(1) KDP C Decision Memorandum, (2) Datasheet, Quarterly Data Call for Contract Baseline	Annually (included in NASA's annual budget; if a project rebaselines, report may be required before next budget)	Review by OMB part of NSPD-49 submissions (see below)
NSPD-49 Report (Applicable to (1) projects in Development with LCC > \$250 million; (2) Projects in Formulation with	Current Estimate	(1) Same as MPAR (2) Contract values	None	Quarterly data call		Quarterly
	Baseline (1) KDP C	(1) Same as MPAR (2) None	(1) Same as MPAR (2) None	(1) KDP C DW & (2) None		(1) Quarterly following KDP C

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 - 5.13 **NASA Required and Recommended Leading Indicators**
 - 5.14 EVM and Integrated Baseline Reviews
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- Definition and application
- Gathering and reporting data
- Required Leading Indicators with examples
 - RID/RFA/AI Burndown
 - Mass Margin
 - Power Margin
- Other Leading Indicators and Resources

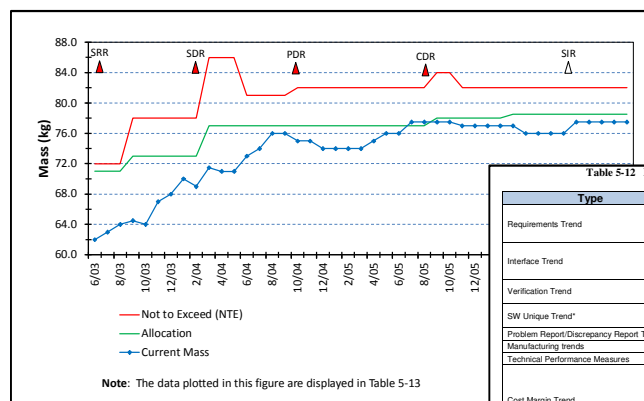


Table 5-12 Examples of Other Leading Indicator

Type	Indicator
Requirements Trend	% Requirement Growth
	TBD/TBR Burndown
	Pending Req. Changes
Interface Trend	% Interface Documentation Approve/Pending
	TBD/TBR Burndown
	Pending Interface Changes
Verification Trend	Verification Closure Burndown
	Number of Deviations/Waivers approved/open
SW Unique Trend*	Number of Requirements verified and validated per Build/Release vs plan
Problem Report/Discrepancy Report Trend	# Open/closed PRODs
Manufacturing Trends	# Nonconformance/Corrective Actions
Technical Performance Measures	Trend of Key Design/Performance Parameters
	Expenditure of LIFE
	Plan/actual
	EVM
Cost Margin Trend	NOA
	Burndown/Analysis of closing out threats and lens over time
	Critical Path Slack/Float
Schedule Margin Trend	Critical Milestone Slip
	Schedule Metrics
	EVM
Resource Trends	Number of Completed Key Milestones vs Plan
	ABC versus Actual Funded Level
Staffing Trend	Management Agreement versus Actual Funded Level
	FTE
	WVE

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- Overview
- Integrated Baseline Review
- EVM Performance Reporting

Margin Notes

An Integrated Baseline Review is not a pass/fail event, an independent review, a time to resolve technical issues, nor a demonstration of EVMS compliance, but a point on the path of a continuous analytical process.

The Performance Measurement Baseline is a time-phased cost plan for accomplishing all authorized work scope in a project's life cycle, which includes both M&A and production work.

For contracts and subcontracts valued from \$20 million to \$50 million, the EVMS shall be compliant with the guidelines in ANSI/EIA 748, but does not require validation. For contracts and subcontracts valued at \$50 million or more, the EVMS shall be compliant with the guidelines in ANSI/EIA 748, but does not require validation.

EVM requirements apply to NASA projects and contracts with development or production work when the estimated LCC is \$20 million or more. EVM requirements also apply to single-project programs and may, at the discretion of the Mission Directorate Associate Administrator (MDAA), apply to other projects and tightly coupled programs.

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- Selecting Program and Project Managers
- Certifying Program and Project Managers
- Agency Roles and Responsibilities
- Certification Process
- Resume and competency assessment
- Supervisory Endorsement
- Meeting and maintaining Certification Requirements

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Table 5-13 NASA Program and Project Management Competencies and Common Competencies

Project Proposal	Conceptualizing, analyzing, and defining program/project plans and requirements and using technical expertise to write, manage, and submit winning proposals. Also involves developing functional, physical, and operational architectures including life-cycle costing.
Requirements Development	Developing project requirements using functional analysis, decomposition, and allocation; finalizing requirements into the baseline; and managing requirements so that changes are minimal. Defining, developing, verifying, reviewing and managing changes to program/project requirements.
Acquisition Management	Developing, implementing, and monitoring acquisition strategies, procurement processes, contract activities, and approval requirements to support flight hardware/software or other project requirements.
Project Planning	Developing effective project management plans and technical integration of project elements for small, moderate, and complex projects including scope definition, schedule and resource estimation and allocation for all project phase activities from concept to launch and tracking.
Cost-Estimating	Developing credible cost estimates to support a variety of systems engineering trade studies, affordability analyses, strategic planning, capital investment decision-making, and budget preparation during project planning. Also, providing information for independent assessments as required.
Risk Management	Risk-Informed Decision Making (RIDM) for selection of program/project alternatives; Continuous Risk Management (CRM) for identifying, analyzing, planning, tracking, controlling, and communicating and documenting individual and aggregate risks for the purpose of meeting program/project objectives within stated risk tolerance levels.

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- Definitions of key words
- Definition of acronyms

Acquisition. The process for obtaining the systems, research, services, construction, and supplies that NASA needs to fulfill its missions. Acquisition—which may include procurement (contracting for products and services)—begins with an idea or proposal that aligns with the NASA Strategic Plan and fulfills an identified need and ends with the completion of the program or project or the final disposition of the product or service.

ABC	Agency Baseline Commitment
ACD	Architectural Control Document
AI&T	Assembly, Integration, and Test
ANSI/EIA	American National Standards Institute/Electronic Industries Alliance

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- Provides the rationale for each requirement in NPR 7120.5E

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Para #	Requirement Statement	Rationale for Requirement
1.1.2	NASA Centers, Mission Directorates, and other organizations that have programs or projects shall develop appropriate documentation to implement the requirements of this NPR.	NPRs typically cannot provide adequate Center or Mission Directorate policy, procedural requirements, or instructions, especially when a situation is unique to a particular Center or MD. So, Centers and MDs are required to develop flow-down requirements from this NPR.
1.1.3	The Mission Directorate shall submit their plan for phased tailoring of the requirements of this NPR within 60 days of the effective date of this NPR.	This NPR's requirements apply to existing program's and project's current and future phases as determined by the responsible Mission Directorate, approved by the NASA Chief Engineer (or as delegated), and concurred with by the Decision Authority. The Mission Directorate's plan for phased tailoring of the NPR's requirements is due within 60 days of the effective date of this NPR.
2.1.1	Regardless of the structure of a program or project meeting the criteria of Section P.2, this NPR shall apply to the full scope of the program or project and all the activities under it.	Large projects tend to divide their work into smaller "activities," elements, etc. and these must be managed according to <i>NPR 7120.5</i> even though they are not listed in a Program or Project Plan.
2.1.4.1	Projects are Category 1, 2, or 3 and shall be assigned to a category based initially on: (1) the project life-cycle cost (LCC) estimate, the	Projects vary in scope and complexity and thus require varying levels of management requirements and Agency attention and oversight. Project categorization defines

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• Provides a summary of the roles and responsibilities for key program and project management officials

Table D-1 Roles and Responsibilities Relationships Matrix

	Office of the Administrator	Administrator Staff and Mission Support Offices	Mission Directorate Associate Administrator	Center Director	
				Institutional	Technical Authority
Strategic Planning	Establish Agency strategic priorities and direction Approve Agency Strategic Plan and programmatic architecture, and top-level guidance Approve implementation plans developed by Mission Directorates	Lead development of Agency Strategic Plan Lead development of Annual Performance Plan	Support Agency strategic planning Develop directorate implementation plans and cross-directorate architecture plans consistent with Agency strategic plans, architecture, and top-level guidance	Support Agency and Mission Directorate strategic planning and supporting studies	
Program Initiation (FAD/ASM)	Approves programs and assigns them to MDs and Centers and validates partnerships Approve Acquisition Strategy	Approve Program Chief Engineers' (Technical Authority) (OCE) When applicable, approve program's approach to Health and Medical Technical Authority based on Center's HMTA infrastructure (OCHMO) Approves procurement strategy (AA for Procurement)	Implement new programs via FAD Recommend assignment of programs to Centers Approve appointment of Program Managers Approve Acquisition Strategy	Provide human and other resources to execute FAD Recommend Program Managers to MDAA Ensure Acquisition Strategy and the program's plans are executable	Appoint Program Chief Engineers and SMA TA (Technical Authority) in consultation with and after approval by OCE and OSMA, respectively Appoint Center Lead Discipline Engineers (LDE)

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For each KDP and associated life-cycle review provides specifics for addressing the six assessment criteria required to demonstrate that the program or project has met the expected maturity state

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Table E-1 Expected Maturity State Through the Life Cycle of Uncoupled and Loosely Coupled Programs

KDP Review	Associated LCR and LCR Objectives	Expected Maturity State by Assessment Criteria				
		Agency Strategic Goals	Management Approach	Technical Approach	Budget and Schedule	Resource Other Than Budget
KDP 01	SRR—To evaluate whether the program functional and performance requirements are properly formulated and correlated with the Agency and Mission Directorate strategic objectives; to assess the credibility of the program's estimated budget and schedule.	The program has merit and is within the Agency scope; program requirements reflect Mission Directorate requirements and constraints, and are approved.	Program Formulation Authorization Document (FAD) has been approved and a preliminary Program Plan is appropriately mature; the management framework is in place with key interfaces and partnerships identified; and preliminary acquisition strategy is defined.	Functional and performance requirements have been defined, and the requirements satisfy the Mission Directorate needs; a feasible set of program implementation options has been identified that broadly addresses the functional and performance requirements.	Credible risk-informed program implementation options exist that fit within desired schedule and available funding profile.	Preliminary staffing and essential infrastructure requirements have been identified and documented; preliminary sources have been identified.

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Provides a description of each type of Control Plan and has references for additional information

Control Plan	Description	For Additional Information
Technical, Schedule, and Cost Control Plan	Describes how the program/project plans to control program/project requirements, technical design, schedule, and cost to achieve its high-level requirements	<ul style="list-style-type: none"> • Section 3.3.3.5, 4.4.4.2.2, 4.4.6.2.2 and 4.5.3.2.2 of this handbook
Safety and Mission Assurance Plan	The SMA Plan addresses life cycle SMA functions and activities including SMA roles, responsibilities and relationships	<ul style="list-style-type: none"> • NPD 8730.5 & 8720.1 • NPR 8715.3, 8705.2, 8705.6 & 8735.2 • NASA Standards 8719.13 & 8739.8 • Section 3.3.4, 4.4.4.3 and 4.5.3.3 of this Handbook
Risk Management Plan	Summarizes how the program/project will implement the NASA risk management process in accordance	<ul style="list-style-type: none"> • Section 3.3.3.5 and 4.4.4.2.2 of this Handbook • NPR 8000.4
Acquisition Plan	This Plan documents an integrated acquisition strategy that enables the program/project to meet its mission objectives	<ul style="list-style-type: none"> • Section 3.3.3.5, 4.4.4.2.2 and 4.4.6.2.2 of this Handbook
Technology Development Plan	Describes the technology assessment, development, management, and acquisition strategies needed to achieve the program/project's mission objectives. Also describes how opportunities for leveraging ongoing technology efforts, transitioning technologies and commercialization plans	<ul style="list-style-type: none"> • NPD 7500.2 • NPR 7500.1 • Section 3.3.4 and 4.4.4.3 of this Handbook

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- Provides a list of references used in the handbook
 - External References
 - NPDs Referenced
 - NPRs Referenced
 - NASA Standards Referenced
 - Handbooks References

NPDs Referenced

The latest versions of these policy documents can be found in the NASA Online Directives Information System library at <http://nodis3.gsfc.nasa.gov>

NPD 1000.0, NASA Governance and Strategic Management Handbook

NPD 1000.5, Policy for NASA Acquisition

...

NPRs Referenced

NPR 1040.1, NASA Continuity of Operations (COOP) Planning Procedural Requirements

...



Examples of Detailed Content

- Overview of detail in Chapters 3 and 4
- Chapter 3: Example of Required Product Information
- Chapter 3: One- and Two-Step PDR Life-Cycle Review Overview
- Chapter 4: Example of Summary Flow of Activities Figure
- Chapter 4: Project Tailoring
- Chapter 4: Launch Approval and Transition to Operations
- Chapter 5 Special Topics and Information:
 - NASA Governance
 - Technical Authority
 - Dissenting Opinion Process
 - Maturing, Approving, and Maintaining Program and Project Plans, Baselines, and Commitments
 - Phases included in Defined Cost Terms



Chapters 3 and 4: Program and Project Life Cycles, Oversight, and Activities by Phase (1 of 2)

- These chapters provide detailed information on:
 - Program and project life cycles, phases, and reviews
 - Role of Standing Review Board, LCR assessment criteria, internal reviews leading to LCRs, and one-step and two-step LCRs
 - Agency oversight and approval for programs and projects, including Center and Agency level reviews leading to approval for life-cycle phase transitions:
 - Roles and responsibilities of Decision Authority, Management Councils (APMC, DPMC, CMC), and Center Director
 - Formulation Agreement
 - Key Decision Points and associated program or project expectations and potential outcomes
 - Decision Memorandum, Management Agreement, and Agency Baseline Commitment



Chapters 3 and 4: Program and Project Life Cycles, Oversight, and Activities by Phase (2 of 2)

- Detailed description of integrated flow of activities and products required by life-cycle phase:
 - Chapter 3 covers Formulation and Implementation and life-cycle phases across program types and activities unique to program types
 - Chapter 4 covers project Pre-Phase A through Phase F life-cycle phases
- Each life-cycle phase description includes:
 - Overview of phase's activities including objectives of associated LCRs
 - Detailed description of management, planning and control activities and products
 - Detailed description of technical activities and products
 - Guidance for completing phase and preparing for next phase, and reporting activities during phase



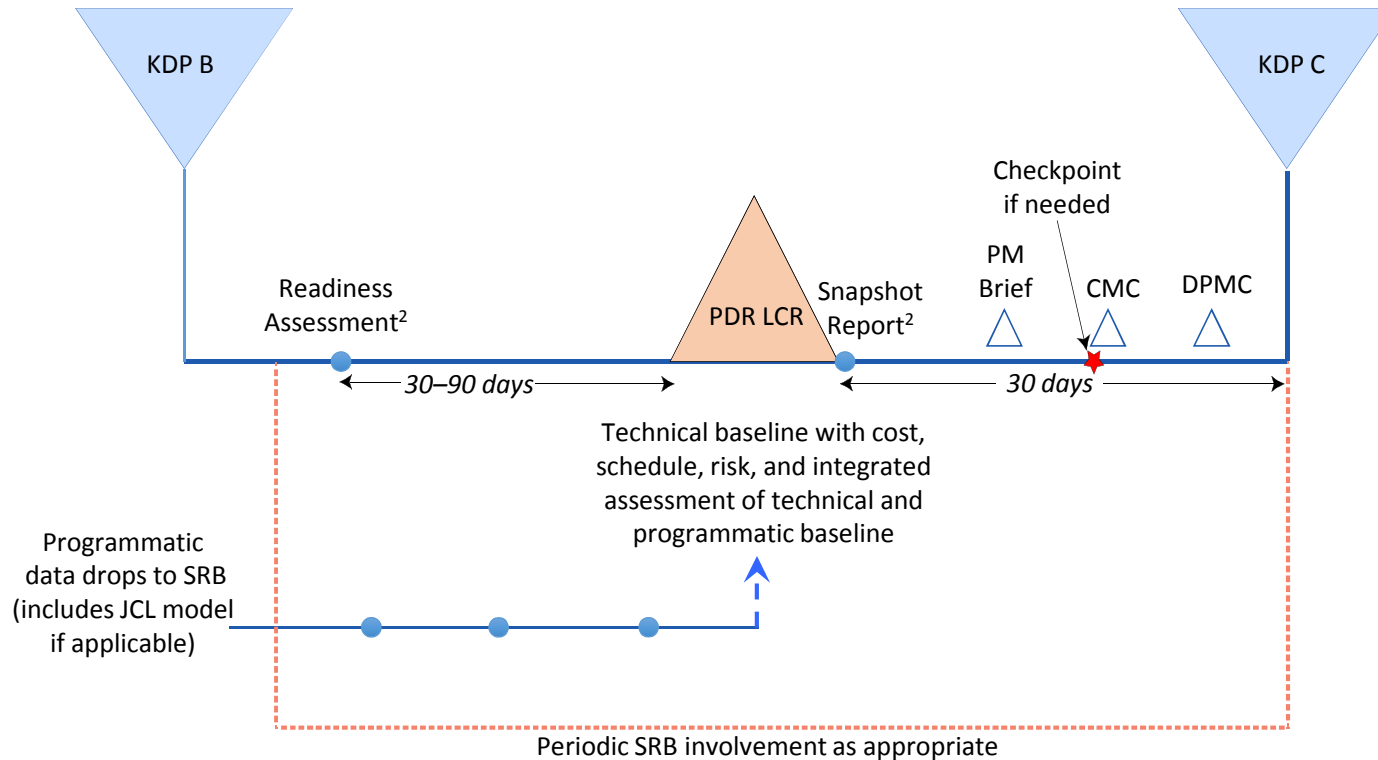
Chapter 3: Example of Required Product Information

- PM Handbook information for control plans and other products include:
 - Bold blue font indicating a required plan or product
 - Content to be included in plan or product
 - When plans are baselined or products are due for each program type
 - References to documents for additional detail, when applicable
 - Summary tables at the end of Chapter 3 that show when plans are baselined and updated, and when products are due.

