

Cover Page

Preface

Informal paragraph by Scolese

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Foreword

The Standing Review Board (SRB) for independent life-cycle reviews is an Agency requirement as defined in NASA Procedural Requirement (NPR) 7120.5D, NASA Space Flight Program and Project Management Requirements. The purpose of the SRB Handbook is to provide the philosophy and guidelines for the setup, processes and products of SRBs in support of the Agency's implementation of its integrated independent life-cycle review process. The SRB Handbook is written to assist the NASA community and SRBs in defining working interfaces with Mission Directorates, programs, projects, Centers, review organizations, and Management Councils based on best practices.

The SRB Handbook can be supplemented and tailored to meet the needs of the Agency. For example, the formality of independent life-cycle reviews is based on the scope, complexity, priority, and risk of the program/project. NPR 7120.5D supports this notion by defining categories for projects that differentiate the varying levels of management requirements and Agency attention and oversight. The project life-cycle cost estimate is a primary discriminator for categorization; however, other discriminators include the use of nuclear power sources and whether or not the system being developed is for human space flight. The priority level, which is related to the importance of the activity to NASA, is also a qualifier; i.e., the extent of international participation (or joint effort with other government agencies), the degree of uncertainty surrounding the application of new or untested technologies, and spacecraft/payload development risk classification. These factors, as well as the inherent risk of the program or project, must all be taken into consideration when determining the level of implementation of this handbook.

The SRB Handbook applies to NASA Headquarters and NASA Centers, including Component Facilities and the Jet Propulsion Laboratory. The scope of the SRB Handbook includes independent life-cycle reviews for programs and projects that are governed by NPR 7120.5D. Programs/projects that are governed by other NPRs, sub-projects, or any other activity not necessarily documented as a project may also wish to use these guidelines when appropriate.

The SRB Handbook consists of six core sections:

- **Section 1** provides the context for the process of independent life-cycle reviews. This section introduces the genesis of the concept of a single review team called the SRB. It identifies the objectives and intent of the philosophy behind the SRB process. Section 1 also defines the governance of the SRBs throughout the life-cycle of the program/project.
- **Section 2** defines the highest-level principles that govern the SRB. It includes the assumptions the reader must know to fully understand the process and products of independent life-cycle reviews. Two significant parts in this section are a discussion of independence of the SRB and individual members, and issue resolution.
- **Section 3** establishes the independent life-cycle review scope and expectations for the variety of NASA programs/projects. This section uses tables (referred to as roadmaps) for each program/project type, depicting the SRB independent life-cycle reviews, the typical support assessments, and the reporting venues associated with each independent life-cycle review.
- **Section 4** defines the process of initiating the SRB, with roles and responsibilities of key individuals during that phase. SRB initiation includes principles for staffing teams, and the Terms of Reference are introduced.
- **Section 5** provides the products of the SRB performing an independent life-cycle review. This section introduces the support assessments that will enable added depth of review in standard areas of significance (e.g., Independent Cost Estimate).
- **Section 6** provides a notional review sequence for a single independent life-cycle review. This section provides a walk-through of an independent life-cycle review from end-to-end.

The appendices include examples and templates for the products identified, as well as reference material for the SRB that supplement the core sections.

References

NPD 1000.0, Strategic Management and Governance Handbook
NPR 7120.5D, NASA Space Flight Program and Project Management Requirements
NPR 7123.1, Systems Engineering Procedural Requirements

Table of Contents

Preface	2
Foreword	3
References	3
1.0 Introduction	6
1.1 Purpose	6
1.2 Governance	6
2.0 Guidelines	6
2.1 Major Principles	6
2.2 Assumptions	7
2.3 Independence of Standing Review Boards	7
2.4 Issue Resolution	7
3.0 Standing Review Board Scope and Reporting	7
3.1 Project Standing Review Board Reviews	8
3.1.1 Roadmap for Robotic Mission Projects	8
3.1.2 Roadmap for Human Mission Projects	9
3.2 Program Standing Review Board Reviews	11
3.2.1 Roadmap for Programs with Uncoupled or Loosely Coupled Projects	11
3.2.2 Roadmap for Programs with Single or Tightly Coupled Projects	12
4.0 Standing Review Board Initiation	13
4.1 Membership Selection Principles	13
4.1.1 Chair Selection	14
4.1.2 Review Manager Selection	16
4.1.3 Board Members Selection	16
4.2 Terms of Reference	17
4.2.1 Baseline Terms of Reference	17
4.2.2 Addendum Terms of Reference	17
4.2.3 Terms of Reference Approval Process	18
5.0 Standing Review Board Deliverables	18
5.1 Support Assessments	18
5.1.1 Cost Assessments	18
5.1.1.1 Independent Cost Estimates (for Projects)	18
5.1.1.2 Independent Cost Analysis (for Programs)	19
5.1.2 Schedule Assessments	19
5.1.3 Special Assessments	20
5.2 Findings and Evaluations	20
5.2.1 Findings	21
5.2.2 NPR 7120.5D Success Criteria	22
5.2.3 Center/Mission Directorate Review Objectives	25
5.2.4 Pass/Fail Evaluation	25
5.3 Reports	25
5.3.1 Standing Review Board Briefing to the Program/Project	25
5.3.2 Written Reports	25
5.3.3 Briefing Reports	26
6.0 Review Approach	26
6.1 Review Preparations	27
6.2 Performing Support Assessments	28
6.3 Conducting the Review	28
6.4 Building Consensus	30
6.5 Debriefing the Standing Review Board Findings	31

List of Appendices

Appendix A. Glossary	33
Appendix B. Acronyms	38
Appendix C. Ethics and Independence	40
Appendix D. Chair and Review Manager Approval Letter Example	44
Appendix E. Membership Approval Letter Example	46
Appendix F. Baseline/Addendum Terms of Reference Template	51
Appendix G. Request for Action Guidelines and Template	55
Appendix H. Written Report Template Example	59
Appendix I. Briefing Report Sample Outline	63
Appendix J. Notional SRB Review Schedule Example	64

List of Figures

Figure 4-1. Formulation Process Flow	15
Figure 5-1. Evaluation Process Flow	21
Figure 6-1. Review Process Flow	27
Figure 6-2. Reporting Process Flow	32

List of Tables

Table 3-1. NPR 7120.5D Project Categorization Table	8
Table 3-2. Life-cycle Roadmap for Robotic Mission Projects	9
Table 3-3. Life-cycle Roadmap for Human Mission Projects	10
Table 3-4. Life-cycle Roadmap for Uncoupled or Loosely Coupled Programs	11
Table 3-5. Life-cycle Roadmap for Tightly Coupled or Single Project Programs	12
Table 5-1. Example Mapping NPR 7123.1 Success Criteria to NPR 7120.5D Success Criteria	23
Table 5-2. Project Success Criteria Evaluation Guidance	24
Table 5-3. Program Success Criteria Evaluation Guidance	24

1.0 Introduction

1.1 Purpose

The NASA Procedural Requirement (NPR) 7120.5D, NASA Space Flight Program and Project Management Requirements, introduces the concept of a single independent life-cycle review team called the Standing Review Board (SRB), which performs independent life-cycle reviews defined in that document. The SRB process integrates the NPR 7120.5D requirements and the NPR 7123.1, Systems Engineering Procedural Requirements, into a single independent life-cycle review set of requirements.

The objective of implementing an SRB is to lower the burden of multiple independent life-cycle reviews imposed on programs/projects. The intent of the SRB implementation is to enhance the independent life-cycle review quality and efficiency through the development of common definitions and processes for an integrated SRB. The SRB implementation also ensures that programs/projects, Decision Authorities (DAs), Mission Directorate Associate Administrators (MDAAs), and Technical Authorities (TAs) benefit from consistent, efficient, and value-added independent life-cycle reviews and products.

The implementation of the SRB combines objectives of the convening authorities and as such is a collaboration between the DAs, MDAAs, TAs and the Program Analysis & Evaluation (PA&E) Associate Administrator (AA). The needs and objectives of each are intended to be met through the SRB.

1.2 Governance

The requirement for SRBs is established under the authority of NPR 7120.5D, which is the governing document for independent life-cycle reviews processes and products. NPR 7120.5D also defines the convening authorities for independent life-cycle reviews. In some cases, Center procedural requirements may also govern the SRB products and processes and will be addressed in the Terms of Reference (ToR) for that review. NPR 7120.5D's governance of the SRB is consistent with NASA Policy Directive (NPD) 1000.0, Strategic Management and Governance Handbook.

2.0 Guidelines

The SRB Handbook consists of guidelines that are considered best practices for SRB processes and products. A few of these guidelines are worth noting as "major principles" that the reader should be cognizant of at the onset. Additional principles are noted throughout the SRB Handbook.

2.1 Major Principles

- a. NPR 7120.5D and NPR 7123.1 define the independent life-cycle review requirements; the SRB Handbook discusses how to implement those requirements.
- b. The SRB Handbook is strictly advisory; it is not a requirements document. This means that the SRB Handbook provides best practice guidance that has been proven in the field.
- c. SRBs are independent constructs, constituted with members who are outside the advocacy (decisional) chain of programs/projects.
- d. SRBs perform independent life-cycle reviews and provide recommendations, but do not impose requirements or make decisions; i.e., the SRB is an advisory body.
- e. The explicit customers of the SRB are the independent life-cycle review convening authorities; the implicit customers are the programs/projects being reviewed.
- f. A focus of SRBs is to promote Agency mission success.
- g. The SRB remains intact, with the goal of having the same core membership for the duration of the program/project, although it may be modified or augmented over time with specialized reviewers as needed.
- h. The SRB Chair manages the content and schedule of work that is performed by the SRB (in accordance with the ToR).

- i. SRBs may write Request for Actions (RFAs) but will not write Review Item Discrepancies (RIDs)¹.
- j. The SRB Chair and Review Manager (RM) will work diligently with the program/project to minimize impact on resources and schedules.
- k. The SRB Chair and RM will coordinate activities with the program/project to minimize duplication of effort; i.e., attend internal reviews rather than requesting special sessions.
- l. When an SRB member attends a program/project internal decisional review or meeting, the SRB member will be a non-voting observer, to ensure their continued independence.
- m. The SRB Chair, RM, and cost discipline expert will be funded by an independent account and all other members will be funded by the program/project budget. Contracts for members will be through an independent means; i.e., not the program/project organization. Budgeting for these members of the SRB will be handled on a case-by-case basis.
- n. Any opinions of the SRB will be clearly articulated to the program/project being reviewed prior to reporting at any other level.

2.2 Assumptions

- a. The reader has a working knowledge of NPR 7120.5D and NPR 7123.1 requirements, processes, and products.
- b. The SRB review process is not an audit function.
- c. Any unintended contradictions between the SRB Handbook and NPRs 7120.5D and 7123.1 shall always be resolved in favor of the NPRs.
- d. Centers have institutionalized and maintain a closed-loop RFA process consistent with the process described in Section 6.3.
- e. The Agency governance structure continues to hold within the convening authorities and dissent among the convening authorities should be raised to the next level of Agency governance.
- f. NPR 7120.5D, section 2.5.1, notes that prior to an independent life-cycle review, “programs/projects conduct internal reviews to initially establish and then manage the program/project baseline.” The SRB process is not meant to replace, upset, circumvent, define, or control that process.