“3.3.4 Technical Activities and Products

Loosely coupled, uncoupled, and tightly coupled programs develop a preliminary **Systems Engineering Management Plan (SEMP)** that includes the content required by *NPR 7123.1* by SRR and baseline the plan by SDR. Single-project programs baseline their plan at SRR to ensure....”

One-Step¹ PDR Life-Cycle Review Overview

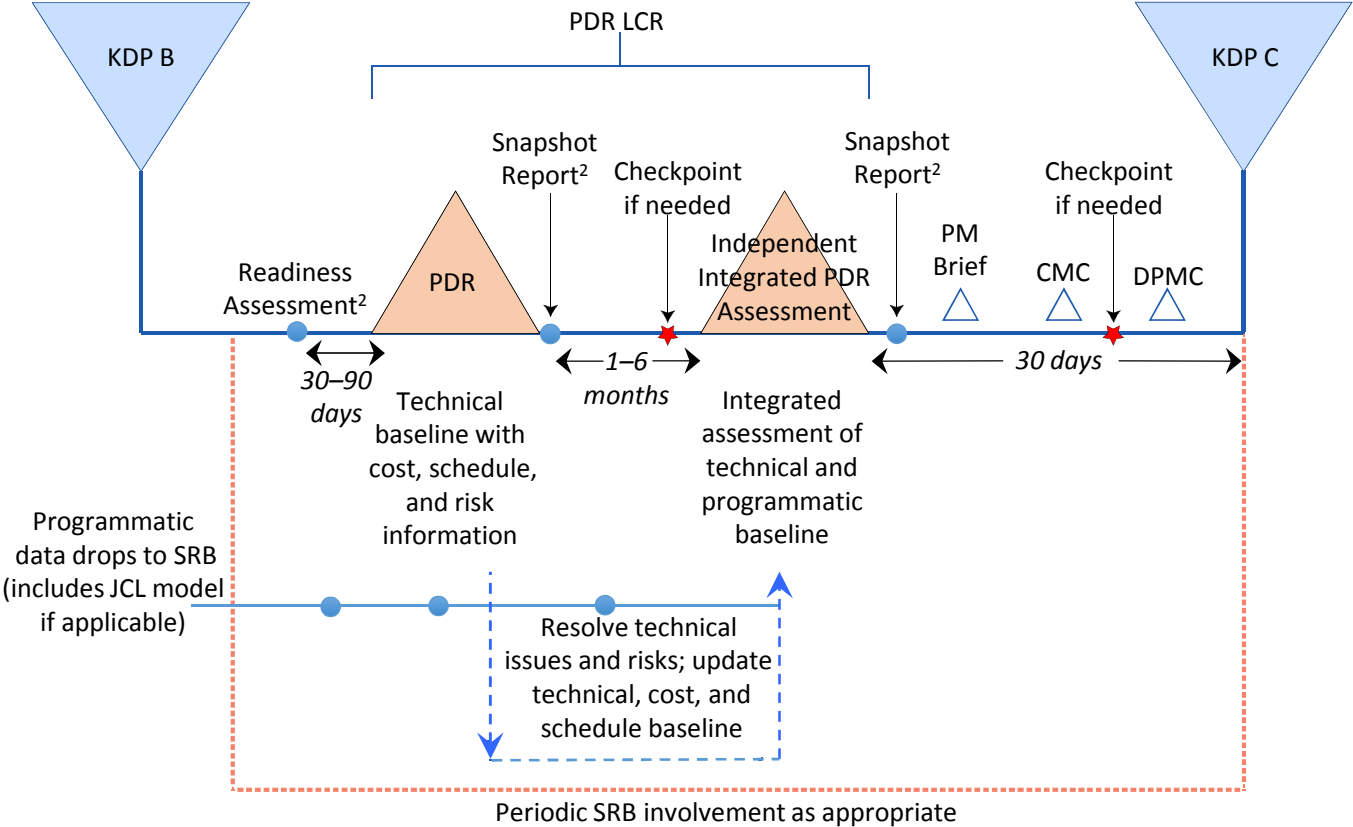


Note: Time is not to scale

1. A one- or two-step review may be used for any life-cycle review.

2. The *NASA Standing Review Board Handbook* provides information on the readiness assessment, snapshot reports, and checkpoints associated with life-cycle reviews.

Two-Step¹ PDR Life-Cycle Review Overview



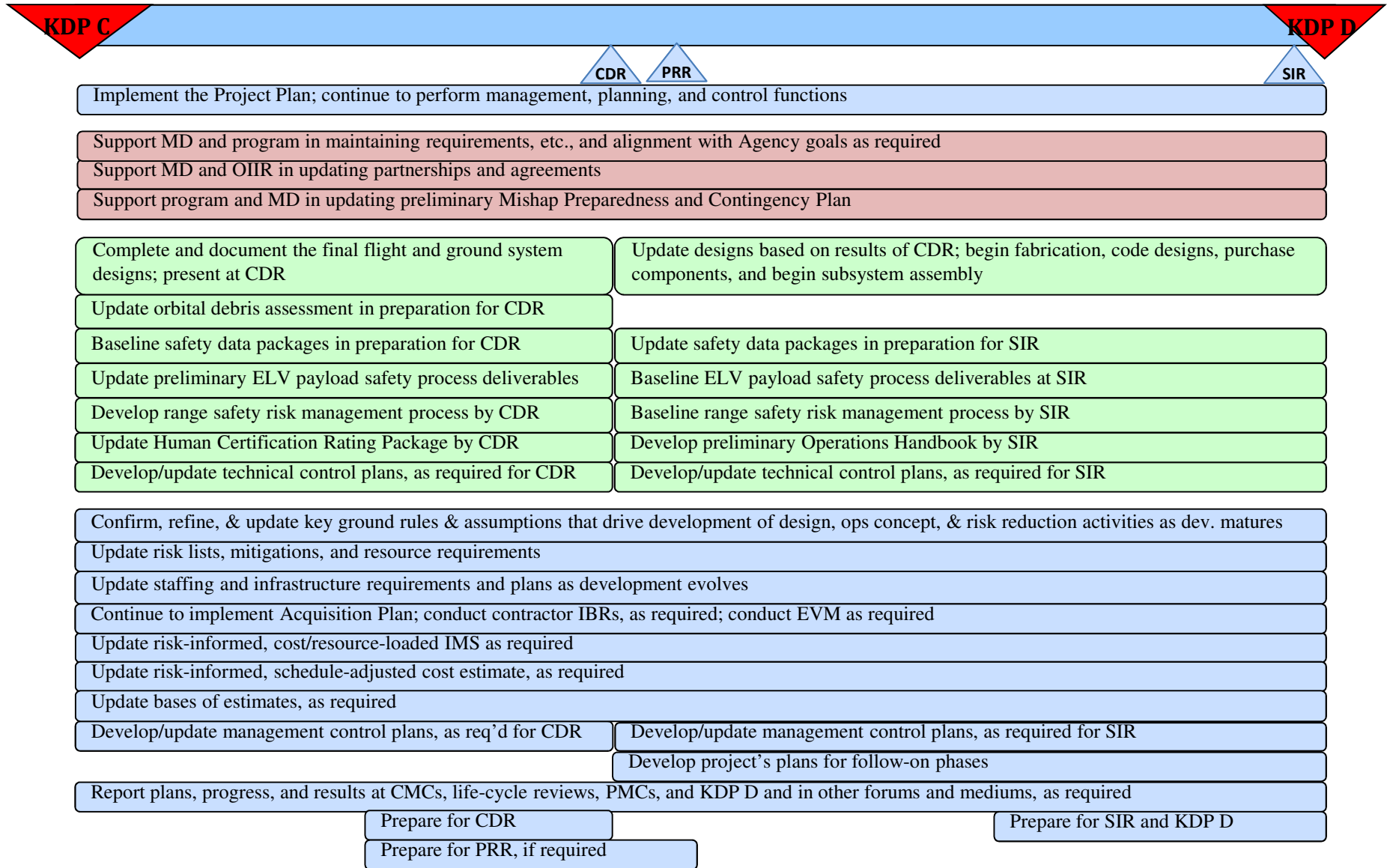
Note: Time is not to scale

1. A one- or two-step review may be used for any life-cycle review.
2. The *NASA Standing Review Board Handbook* provides information on the readiness assessment, snapshot reports, and checkpoints associated with life-cycle reviews.



Example of Summary Flow of Activities Figure

Figure 4-13 Project Phase C Flow of Activities





Chapter 4: Project Tailoring

“4.1.5 Project Tailoring

Project teams are expected to tailor the requirements of *NPR 7120.5* to meet the specific needs of the project. In general, all the requirements would be expected to be applicable to Category 1 projects, while Category 3 projects, for example, may only need some of the more significant requirements for success. When a project team and its management determine that a requirement is not needed, the process for tailoring that requirement requires getting permission from the requirement owner to waive the requirement as described in Section 5.4. This can be done using the Compliance Matrix ...”

Table 4-2 Example of Tailoring for Small Projects

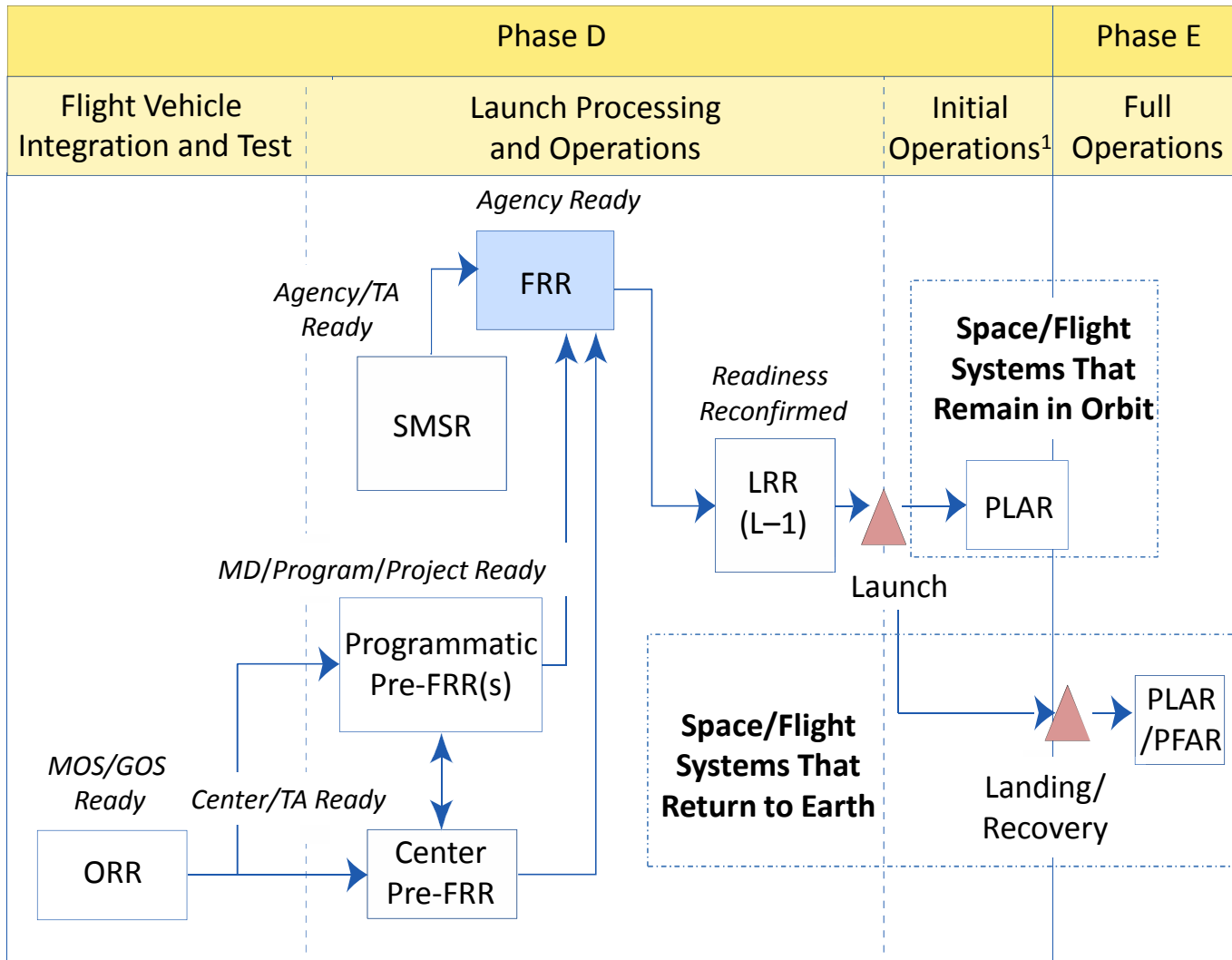
Requirement/ Paragraph	Comply	Justification	Approval
Table I-4: 10. ELV Payload Safety	FC	Projects that fall under the applicability of <i>NPR 8715.7</i> will produce the Safety Process Deliverables as defined. Projects that do not fall under the applicability of <i>NPR 8715.7</i> will comply with <i>NPR 8715.3</i> to ensure adherence to appropriate local requirements.	
Table I-4: 11. V&V Report	FC		
Table I-4: 12. Operations Handbook	T	List of Operations Procedures for launch site, on-orbit verification and checkout, and demonstration operations to be provided as part of review briefing package	OCE
Table I-4: 13. Orbital debris, 14. End of Mission Plan, 15. Mission Report, 1. Formulation Agreement, 2. Project Plan	FC		



Chapter 4: Launch Approval and Transition to Operations

- PM Handbook is first document to address complex launch review processes for human and robotic space flight programs and projects in one place.
- KDP III/KDP E marks decision to launch and conduct early operations, includes approval for transition to operations. However, KDP is not the end of the life-cycle phase since transition to operations (Phase E) is not aligned with KDP.
 - Robotic space flight - transition occurs after successful launch and on-orbit checkout
 - Human space flight - transition occurs after successful completion of initial operations:
 - May require multiple launch, flight, landing and recovery operations sequences (flight systems that return to Earth) or multiple launch and flight operations sequences (flight systems that remain in orbit, e.g. ISS)
 - May span multiple years
- Handbook details flow of reviews leading to KDP III/KDP E, and activities to be completed prior to transition to operations - reviews and activities are different for human and robotic space flight.

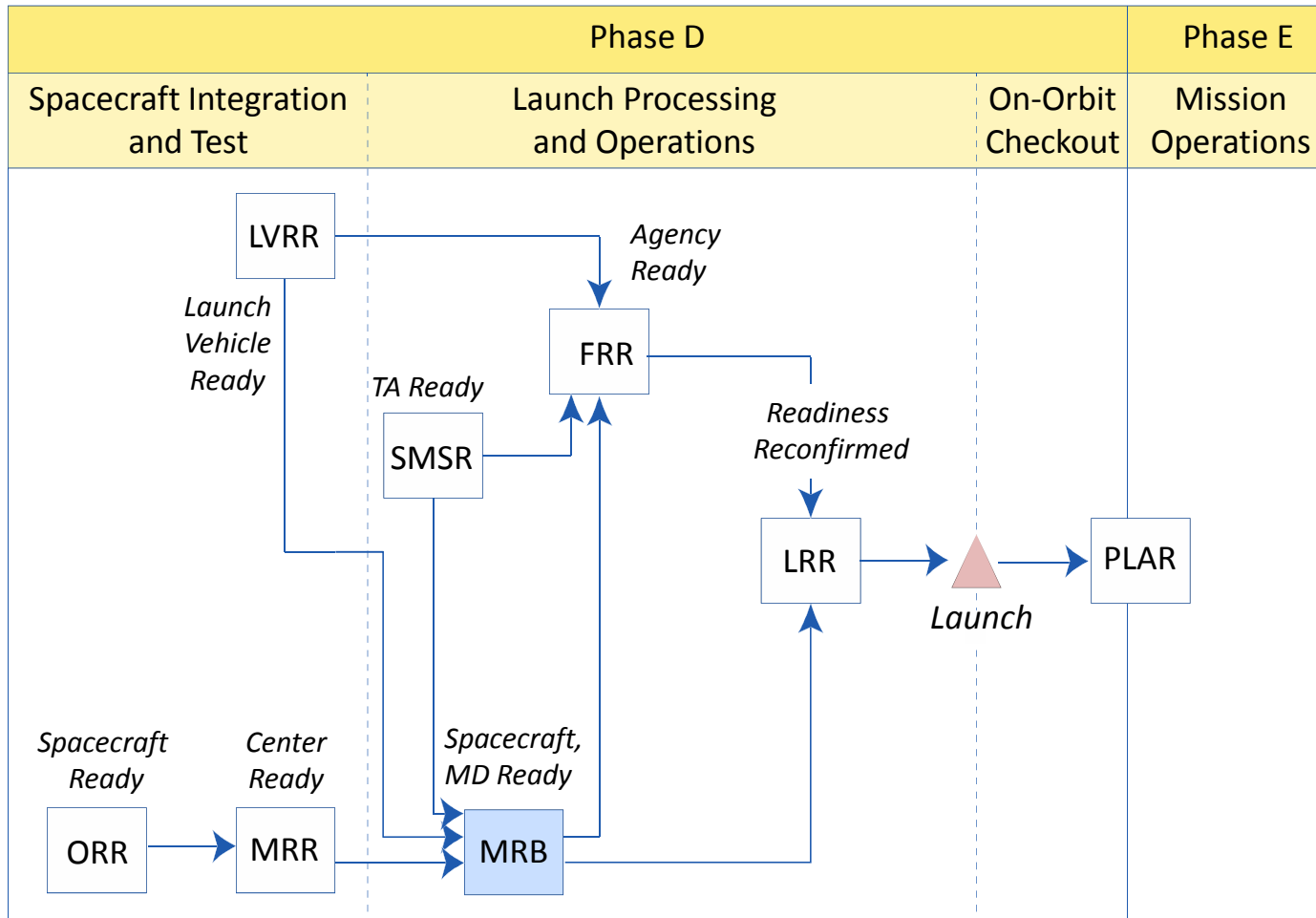
Figure 4-14 KDP III/KDP E Flow Chart for Human Space Flight Programs and Projects



- Review
- KDP III/KDP E

¹ Initial operations may include multiple launch, flight, and landing/recovery operations sequences.