2.3 Independence of Standing Review Boards

Ethical principles are considered to be the foundation for maintaining independence. Appendix C² is dedicated to the subjects of ethics and independence. In the SRB Handbook, independence is used in broad terms and the term “non-advocate,” used extensively in NASA policy, is considered encompassed by the term “independent.”

2.4 Issue Resolution

Infrequent circumstances may arise when a disagreement occurs between the SRB and program/project. Every effort should be made first to resolve the issue between the SRB (Chair & RM’s organization) and the program/project manager (PM) or designee. If the issue cannot be resolved, it is elevated to the convening authorities for resolution. Resolution should be attempted at successively higher levels until resolved. If necessary, issue adjudication can be taken all the way to the Office of the Administrator.

3.0 Standing Review Board Scope and Reporting

SRBs are formulated to independently assess programs/projects throughout their life-cycles, typically at the life-cycle reviews. The SRB is responsible for meeting the objectives of all convening authorities, which may vary throughout the program/project life-cycle. In Section 3, the life-cycle reviews are summarized for each type of program/project. Broken down by life-cycle phases, this section uses succinct roadmaps showing the SRB participation, support assessments timing, and reporting venues that are appropriate for that phase. The roadmaps also anchor these activities to the Key Decision Points (KDPs) within the program/project life-cycle.

¹ RIDs are part of the project’s internal process that influences the baseline.

² Appendix C was derived from the Government Accountability Office (GAO), Generally Accepted Government Auditing Standards (GAGAS) (January 2007 Revision). The usefulness is not to compare these two professions but to reference the common attributes of ethics and independence.

3.1 Project Standing Review Board Reviews

NASA formulates projects to implement a diversity of products with widely varying costs and risks. For this reason, projects are categorized into three groups to define the level of management attention and KDP decision level appropriate to each project, based on cost and risk. Similarly, the SRB initiation and reporting process is somewhat different depending on the project category. NPR 7120.5D's Table 2-1 provides a project categorization table that is reproduced here as Table 3-1, since it affects the SRB project roadmaps.

Priority Level	LCC > \$1B, use of nuclear power source, or human space flight		
	LCC < \$250M	\$250M ≤ LCC ≤ \$1B	LCC > \$1B, use of nuclear power source, or human space flight
High	Category 2	Category 2	Category 1
Medium	Category 3	Category 2	Category 1
Low	Category 3	Category 2	Category 1

Note: The threshold values in Table 2-1 are updated annually as part of the Agency's strategic planning guidance.

Table 3-1. NPR 7120.5D Project Categorization Table

Two significant groups of projects in NPR 7120.5D are robotic and human flight projects. Accordingly, robotic mission projects and human mission projects have different life-cycle reviews, assessment requirements, and reporting venues. Hence, the roadmaps for each are different.

3.1.1 Roadmap for Robotic Mission Projects

The SRB roadmap for robotic mission projects is depicted in Table 3-2. The table contains the project life-cycle phases from top to bottom. The SRB is intended to support the reviews in the life-cycle with a consistent core membership; however, the SRB Chair will evaluate the SRB members required to attend each review to ensure a value-added review. In general, the technical members are expected to attend all reviews. Each of the life-cycle reviews are listed next, followed by the level of SRB participation in each review. This participation can range from presiding over the review with full board attendance, e.g., the Preliminary Design Review (PDR), to no participation in reviews that are independent of the SRB, e.g., the Safety and Mission Success Review (SMSR). Each of the life-cycle reviews is defined in greater detail in Table 2-6 of NPR 7120.5D.

The SRB support assessments are also identified in Table 3-2, including the Independent Cost Estimate (ICE)³ and the Independent Schedule Assessment (ISA), (see section 5.1 for support assessment details). Preliminary ICE/ISAs are performed at the project Mission Definition Review (MDR), followed by baseline ICE/ISAs at the PDR. Follow-up cost reserve assessments should be performed at the Critical Design Review (CDR) and again at the System Integration Review (SIR) to ensure that reserves continue to be adequate to complete the implementation. Follow-up schedule critical paths assessment (CPA) and funded slack assessments should be performed at the CDR, and slack should again be examined for adequacy at the SIR, just before system-level integration/test activities get underway.

The SRB reporting venues for each of the project life-cycle reviews are also listed. From left to right (and in the reporting sequence for each review), the presentations of the SRB findings are to the:

- a. Project,
- b. Center Management Council (CMC),
- c. Project's Program Office,
- d. MD Program Management Council (PMC), and
- e. Agency PMC.

³ See Section 5.1.1.1 for definitions of preliminary and baseline maturity levels.

NASA Life Cycle Phases	Project Life Cycle Phases	Project Life Cycle Reviews		SRB Participation	Support Assessments ¹		Reporting Venues					
					ICE	ISA	Project	CMC	Program	MDPMC	APMC	
Formulation	Pre-Systems Acquisition	Pre-Phase A	MCR ² - Mission Concept Review	Case-by-case			X	X	X	X	Cat. 1	
		Key Decision Point A										
		Phase A	SRR ³ - System Requirements Review MDR ³ - Mission Definition Review (PNAR ⁷)	Full Board		Prelim	Prelim	X	X	X	X	Cat. 1
	Key Decision Point B											
	Phase B	PDR - Preliminary Design Review (NAR ⁶)	Full Board	Baseline	Baseline		X	X	X	X	Cat. 1	
	Key Decision Point C - Transition from Formulation into Implementation											
Implementation	Systems Acquisition	Phase C	CDR - Critical Design Review PRR ⁴ - Production Readiness Review SIR - System Integration Review	Full Board Chair and Member Subset ⁵	Reserve	CPA/Slack	X	X	X	X	Cat. 1	
		Key Decision Point D										
		Phase D	ORR - Operational Readiness Review SMSR - Safety and Mission Success Review FRR - Flight Readiness Review LRR - Launch Readiness Review	Chair and Member Subset ⁵ None Full Board Non-voting Observers ⁸	Phase E Reserve	Phase E Slack		X	X	X	X	Cat. 1
	Key Decision Point E											
	Operations	Phase E	PLAR - Post-Launch Assessment Review CERR - Critical Event Readiness Review	Non-voting Observers ⁸ Non-voting Observers ⁸								
	Key Decision Point F											
	Decommissioning	Phase F	DR - Decommissioning Review	Chair and Member Subset ⁵				X	X	X	X	Cat. 1

Notes:

- Support Assessment entries have the following meanings: Prelim means preliminary cost/schedule assessments based on Phase A information; Baseline means final cost/schedule assessments prior to approval for implementation; Reserve means an assessment of cost reserves to go; CPA means schedule critical path analysis; Slack means an assessment of remaining funded schedule reserve.
- For Program-directed Projects only (in some instances the MCR may occur before the SRB is formulated, in which case the SRR will be the first life-cycle review assessed by the SRB); instead of an MCR, AO-selected Projects have a TMC Evaluation of their Mission Concept Studies at the conclusion of Step 2 which is not performed by an SRB.
- At some Centers the SRR and MDR are combined into one review.
- PRRs are only needed when multiple flight system copies (≥ 4) are being developed; timing is discretionary.
- Chair determines which members should attend, including themselves (this participation is part of the Addendum ToR for each Review).
- LRRs, PLARs, and CERRs are performed by the Mission Management Team (MMT); the SRB Chair (and/or Designee) attend as non-voting observers.
- Preliminary Non-Advocate Review
- Non-Advocate Review

Table 3-2. Life-Cycle Roadmap for Robotic Mission Projects

Consideration to project category and life-cycle review is required when determining the SRB reporting venue. Only Category 1 project SRBs report to the Agency PMC, all other project SRBs complete their reporting at the MD PMC level. If a review does not conclude at a KDP (e.g., the CDR), the SRB report ends at the MD PMC. At the discretion of the NASA AA, these review results for Category 1 projects may be further reported to the Agency PMC. The actual reporting requirements for each review with SRB participation are determined with the preparation of the Addendum ToR for that review (see section 4.2 for ToR details). The Addendum ToRs specify the reporting requirements of the SRBs.

3.1.2 Roadmap for Human Mission Projects

The SRB roadmap for human mission projects is depicted in Table 3-3. The table contains the project life-cycle phases from top to bottom. By definition this is also the life-cycle of the SRB. Each of the life-cycle reviews are listed next, followed by the level of SRB participation in the review. Each of the life-cycle reviews is defined in greater detail in Table 2-6 of NPR 7120.5D.

The SRB support assessments are identified in the table, including the ICE⁴, and the ISA (see section 5.1 for support assessment details). Preliminary ICE/ISAs are performed at the project System Definition Review (SDR), followed by baseline ICE/ISAs at the PDR. Follow-up cost reserve assessments should be performed at the CDR and again at the SIR to ensure that reserves continue to be adequate to complete the implementation.

⁴ See Section 5.1.1.1 for definitions of preliminary and baseline maturity levels.

Follow-up schedule CPA and funded slack assessments should be performed at the CDR, and slack should again be examined for adequacy at the SIR, just before system-level integration/test activities get underway.

The SRB reporting venues for each of the project life-cycle reviews are also listed. From left to right (and in the reporting sequence for each review) the presentations of SRB findings are to the:

- a. Project,
- b. CMC,
- c. Project's Program Office,
- d. MD PMC, and
- e. Agency PMC.

NASA Life Cycle Phases	Project Life Cycle Phases	Project Life Cycle Reviews		SRB Participation	Support Assessments ¹		Reporting Venues					
					ICE	ISA	Project	CMC	Program	MDPMC	APMC	
Formulation	Pre-Systems Acquisition	Pre-Phase A	MCR ² - Mission Concept Review	Case-by-case			X	X	X	X	X	
		Key Decision Point A										
		Phase A	SRR - System Requirements Review	Full Board			X	X	X	X		
			SDR - System Definition Review (PNAR ⁴)	Full Board	Prelim	Prelim	X	X	X	X	X	X
		Key Decision Point B										
Phase B	PDR - Preliminary Design Review (NAR ⁵)	Full Board	Baseline	Baseline	X	X	X	X	X	X		
Key Decision Point C - Transition from Formulation into Implementation												
Implementation	Systems Acquisition	Phase C	CDR - Critical Design Review	Full Board	Reserve	CPA/Slack	X	X	X	X		
			PRR ³ - Production Readiness Review	Chair and Member Subset ⁶			X	X	X	X		
			SIR - System Integration Review	Full Board	Reserve	Slack	X	X	X	X	X	
		Key Decision Point D										
		Phase D	SAR - System Acceptance Review	Chair and Member Subset ⁶	Reserve	Slack	X	X	X			
			ORR - Operational Readiness Review	Chair and Member Subset ⁶	Phase E Reserve	Phase E Slack	X	X	X	X		
	SMSR - Safety and Mission Success Review		None									
	Phase E	FRR - Flight Readiness Review	Non-voting Observers ⁷									
		LRR - Launch Readiness Review	Non-voting Observers ⁷									
		Key Decision Point E										
	Operations	Phase E	PLAR - Post-Launch Assessment Review	Non-voting Observers ⁷								
			CERR - Critical Event Readiness Review	Non-voting Observers ⁷								
PFAR ⁸ - Post-Flight Assessment Review			Chair and Member Subset ⁶			X	X	X	X	X		
Key Decision Point F												
Decommissioning	Phase F	DR - Decommissioning Review	Chair and Member Subset ⁶				X	X	X	X	X	

Notes:

1. Support Assessment entries have the following meanings: Prelim means preliminary cost/schedule assessments based on Phase A information; Baseline means final cost/schedule assessments prior to approval for implementation; Reserve means an assessment of cost reserves to go; CPA means schedule critical path analysis; Slack means an assessment of remaining funded schedule reserve.
2. In some instances the MCR may occur before the SRB is formulated, in which case the SRR will be the first life-cycle review assessed by the SRB.
3. PRRs are only needed when multiple flight system copies are being developed; timing is discretionary.
4. Preliminary Non-Advocate Review
5. Non-Advocate Review
6. Chair determines which members should attend, including themselves (this participation is part of the Addendum ToR for each Review).
7. LRRs, FRRs, PLARs, and CERRs are performed by the Mission Management Team (MMT); the SRB Chair (and/or Designee) attend as non-voting observers.
8. If the Human Project is part of a Tightly-Coupled Program, the PFAR will be held at the Program Level at the discretion of the MDAA.