Figure 4-15 KDP III/KDP E Flow Chart for Robotic Space Flight Programs and Projects



- Review
- KDP III/KDP E



Chapter 5 Special Topic: NASA Governance

- Describes both Programmatic Authority and Institutional Authority, how the two Authorities interrelate and more definition on the Center Director's role.

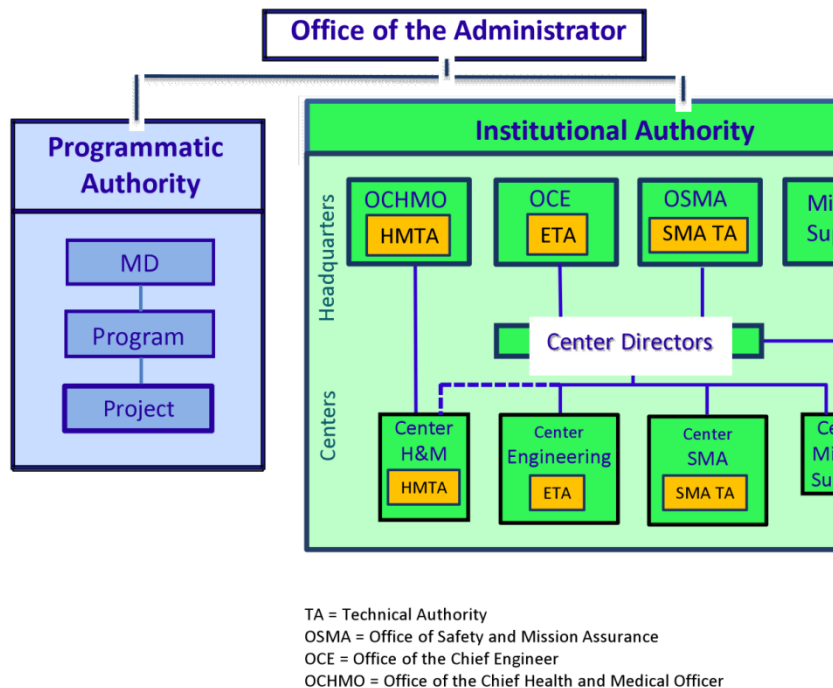


Figure 2-3 Separation of Programmatic and Institutional Authority

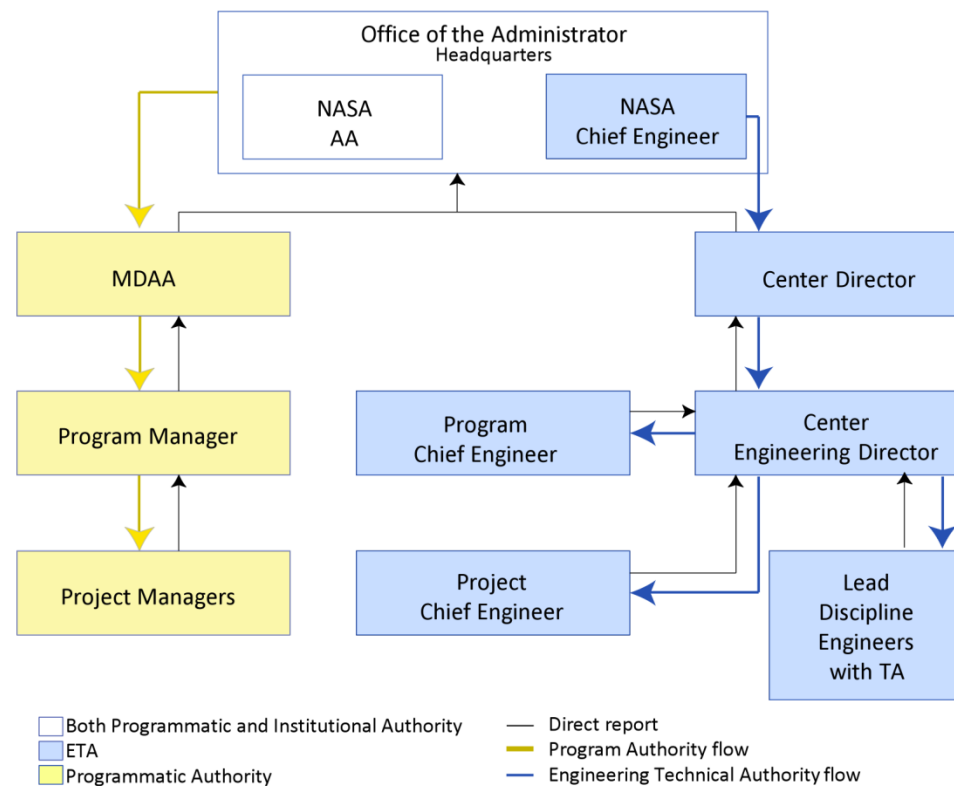
In accordance with NPR 7120.5: “Center Directors are responsible and accountable for all activities assigned to their Center. They are responsible for the institutional activities and to ensure the proper planning and assure the proper execution of programs and projects assigned to the Center.” This means that the Center Director is responsible for ensuring that programs and projects develop plans that are executable within the guidelines from the Mission Directorate and for assuring that these programs and projects are executed within the approved plans. In cases where the Center Director believes a program or project cannot be executed within approved guidelines and plans, the Center Director works with the project manager, program manager and Mission Directorate to resolve the problem.



Chapter 5 Special Topic: Technical Authority

- Describes in more detail origin of Technical Authority (TA), flow of TA through NASA, roles, responsibilities and approaches for:
 - Engineering Technical Authority (ETA)
 - Safety and Mission Assurance Technical Authority (SMA TA)
 - Health and Medical Technical Authority (HMTA)

Figure 5-3
Simplified Illustration
of a Representative
Engineering
Technical Authority
Structure



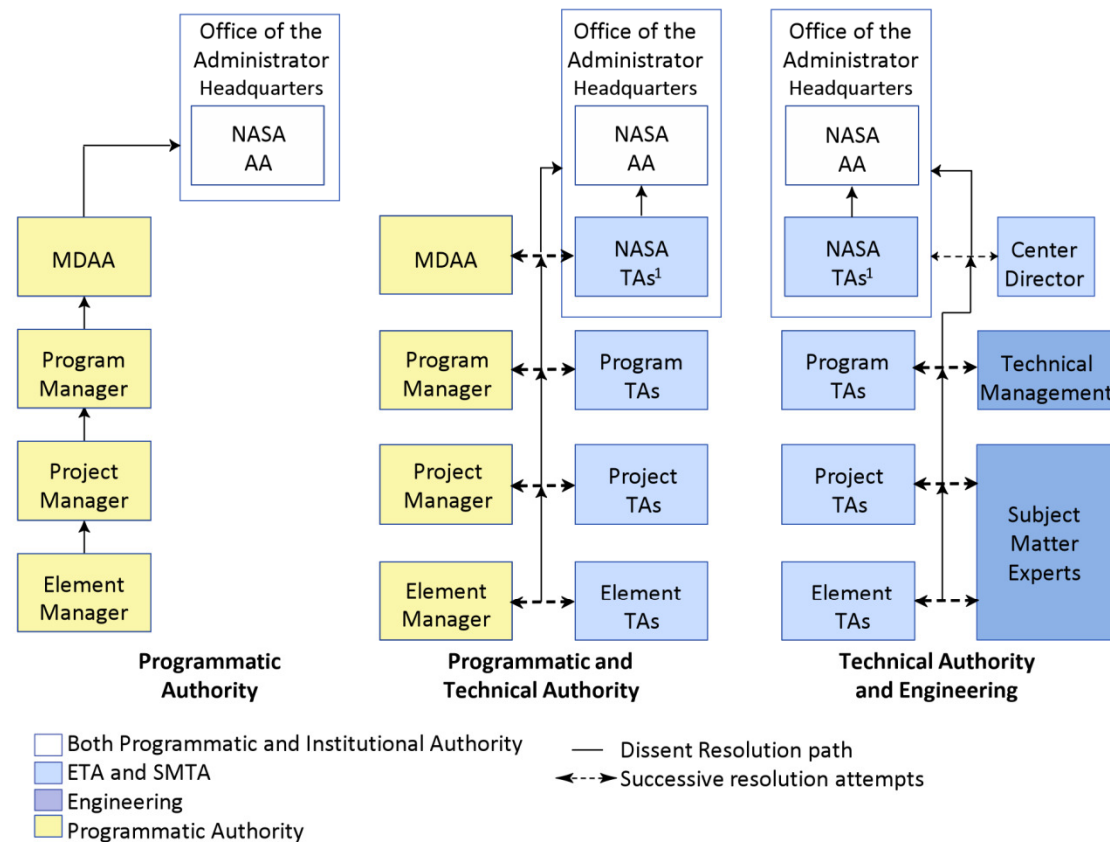
Note: This figure is a simplified representation and does not necessarily depict all involved parties.



Chapter 5 Special Topic: Dissenting Opinion Process

- Describes in more detail what a Dissenting Opinion is, how dissenting opinion process works, and roles and responsibilities of various individuals in resolving a dissenting opinion. Covers multiple scenarios.

Figure 5-6
Simplified Potential
Appeal Paths for
Dissenting Opinion
Resolution in a
Single-Center
Environment



¹NASA TAs represents TAs above Program level, including NASA Chief Engineer

Note: This figure is a simplified representation of levels of dissent and does not necessarily depict all involved parties. Resolution is attempted at each level. If not resolved, the issue rises to the next level. The dissenting opinion process can start at any level.



Chapter 5 Special Topic: Maturing, Approving, and Maintaining Program and Project Plans, Baselines, and Commitments

- Provides detailed information on policy for developing and managing a well-defined baseline for programs and projects.
 - Maturing Life-Cycle Cost (LCC) and schedule estimates during Formulation
 - Establishing the Agency Baseline Commitment at transition to Implementation
 - Relationships between LCC, ABC, UFE and Management Agreement
 - Guidance related to changing the ABC, if necessary
 - Decision Authority
 - Makes KDP determination and authorizes key parameters that govern remaining life-cycle activities.
 - Decision Memorandum (DM) content and development process
 - Management Agreement (part of DM)
 - Defines parameters, including cost and schedule, and authorities for which program or project manager has management control and accountability.

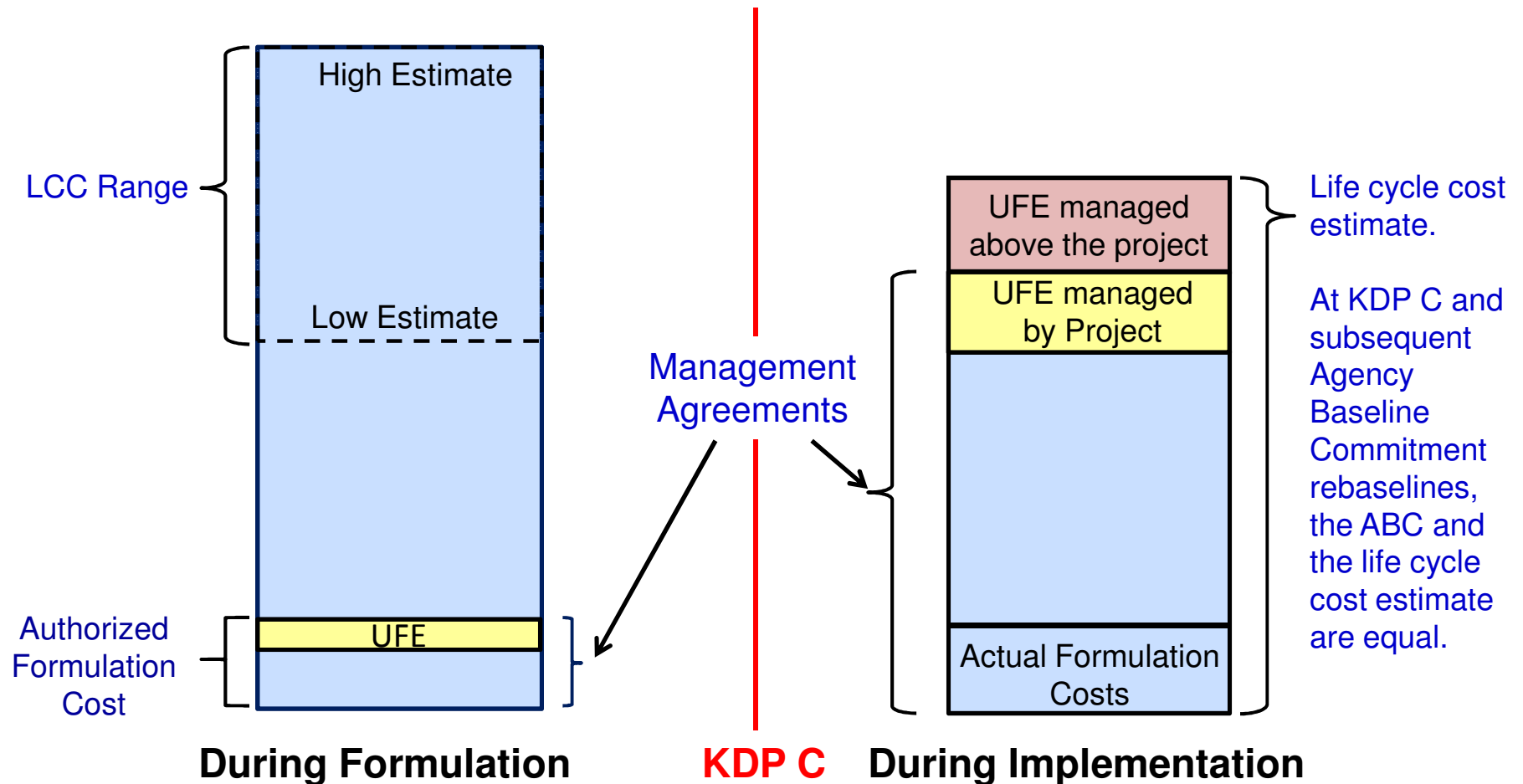


Phases Included in Defined Cost Terms

Definition	Formulation			Implementation				
	Project Phases							
	Pre-Phase A	A	B	C	D	E	Extended Operations	F
Formulation Cost								
Development Cost								
JCL Scope								
Life-Cycle Cost								
Agency Baseline Commitment								

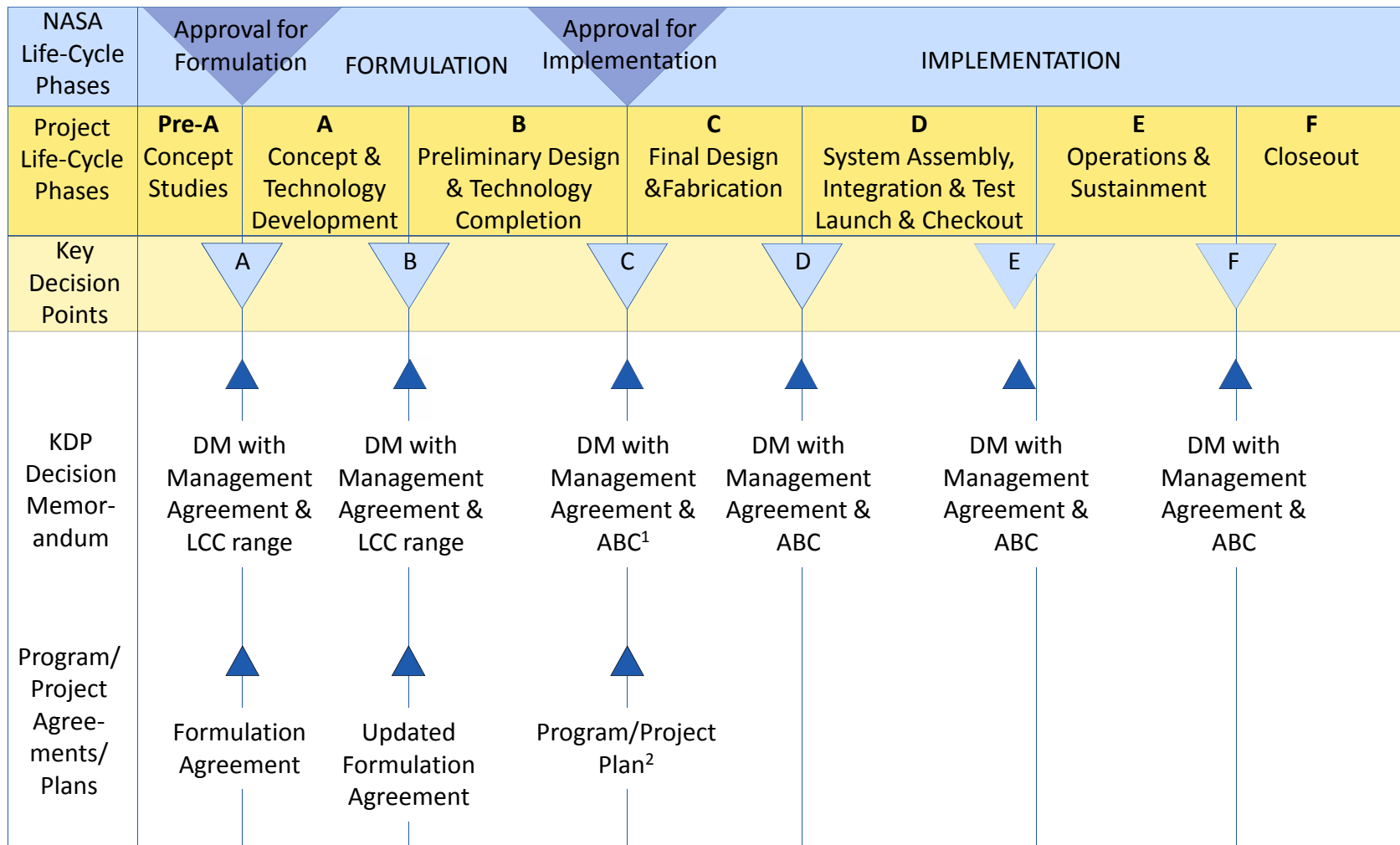


Figure 5-10 Constituent Parts of Project's Life-Cycle Cost Estimate for Formulation and Implementation



Note: Figure is notional and not drawn to scale

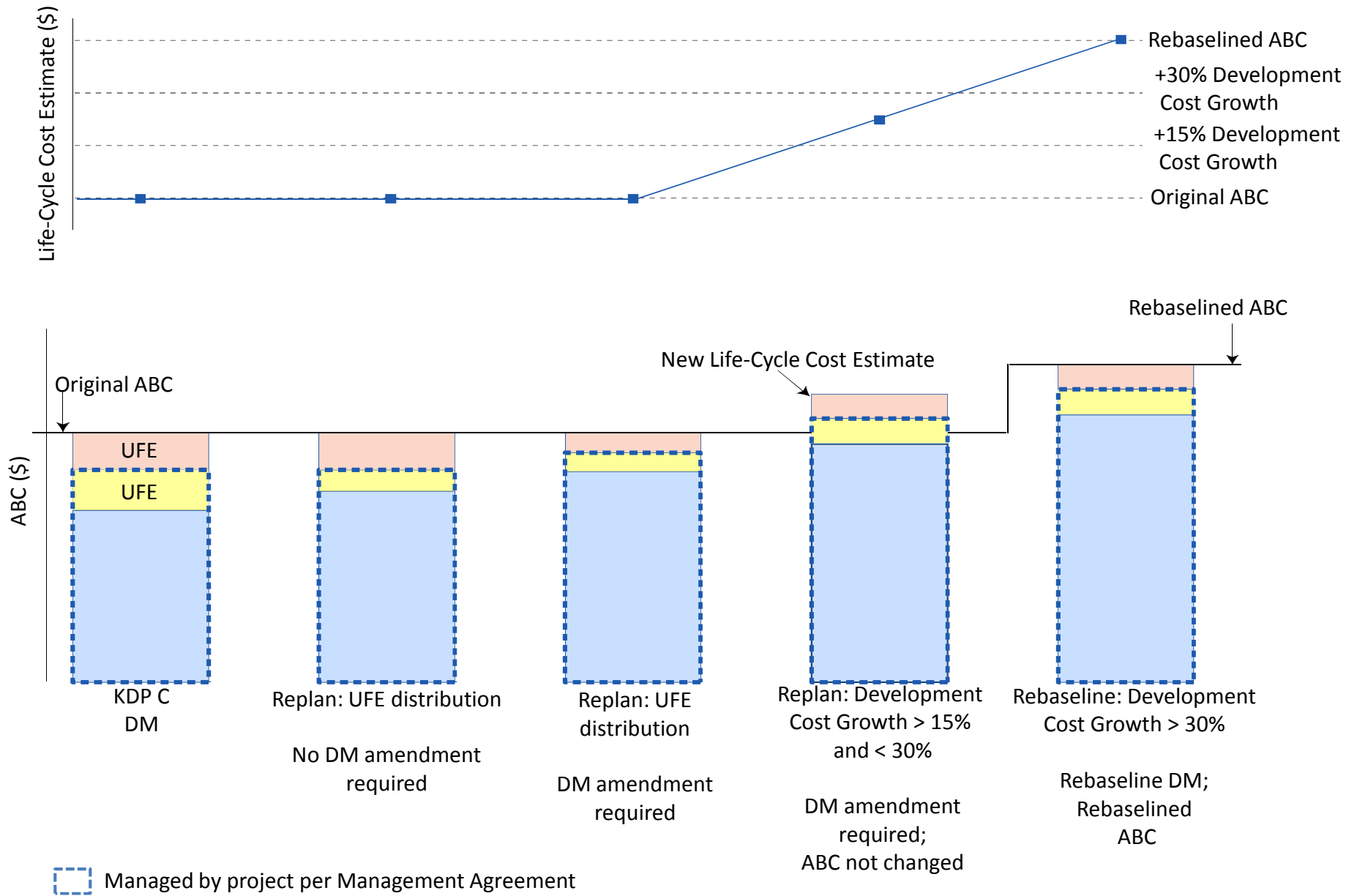
Figure 5-9 Approving Plans and Baselines



¹Changes in the ABC after this point may require a rebaseline review.

²Program/Project Plans are updated as needed during Implementation.

Figure 5-11 Distribution of UFE Versus Cost Growth Scenarios





PM Handbook

Summary and Conclusion

- Envisioned as companion guidance document to support implementation of streamlined NPR 7120.5E requirements
 - Focus on what program or project manager needs to know
 - Provide context, rationale, and greater depth of detail, and guidance based on best practices, and concrete examples of successful approaches
 - Explore nuances and implications of requirements
- Value to program or project manager:
 - Reference document - balanced between incorporating everything vs. referencing numerous documents
 - Inclusive for program and project managers to go to one place to find (or find pointers to) what they need to implement NPR 7120.5E
 - Provides wealth of readily accessible information using over 160 Figures, Tables, Highlight notes and Boxes
 - Contains unique content and delves into greater levels of detail on 15 important special topics

PM handbook focuses on support to program and project managers in implementing requirements to enhance mission success



Standing Review Board Handbook

by James Ortiz



Purpose of the SRB Handbook

- Provides guidance based on best practices for the planning, preparation, review, reporting, and closeout of Standing Review Board (SRB) activities.
- Handbook is consistent with the NASA Space Flight Program and Project Management Handbook as companion documents to *NPR 7120.5E, NASA Space Flight Program and Project Management Requirements*.
- The SRB content in both handbooks is complementary.
 - The **PM Handbook** contains a summary of SRB processes from the standpoint of the program or project manager
 - The **SRB Handbook** was developed from the standpoint of what SRBs and participants in independent reviews need to know to successfully perform the reviews
- Provides review guidance and best practices to most effectively satisfy the program and project independent review requirements established in *NPR 7120.5E* and *NPR 7123.1B, NASA Systems Engineering Processes and Requirements*.

The SRB is the board responsible for conducting independent reviews (life cycle and special) of a program or project and for providing objective, expert judgments to the Convening Authorities.



SRB Handbook Team

- Core team members included:
 - James Ortiz, Michelle Calloway, Pete Polen, Tahani Amer, Richard Greathouse, Ron Baker, Heidemarie Borchardt, Chris Chromik, Debra Kromis, Erin Moran, Mike Paraska, Deb Moore, and Simon Chung
- PM Handbook Partners:
 - Mike Blythe, Mark Saunders, Linda Voss, and Kathy Symons
- Significant input and helpful comments were received by many others, including SRB members (chairs, review managers, and programmatic analysts), program and project managers and their staffs, mission directorate project executives, center staff, legal and procurement teams, and Agency leadership.



Overview

- The SRB Handbook is a reference document that focuses on independent reviews performed at the Agency level* for space flight programs and projects.
- Contains NASA policy guidance to ensure the independence and integrity of the Agency's independent life-cycle reviews (LCRs) (mandatory).
- The *SRB Handbook* guidance may be tailored to meet the needs of the Agency, Mission Directorates, Centers, and the programs and projects being reviewed.
- Other users of the Handbook include:
 - Centers and other organizations using an SRB or equivalent independent review teams use this Handbook as guidance and adjust the Agency-level specific content to the Center's review processes, practices, and organizational structure.
 - Non spaceflight programs or projects that need independent review can use this Handbook as a reference.

* Agency-level reviews are SRB reviews performed for Programs and Category 1 and 2 projects (above \$ 250 M life-cycle cost) under the responsibility of the Independent Program Assessment Office (IPAO)

Table 2-1 Agency-Level Reviews Conducted by SRBs

Review	Uncoupled or Loosely Coupled Programs	Single-Project Programs	Tightly Coupled Programs	Projects
System Requirements Review (SRR)	X	X	X	X
System Definition Review (SDR) , or Mission Definition Review (MDR)	X	X	X	X
Preliminary Design Review (PDR)		X	X	X
Critical Design Review (CDR)		X	X	X
System Integration Review (SIR)		X	X	X
Operational Readiness Review (ORR)		X	X	X
Program Implementation Reviews (PIR)	X	X	X	

*Blue text denotes reviews that precede a KDP



Value to SRBs and the Program Management Community

- The SRB Handbook provides review guidance for the program and project communities and for the SRBs regarding the expectations, processes, products, timelines, and working interfaces as defined in NPR 7120.5E.
 - Captures best practices for the conduct of independent LCRs based on years of experience and process improvement.
 - Ensures a level of consistency in the performance of SRB activities as SRBs engage in assessments on a diverse portfolio of programs and projects across the mission directorates.
 - Source of education for SRB members, project personnel, and others involved or interested in the independent LCRs.
- The SRB Handbook was first published in 2009 (aligned with NPR 7120.5 D).
- An interim update was completed in September 2011 (to begin alignment NPR 7120.5E).
- This update, Rev A, completes alignment with NPR 7120.5 E and initial release of the PM Handbook. Traceability matrix from NPR 7120.5 E to SRB Handbook in Appendix G.



Our Approach

- Handbook addresses all aspects of the independent reviews beginning with an understanding of how independent review supports NASA Governance followed by more elaborate aspects of planning and performing SRB reviews.
- The Handbook uses descriptive narrative providing rationale and examples to help illustrate the recommended approaches.
- General flow:
 - It begins by discussing SRB governance and listing key guidelines considered to be major principles underlying SRB processes and products ([Chapter 1](#)).
 - It continues with the purpose and function of the SRB and its participation in the LCR process ([Chapter 2](#)).
 - The Handbook then discusses the formation of a SRB and the main factors considered for membership ([Chapter 3](#)).
 - The next step is to examine the LCR process for tightly coupled programs, loosely coupled or uncoupled programs, and single-project programs ([Chapter 4](#)).
 - The Handbook closes with a discussion on SRB assessments and products, with examples of program and project assessment guidance, detailing the six SRB assessment criteria ([Chapter 5](#)).



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G Traceability of SRB Requirements in NPR 7120.5E to the SRB Handbook

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- Purpose of This Handbook
- SRB Governance and Convening Authorities
- Applicability of the Handbook
- Major Principles

1 Introduction

A key element in the National Aeronautics and Space Administration's (NASA's) strategic framework for managing space flight programs, Standing Review Boards (SRBs) help ensure appropriate program and project management oversight in order to increase the likelihood of mission success. This chapter explains the purpose and applicability of this SRB Handbook, notes SRB governance, and lists key guidelines considered major principles underlying SRB processes and products.

1.1 Purpose of This Handbook

This SRB Handbook provides review guidance for the program and project communities and for the SRBs regarding the expectations, processes, products, timelines, and working interfaces with review organizations, Centers, Mission Directorate, Mission Support Organizations, and Management Councils. It provides guidelines for membership selection, review implementation, review products, and reporting of results.

The SRB Handbook guidance may be tailored, with the Convening Authorities' approval, to meet the needs of the Agency, Mission Directorate, Centers, and the programs and projects being reviewed. The final review agreement of the SRB, program and project, and Convening Authorities for program and project Life-Cycle Reviews (LCRs) is documented in the terms of reference, as described in [Section 5.1](#) and [Appendix 1.1](#).

1.2 SRB Governance and Convening Authorities

NPR 7120.5, NASA Space Flight Program and Project Management Requirements, the governing document for LCR processes and products, establishes the requirements for an SRB to perform an independent assessment of a space flight program or project at specific LCRs. NPR 7120.5 governance of

Independent reviews conducted by SRBs are key elements in the Agency's oversight of programs and projects.



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- SRB Introduction
- SRB Review Criteria and Maturity States
- SRB Program and Project Reviews
- SRB Participation in Selected Program or Project Internal Reviews

Table 2-1 Agency-Level Reviews Conducted by SRBs

Review	Uncoupled or Loosely Coupled Programs	Single-Project Programs	Tightly Coupled Programs	Projects
System Requirements Review (SRR)	X	X	X	X
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Preliminary Design Review (PDR)		X	X	X
Critical Design Review (CDR)		X	X	X
System Integration Review (SIR)		X	X	X
Operational Readiness Review (ORR)		X	X	X
Program Implementation Reviews (PIR)	X	X	X	



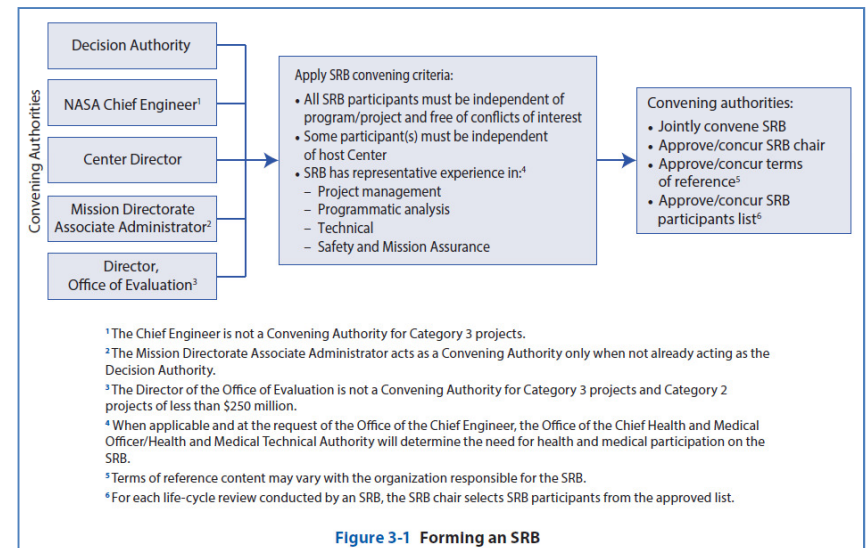
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- Structure
- SRB Independence and Integrity
- Composition and Balance
- Selection and Approval of SRB Members and Consultants-to-the-Board





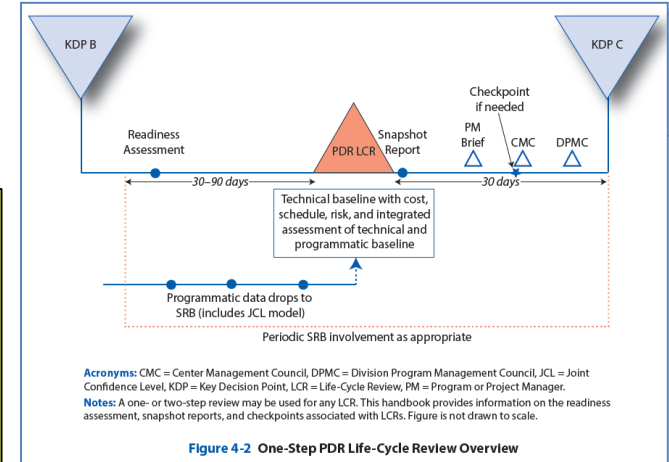
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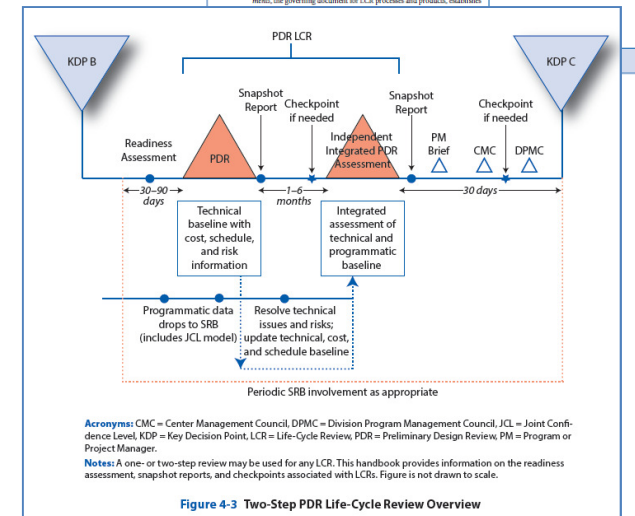
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- Life-Cycle Review Methods
- Snapshot Report
- Checkpoints
- SRB Kick-Off Meeting
- Programmatic Analysis
- Site Review
- Key Decision Points
- Late Life-Cycle Reviews
- Special Reviews Conducted by the SRB



1.2 SRB Governance and Convening Authorities

NPR 7120.5, NASA Space Flight Program and Project Management Regulations, the governing document for LCR processes and products, establishes





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- Maturity Matrices
- NPR 7123.1 Entrance and Success Criteria
- Requests for Action, Findings, and Recommendations
- SRB Member Product
- Snapshot Report Briefing
- SRB Management Briefing Package
- Briefings
- KDP Decision Memorandum
- Customer Surveys
- RRD Package

Table 5-2 Example of Project Assessment Guidance

Criteria	Project Assessment Metrics		
	Successful	Partially Successful	Unsuccessful
Adequacy of risk management approach and risk identification/mitigation per NPR 8000.4	The NASA continuous risk management paradigm is practiced. A knowledgeable risk manager has been assigned. A risk management plan exists and is followed; a risk database is being utilized to monitor, track, and communicate risks. Risks have been identified within the schedule with mitigation plans and are under configuration control. Reserves are adequate to manage risks. A full list of program or project risks—including title, description, mitigation plan, likelihood, and consequence—is delivered to support SRB schedule risk analysis, cost risk analysis, range estimate, and/or JCL. Uncertainty is mapped to cost and schedule.	The NASA continuous risk management paradigm is practiced. A risk manager has been assigned. A risk management plan exists, but risk identification and/or mitigation is incomplete; reserves may not be adequate to manage risks. Risk management plan implementation is incomplete or ineffective. A list of program or project risks—including title, description, mitigation plan, likelihood, and consequence—is delivered to support SRB preliminary schedule risk analysis, cost risk analysis, range estimate, and/or JCL. Uncertainty is mapped to cost and schedule.	A risk management plan does not exist or is incomplete; top risks have not been identified; not possible to determine adequacy of reserves to manage risks.

Acronyms: BOE = Basis Of Estimate, LCC = Life-Cycle Cost, IMS = Integrated Master Schedule, JCL = Joint Confidence Level, NPD = NASA Policy Directive, NPR = NASA Procedural Requirement, UFE = Unallocated Future Expenses, WBS = Work Breakdown Structure.