Table 3-3. Life-cycle Roadmap for Human Space Flight Projects

All human mission projects are Category 1 projects (as defined by NPR 7120.5D). Hence, all human project SRBs complete their reporting at the Agency PMC level when the review is concluded at a KDP. For other reviews the reporting venues depend upon the level of SRB participation (e.g., since the SRB Chair attends Flight Readiness Reviews in an advisory capacity, he/she makes inputs to the review board rather than submitting an independent report to the venues). The actual reporting requirements for each review with SRB

participation are determined with the preparation of the Addendum ToR for that review (see section 4.2 for ToR details). The Addendum ToRs specify the reporting requirements of the SRBs.

3.2 Program Standing Review Board Reviews

The most significant difference in the SRB assessment approach to NASA programs is whether the projects within each program are coupled or uncoupled.

3.2.1 Roadmap for Programs with Uncoupled or Loosely Coupled Projects

Programs consisting of multiple projects that are not directly connected to one another (either by schedule, cost, technical interfaces, or management structures) are characterized as uncoupled or loosely coupled programs in NPR 7120.5D. There is a specific life-cycle for these programs, and hence, also a specific SRB roadmap. The SRB roadmap for uncoupled or loosely coupled programs is presented in Table 3-4.

The life-cycle phases are depicted in the table, broken down in rows between formulation and implementation. The SRB life-cycle reviews for the program are also listed – there are only three life-cycle reviews for programs of these types with SRB participation. The Program SRR (P/SRR) / Preliminary Program Approval Review (PPAR), and the Program SDR (P/SDR) / Program Approval Review (PAR) occur during the formulation of a new program. The third review, the Program Implementation Review (PIR) / Program Status Review (PSR)⁵, is a periodic review held biennially (~2 years) as the program implementation proceeds. Each of these reviews is defined in greater detail in NPR 7120.5D, Table 2-5. Note that there is a KDP at the conclusion of the P/SDR and the PIR.

NASA Life Cycle Phases		Program Life-Cycle Reviews		SRB Participation	Support Assessments ¹		Reporting Venues				
					ICA	ISA	CMC	Program	MDPMC	APMC	
Formulation	Pre-Program Acquisition	P/SRR - Program/System Requirements Review (PPAR) ²		Full Board	Prelim	Prelim	X	X	X	X	
		Key Decision Point 0									
		P/SDR - Program/System Definition Review (PAR) ³		Full Board	Baseline	Baseline	X	X	X	X	
Key Decision Point 1 - Transition from Formulation into Implementation											
Implementation	Program Acquisition and Operations ⁴	PIR - Program Implementation Review (PSR) ⁵		Full Board	Update	Update	X	X	X	X	
		Key Decision Point n									

Notes:

1. Support Assessment entries have the following meanings: Prelim means preliminary cost/schedule assessments based on Phase A information; Baseline means final cost/schedule assessments prior to approval for implementation; Update means a 2-year update to the previous baseline assessment.
2. Preliminary Program Approval Review
3. Program Approval Review
4. Once Program Implementation has been approved (KDP 1), PIRs are conducted ~ every 2 years.
5. Program Status Review

Table 3-4. Life-cycle Roadmap for Uncoupled or Loosely Coupled Programs

The support assessments, i.e., Independent Cost Analysis (ICA) and ISA, performed by the SRB in conjunction with the life-cycle reviews are listed (see section 5.1 for support assessment details). Program SRBs perform a preliminary ICA and ISA at the P/SRR, followed by a baseline ICA and ISA at the P/SDR. These baseline assessments, along with other SRB findings, support the KDP gate transition from program formulation to implementation. The SRB will re-perform its baseline ICA and ISA at each PIR, incorporating changes that have occurred within the program that affect its ongoing implementation plans.

⁵ The PSR and the PIR are related but not the same. The PSR is conducted by the program to capture and present to its team members and the SRB the current state of the program and its plan for the future. The SRB participates in this review by conducting an independent assessment of the program and its plans. This independent assessment is the PIR. The SRB will work with the program to ensure that the PSR agenda includes all relevant topics necessary for the PIR.

The reporting venues for all uncoupled or loosely coupled program SRBs include the Program Office itself as well as the appropriate CMC, MD PMC, and the Agency PMC. All three venues apply to all three SRB program independent life-cycle reviews.

3.2.2 Roadmap for Programs with Single or Tightly Coupled Projects

Programs consisting of just one large project or multiple projects that are directly connected to one another (e.g., Space Shuttle program) are characterized as single-project or tightly coupled programs in NPR 7120.5D. There is a specific life-cycle for these programs, and hence, also a specific SRB roadmap. The SRB roadmap for single-project or tightly coupled programs is presented in Table 3-5.

NASA Life Cycle Phases		Program Life Cycle Reviews		SRB Participation	Support Assessments ¹		Reporting Venues				
					ICA	ISA	CMC	Program	MDPMC	APMC	
Formulation	Pre-Program Acquisition	P/SRR - Program/System Requirements Review (PPAR) ²		Full Board	Prelim	Prelim	X	X	X	X	
		Key Decision Point 0									
		P/SDR - Program/System Definition Review (PAR) ³		Full Board	Baseline	Baseline	X	X	X	X	
Key Decision Point I - Transition from Formulation into Implementation											
Implementation ^{4,5}	Program Acquisition	PDR - Preliminary Design Review		Full Board	Update	Update	X	X	X	X	
		Key Decision Point II									
		CDR - Critical Design Review		Full Board	Reserve	CPA/Slack	X	X	X		
		SIR - System Integration Review		Full Board	Reserve	Slack	X	X	X	X	
		Key Decision Point III									
		ORR - Operational Readiness Review		Chair and Member Subset ⁶	Phase E Reserve	Phase E Slack	X	X	X		
		SMSR - Safety and Mission Success Review		None							
	FRR - Flight Readiness Review		Non-voting Observers ⁷								
	LRR - Launch Readiness Review		Non-voting Observers ⁷								
	Key Decision Point IV										
Operations		PLAR ⁸ - Post-Launch Assessment Review		Non-voting Observers ⁷							
		CERR ⁸ - Critical Event Readiness Review		Non-voting Observers ⁷							
		PFAR - Post-Flight Assessment Review		Non-voting Observers ⁷							
		PIR ⁹ - Program Implementation Review (PSR) ¹⁰		Full Board	Update	Update	X	X	X	X	
Key Decision Point n											

Notes:

- Support Assessment entries have the following meanings: Prelim means preliminary cost/schedule assessments based on Phase A information; Baseline means final cost/schedule assessments prior to approval for implementation; Reserve means an assessment of cost reserves to go; CPA means schedule critical path analysis; Slack means an assessment of remaining funded schedule reserve; Update means an update to the previous assessment.
- Preliminary Program Approval Review
- Program Approval Review
- Single-Project Program reviews from PDR until Operations are the same reviews (not duplicates) as the Project reviews.
- Tightly-Coupled Program reviews during Implementation are intended to ensure overall integration of all the program elements (i.e., the Projects), and hence, occur after all the Program's Projects have completed the same milestone review.
- Chair determines which members should attend, including themselves (this participation is part of the Addendum ToR for each Review).
- The FRR and PFAR are held at the discretion of the MDAA; the program SRB chair and project SRB chairs attend as advisory members to the flight and mission operations review boards. The SRB input is provided during this board meeting.
- PLARs and CERRs are performed by the Mission Management Team (MMT); the SRB Chair (and/or Designee) attend as non-voting observers.
- Once in Operations, PIRs are conducted ~ every 2 years for both Single-Project and Tightly-Coupled Programs.
- Program Status Review

Table 3-5. Life-cycle Roadmap for Single-Project or Tightly Coupled Programs

The life-cycle phases are depicted in the table, broken down in rows between formulation and implementation. The life-cycle reviews for the program are also listed, followed by the SRB participation in these reviews. The first two SRB reviews, the P/SRR (PPAR) and the P/SDR (PAR), occur during the formulation of a new program. The next seven life-cycle reviews cover the program acquisition phase. For single-project programs these are, in fact, the project reviews held during this phase. Note the varying level of SRB participation in these reviews, which ranges from full board participation (Chair presides over the review) to no participation in reviews that are independent of the SRB (e.g., the SMSR). Nonetheless, there is sufficient SRB involvement in the program acquisition phase reviews to enable the SRB to completely assess the implementation progress of the program.

For tightly coupled programs, these reviews “mirror” similar reviews within each of the constituent projects of the program but typically occur after all “like” project reviews have been completed, in order to achieve an integrated assessment of the program at that point in its life-cycle. Once in the operation phase of the program life-cycle, PIRs/PSRs⁶ are held biennially (~2 years) to assess the program, just as is done in uncoupled or loosely coupled programs. During operations, program-level Post Launch Assessment Reviews (PLARs) and Critical Events Readiness Reviews (CERRs) may also be held for the benefit of the program and their associated MD (only the SRB Chair or their designee attend these reviews in an advisory capacity). Again, each of these reviews is defined in greater detail in NPR 7120.5D, Table 2-5.

The support assessments (i.e., ICA and ISA) performed by the SRB in conjunction with the life-cycle reviews are listed (see section 5.1 for Support Assessment details). Program SRBs perform a preliminary ICA and ISA at the P/SRR, followed by a baseline ICA and ISA at the P/SDR. These baseline assessments, along with other SRB findings, support the KDP gate transition from program formulation to implementation. Once in implementation, an updated ICA is performed at the PDR; at the subsequent CDR and SIR, the adequacy of remaining cost reserves should be reassessed. Regarding the program schedule, a CPA should be performed at the PDR and CDR. Reassessment of the program’s available schedule slack should be addressed at both the CDR and SIR. Both the ICA and ISA need to be re-performed at each of the PIRs, after the program has transitioned to its operation phase.

The reporting venues for all single-project or tightly coupled program SRBs includes the Program Office itself, as well as the appropriate CMC, MD PMC, and the Agency PMC. Different venues apply to each program life-cycle review, depending upon the SRB participation level at the review.

4.0 Standing Review Board Initiation

4.1 Membership Selection Principles

This section provides a number of principles to consider when architecting a new SRB. The most significant principle is to select the “right team.” The determinants for membership are prioritized as 1) competency, 2) current practitioners, and 3) independence. There is no master formula or “one size fits all” philosophy or predetermination for staffing teams. In fact, there may be circumstances when doing the right thing outweighs some if not all of the principles below.