¹ A range estimate is required at Key Decision Point (KDP) B; a JCL is only required at KDP C or by special request by the Convening Authorities.



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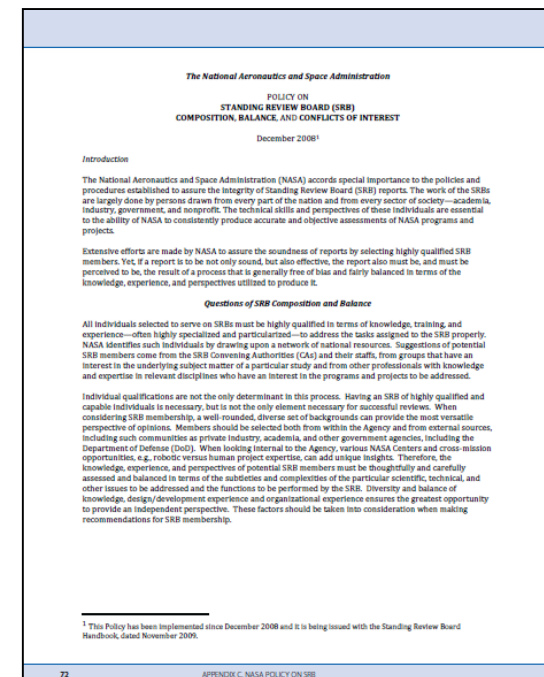
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Acceptable Risk. The risk that is understood and agreed upon, governing that, within tolerable, and such that no further specific mitigating actions (except actions might have already occurred.)		AA	Associate Administrator
Acquisition. The process for obtaining the systems, materials, and supplies that NASA needs to fulfill its mission, which may include procurement (contracting for services) and begins with an idea or proposal that also through the end fulfills an identified need and ends the program or project or the final disposition of the project.		ABC	Agency Baseline Commitment
Acquisition Strategy Meeting. A forum where senior program and project acquisition managers discuss significant budget expenditures. The ASM is held at the Mission Support Office level, implementing the direction of the other agency acquisition strategy planning. The early in formulation, but the timing is determined by the ASM focus on considerations, such as the workforce, maintaining core capabilities and make-or-buy decisions, and supporting core competencies and potential partners.		APL	Advanced Physics Laboratory
Agency Baseline Commitment (ABC). Establishes an agreed-upon baseline of project requirements, milestones, and other information that forms the basis for NASA's commitment to the Office of Management and Budget (OMB) only one official baseline exists for a NASA program.		APMC	Agency Program Management Council
Agency Program Management Council (APMC). The main group, chaired by the NASA Administrator, that formulates program performance, recommending approval, and		BOE	Boeing
		CA	Contracting Authority
		CADR	Cost Analysis Data Requirement
		CDR	Critical Design Review
		CDR	Critical Design Review
		CFR	Code of Federal Regulations
		CMC	Center Management Council
		COO	Contracting Officer
		COI	Conflict of Interest
		CRM	Customer Risk Management
		CS	Civil Service Commission Board
		CSB	Civil Service Commission Board with expert support
		DA	Decision Authority
		DPAC	Director Program Management Council
		EAC	Evaluation and Assessment Group
		EVM	Earned Value Management
		FAD	Formulation Authorization Document
		FIR	Flight Readiness Review
		ICA	Independent Cost Analysis
		ICE	Independent Cost Estimate
		IMR	Individual Member Independent Report
		IMS	Integrated Master Schedule
		IPA	Independent Programmatic Analysis
		IPAO	Independent Program Assessment Office
		ICL	Inter-Confidence Level
		IPL	Jet Propulsion Laboratory



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The National Aeronautics and Space Administration

BACKGROUND INFORMATION AND CONFIDENTIAL CONFLICT OF INTEREST DISCLOSURE

NAME: _____ TELEPHONE: _____
ADDRESS: _____
EMAIL ADDRESS: _____
CURRENT EMPLOYER: _____
PROGRAM/PROJECT SRB: _____

There are three parts to this form, Part I Background Information, Part II Confidential Conflict of Interest Disclosure, and Part III, Certification. Complete all parts, sign and date this form on the last page, and return the form to: _____ Retain a copy for your records.

PART I BACKGROUND INFORMATION

INSTRUCTIONS

Please provide a curriculum/resume that identifies your relevant experience, organizational affiliations, government service, etc. to this SRB activity. In addition, please specifically respond to the three specific areas identified below to facilitate an overall assessment of any biases that may exist relative to this SRB activity.

I. ORGANIZATIONAL AFFILIATIONS. Report your relevant current business relationships (e.g., as an employee, owner, officer, director, consultant) and your relevant current remunerated or volunteer non-business relationships (e.g., professional organizations, trade associations, public interest or civic groups).

II. OTHER SUPPORT. Report relevant information regarding both public and private sources of current support (other than your present employer), including sources of funding, equipment, facilities.

III. ADDITIONAL INFORMATION. If there are relevant aspects of your background or present circumstances not addressed above that might reasonably be construed by others as affecting your judgment in matters within the assigned task of the SRB or panel on which you have been invited to serve, and therefore might constitute an actual or potential conflict of interest or source of bias, please describe them briefly. This could include your relationships with individuals (rather than organizations) involved in the subject of the SRB activity.

SPECIFIC AFFILIATIONS, SUPPORT, AND OTHER INFORMATION:

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Option	CS	CS2	NC
Description	Civil Service (CS) Consensus Board—No Expert Support	Civil Service Consensus Board with Expert Support	Non-Consensus Mixed Board
SRB chair	CS	CS	Either CS or non-CS
SRB Review Manager	CS or JPL*	CS or JPL*	CS or JPL
SRB composition	CS only	CS only; experts provide analyses to SRB	Either CS or non-CS
SRB product	SRB produces a briefing package with findings of fact and recommendations; RFAs (or equivalent) from individual members**, chair briefs report.	SRB produces briefing package with findings of fact and recommendations; RFAs (or equivalent) from any individual**, reports from individual experts**; chair briefs SRB report.	Review manager assists the chair in assembling the briefing package based on inputs and RFAs from all individuals**; chair briefs personal findings and recommendations.
Minority report	Minority reports documented in SRB report and in RFAs	Minority reports documented in SRB report and RFAs	No minority report***
SRB interaction	For CS and CS2 boards, as noted: Consensus is reached by the Civil Service board members under the civil service consensus (CS) and the civil service with consult support (CS2) SRB configurations. Consultants (non-board members) supporting CS2 boards may interact with the projects or programs on behalf of the SRB members to gather information used to support SRB non-deliberative discussions. For all board options: All board members can participate in open discussion with the project and within the SRB. Everyone can openly discuss individual points of view.		
Independence	Normal CS ethics rules apply	Experts providing support are not on the SRB. Apply independence standards to experts.	Apply independence standards to experts, but allow some impairments, if approved.

* JPL review managers are not members and do not have a vote.
 ** Reports and RFAs can contain individual recommendations.
 *** The minority report requirements do not abridge NASA's Dissenting Opinion process per NPRD 1000.0.
 SRB structure is determined on the needs of the program or project and is documented in the Terms of Reference (ToR).



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Program Life Cycle—Program Implementation Review						
NPR 7123.1B (PIR success criteria)	Assessment Criteria/NPR 7120.5E					
	Alignment with and contribution to Agency strategic goals	Adequacy of management approach	Adequacy of technical approach	Adequacy of the integrated cost and schedule estimates and funding strategy	Adequacy and availability of resources other than budget	Adequacy of the risk management approach
Program still meets Agency needs and should continue.	P					
The program cost and schedule estimates are credible and within program constraints.		S		P	S	S
Risks are identified and accepted by program/project leadership, as required.		S	S	S	S	P
Technical trends are within acceptable bounds.		S	P			S
Adequate progress has been made relative to plans, including the technology readiness levels.		S	P	S		
Technologies have been identified that are ready to be transitioned to another project or to an organization outside the Agency.		P	S	S		

Note: P = Primary, S = Secondary.



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- D Disclosure and NDA for Contracted SRB Member/Consultant
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- F NPR 7123.1 to NPR 7120.5 Mapping Example
- G Traceability of SRB Requirements in NPR 7120.5E to the SRB Handbook**
- H Terms of Reference Template
- I Reference Documents

NPR Para #	NPR 7120.5E Requirement Statement	Reqm't Owner	Tailor	MD AA	CD	PM	Comply?	SRB Reqm't	SRB Handbook Rev A
2.2.5	The program or project and an independent Standing Review Board (SRB) shall conduct the SRR, SDR/MDR, PDR, CDR, SIR, ORR, and PIR LCRs in Figures 2-2, 2-3, 2-4, and 2-5.	OCE	X			A		Yes	Sections 2.2, 2.3, 2.4
2.2.5.1	The Conflict of Interest (COI) procedures detailed in the <i>NASA Standing Review Board Handbook</i> shall be strictly adhered to.	OCE	X	A	A	A		Yes	Section 3.2
2.2.5.2	The portion of the LCR conducted by the SRB shall be convened by the Convening Authorities in accordance with Table 2-2.	OCE	X	A	A	A		Yes	Chapters 2 and 3
2.2.5.3	The program or project manager, the SRB chair, and the Center Director (or designated Engineering Technical Authority representative) shall mutually assess the program's or project's expected readiness for the LCR and report any disagreements to the Decision Authority for final decision.	OCE	X		A	A		Yes	Section 4.2
2.3.4	Following each LCR, the independent SRB and the program or project shall brief the applicable management councils on the results of the LCR to support the councils' assessments.	OCE	X	A	A	A		Yes	Sections 5.7, 5.8, 5.9

Note: This table is an excerpt of the Compliance Matrix in Appendix C of NPR 7120.5E, NASA Space Flight Program and Project Management Requirements modified to show how its requirements map to the discussions in the present handbook. Note that NPR 7120.5E may have implied requirements that are applicable to the SRB as well.



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Terms of Reference for the Life-Cycle Reviews
of the [Program or Project Name]

<p>Approved by:</p> <p>_____</p> <p>[Name] Director, Office of Evaluation NASA Headquarters</p> <p>_____</p> <p>[Name] (Programs only) NASA Chief Engineer NASA Headquarters</p> <p>_____</p> <p>[Name] Associate Administrator, [Designated] Mission Directorate NASA Headquarters</p> <p>_____</p> <p>[Name] Center Director [Center Name]</p> <p>_____</p> <p>[Name] (Programs & Category 1 Projects only) NASA Associate Administrator NASA Headquarters</p>	<p>Concurred by:</p> <p>_____</p> <p>[Name] (Category 1 & 2 Projects only) NASA Chief Engineer NASA Headquarters</p>
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90 APPENDIX H. TERMS OF REFERENCE TEMPLATE



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G Traceability of SRB Requirements in NPR 7120.5E to the SRB Handbook

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Reference Documents

NPD 1000.0A, NASA Governance and Strategic Management Handbook
NPD 1000.5A, Policy for NASA Acquisition
NPR 1900.3B, Ethics Program Management
NPR 7120.5E, NASA Space Flight Program and Project Management Requirements
NPR 7123.1B, NASA Systems Engineering Processes and Requirements
NPR 8000.4, Agency Risk Management Procedural Requirements
TBD, NASA Space Flight Program and Project Management Handbook
NASA/SP-2010-3403, NASA Schedule Management Handbook
NASA/SP-2011-3422, NASA Risk Management Handbook



Chapter 1: Introduction

- **Chapter 1** provides the context for the process of independent LCRs and identifies major principles of the SRB process derived from best practices. It defines the governance of SRBs throughout the life-cycle of the program or project.

As key element in the National Aeronautics and Space Administration's (NASA's) strategic framework for managing space flight programs, Standing Review Boards (SRBs) help ensure appropriate program and project management oversight in order to increase the likelihood of mission success.

Major Principles (examples)

- **Purpose of the SRB** - SRBs have an advisory role. The SRB conducts the LCRs and can provide recommendations, but the SRB members and consultants-to-the-board do not impose requirements on, make decisions for, or direct the program or project.
- **SRB Memberships** - For Agency-level reviews, the Review Manager and programmatic analysts are assigned by the IPAO.
- **Roles and Responsibilities of the SRB** - The SRB chair and the Review Manager manage the content and schedule of work performed by the SRB.
- **SRB Independence and Integrity** - The SRB functions independently of the program or project.



NPR 7120.5E Compliance Matrix Excerpt (Appendix C)

NPR Para #	NPR 7120.5E Requirement Statement	Reqm't Owner	Tailor	MD AA	CD	PM	Comply?	SRB Reqm't	SRB Handbook Rev A
2.2.5	The program or project and an independent Standing Review Board (SRB) shall conduct the SRR, SDR/MDR, PDR, CDR, SIR, ORR, and PIR LCRs in Figures 2-2, 2-3, 2-4, and 2-5.	OCE	X			A		Yes	Sections 2.2, 2.3, 2.4
2.2.5.1	The Conflict of Interest (COI) procedures detailed in the <i>NASA Standing Review Board Handbook</i> shall be strictly adhered to.	OCE	X	A	A	A		Yes	Section 3.2
2.2.5.2	The portion of the LCR conducted by the SRB shall be convened by the Convening Authorities in accordance with Table 2-2.	OCE	X	A	A	A		Yes	Chapters 2 and 3
2.2.5.3	The program or project manager, the SRB chair, and the Center Director (or designated Engineering Technical Authority representative) shall mutually assess the program's or project's expected readiness for the LCR and report any disagreements to the Decision Authority for final decision.	OCE	X		A	A		Yes	Section 4.2
2.3.4	Following each LCR, the independent SRB and the program or project shall brief the applicable management councils on the results of the LCR to support the councils' assessments.	OCE	X	A	A	A		Yes	Sections 5.7, 5.8, 5.9

Note: This table is an excerpt of the Compliance Matrix in Appendix C of NPR 7120.5E, *NASA Space Flight Program and Project Management Requirements* modified to show how its requirements map to the discussions in the present handbook. Note that NPR 7120.5E may have implied requirements that are applicable to the SRB as well.



Chapter 2: Standing Review Board Overview

- **Chapter 2** provides an overview of the SRB and its purpose, function, and participation in the LCR process.

NPR 7120.5 requires the use of a single, independent review team called the SRB to conduct certain LCRs

- LCRs are essential to conducting, managing, evaluating, and approving space flight programs and projects, and are an important part of NASA's system of checks and balances.
- NASA accords special importance to maintaining the integrity of its independent review process.
- 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 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.



Chapter 3: Forming a Standing Review Board

- **Chapter 3** establishes the guidelines for the formation of SRBs for the different NASA programs and projects. It describes the three possible SRB structures and outlines the means by which SRB members and consultants-to-the-board are qualified and approved to serve.

➤ **Structure** - NASA implements three SRB structures for Agency-level space flight program or project LCRs. They are the Civil Service Consensus Board (CS), the Civil Service Consensus Board with Expert Support (CS2), and the Non-Consensus Mixed Board (NC).

➤ **SRB Independence and Integrity** - SRBs must conduct assessments free of bias through a membership balanced in terms of knowledge, experience, and perspectives.

• **Composition and Balance** - The selection and vetting process ensures the technical and programmatic areas are covered expertly and adequately. When forming the SRB, a very important aspect is determining the “right size” of the membership that is able to meet the expectations of the LCR.

➤ **Selection and Approval of SRB Members and Consultants-to-the-Board** - SRB formulation includes the identification and approval of the SRB chair and all other board members and consultants-to-the-board, assignment of the Review Manager.



Acceptable SRB Structures for a Life-Cycle Review

Option	CS	CS2	NC
Description	Civil Service (CS) Consensus Board—No Expert Support	Civil Service Consensus Board with Expert Support	Non-Consensus Mixed Board
SRB chair	CS	CS	Either CS or non-CS
SRB Review Manager	CS or JPL*	CS or JPL*	CS or JPL
SRB composition	CS only	CS only; experts provide analyses to SRB	Either CS or non-CS
SRB product	SRB produces a briefing package with findings of fact and recommendations; RFAs (or equivalent) from individual members**, chair briefs report.	SRB produces briefing package with findings of fact and recommendations; RFAs (or equivalent) from any individual**, reports from individual experts**; chair briefs SRB report.	Review manager assists the chair in assembling the briefing package based on inputs and RFAs from all individuals**; chair briefs personal findings and recommendations.
Minority report	Minority reports documented in SRB report and in RFAs	Minority reports documented in SRB report and RFAs	No minority report***
SRB interaction	For CS and CS2 boards, as noted: Consensus is reached by the Civil Service board members under the civil service consensus (CS) and the civil service with consult support (CS2) SRB configurations. Consultants (non-board members) supporting CS2 boards may interact with the projects or programs on behalf of the SRB members to gather information used to support SRB non-deliberative discussions. For all board options: All board members can participate in open discussion with the project and within the SRB. Everyone can openly discuss individual points of view.		
Independence	Normal CS ethics rules apply	Experts providing support are not on the SRB. Apply independence standards to experts.	Apply independence standards to experts, but allow some impairments, if approved.

* JPL review managers are not members and do not have a vote.