A very important philosophy when architecting the SRB is determining the “right size” team that can meet the expectations of the life-cycle review charter. On average, project SRBs should be around 12 members and program SRBs should be 6 to 8 members total. These numbers include a single Chair and RM as specified in NPR 7120.5D. Minimizing the number of members on the team has been considered best practice; however, every SRB team size decision requires consideration of many variables. Keep the number of members selected for the duration of the program/project life-cycle to a minimum. Multiple disciplines can sometimes be covered by one member (i.e. electrical and systems engineering). Consider temporarily adding specialists tasked to review specific items identified by the members.

Depth and breadth of knowledge are phrases most often used to describe well-rounded candidate reviewers. Depth is usually related to a competency in one or more subject’s areas and is a prerequisite for being nominated to fill a particular discipline area on the SRB. Competency should not only be thought of from a technology standpoint but also from management and integration. Those who have one or more competencies are considered to have a breadth of knowledge that is sought after for an SRB candidate. However, competency is just one attribute to be emphasized. A second and related attribute is current or recent experience as a practitioner. In NASA, where technology, process, and policy are changing rapidly, currency is an important

⁶ The PSR and the PIR are related but not the same. The PSR is conducted by the program to capture and present to its team members and the SRB the current state of the program and its plan for the future. The SRB participates in this review by conducting an independent assessment of the program and its plans. This independent assessment is the PIR. The SRB will work with the program to ensure that the PSR agenda includes all relevant topics necessary for the PIR.

aspect to consider for a reviewer. Hence, it is important to balance competence with current or recent experience in the selection of well-qualified SRB members.

Also when considering the SRB membership, a well-rounded, diverse set of backgrounds can provide the most versatile perspective of opinions. With the other qualifiers in mind, members should be selected both from within the Agency and from external resources, including such communities as the Department of Defense (DoD), private industry, academia, and other government agencies. When looking internal to the Agency, non-host Centers and cross-mission opportunities, e.g., robotic versus human project expertise, can add cross-fertilization benefits. For project SRBs in particular, a suggested diversity rule of thumb is that approximately half of the members should come from somewhere (internal and external) other than the host Center. Regardless of the representation, all nominees must satisfy the independence criterion as discussed in Section 2.3 (and Appendix C). This is especially important when selecting the SRB Chair in order to minimize the potential for awkward conflict-of-interest situations. While this does not preclude selection of the Chair from the host Center staff, special care must then be taken to ensure clear organizational independence from the project itself. The bottom line is to select the highest qualified, independent team, regardless of where they are from.

Internal to the Agency, there are a number of Mission Support Offices (MSOs) that are defined by the Agency governance model to be independent of the programs/projects. These MSOs can give a team a second level of support when analysis is to be done. For example, the Independent Program Assessment Office (IPAO) may have one cost analyst defined as a team member yet when discrete cost risk analyses are to be completed, this member may be able to utilize a “reach back” capability into their organizations to garner support to complete the additional task, thus reducing the need for permanent, active SRB members. Other examples can come from the Office of Safety and Mission Assurance (OSMA), the NASA Safety Center (NSC), and the NASA Engineering and Safety Center (NESC). Another option to leverage existing resources is to use membership from other related teams: e.g., project SRB Chairs may have membership on program SRBs.

4.1.1 Chair Selection

The Chair of the SRB is selected first and is expected to ensure that the independent review process is implemented by the SRB. This position typically is filled by a person who is well recognized for expertise related to the program/project being reviewed. Also, it is expected that the Chair have a depth of technical knowledge and the breadth of experience that goes with this elevated level of distinction of leading the SRB. Personal attributes for the Chair are usually good communication skills (both written and oral), organizational, and leadership skills. The Chair is recruited with the intent to lead the SRB for the full life-cycle of the program/project. This level of effort for the Chair must be well understood prior to acceptance of this responsibility.

Selection Process for Chair

The selection process is a collaboration between the DA, TA, MDAA, and PA&E. While it is initiated at the Center for projects, it is intended to be a group effort between all of the convening authorities until a suitable SRB Chair and membership is selected. All parties shall approve the SRB Chair.

- a. The first step in the initiation of the SRB formulation process is depicted in Figure 4-1. This process will take place once in the life-cycle of a program/project and is the genesis of the team building exercise. For a project, the first step is the Center Director (or his/her representative) develops a Chair nomination(s) package. For all programs, including single-project programs, the MDAA initiates the first step (i.e., development of a Chair nomination package). The nomination package should include, as a minimum, (1) a short description of the program/project the SRB is being stood up for, (2) a nominal schedule for the review, anchored by a project-controlled milestone, e.g. conclusion of internal review activities, and (3) the nominated candidate(s) biography with relevant information justifying his/her nomination.
- b. The nomination package should be sent to the PA&E/IPAO for a program or Category 1 and Category 2 (life-cycle cost (LCC) > \$250M) project, or the host Center review organization for Category 2 (LCC < \$250M) and Category 3 projects.

- c. After reviewing the Chair nomination package, the IPAO Director (or Center review organization) assigns a RM to facilitate the completion of the SRB formulation process.
- d. The RM facilitates the Chair nomination process with the remainder of the convening authorities. Every convening authority will have the opportunity to review the nomination(s) and submit nominations of their own. Ideally, the RM will facilitate a meeting or telecon for the convening authorities to discuss the nomination(s). However, at a minimum, the RM distributes the Chair nomination(s) to all the convening authorities and requests unofficial approval or alternative nominations.
- e. Simultaneously, the RM facilitates the due diligence of the Chair nomination(s). Due diligence includes, but is not limited to, a check on availability and independence, distribution of Agency documentation to give the candidate the big picture view of the services he/she is being requested to provide, etc.
- f. The RM facilitates the convening authorities' consensus of a candidate then gains the appropriate approvals/concurrence by each required organization.
- g. If consensus cannot be reached between the convening authorities, the DA will make the final decision.
- h. The RM concludes the process by documenting and archiving the decision in a Chair and RM approval letter. The Chair and RM approval letter (see Appendix D for an example) will be submitted as a Memorandum of Record and contain the following as a minimum:
 - i. A description of the program/project for which the Chair and RM are nominated and assigned, respectively.
 - ii. A short bio of each with relevant information that justifies nomination for that position on the SRB.
 - iii. A verification statement about their independence or a disclosure of anything that could be perceived as lack of appearance of independence.

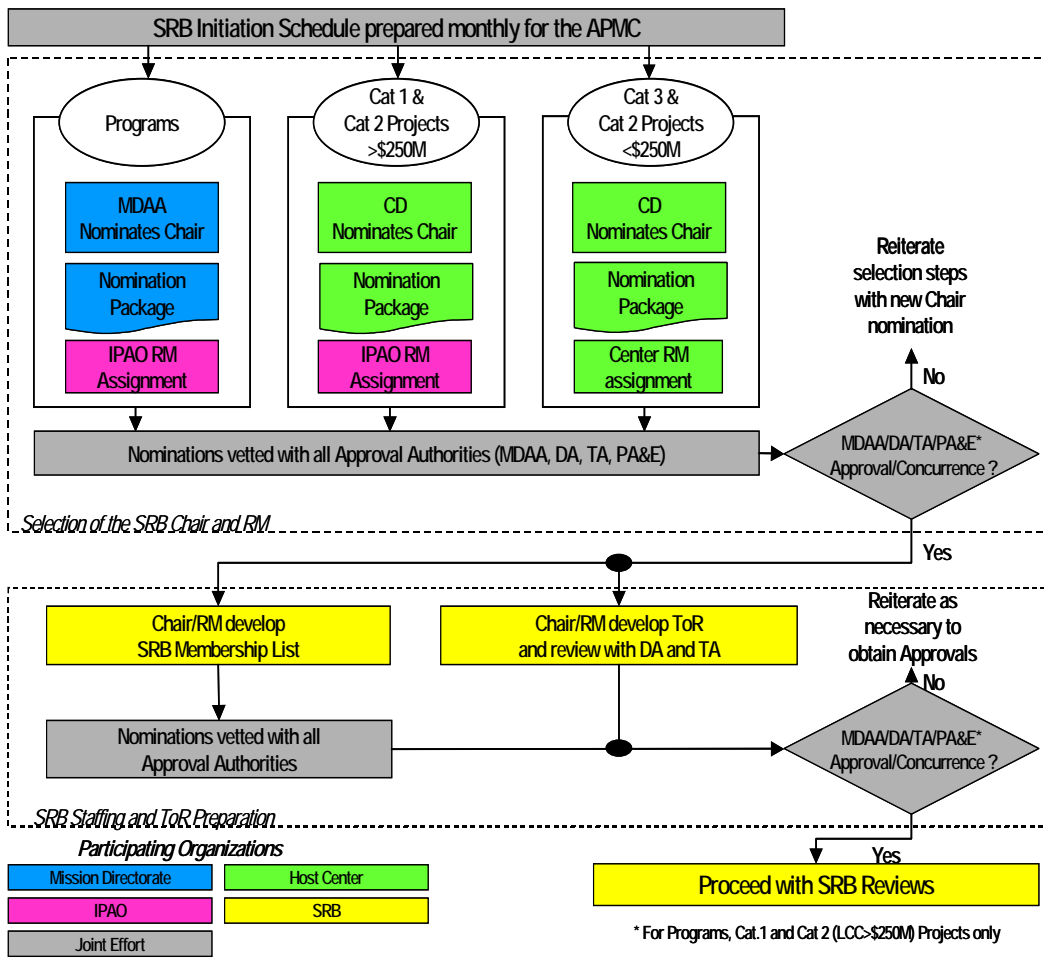


Figure 4-1. Formulation Process Flow

4.1.2 Review Manager Selection

The RM provides a critical function in the independent life-cycle review process. The RM is the single point of coordination across the Agency for consistency of implementation of policy, process, and development of products in terms of the independent life-cycle review process. The RM must possess a high level of knowledge of the program/project and SRB policy (i.e. NPR 7120.5D and NPR 7123.1) and processes such as those defined in the Systems Engineering and SRB Handbook, as the RM facilitates the SRB process for the life-cycle of the program/project. Ideally, the RM will also serve on the SRB as a specific discipline expert.

Selection Process for Review Manager

- a. The RM is assigned by PA&E/IPAO for a program review or Category 1 and Category 2 (LCC > \$250M) projects or the host Center review organization for Category 2 (LCC < \$250M) and Category 3 projects (see Figure 4-1).
- b. The RM assignment is approved simultaneously with the Chair by way of a Chair and RM approval letter described in the *Selection Process for Chair* section 4.1.1.

4.1.3 Board Members Selection

It is highly recommended that when architecting a team, the following are weighed in order:

- a. First, the disciplines necessary to make up the team must be derived from the program/project content. A good practice is to start with the program/project work breakdown structure (WBS). Consideration should be given to risk areas of the program/project.
- b. Second, consider available expertise that might be used to fill the roster. A good practice has been to build a matrix that crosses disciplines with available experts keeping in mind that certain individuals may fill more than one role.
- c. Third, take into account the principles of Section 4.1 of non-host Center and functional support office membership. In other words, no office has an automatic right to representation. The team should be made up of the best people available, wherever they are from.

As described in the principles section, there is no one-size-fits-all circumstance for team composition.

Selection Process for SRB Members

- a. The Chair has the responsibility for developing the candidate membership list for the SRB. However, the membership is approved by the convening authorities. The RM will support the Chair by providing points of contact for Center nominations.
- b. The RM facilitates the nomination process with the convening authority (see Figure 4-1). All convening authorities have the opportunity to review the nomination(s) and submit alternative nominations. Specifically, the RM distributes the initial nomination(s) to the convening authority and requests unofficial approval or alternative nominations.
- c. Simultaneously, the RM facilitates the due diligence of the nominated members. Due diligence includes, but is not limited to, a check on availability and independence, distribution of Agency documentation to give the candidates the big picture view of the services he/she is being requested to provide, etc.
- d. The RM facilitates the convening authorities' consensus of the team, and then gains the appropriate approvals/concurrence of each required organization.
- e. If consensus cannot be reached between the convening authorities the DA will make the final decision.
- f. The RM concludes the process by documenting and archiving the decision in a Team Member approval letter. The Team Member approval letter (see Appendix E for an example) will be submitted as a Memorandum of Record and contain the following as a minimum:
 - i. A description of the program/project for which the nominations are requested.
 - ii. A short bio of each team member with relevant information that justifies nomination for that position on the SRB.

- iii. A verification statement about their independence or a disclosure of anything that could be perceived as lack of appearance of independence.
 - iv. A note about the importance and priority for the services being rendered (this is especially important for the priority of this work over other commitments of Civil Servants).
 - v. A matrix demonstrating how the membership will cover the areas of interest.
- g. The convening authorities must approve any change in membership.

4.2 Terms of Reference

A ToR is an agreement between the SRB and the convening authorities. In general, a ToR documents the SRB charter, scope, and agreements between the convening authorities and the SRB.

There are two types of ToRs to be written, each having a specific purpose, i.e., Baseline and Addendum ToRs. For configuration control purposes, the Baseline ToR will be the governing document and Addendum ToRs will be added as each independent life-cycle review takes place. The first review performed by the SRB will have a Baseline and the first Addendum ToR approved simultaneously; subsequent reviews will only require Addendum ToRs. This means that each Addendum ToR that is attached will be approved and reflected in the change log of the Baseline ToR.

4.2.1 Baseline Terms of Reference

A Baseline ToR is written once for the life-cycle of a program/project and should include all the independent life-cycle reviews to be performed by the SRB (see Appendix F for an example). For a new program/project or the first time a program/project goes through the SRB formulation process, the Baseline ToR is written simultaneously with the membership selection process.

The typical content of a Baseline ToR consist of:

- a. A short description of the program/project as it exists at the time of writing.
- b. A list of all known independent life-cycle reviews the SRB is being stood up to review.
- c. A notional schedule for each life-cycle review.
- d. A list of the support assessments that will be required throughout the life-cycle of the program/project, e.g. ICE, ISA, Human Rating Assessment, etc.
- e. Any special circumstances or risks that should be considered that could affect team size or makeup.
- f. A statement of cooperation, that between life-cycle reviews and prior to an Addendum ToR being written for a specific review, that the program/project and the Chair will work together for the appropriate notice and participation of internal reviews or subsystem reviews that are necessary and appropriate for the SRB to attend.

4.2.2 Addendum Terms of Reference

An Addendum ToR is written for each specific independent life-cycle review and will be attached to the Baseline ToR for configuration control (see Appendix F for an example). For a new program/project or the first time a program/project goes through the SRB formulation process, the first Addendum ToR will be developed and submitted along with the Baseline ToR.

The typical content of an Addendum ToR includes:

- a. A short description of all changes in budget and/or content compared to that described in either the Baseline ToR or previous Addendum ToRs that might affect the size or the makeup of the SRB.
- b. The specific entrance and exit/success criteria for that review.
- c. Specific Center or MD review objectives.
- d. Support assessments to be performed.
- e. A list of points of contact for internal communication.
- f. A list of program/project deliverables (documents requested).

- g. A list of SRB products (reports, e.g., oral and written).
- h. A schedule of events, including all reports and venues. A timetable of events anchored by a project-controlled milestone event, e.g. conclusion of the internal reviews.

4.2.3 Terms of Reference Approval Process

- a. The ToR development process is spearheaded by the Chair and facilitated by the RM. The Chair and RM must work collaboratively with the convening authorities and the program/project to develop a ToR that meets the expectations for the Agency and embraces the needs of the program/project to become a value-added effort for all stakeholders.
- b. The RM facilitates the vetting process with all convening authorities prior to circulating the ToR for approvals/concurrences with the same individuals.
- c. The RM facilitates the submittal of each ToR for approval/concurrence.

5.0 Standing Review Board Deliverables

There exist a small set of products that are fundamental and necessary for independent life-cycle reviews and are required of all SRBs. All SRBs will perform support assessments, produce findings and recommendations, and prepare reports.

5.1 Support Assessments

Performing support assessments is a role of the SRB. Support assessments provide an opportunity to apply the expertise of the SRB in a very specific area in great detail. It is important for the SRB to have ownership of the support assessments because they link the cost, schedule and technical aspects of the project.

Support assessments are broken down into two discipline areas (cost and schedule) and one general category (special). The level of detail and the type of assessment in each discipline vary, depending on whether it is a program/project and where it is in its life-cycle.

5.1.1 Cost Assessments

5.1.1.1 Independent Cost Estimates (for Projects)

An ICE is an independent project cost estimate that is prepared and owned by the SRB. ICEs are bounded by the project scope (total life-cycle through all phases), schedule, technical content, risk, ground rules, and assumptions. ICEs are generally developed using primarily parametric estimating methods and are also supplemented by the use of factors and other estimating methodologies. ICEs are tailored to reflect the design, development state, difficulty of the project, and the expertise of project team members.

ICEs are presented in a series of data/information submitted by the lead cost estimator. The following data/information are provided: 1) scope of the ICE using the project WBS, 2) general ground rules and assumptions necessary to bound and estimate the project, 3) list of estimating methodologies employed, 4) cumulative probabilistic distribution (i.e., the S-curve), and 5) comparison of the ICE to the project office estimate.

To bring rigor to the ICE, in general, given sufficient resources and time, the ICE will be estimated by a primary methodology, crosschecked with a secondary methodology, compared with an analogy, and a list of discrete cost risk analyses will be provided.

For Category 1 and 2 projects, IPAO will provide the SRB members responsible for the ICE. For Category 3 projects, SRB members responsible for the ICE may be provided by the IPAO, the Center Systems Management Office (SMO), or Center systems management function, as appropriate.

The ICE will be vetted through the SRB technical members, and the SRB team as a whole will take ownership by validation of the inputs into the estimating methodologies. The ICE will be a product of the entire SRB.

The ICE is based on the same project definition documentation and technical baseline as used for the project Life-Cycle Cost Estimate (LCCE). Using a common baseline will support a successful reconciliation of the ICE and the project office cost estimate. The reconciliation may be conducted incrementally as segments of the estimates are completed, as well as in its entirety once the full estimate is complete. Reconciliation will ensure that the ICE is reflective of the technical and programmatic state of the project as assessed by the SRB and vetted through the project office.

Maturity Levels (LCCE & ICE)

Preliminary

- a. The preliminary LCCE and ICE are based on the project's technical baseline/mission concept and preliminary integrated master schedule.
- b. The preliminary LCCE and ICE use the latest available full-cost accounting initiative guidance and practices.
- c. The preliminary LCCE and ICE include reserves, along with the level of confidence estimate provided by the reserves based on a cost-risk analysis.
- d. The preliminary LCCE and ICE are time-phased by Government Fiscal Year (GFY) to WBS Level 2.

Baseline

- a. The baseline LCCE and ICE are based on the PDR-technical baseline and integrated master schedule and are expected to include a review of the entire scope of work with a series of in-depth assessments of selected critical work elements of the WBS prior to and following the project's PDR preceding KDP C. (Note: The Cost Analysis Data Requirement (CADRe) is updated to reflect changes.)
- b. The baseline LCCE and ICE use the latest available full-cost accounting initiative guidance and practices.
- c. The baseline LCCE and ICE include reserves, along with the level of confidence estimate provided by the reserves based on a cost-risk analysis.
- d. The baseline LCCE and ICE are time-phased by Government Fiscal Year (GFY) to WBS Level 2.

5.1.1.2 Independent Cost Analysis (for Programs)

The SRB conducts the ICAs, which are independent analysis of program resources including the budget and financial management associated with the program content. ICAs include, but are not limited to, the assessment of cost estimates, budgets, and schedules in relation to the program and its constituent projects' technical content, performance, and risk. Using the ICA, the SRB assesses the adequacy of the budget and management practices to accomplish the work scope through the budget horizon; as such, ICAs can be performed for programs/projects when a life-cycle ICE is not warranted.

For programs, IPAO provides the SRB members responsible for the ICA.

ICAs are comprehensive in nature and broad in scope; unlike the ICEs, ICAs are generally qualitative and do not employ the standard cost estimating suite of tools. Given the program content, the ICAs assess the program's funds obligations, congruency of the funds and its intended purposes, and demonstration of strong financial management practices. For ICAs, the type of data/information will vary and consequently the final ICA product will be tailored to address the state of the program.

5.1.2 Schedule Assessments

An ISA is conducted so the SRB can develop an understanding of the realism and completeness of the program/project schedule, assess risk, and identify where there may be inadequate phasing of available resources versus required resources.

The entire technical team should participate in identifying schedule risk areas based on sound technical judgment and area of expertise. As with the cost estimate, the team members must take ownership of the results of the assessment.

A program ISA is performed more from a strategic viewpoint utilizing the program plan/roadmap to assess the viability of the program planning for the next 10 years. A program ISA assesses the program's long-term alignment with sponsor goals and objectives.

A project ISA focuses on the detail implementation plan for that specific project. Items utilized in performing the assessment include the project plan, WBS, project master schedule, and project detail schedules.

5.1.3 Special Assessments

Special assessments are intended to provide independent, detailed information to the SRB about a specific topic or area, and are typically performed before the independent life-cycle review(s) dealing with the assessment subject matter. Among the motivations for special assessments are the following:

- a. To obtain an independent "second opinion" when appropriate,
- b. To explore an issue in greater depth than the program/project chooses to do, or
- c. To satisfy a directive from one of the convening authorities.

Special assessments are not to be confused with "Special Reviews" defined in NPR 7120.5D, paragraph 2.5.3. Special Reviews are reviews not specified as an independent life-cycle review in NPR 7120.5D. They are a stand alone review and need the approval of the convening authority to be performed and require their own ToR. On the other hand, special assessments are part of an independent life-cycle review and may be recommended by either the SRB or the convening authority. Special assessments require approval in the appropriate life-cycle review Addendum ToR.

Members of the SRB can perform these special assessments if they have the required expertise and are available to perform the task. Also, personnel outside the SRB who possess the requisite expertise can perform special assessments. Candidates include NASA Center personnel, members of NESC, DoD, and other government or contractor personnel. Some examples of special assessments include:

- a. Reliability assessments (e.g., Probability Risk Assessments, Failure Mode Effects and Criticality Analysis, Fault-Tree Analyses, etc.)
- b. Human Rating Assessments,
- c. Specific technical assessments (e.g., instrument/sensor performance, technology readiness, etc.).