** Reports and RFAs can contain individual recommendations.

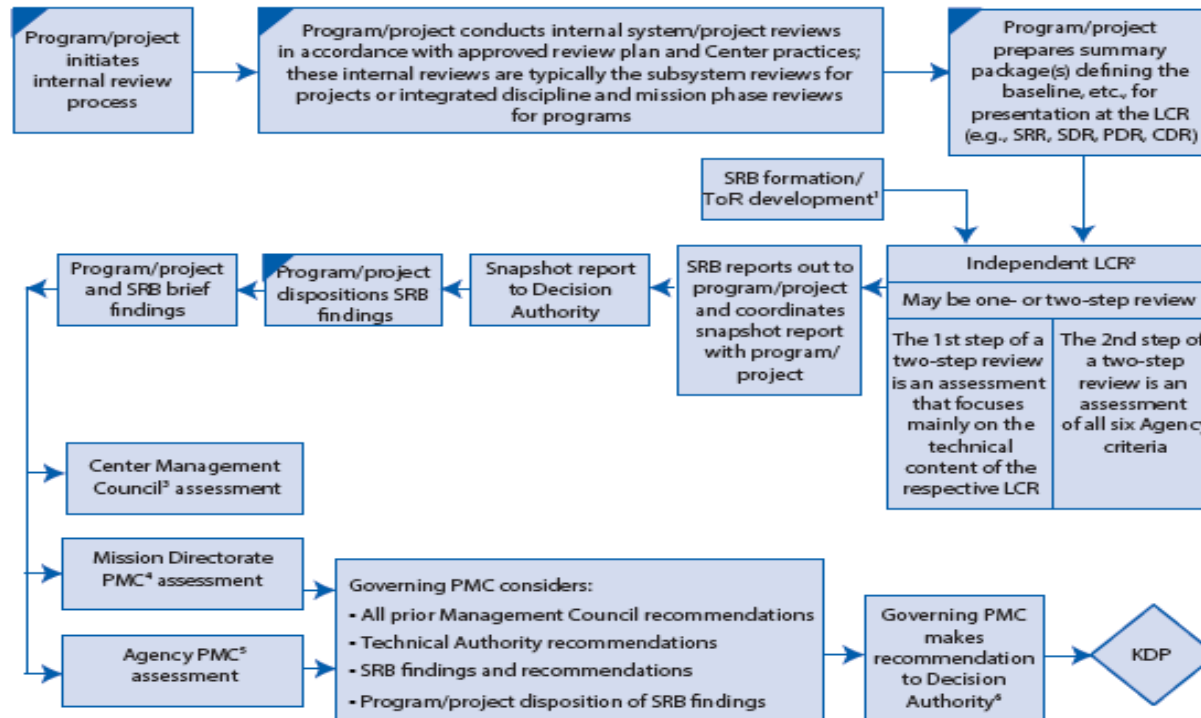
*** The minority report requirements do not abridge NASA's Dissenting Opinion process per *NPD 1000.0*.

SRB structure is determined on the needs of the program or project and is documented in the Terms of Reference (ToR).



Chapter 4: Life-Cycle Review Process

- Chapter 4 provides a description of the LCR processes from beginning to end.



Legend: ▼ Program/project activity

Acronyms: CDR = Critical Design Review, KDP = Key Decision Point, LCR = Life-Cycle Review, PDR = Preliminary Design Review, PMC = Program Management Council, SDR = System Definition Review, SRR = System Requirements Review, ToR = Terms of Reference.

¹ See Figure 3-1.

² Successful readiness assessment prerequisite for advancing to the site review. See Chapter 4 for details.

³ May be an Integrated Center Management Council when multiple Centers are involved.

⁴ The Mission Directorate PMC is the Governing PMC for Category 2 and 3 projects.

⁵ The Agency PMC is the Governing PMC for programs and Category 1 projects.

⁶ The LCR is complete when the Governing PMC and the Decision Authority complete their assessment.

Figure 4-1 Program/Project Independent Life-Cycle Review Process

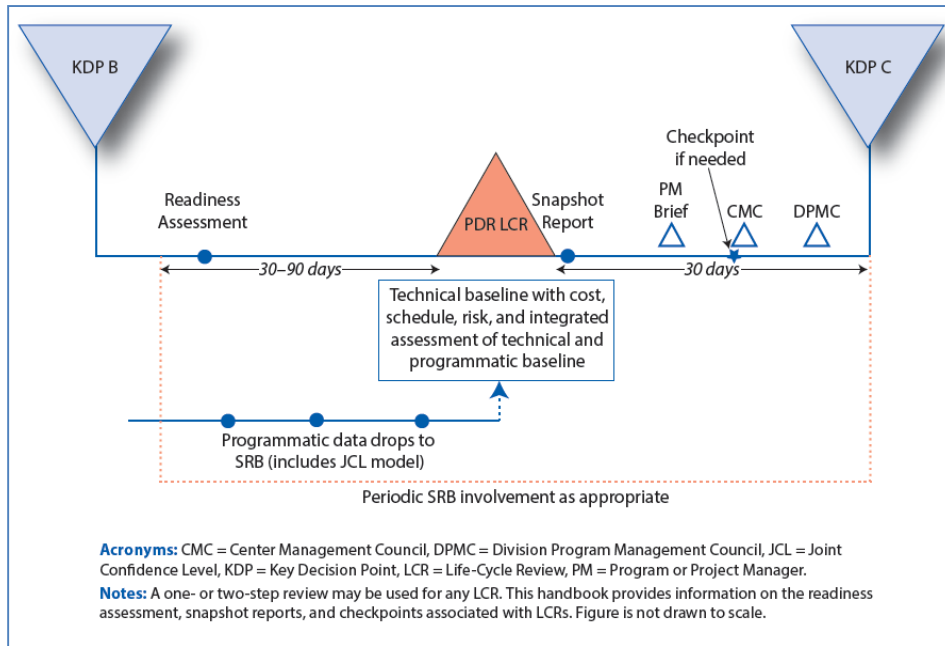


Chapter 4: Life-Cycle Review Process (Cont)

- **LCR Elements (example)**
 - **Terms of Reference** - The Terms of Reference (ToR) is the agreement between the SRB, Convening Authorities, and program or project that specifies the nature, scope, schedule, and ground rules for the conduct of the LCR by the SRB (Standard TOR in Appendix H).
 - **Readiness Assessment** - The readiness assessment is a check conducted to ensure that the programmatic and technical products for the LCR will be available with the expected maturity to support the LCR timelines.
 - **Snapshot Report** - Rapid reporting to the Convening Authorities and Decision Authority is essential to efficient and effective management of programs and projects. The SRB chair is required to provide a one-page written summary of his/her preliminary findings no later than 24 to 48 hours after the site review conclusion.
 - **SRB Kick-Off Meeting** - The SRB kick-off meeting is a preparatory activity that precedes the active engagement of the SRB in the site review.
 - **Programmatic Data Submittal from Program or Project** - It is very beneficial for the program or project management to meet with the chair, the Review Manager, and the lead programmatic analyst at the SRB planning session to plan for the review approximately six months in advance of the site review. Review requirements, data products, and the SRB review timeline including data deliveries should be discussed and agreed by all parties.
 - **Site Review** - The site review is the formal, independent review of the programs or projects by the SRB for the LCR.

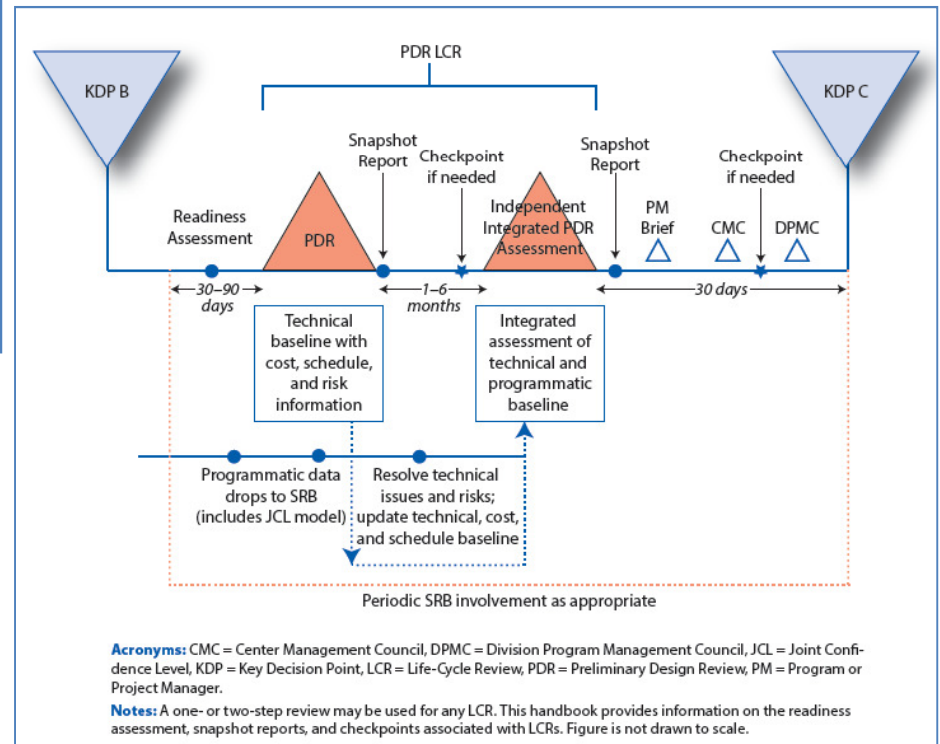


Chapter 4: Life-Cycle Review Process (Cont)



One-Step PDR Life-Cycle Review Overview

Two-Step PDR Life-Cycle Review Overview





Chapter 5: Standing Review Board Products

- **Chapter 5** discusses the products and responsibilities of the SRB. It provides examples of program and project assessment guidance and details the six SRB assessment criteria.

The SRB's role is to provide the Convening Authorities with an expert judgment of the adequacy of the program's or project's technical and programmatic approach, risk posture, progress relative to the baseline, and readiness to advance to the next development level.

Key Points regarding SRB responsibilities and products:

- **Depth of penetration** - It is the responsibility of the SRB to establish a review level that sufficiently meets the requirements of the ToR.
- **SRB awareness between LCRs** - Because the SRB is on standby between LCRs, it is the responsibility of the Review Manager to maintain contact with the program or project regarding information provided outside of the LCRs.
- **SRB ownership of programmatic analyses** - The SRB has full ownership of the programmatic assessments because they link cost, schedule, and management with the technical aspects of the program or project.
- **Time criticality for preparation and review of programmatic analyses** - Programmatic data must be received within the required timeframes in order to afford the SRB an opportunity to provide feedback to the program or project prior to a review.



Chapter 5: Standing Review Board Products (Cont.)

- **Selected Chapter 5 Sections**

- **Criteria Assessment** – Description of SRB assessment for each of the six element criteria in NPR 7120.5E, including types of programmatic (cost and schedule) analyses and assessments.

Table 5-2 Example of Project Assessment Guidance

Criteria	Project Assessment Metrics		
	Successful	Partially Successful	Unsuccessful
Adequacy of risk management approach and risk identification/mitigation per NPR 8000.4	The NASA continuous risk management paradigm is practiced. A knowledgeable risk manager has been assigned. A risk management plan exists and is followed; a risk database is being utilized to monitor, track, and communicate risks. Risks have been identified within the schedule with mitigation plans and are under configuration control. Reserves are adequate to manage risks. A full list of program or project risks—including title, description, mitigation plan, likelihood, and consequence—is delivered to support SRB schedule risk analysis, cost risk analysis, range estimate, and/or JCL. Uncertainty is mapped to cost and schedule.	The NASA continuous risk management paradigm is practiced. A risk manager has been assigned. A risk management plan exists, but risk identification and/or mitigation is incomplete; reserves may not be adequate to manage risks. Risk management plan implementation is incomplete or ineffective. A list of program or project risks—including title, description, mitigation plan, likelihood, and consequence—is delivered to support SRB preliminary schedule risk analysis, cost risk analysis, range estimate, and/or JCL. Uncertainty is mapped to cost and schedule.	A risk management plan does not exist or is incomplete; top risks have not been identified; not possible to determine adequacy of reserves to manage risks.

Acronyms: BOE = Basis Of Estimate, LCC = Life-Cycle Cost, IMS = Integrated Master Schedule, JCL = Joint Confidence Level, NPD = NASA Policy Directive, NPR = NASA Procedural Requirement, UFE = Unallocated Future Expenses, WBS = Work Breakdown Structure.

¹ A range estimate is required at Key Decision Point (KDP) B; a JCL is only required at KDP C or by special request by the Convening Authorities.



Chapter 5: Standing Review Board Products (Cont.)

- **Selected Chapter 5 Sections**

- **Requests for Action (RFA), Findings, and Recommendations** - The RFA process used by the program or project must be a closed-loop process that provides tracking, disposition, and closure of the RFAs.
- **SRB Member Product** - SRB members provide the Review Manager and the SRB chair with individual written assessments. The Individual Member Independent Report (IMIR) and score card are the required format for the assessments.
- **Snapshot Report Briefing** - The snapshot report briefing takes place via a teleconference unless the Decision Authority requests otherwise. The Review Manager facilitates the discussion by briefly introducing the topic, the review milestone, and the key participants in the teleconference.
- **Briefings** - Briefings capture a summary of the LCR process and highlight SRB findings and recommendations. The briefings communicate the results of the review to the program or project and NASA management. The ToR identifies the reporting venues for each specific LCR.
- **KDP Decision Memorandum** - The Decision Authority's key decision points (KDP) are summarized and recorded in the Decision Memorandum, signed at the conclusion of the governing PMC. The Review Manager coordinates the Office of Evaluation (OoE) review of the Decision Memorandum prior to the governing PMC.



SRB Handbook

Summary and Conclusion

- A companion guidance document consistent with the PM Handbook to support implementation of NPR 7120.5E.
 - Provides guidance based on best practices for the planning, preparation, review, reporting, and closeout of Standing Review Board (SRB) activities.
 - Contains NASA policy guidance to ensure the independence and integrity of the Agency's independent life-cycle reviews (LCRs).
 - Addresses all aspects of the independent reviews beginning with an understanding of how independent review supports NASA Governance followed by more elaborate aspects of planning and performing SRB reviews.
- Value to SRBs and project management community:
 - Provides review guidance for the program and project communities and for the SRBs regarding the expectations, processes, products, timelines, and working interfaces as defined in NPR 7120.5E.
 - Captures best practices for the conduct of independent LCRs based on years of experience and process improvement.
 - Provides a source of education for SRB members, project personnel, and others involved or interested in the independent LCRs.

SRB handbook focuses on Agency level independent reviews performed to increase the likelihood of mission success



Contacts and Key Resources





PM Handbook Contacts

For additional questions/comments on PM Handbook, please contact:

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or

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Review Manager, IPAO

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Key Resources for Further Information

The following resources can be found at:

http://nodis3.gsfc.nasa.gov/OCE_rep/OCE_list.cfm. (Access to this site is also available through clicking on the "Other Policy Documents" menu in the NODIS library and then selecting the Office of the Chief Engineer tab.)

- *NASA Space Flight Program and Project Management Handbook*
- *NASA Standing Review Board Handbook*
- *Center Director Role and Responsibilities--June 2011—RTQs*
- *Compliance Matrix for NPR 7120.5 Rev E*
- *Letter of Delegation (Delegation guidance for OCE requirements)*
- *NASA/SP-2010-3406, Integrated Baseline Review Handbook*
- *NASA/SP-2012-599, NASA Earned Value Management (EVM) Implementation Handbook*
- *NASA Schedule Management Handbook*
- *NASA Work Breakdown Structure Handbook*
- *NASA/SP-2011-3422, NASA Risk Management Handbook*

Additional information on independent reviews can be found at the IPAO website:

<http://www.nasa.gov/offices/ipce/ipao/index.html>



Questions and Answers





Backup Charts

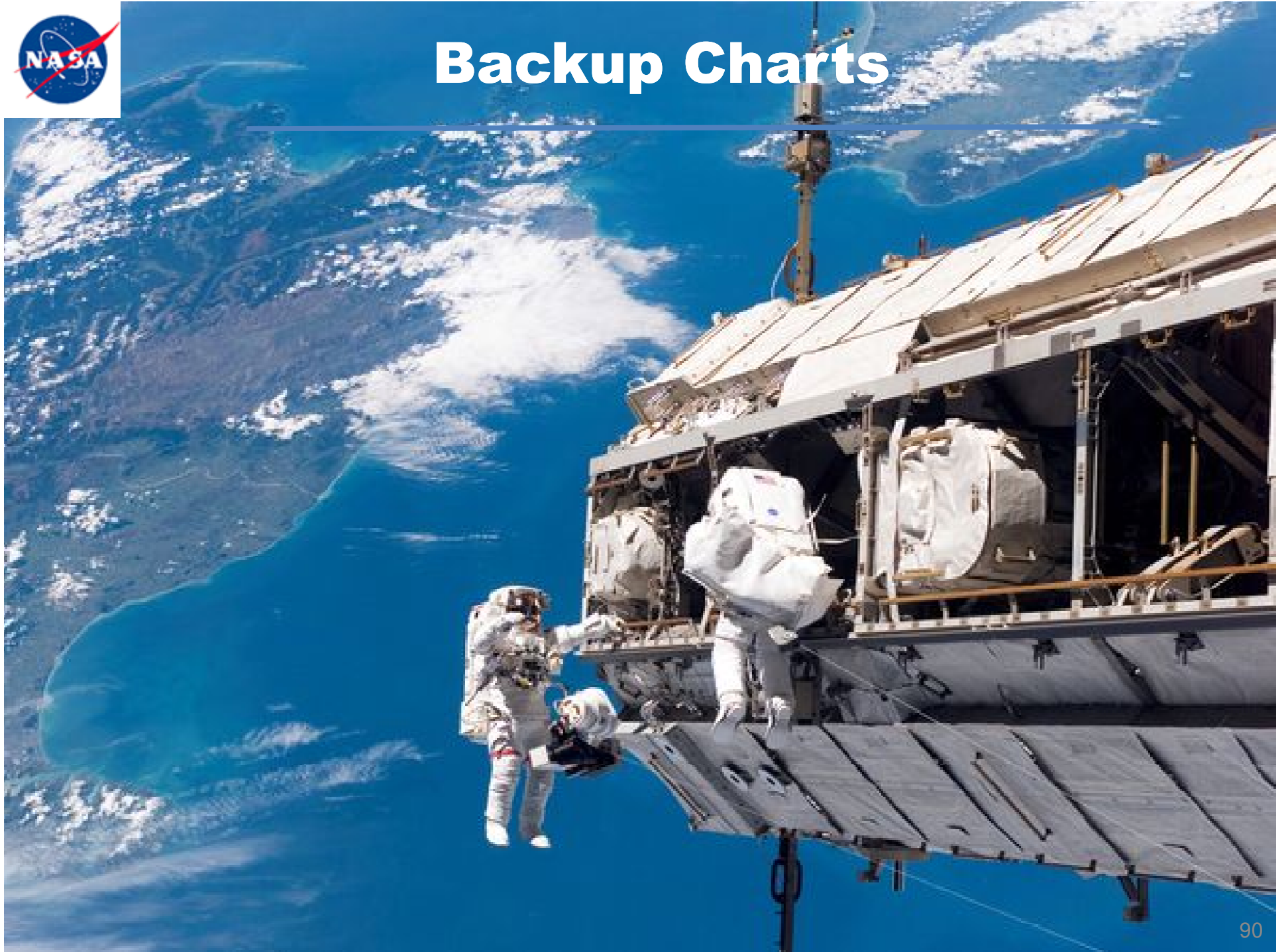
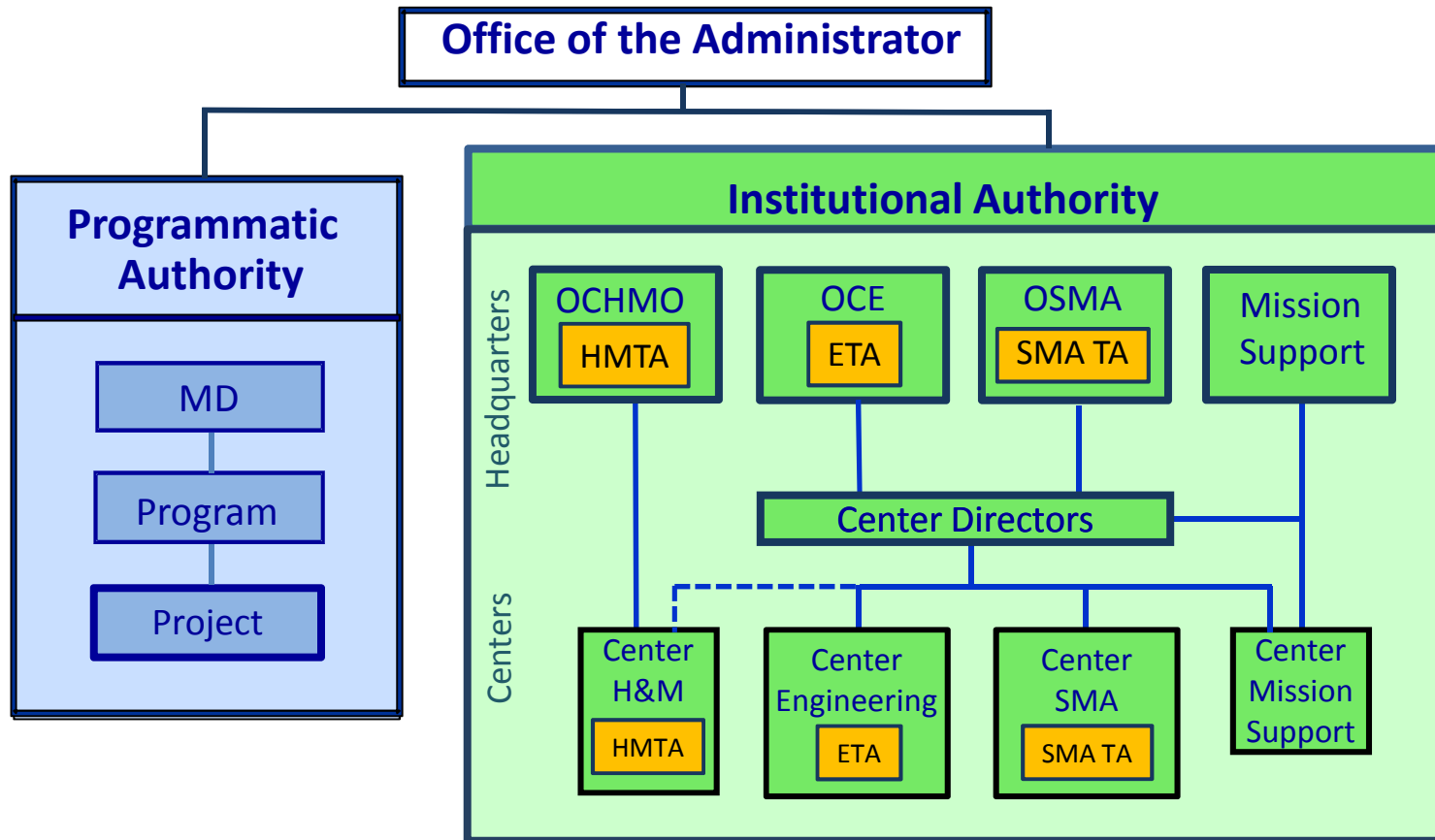


Figure 2-3 Separation of Programmatic and Institutional Authorities



TA = Technical Authority
 OSMA = Office of Safety and Mission Assurance
 OCE = Office of the Chief Engineer
 OCHMO = Office of the Chief Health and Medical Officer

----- Indicates not all Centers have HMTA. Sometimes that function is served by Engineering and SMA TAs

Figure 4-1 NASA Project Life Cycle

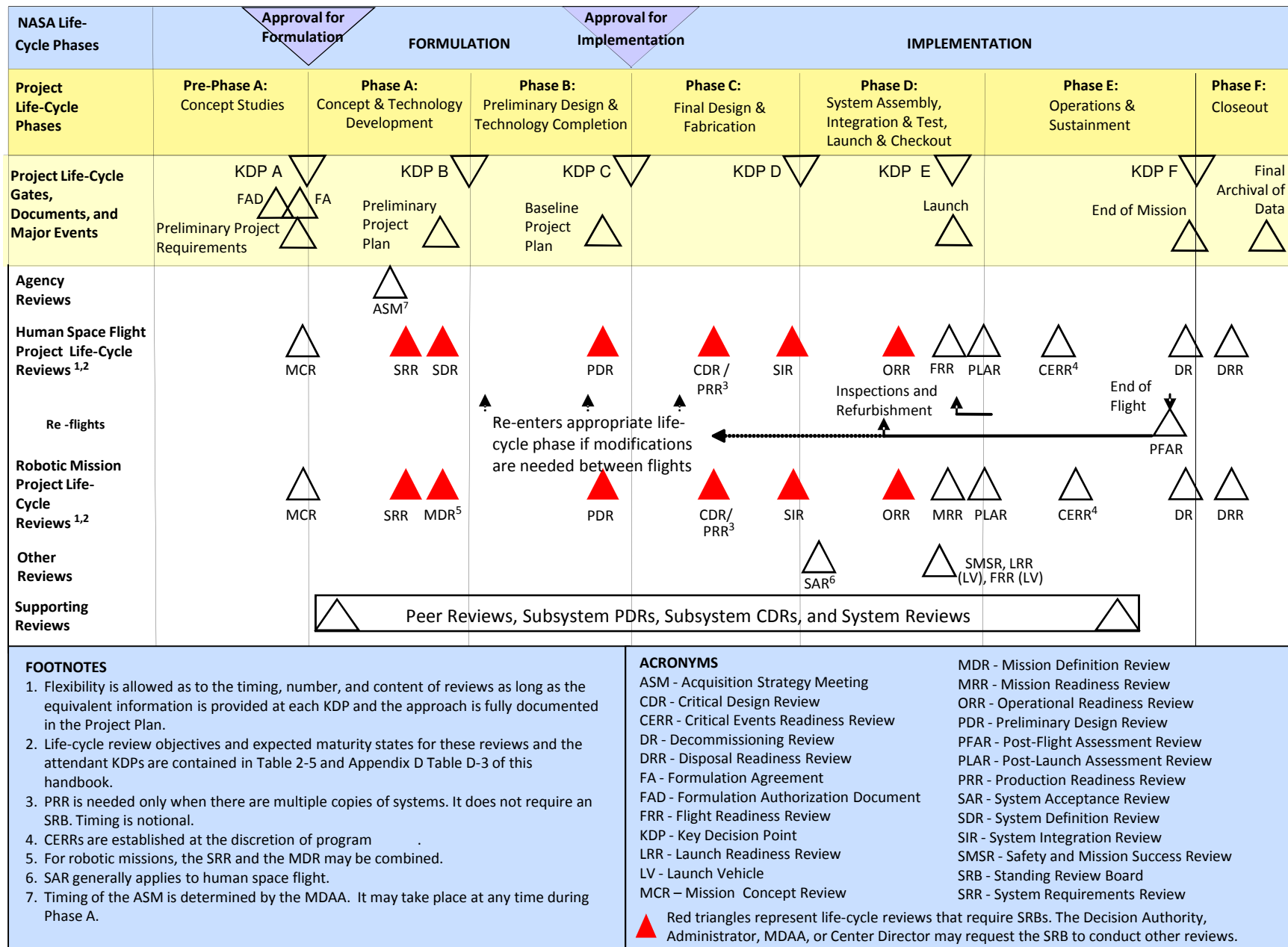
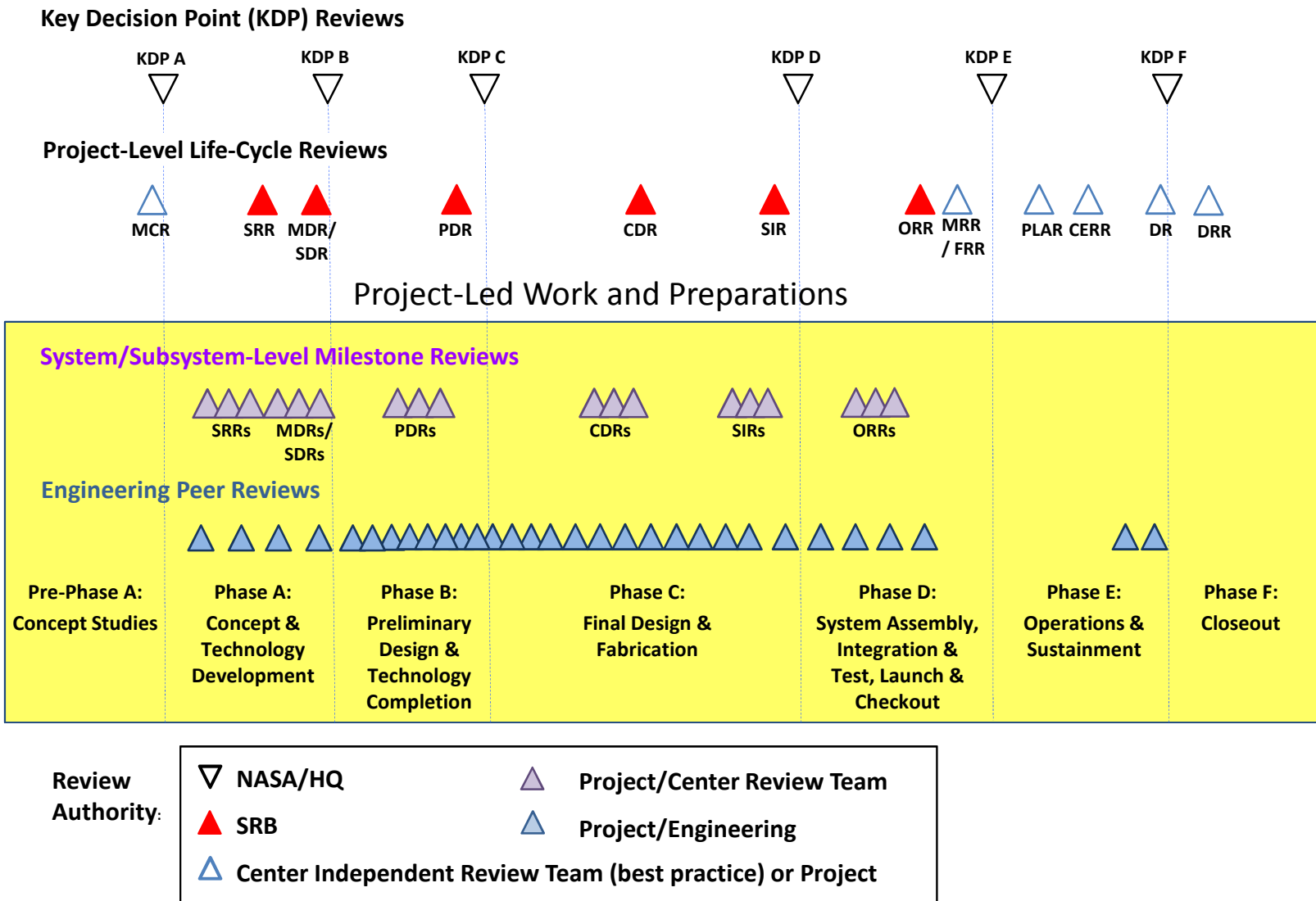
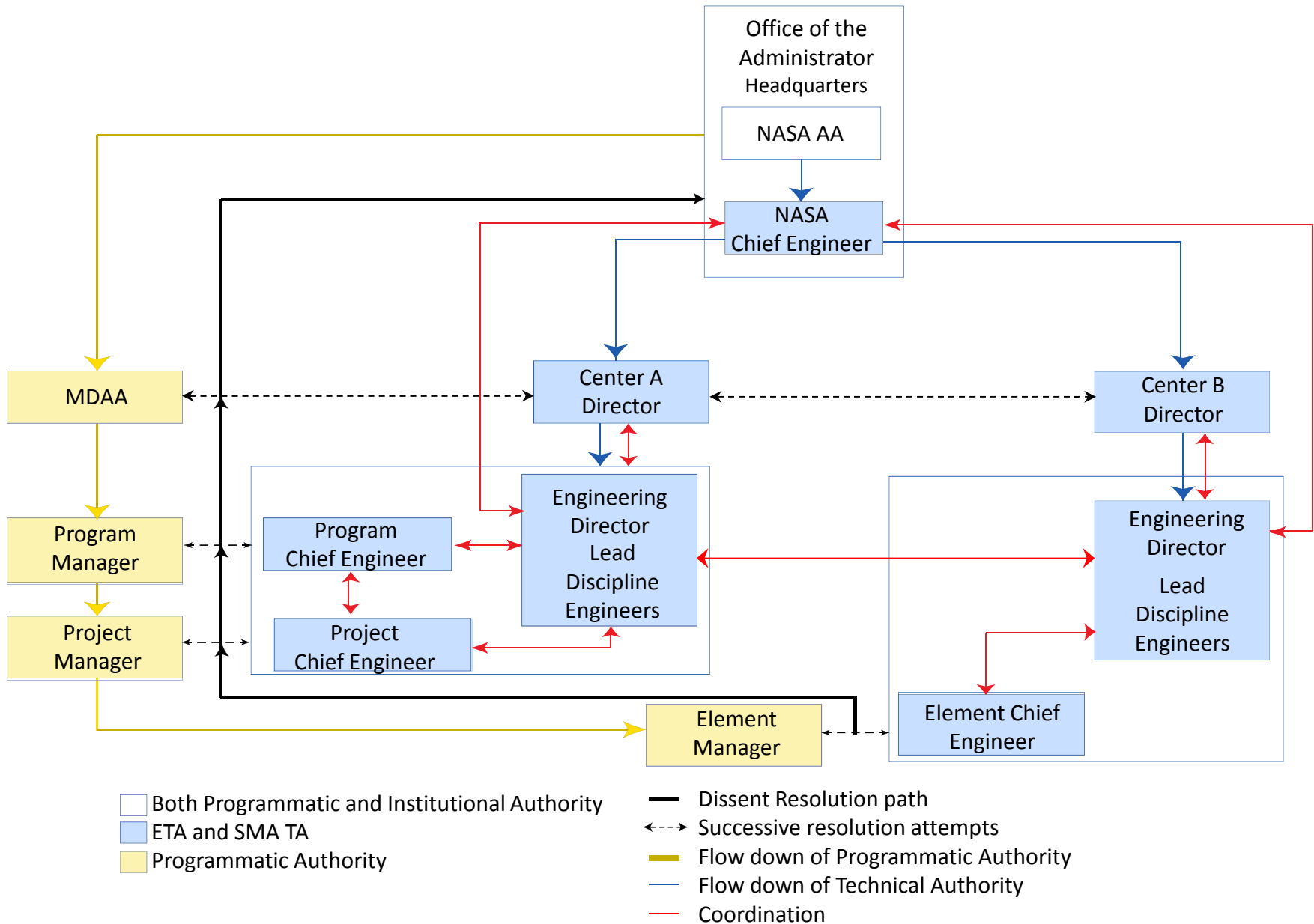


Figure 4-2 Project-Led Work in Preparation for LCR



Note: This graphic is a generalized example. Each Center may have a different approach.

Figure 5-7 Dissenting Opinion Resolution Path in Multi-Center Environment



Note: This figure is a simplified representation of levels of dissent and does not necessarily depict all involved parties. Resolution is attempted at each level. If not resolved, the issue rises to the next level. The dissenting opinion process can start at any level.



Formulation Agreement

- Formulation Agreement is a tool for communicating and negotiating program or project's schedule and funding requirements during Phase A and Phase B with Mission Directorate.
 - Identifies and prioritizes technical and acquisition activities necessary to accurately characterize complexity and scope; increase understanding of requirements; identify and mitigate safety, technical, cost, and schedule risks, and develop high quality cost and schedule estimates.
- Formulation Agreement required for projects and single-project programs.
- Agreement is approved at KDP A (baselined for Phase A and preliminary for Phase B), and updated and approved at KDP B (baselined for Phase B).
- For projects with LCC > \$250 million and single-project programs, Formulation Agreement enables development of high-fidelity cost and schedule range estimates and associated confidence levels at KDP B, and high-fidelity cost and schedule commitments and associated JCL at KDP C, and to commit to a successful plan for Implementation at KDP C.



Management Agreement

- Management Agreement contained within the Decision Memorandum, which is documented at every KDP.
- Defines parameters and authorities over which the program or project manager has management control and authority.
- Program or project manager accountable for compliance with terms of the agreement.
- Management Agreement typically viewed as a contract between Agency and program or project manager
 - May be changed between KDPs as program or project matures with approval from Decision Authority - requires renegotiation and acceptance.