5.2 Findings and Evaluations

It is recommended that the SRB follow a step-wise evaluation process in their assessments of programs/projects. This process proceeds from the development of findings to the ultimate pass/fail determination for a review through the following steps:

- a. Findings (identification of strengths and weaknesses) and recommendations
- b. ToR success criteria, which will include evaluation of NPR 7120.5D Success Criteria, Open RFA action items including potential impact and may include assessment of Center or MD specific review objectives, and
- c. Pass/Fail determination

This approach has a hierarchal character that is depicted in Figure 5-1. Proceeding in this manner permits the SRB to begin with a comprehensive assessment of the entire review scope, and then through a structured process of consolidation arriving at the final determination of a successful (pass) or unsuccessful (fail) conclusion.

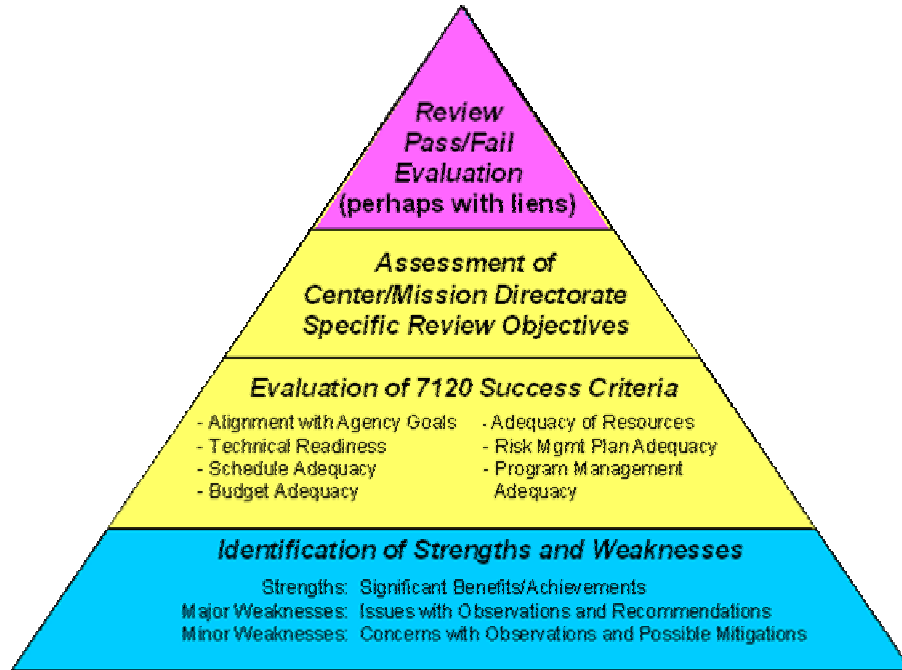


Figure 5-1. Evaluation Process Flow

5.2.1 Findings

The SRB’s assessment of program’s/project’s readiness to proceed into the next phase of its life-cycle should begin at the most detailed level in terms of strengths and weaknesses, with respect to the scope of the review as defined in ToR.

Whether a finding of the program/project is either a strength or weakness, the SRB should be able to define each finding at a summary level in one succinct sentence.

Strengths

If the evaluated finding is a strength, it should be something that has been observed by the SRB to be better-than-expected at the associated point in the life-cycle. Additional detail may be provided, as appropriate, to more clearly explain why the identified finding is considered a strength. The SRB should identify the benefit(s) expected to accrue to the program/project in its subsequent implementation and operation activities. A strength could also be an observance that the rest of the Agency could benefit from.

Weaknesses (Issues & Concerns)

At the conclusion of a program/project life-cycle review, it is likely that the SRB will have identified several different weaknesses. The SRB should first attempt to consolidate “like” weaknesses into one encompassing weakness. Clearly, some of these consolidated weaknesses will be a greater threat to success than others. The SRB should then determine by consensus which of these consolidated weaknesses constitute a critical threat to the future success of the program/project. If it is deemed critical, it should be treated as an “issue” in the SRB findings. Each issue should be accompanied by observations that substantiate the criticality of the issue to program/project success. With this perspective, the SRB should then identify as part of its findings, a recommendation(s) for correcting the weakness, along with a timetable that is consistent with the subsequent implementation/operation activities planned.

If the SRB determines that a consolidated weakness is worthy of mention, but is not critical to the future success of the program/project, it should be treated as a “concern” in the findings. Each identified concern should be accompanied by a suggested fix(es) that the program/project is encouraged to consider, again placed in context with subsequent implementation/operation activities.

5.2.2 NPR 7120.5D Success Criteria

At the next level in the evaluation process, it is recommended that the SRB conduct a consensus assessment of the NPR 7120.5D review success criteria. There are seven success criteria that are defined as follows:

- a. Alignment with and contributing to Agency needs, goals, and objectives, and the adequacy of requirements flow-down from those;
- b. Adequacy of technical approach as defined by NPR 7123.1 entrance and success criteria;
- c. Adequacy of schedule;
- d. Adequacy of estimated costs (total and by fiscal year), including Independent Cost Analyses (ICAs) and Independent Cost Estimates (ICEs), against approved budget resources;
- e. Adequacy/availability of resources other than budget;
- f. Adequacy of risk management approach and risk identification/mitigation; and
- g. Adequacy of management approach.

These criteria embrace the entire scope of the program/project implementation/operation performance, and hence, an objective evaluation of these criteria provides a comprehensive summary assessment of the state of the program/project.

It should be apparent that the contribution of each of these criteria to the overall state of the program/project varies as the program/project proceeds through its life-cycle. For example, the first criterion (Alignment with Agency Goals) should be completely met early in the life-cycle, preferably by PDR, or else the project should not be allowed to proceed. The SRB should continue to monitor the program/project against this criterion, because Agency goals do change over the decade or more life-cycle of many programs/projects. However, the likelihood of there being an issue in meeting this criterion should be significantly lower later in the life-cycle.

NPR 7123.1 provides guidance on the temporal importance of each of the success criteria in terms of detailed exit criteria for each of the program/project life-cycle reviews. These more detailed exit criteria have been mapped into the seven success criteria itemized above for each program/project life-cycle review (as an example see Table 5-1, which shows this mapping for the SRB PDR life-cycle review). A table for each life-cycle review is available through the IPAO.

Project Life-Cycle Review: Preliminary Design Review (PDR)							
NPR 7123.1 Success Criteria	NPR 7120.5D Review Criteria (Project Adequacies) ¹						
	a. Reqmnts	b. Technical	c. Schedule	d. Budget	e. Resources	f. Risks	g. Mgmt
1. The top-level requirements - including mission success criteria, TPMs, and any sponsor-imposed constraints - are agreed upon, finalized, stated clearly, and consistent with the preliminary design.	Primary Relevance	Secondary Relevance					S
2. The flow down of verifiable requirements is complete and proper or, if not, an adequate plan exists for timely resolution of open items. Requirements are traceable to mission goals and objectives.	P						S
3. The preliminary design is expected to meet the requirements at an acceptable level of risk.	S	P				S	
4. Definition of the technical interfaces is consistent with the overall technical maturity and provides an acceptable level of risk.		P				S	S
5. Adequate technical interfaces are consistent with the overall technical maturity and provide an acceptable level of risk.		P					
6. Adequate technical margins exist with respect to TPMs.		P					
7. Any required new technology has been developed to an adequate state of readiness, or back-up options exist and are supported to make them a viable alternative.		P	S	S			
8. The project risks are understood and have been credibly assessed, and plans, a process and resources exist to effectively manage them.			P	P	P	P	S
9. Safety and mission assurance (i.e., safety, reliability, maintainability, quality, and EEE parts) have been adequately addressed in preliminary designs and any applicable S&MA products (e.g., PRA, system safety analysis, and failure modes and effects analysis) have been approved.	P	S				S	P
10. The operational concept is technically sound, includes (where appropriate) human factors, and includes the flow down of requirements for its execution.	S	P			S		

1. NPR 7120.5D Criteria a. Alignment with and contributing to Agency needs, goals, and objectives, and the adequacy of requirements flow-down from those; b. Adequacy of technical approach as defined by NPR 7123.1 entrance and success criteria; c. Adequacy of schedule; d. Adequacy of estimated costs (total and by fiscal year), including ICAs and/or ICEs, against approved budget resources; e. Adequacy/availability of resources other than budget; f. Adequacy of risk management approach and risk identification/mitigation; and g. Adequacy of management approach.

Table 5-1. Example Mapping NPR 7123.1 Success Criteria to NPR 7120.5D Success Criteria

The standard metric for the SRB success criteria evaluations is a three-level metric scale, i.e., successful (green), partially successful (yellow), or unsuccessful (red). This is sometimes referred to as a “stop-light” assessment. Tables 5-2 and 5-3 provide further guidance on how to apply these metrics to the evaluation of each of the seven success criteria for project and program life-cycle reviews, respectively. The SRB is expected to provide its evaluation for each of the success criteria, along with supporting rationale that addresses the topics provided as guidance in these tables. Note that the metrics in the tables should be used as guidance only; as the program/project matures, the metrics for the criteria should become more demanding, as a deficiency that might be acceptable early in the program/project is likely to be unacceptable later. It is up to the SRB to use its expertise to evaluate the program/project, taking into account the stage in the life-cycle or other circumstances, and assess the risks that any deficiencies against the “green” standard pose to the successful execution of the program/project.

Success Criteria	Project Evaluation Metrics		
	Successful	Partially Successful	Unsuccessful
Alignment with Goals	Project objectives are well-align with strategic goals; Project aligns with level 2 requirements; objective-driven requirements are clearly flowed down thru the WBS and driving the baseline mission design; project is in compliance with required NASA policy directives (NPDs) and procedural requirements (NPRs).	Traceability of Project objectives to strategic goals is unclear; project is working to align with level 2 requirements; requirements flow-down is incomplete; design capabilities are not yet consistent with requirements; project is satisfactorily working to meet compliance with required NPDs and NPRs.	Concept capabilities are driving project objectives; project does not align with level 2 requirements; objectives do not align with strategic goals; requirements flow-down is haphazard, without traceability, and/or not driving the design; Project does not appear to be able to meet compliance with NPDs and NPRs.
Technical Adequacy	There is an acceptable baseline design; the design is requirements driven; the capabilities of the design ensure adequate technical margins against the requirements.	The design has not yet stabilized; design trades remain open beyond expected milestones; some baseline design margins are inadequate against requirements; technical readiness (TRL 7) is a concern.	There is an inadequate baseline design; technical margins are clearly inadequate at this point in the project life-cycle; technical maturity (TRL 7) is unlikely within planned schedules.
Schedule Adequacy	A master schedule with sufficient detail appropriate to life-cycle progress exists; CPs are understood and are adequately margined with funded schedule reserve.	The master schedule lacks maturity relative to development progress; funded schedule slack may not be sufficient to accommodate CPs; risk mitigation plans have not been incorporated into the schedule.	The master schedule either does not exist, or is only notional; CPs are not identified; little or no funded schedule slack exist; the schedule violates legacy project experience without an alternative basis.
Budget Adequacy	An adequate basis-of-estimate exists for the LCC; program-level annual funding is adequate to support the implementation schedule; cost reserves are consistent with a 70% confidence level.	The LCC basis-of-estimate is questionable; program-level funding is not consistent with project plans; cost reserves only support a 40-65% confidence level.	No credible LCC basis-of-estimate exists; program-level funding profiles are either clearly inadequate or unknown; cost reserves yield a less than 40% confidence level.
Resource Adequacy	All resources and facilities have been identified and are available; project is adequately staffed.	Availability of some needed resources and/or facilities are questionable; staffing may be inadequate or lagging plan.	Needed resources and/or facilities are either not identified or not available within schedule and cost; staffing is clearly inadequate.
Risk Management Adequacy	An adequate risk management plan exists; risks have been identified with mitigation plans; reserves are adequate to manage top risks.	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 incomplete or ineffective.	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. Risk management plan implementation incomplete or ineffective.
Project Management Adequacy	An effective organization structure exists; mgmt processes exist to effectively direct/control the project; essential interfaces are defined and agreements in place.	Organizational structure is lacking in some areas; control processes are questionable or have latency issues; interfaces are incomplete.	Organizational structure is unacceptable; necessary interfaces don't exist; control processes are notional and not in place.