Agency Baseline Commitment

- An integrated set of program or project requirements, cost, schedule, technical content, and when applicable, JCL.
- Established at transition to Implementation (KDP I/KDP C).
 - ABC cost equal to LCC approved by Agency
 - Includes actual Formulation costs (Phases A and B) and estimated costs for Implementation (Phases C, D, E and F).
 - Does not include actual cost for Pre-Phase A or Extended Operations.
- ABC required for all projects, tightly coupled programs and single-project programs. Not required for loosely coupled and uncoupled programs.
- ABC is the only official baseline for a program or project.
- ABC for projects with LCC > \$250 million and for tightly coupled and single-project programs forms basis for Agency's external commitment to OMB and Congress, and serves as basis by which external stakeholders measure NASA's performance.
- Changes to ABC are controlled through formal approval process.



Joint Confidence Level

- Product of probabilistic analysis of coupled cost and schedule to measure likelihood of completing all remaining work at or below the budgeted levels and on or before planned completion of development phase.
- Established at transition to Implementation (KDP I/KDP C).
 - Calculation includes period from approval for Implementation through handover to operations (Phases C and D).
- Required for all tightly coupled and single-project programs, and for all projects with LCC > \$250 million.
- Calculation includes consideration of risk associated with all elements, regardless of whether or not they are funded from appropriations or managed outside of program or project.
- Per NPR 7120.5, Mission Directorates plan and budget tightly coupled and single-project programs, and projects with LCC > \$250 million based on 70% JCL or as approved by Decision Authority. Mission Directorates ensure funding is consistent with Management Agreement and in no case less than 50% JCL.



Unallocated Future Expenses

- The portion of estimated cost required to meet specified confidence level* that cannot yet be allocated to specific WBS sub-elements because the estimate includes probabilistic risks and specific needs that are not known until risks are realized.
- When UFE is a product of the probabilistic JCL analysis, any reduction in UFE reduces probability of achieving program or project cost and schedule targets in a manner that can be explicitly quantified.
- UFE documented in Decision Memorandum and Management Agreement
 - UFE held at program or project level documented in Management Agreement
 - UFE held at Mission Directorate level documented in Decision Memorandum
- Program or project manager may distribute UFE in the Management Agreement to specific WBS sub-elements without seeking approval.
- Approval and amendment to Decision Memorandum required to distribute UFE held at the Mission Directorate level.

*Programs and projects not required to develop confidence levels: UFE informed by risk posture in accordance with Mission Directorate and Center guidance and requirements. Rationale should be documented, traceable, repeatable, and defensible.



Life-Cycle Cost

- Total cost of program or project over planned life cycle from Formulation (excluding Pre-Phase A) through Implementation (excluding extended operations).
 - LCC includes all costs, including all unallocated future expenses and funded schedule margins.
- Tightly coupled and single-project programs document LCC in accordance with life-cycle scope defined in Formulation Authorization Document (FAD) or Program Commitment Agreement (PCA).
 - Constituent projects document LCC in accordance with life-cycle scope defined in program's Program Plan, FAD or PCA, or project's FAD.
- During Formulation, projects with LCC > \$250 million and all tightly coupled and single-project programs document LCC as a range with high and low estimate.
 - Range reflects broad uncertainties regarding scope, technical approach, safety objectives, acquisition strategy, implementation schedule, and associated costs.
 - Range is refined as Formulation proceeds.
- During Implementation LCC is documented as a single number.



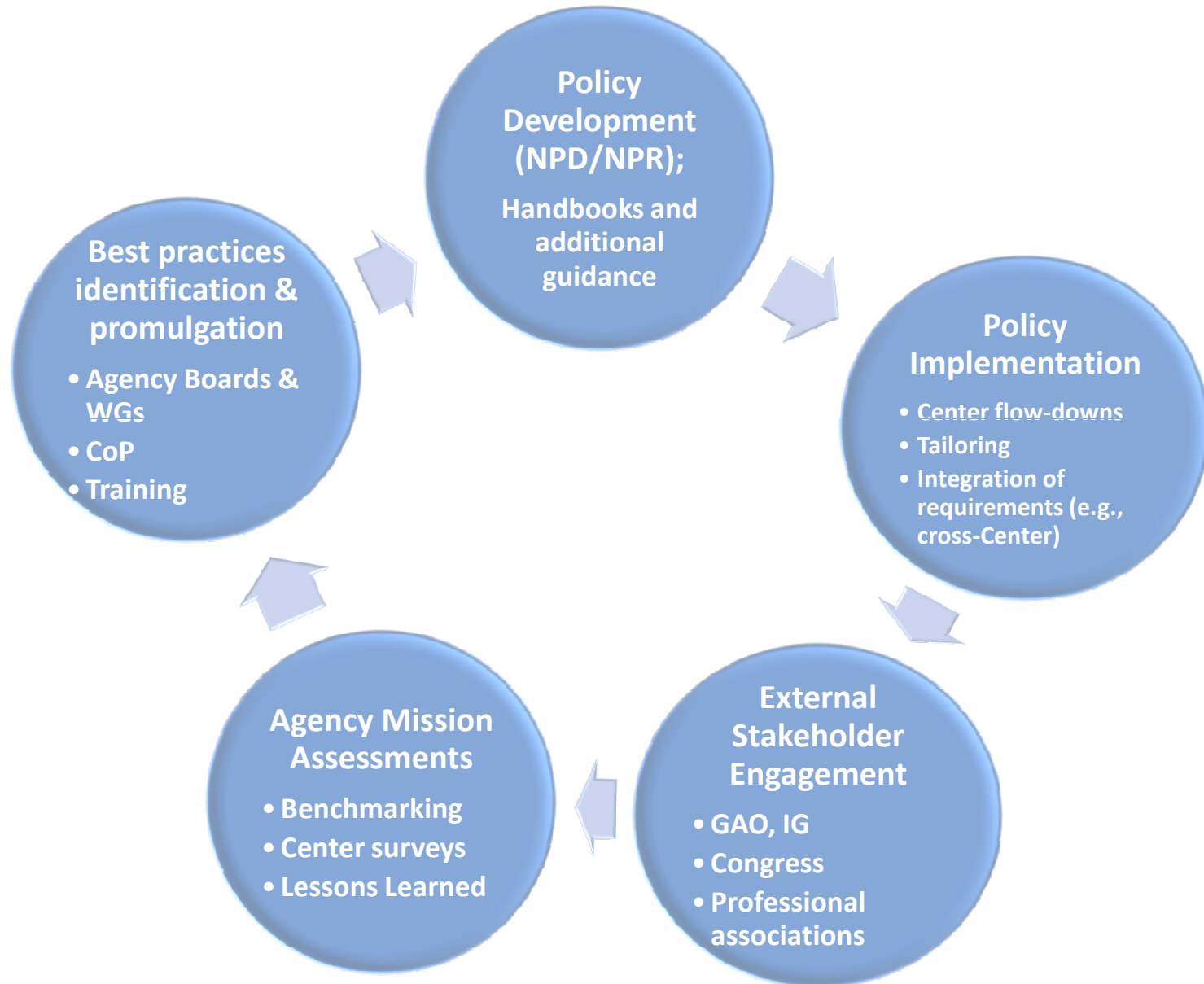
PM Handbook History/Schedule

- Decision to streamline NPR 7120.5E: June 2011
- NPR 7120.5E released: August 2012
- Interim PM Handbook posted: December 2011
- Development of PM Handbook by Core Team (subordinate to finalizing Rev E): August 2011 – December 2012
- Red Team review and comment disposition: February 2013 – July 2013
- Chief Engineer Review: September 2013 – October 2013
- Final Core Team review and update: October 2013 – December 2013
- PM and revised SRB Handbooks draft posted: January 25, 2014 on OCE tab in NODIS at http://nodis3.gsfc.nasa.gov/OCE_rep/OCE_list.cfm
- STI review*: January – March 2014
- Final PM Handbook to be on OCE tab in NODIS at http://nodis3.gsfc.nasa.gov/OCE_rep/OCE_list.cfm and STI library at <http://www.sti.nasa.gov>.

*PM Handbook will NOT go through NODIS process, but instead through STI process where it will become a NASA Special Publication (SP) document.



NASA Policy/Guidance Development and Evolution





Chairing the LCR

- Except in special cases, a one-step LCR and both steps of a two-step LCR are chaired by the SRB.
- There are special cases, particularly for human space flight programs and projects, where the LCR is used to make formal decisions to complete technical work and align it with cost and schedule.
- In these cases, program or project manager may co-chair the LCR and the SRB will conduct the independent assessment concurrently.
- Program or project manager works with SRB chair to develop LCR agenda and agree on how LCR will be conducted to ensure that the SRB can fully accomplish independent assessment.
- Program or project manager and SRB chair work together to ensure LCR Terms of Reference (ToR) reflect their agreement and convening authorities approve approach.



Terms of Reference Template Cover

**Terms of Reference for the Life-Cycle Reviews
of the [Program or Project Name]**

Approved by:

Concurred by:

[Name]
Director, Office of Evaluation
NASA Headquarters

[Name] *{Category 1 & 2 Projects
only}*
NASA Chief Engineer
NASA Headquarters

[Name] *{Programs only}*
NASA Chief Engineer
NASA Headquarters

[Name]
Associate Administrator, [Designated] Mission
Directorate
NASA Headquarters

[Name]
Center Director
[Center Name]

[Name] *{Programs & Category 1 Projects
only}*
NASA Associate Administrator
NASA Headquarters

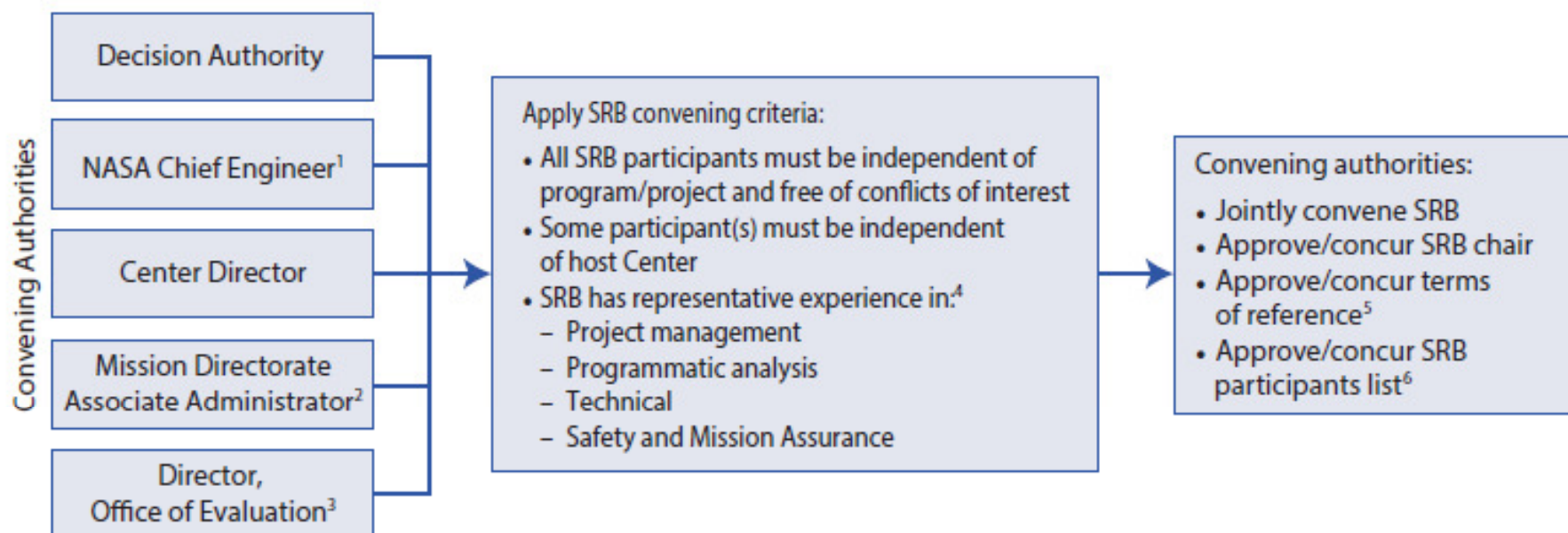


Example: Civil Servant Conflict of Interest

- Internal screening is performed to ensure the independence of civil servants on an SRB. All civil servants must have a current Office of Government Ethics Form 450 or Standard Form 278, as applicable, on file with NASA (or available to NASA) prior to being considered for SRB membership. These forms must be updated annually.
- The Langley Research Center (LaRC) Office of Chief Counsel (OCC) will identify disqualifying personal and positional conflicts of interest in accordance with the relevant laws and regulations governing standards of ethical conduct. A civil servant must not participate in any SRB activity until the LaRC OCC has made a determination that the civil servant has no financial interests that will create a conflict with service on an SRB. When the OCC informs the Independent Program Assessment Office (IPAO) that a person cannot serve on the SRB due to a personal or positional conflict of interest, the IPAO may:
 - Find an alternative SRB member,
 - Request divestiture of a financial interest that creates the conflict of interest, or
 - Pursue a waiver for the disqualified individual. See 18 USC § 208 and “Standards of Ethical Conduct for Employees of the Executive Branch” contained in 5 CFR (Code of Federal Regulation) part 2635, as supplemented by 14 CFR 1207.



Forming an SRB



¹ The Chief Engineer is not a Convening Authority for Category 3 projects.

² The Mission Directorate Associate Administrator acts as a Convening Authority only when not already acting as the Decision Authority.

³ The Director of the Office of Evaluation is not a Convening Authority for Category 3 projects and Category 2 projects of less than \$250 million.

⁴ When applicable and at the request of the Office of the Chief Engineer, the Office of the Chief Health and Medical Officer/Health and Medical Technical Authority will determine the need for health and medical participation on the SRB.

⁵ Terms of reference content may vary with the organization responsible for the SRB.

⁶ For each life-cycle review conducted by an SRB, the SRB chair selects SRB participants from the approved list.

Figure 3-1 Forming an SRB



Maturity Parameters

Maturity Parameter	Requirement Location
Review entry criteria	<i>NPR 7123.1, Appendix G</i>
Review success criteria	<i>NPR 7123.1, Appendix G</i>
Control plans maturity matrix	<i>NPR 7120.5E, Appendix I</i>
Products maturity matrix	<i>NPR 7120.5E, Appendix I</i>
Expected maturity state overall at KDP reviews and specific LCRs	<i>NPR 7120.5E, Tables 2-3–2-6</i>
Maturity tables (with review criteria details)	<i>NASA Space Flight Program and Project Management Handbook, Appendix D</i>



Communities of Practice Resources

- NASA Engineering Network (NEN) Program/Project Management Community of Practice (PM CoP): <https://nen.nasa.gov/web/pm/7120.5d-background>
- OCFO CoP: <https://max.omb.gov/community/pages/viewpage.action?pageId=646907686>
- OCFO/SID Cost and Schedule CoP (includes external reporting): <https://max.omb.gov/community/x/TQePJg>.
- Systems Engineering CoP: <https://nen.nasa.gov/web/se>
- EVM CoP: <http://evm.nasa.gov>



Additional PM and SRB Handbook References

- *NPD 1000.0, NASA Governance and Strategic Management Handbook*
- *NPD 1000.5, Policy for NASA Acquisition, also referenced as NPD 1000.5A, Policy for NASA Acquisition*
- *NPD 1001.0, NASA Strategic Plan*
- *NPD 1600.2, NASA Security Policy*
- *NPD 7120.4, NASA Engineering and Program/Project Management Policy*
- *NPD 8700.1, NASA Policy for Safety and Mission Success*
- *NPR 1900.9, Ethics Program Management*
- *NPR 7123.1, NASA Systems Engineering Processes and Requirements*
- *NPR 7120.5E, NASA Space Flight Program and Project Management Requirement*
- *NPR 7150.2, NASA Software Engineering Requirements.*
- *NPR 8000, Agency Risk Management Procedural Requirements*
- *NPR 8705.2, Human-Rating Requirements for Space Systems*
- *NPR 8705.6, Safety and Mission Assurance (SMA) Audits, Reviews, and Assessments*
- *NPR 9420.1, Budget Formulation*
- *NPR 9470.1, Budget Execution*
- *NASA Cost Estimating Handbook*
- *SSSE MH2002, The Science Mission Directorate Enterprise Management Handbook*
- *NASA-HDBK-2203 NASA Software Engineering Handbook,*
<https://swehb.nasa.gov/display/7150/Book+A.+Introduction>
- *NASA/SP-2007-6105, Systems Engineering Handbook, Rev 1, 2007.*
- *Federal Acquisition Regulation (FAR), 48 C.F.R.*
- *FY 2008 House Appropriations Report H.R.2764 (P.L.110-161), "Audit of NASA large-scale programs and projects,"*
- *NASA FAR Supplement (NFS), 48 C.F.R., Chapter 18*
- *White House, Office of Management and Budget (OMB) Circular A-11, Preparation, Submission and Execution of the Budget, Section 6. (7/26/2013)*



Additional Resources

NPDs and NPRs: The latest versions of these policy documents can be found in the NODIS library at <http://nodis3.gsfc.gov>

Handbooks: NASA Special Publications (SP) handbooks can be found in the STI library at <http://www.sti.nasa.gov>. Other handbooks except the SMD handbook can be found on the OCE tab under the “Other Policy Documents” menu in the NODIS library at <http://nodis3.gsfc.nasa.gov>

NASA Standards:

NASA Technical Standards can be found under the “Other Policy Documents” menu in the NODIS library at <http://nodis3.gsfc.gov>

Budgets:

Preparation, submission and execution of the Budget (section 6) at http://www.whitehouse.gov/sites/default/files/omb/assets/a11_current_year/s20.pdf

Certification of PMs: Program and Project Manager requirements for certification can be found at http://www.whitehouse.gov/sites/default/files/omb/procurement/workforce/fed_acq_cert_42507.pdf

GAO Reports: Results annually published at:

http://gao.gov/search?search_type=Solr&o=0&facets=&q=NASA+Assessments+of+Selected+large-scale+projects&adv=0