Table 5-2. Project Success Criteria Evaluation Guidance

Success Criteria	Program Evaluation Metrics		
	Successful	Partially Successful	Unsuccessful
Alignment with Goals	Program objectives are prioritized and well-aligned with strategic goals; objective-driven L1 requirements are defined for current and near-term projects	Program objectives are not well-aligned with strategic goals; L1 requirements for near-term projects are immature	Program objectives are notional and/or don't align with strategic goals; L1 requirements for existing projects may be lacking and do not exist for near-term projects
Technical Adequacy	A 10-year architecture exists, consistent with program/agency goals; project concepts exist for the architecture that are driving near-term technology investments; key external interfaces/needs are defined	The 10-year architecture is notional and not always consistent with Agency goals; future mission concepts are inadequate for planning guidance; external needs are poorly defined	A 10-year architecture does not exist; future mission concepts are without basis; little or no planning guidance exist for current readiness investments
Schedule Adequacy	A program roadmap exists, aligned with the program architecture, and is credible in terms of technical readiness and budget adequacy; near-term roadmap milestones are specific; longer-term milestones are robust to program uncertainties; adequate schedule margin exists in defined projects.	The program roadmap is incomplete; future milestones and associated needs may be inadequate to support budget and/or technical planning needs; marginal schedule margin exists in defined projects.	A program roadmap does not exist; future key milestones are unknown; there is no basis for scheduling program investments and readiness activities; inadequate schedule margin exists in defined projects.
Budget Adequacy	The current program budget is adequate to support existing program scope; the approved 5-year budget plan is sufficient to implement the program plan; the program funding wedge is adequate for the formulation of projects beyond the 5- year horizon; the program APA is adequate for near-term uncertainties.	The current and approved 5-year budgets may not be adequate to support the program plan; the program funding wedge may not be adequate for the formulation of projects beyond the 5- year horizon; program APA is less than desired to meet near-term uncertainties.	The current program budget and APA are inadequate to support program content; no plan exists to bring program content and budget into alignment; the 5-year budget plan is inadequate to support program expectations; the program funding wedge is inadequate for the formulation of projects beyond the five year horizon.
Resource Adequacy	All key implementation facilities have been identified and are available to support near term (5-year) missions; staffing resource needs have been determined and are available; needed external resources are available.	All key resources and facilities may not be identified to support near term (5-year) missions; known resources may not be available when needed; external resource needs are notional.	Needed resources and/or facilities are not identified; availability of either internal or external resources is unknown.
Risk Management Adequacy	A program risk management plan exist; existing and near-term projects are properly categorized, meet classification requirements and are executing risk management processes; a longer-term risk strategy exists and is consistent with program resources and importance.	The risk management plan is immature; some near-term projects have not been categorized, projects don't meet all classification requirements or aren't fully executing risk management processes; the longer-term program risk strategy is notional at best.	A risk management plan does not exist; categorization of current projects is inconsistent; near-term projects have not been categorized, projects don't meet classification requirements or aren't executing risk management processes; no longer-term program risk strategy exists.
Project Management Adequacy	The program organizational structure is defined and effective; interfaces to projects are clear; program policies and controls are defined; the program base (R&A, Adv Dev, etc.) is adequate.	The program organizational structure lacks clarity; lines of authority may be duplicated; policies/controls are not well defined; interfaces are incomplete; weak program base.	Organizational structure is unacceptable; control processes are notional and not in place; necessary interfaces are not defined; program base not defined.

Table 5-3. Program Success Criteria Evaluation Guidance

5.2.3 Center/Mission Directorate Review Objectives

Some Centers/MDs will define a set of objectives for life-cycle reviews that, if met, represent successful completion of the phase or life-cycle review the program/project has just completed. These objectives usually consolidate the content of more detailed success criteria (as just discussed in the previous subsection) into two or three statements or questions. As an example, the following set of three questions has been used by a Center to determine a successful project CDR:

- a. Do the designs and processes meet requirements and are they sufficiently defined and documented to proceed within the risk policy of the project?
- b. Are the plans for resolving remaining problems consistent with available resources and the project risk policy?
- c. Are the test approach and the status of test products thorough and acceptable?

In order to facilitate communication when the SRB debriefs the results, an evaluation of the specified objectives should be performed by the SRB during its review assessment. Again, in addition to determining whether or not the review objectives have been met, a rationale should be provided with each response to substantiate the SRB's evaluation.

This evaluation step is optional for the Centers/MDs. To determine whether or not this Center/MD evaluation should be performed, the SRB Chair and RM should contact the appropriate representative prior to preparing the Addendum ToR for the review. If there is a request, these objectives can be incorporated in the Addendum ToR, ensuring a comprehensive response as part of the overall SRB assessments and evaluations.

5.2.4 Pass/Fail Evaluation

When the SRB has completed all its evaluations and independent assessments, consolidated its findings, and made its recommendations, its final responsibility is to recommend whether the program/project has passed or failed the life-cycle review. This is the ultimate manifestation of its assessment. When determining the pass or fail conclusion, rationale must be provided. Unless a satisfactory conclusion is given without reservations, the rationale should both explain why the SRB has reservations, and what corrective action needs to take place to put the program/project back on the preferred track, e.g., mitigation of specified liens. Regardless of its conclusion, it is not the responsibility of the SRB to determine if and when a delta-review might be necessary, i.e. the DA may authorize a program/project to proceed in lieu of a non-passing conclusion given by the SRB.

5.3 Reports

5.3.1 Standing Review Board Briefing to the Program/Project

Typically, the SRB will caucus in private immediately following the completion of the independent life-cycle review to ensure consensus on the top-level observations and agree to the RFAs. Senior members of the program/project are invited back for a debrief, of the top-level SRB findings (good and bad), recommendations, and perceptions of the review. The preliminary RFAs are reviewed with the project team at this time as well to ensure understanding of the request(s) for action.

This outbrief provides the program/project with immediate, preliminary feedback from the review in an informal, free, and open discussion. This outbrief is an excellent forum for identifying any misunderstandings between the SRB and the program/project and also establishes an important principle of full and open communication between the SRB and the program/project under review.

5.3.2 Written Reports

The written report provides a relatively complete narrative documentation of the review. It is intended to provide the details of the review process with particular emphasis on the findings and recommendations.

The SRB Chair and RM lead the effort to draft the report with inputs from other SRB team members. See Appendix H for a written report template example.

The report also serves as a stand-alone archive of the products and process of the review. The organization responsible for assigning the RM is responsible for maintaining an archive for each review they have responsibility for.

5.3.3 Briefing Reports

Like the written report, the briefing report captures a summary of the review process and highlights the SRB findings and recommendations, and summarizes the RFAs. It is used to communicate the results of the review, starting with the program/project and including the reporting venues in order, as identified for the specific review.

The SRB Chair and RM lead the effort to draft the briefing report with inputs from other SRB team members. See Appendix I for a briefing report sample outline.

The RM organization is responsible for maintaining an archive for each review they have responsibility for.

6.0 Review Approach

The purpose of this section is to walk the reader through a single independent life-cycle review, from the creation of the Addendum ToR to the final briefing to the governing PMC, by providing lessons-learned guidance on how this can best be done. It should be noted at the outset, that the intent is to provide a *guidance* process, not a required process. Every review has some unique aspects to consider, so one approach does not fit every review situation. Common sense flexibility in planning and executing the SRB's review approach is always needed.

An overview of the SRB review approach is presented in Figure 6-1. There are three areas of responsibility in the approach: 1) the SRB Chair and RM's specific responsibilities, 2) the responsibilities of all the SRB Members, and 3) the responsibilities of SRB members (and supporting staff) performing the support assessments. The review approach is broken down into four generic functions, as indicated by the colors applied to each task in the figure. These functions are:

- a. Review Preparations
- b. Performing Support Assessments
- c. Conducting the Review
- d. Building Consensus

Within each responsibility block (grey background), the order of functions being completed proceeds from top to bottom. Each of these functions is discussed in detail in the subsections below.

A notional schedule for completing all these functions is presented in Appendix J. However, this schedule is not discussed here, simply because actual review schedules vary widely from project to project, program to program, and review to review. The schedule in Appendix J does illustrate the natural sequence of the functions to be performed and can be used as a template in preparing the actual review schedule, which is done as part of writing the Addendum ToR for the review. Actual dates for the schedule are determined on a case-by-case basis with the preparation of each Addendum ToR.

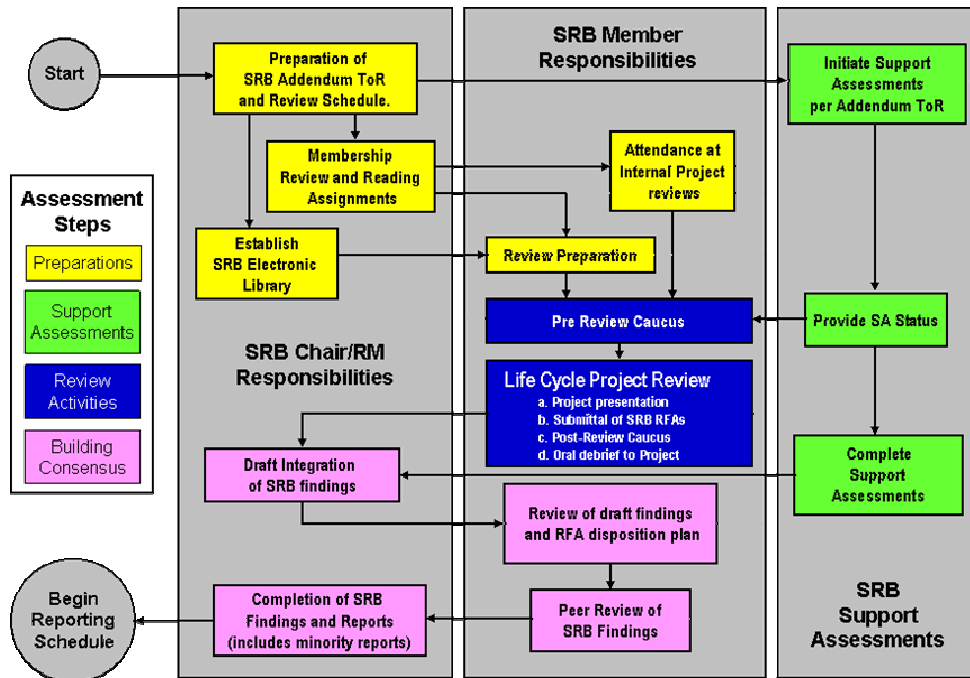


Figure 6-1. Review Process Flow

6.1 Review Preparations

The first task in the review approach is to prepare the Addendum ToR for the review. This should be done as soon as possible after the previous program/project life-cycle review has been completed (or in the beginning of the life-cycle with the Baseline ToR) with a goal of no later than three (3) months prior to an expected review. Timely completion of the Addendum ToR is important, because it establishes the schedule of the many parties/individuals involved in the review process, including the availability of the SRB members, and it defines the roles and responsibilities of the SRB members across the life-cycle phase of the program/project leading up to the independent life-cycle review. It also informs the program/project of their responsibilities/deliverables in supporting the SRB’s charter, i.e., the review entrance criteria (NPR 7123.1) and the Phase requirements (NPR 7120.5D), which determine review readiness. Refer to Section 4.2.2 for the preparation details of Addendum ToRs.

Once the Addendum ToR has been completed, it is submitted for approval and the Chair and RM make the planned membership assignments, configure the SRB Document Library and facilitate program/project document access, and ensure the initiation of the appropriate support assessments.

Each member (including the Chair and RM) then proceeds to prepare for the independent life-cycle review. Their preparation activities may include attending various preceding internal project reviews as appropriate, reviewing program/project documentation, and beginning the support assessments. Internal review attendance must be at the invitation of the Chair of the internal review and/or PM. If the SRB members are scheduled to attend internal program/project reviews, this must first be coordinated with the SRB Chair and RM. During this preparatory period, there may be multiple contacts with program/project personnel, including requests for additional supporting documentation. All such contacts should be coordinated through the SRB Chair and RM in order to avoid overburdening the program/project organizations, and ensure management of SRB resources.

One additional preparation activity, typically undertaken by the SRB Chair early in the life-cycle of projects, is to schedule an information exchange meeting between the SRB membership and the program/project. While this is an optional activity, with the caveat of program/project availability, it has proven to be an effective means of educating the SRB on the goals/objectives, mission concept(s), and implementation plans the program/project

is pursuing. One significant benefit of this early interaction with the program/project is that it eliminates many “informational” questions asked by SRB members during the time-constrained agendas of the independent life-cycle reviews. An additional benefit is the opportunity the SRB has to inform the program/project of their expectations for the upcoming independent life-cycle review content. For projects, such an “orientation” meeting need only be done once before the first life-cycle review. For uncoupled or loosely coupled programs, it may be appropriate to schedule these meetings before each PIR, since these occur on two-year intervals; much can change within a program in two year’s time.

At least a month before the review, the SRB Chair or RM should request a draft review agenda from the program/project. This agenda should be vetted with the SRB membership to ensure that the expected program/project content is included in the planned presentations. Often the level of detail desired at an independent life-cycle review is determined by where the SRB believes the program/project implementation challenges are. Hence, SRB review of the agenda provides an opportunity to “adjust” the planned presentations to include the information needed by the SRB to complete its evaluation.

6.2 Performing Support Assessments

Support assessments of budget/cost and schedule are always performed during the program/project life-cycle. Additional special assessments such as a risk assessment may be performed depending on the importance the subject matter has to program/project success. The purpose and details of each of these types of support assessments is discussed in Section 5.1.

During the course of the support assessment, interaction with the SRB membership is important. The support assessments are not stand alone products provided by single experts: they are the SRB team products that “require” input from the SRB membership. Two such interactions are key (as shown in Figure 6-1):

- a. First, just before the independent life-cycle review, to gather preliminary input from the SRB members, to advise the SRB on the support assessment assumptions, analysis approach, status of driving inputs, and any interim results; and
- b. Second, at the post-review SRB consensus caucus, to get final inputs from the SRB members, and to provide draft support assessment results that may influence SRB findings.

After the second interaction with the SRB, the support assessment should be completed in a timely manner, incorporating feedback from the SRB as appropriate. The results should then be submitted by the support assessment lead to the Chair for incorporation into the SRB draft report. It is important that SRB membership review of its draft report not be done until the report includes the results of all the associated support assessment being performed.

6.3 Conducting the Review

To preface this section, the term “review” must be defined. As should be obvious from this handbook an independent life-cycle review takes place over months rather than days. However, throughout this handbook when the phrase “the review” is used it is usually meant to represent the period of time when the program/project provides presentations to the SRB. In the field “the review” is sometimes referred to as the “site review.”

Program/project independent life-cycle reviews typically take place in or near the host Center and can require 3-4 full days to complete. From the SRB perspective, four specific activities occur during the review week, e.g., a pre-review caucus, the review itself, a post-review caucus, and a “table-top” debrief of preliminary SRB findings to the program/project.

Pre-review Caucus

It is often advantageous for the SRB (especially for their first review and subsequent KDP reviews) to hold a half-day pre-review caucus at the review site to complete final preparations for the review. Topics covered at this caucus should include a review of the agenda, determination of the anticipated need for splinter sessions

during the review to probe specific topics in more detail, reemphasis of specific reviewer attention to their areas of expertise, and discussion of scheduling/logistics for a post-review SRB caucus to be held the day after the review and before members depart to their home bases.

SRB members should become familiar with forms (hard copy or electronic) that will be used to capture their perceived strengths and weakness of the program/project status during the review. A tabular format is typically used with separate templates for strengths and weaknesses. Each reviewer is tasked with completing and submitting these forms at the end of the final day of the review. Using a standard form to capture all reviewers' strengths and weaknesses greatly facilitates the initial integration of reviewer findings. This process can usually be completed the evening after the review by the Chair and RM and be available at the post-review caucus to assist the SRB in converging on its key findings in an efficient manner.

The pre-review caucus is also an opportune time for the support assessment Leads to report on their progress and provide any interim results they may have. Often these results can inform SRB members of pertinent questions to raise during the review.

The Chair and RM should also review the RFA process with the team members and ensure that each member has access to blank RFA forms during the review.

The Independent Life-Cycle Review

Program/Project Presentations

During the review, the program/project presents its status through sequential briefings, typically given by the program/project lead for each topic. The SRB Chair presides over the review, and is responsible for keeping on schedule.

Questions from the SRB members are answered in real time by the presenters if possible. If further detail is required, the program/project may offer to provide the necessary information later in the review, or a splinter session may be arranged in parallel with additional presentations.

Submittal of SRB RFAs

If an SRB member feels that their concern is not adequately addressed, and is unlikely to be resolved within the time-span of the review, they may submit a RFA. RFAs require written responses by the program/project identifying the intended disposition, with concurrence from the RFA author that the issue has been understood, and the response is appropriate. Proposed closure of any actions arising from the RFA also should receive the endorsement of the RFA author that the issue is resolved, before the RFA can be closed. It is acceptable practice for an SRB member to sponsor an RFA submitted by an observer at the review, if they feel the subject matter is appropriate/important to the review. Each Center should have an established RFA process that the program/project can utilize. The process should ensure that each RFA can be tracked from submission to closure. The program/project is responsible for tracking, closing by getting concurrence of the initiator, and reporting the status of RFAs.

Features of a typical RFA process include:

- a. A unique number for each RFA.
- b. A person responsible for developing a response to the RFA from the program/project.
- c. A database that contains each RFA and the data used to close the action.
- d. Each RFA is typically tracked per specific review and the status (open, closed, pending) reported at the next independent life-cycle review. If open, the risk associated with that RFA should be reported.
- e. Closure process includes concurrence by the RFA originator and SRB Chair. Note: if the originator refuses to sign the RFA closure, the Chair can override the process and close the RFA if they believe the RFA has been properly addressed. Note, the RFA originator can then write a dissenting opinion that will be a part of the SRB final report.

Lessons learned from the RFA process are included along with an RFA template in Appendix G.

At the completion of the review, each member submits the strengths and weaknesses they logged to the SRB Chair and RM. The Chair also collects all the RFAs written during the review. It is the Chair's responsibility to review the RFAs for clarity and scope, eliminating redundancies, rejecting those that are out-of-scope, and/or requesting rewrites if the intent/description is unclear.

Post-review Caucus

It is strongly encouraged that the SRB meet immediately after the review (next morning or afternoon as time is available) to discuss their findings. This is an important step in integrating their individual findings and an essential precursor activity to building consensus. The effectiveness of this caucus is enhanced if the Chair and RM can perform an initial integration of the program/project strengths/weaknesses (submitted by the members after the review) before the post-review caucus. Assuming this integration has been done, the SRB can then discuss each consolidated weakness to determine its relative importance, suggest possible mitigation recommendations, and decide whether or not the program/project should be requested to provide any additional relevant information to enlighten the finding.

At a minimum, two objectives should be achieved in the course of the post-review caucus: 1) the SRB should make a preliminary determination of the subset of its identified weaknesses that are most critical (these will potentially be the SRB's issues, while the remaining weaknesses will be treated as concerns), and 2) the Chair should make writing assignments for the report to the members covering all strengths and weaknesses retained at the conclusion of the caucus discussions. Writing assignment should include a due date to ensure the SRB can maintain its evaluation and briefing schedule as detailed in the Addendum ToR.

Taking advantage to the "freshness" of the review, the Chair may also take an initial straw vote of the members on their evaluation of the program/project against the review success criteria (see discussion of success criteria in Section 5.2.2).

Oral Debrief to the Program/Project

Following the post-review caucus, the SRB Chair and RM (and any other key SRB members invited by the Chair) should meet with the key program/project management personnel (representatives from all program/project participating organizations) to provide an oral debrief of the preliminary review findings of the SRB. The results must be understood to be preliminary; the SRB's independent assessments are usually not completed at this time, and those results will clearly impact the ultimate findings of the SRB. Nonetheless, an early indication of the SRB's issues/concerns can be helpful to the program/project and can also provide an opportunity to correct misunderstandings before the SRB finishes its report and briefs its findings to the various management councils. The information is timely for the program/project, since it must decide quickly which findings might alter its on-going work. The Chair should also present the SRB's consolidated RFAs to the program/project for their disposition. This debrief to the program/project can be completed in 1-2 hours, and is typically scheduled in the early afternoon of the day after the review and subsequent SRB caucus work has been completed.

6.4 Building Consensus

If the SRB has held a post-review caucus, the basis for building consensus on the SRB findings is already established. The next step is the drafting of the SRB report, which is done by the Chair and RM using the writing assignment inputs of the members, as well as the review material, and program/project provided supporting documentation. The results of the support assessments should also be completed and incorporated into the draft report. The draft should be completed within 2-3 weeks after the review.

After a draft report is completed, the SRB should again convene (probably for the final time regarding the subject review) to finalize their consensus findings. Historically, this has been a two-day meeting, usually held at a NASA facility. The format of the meeting (face-to-face, video conference, tele-conference) is secondary to full SRB participation. Review discussion of the draft report is the means by which consensus is accomplished.

This discussion determines the final set of strengths, key weaknesses (issues) and other weaknesses (concerns). The meeting also informs the members of the support assessment results that may affect their findings.

An important and final action of the SRB during this consensus working meeting is to determine the evaluation (successful/green, partially successful/yellow, or unsuccessful/red) of the seven review success criteria. This process usually involves a fair amount of discussion among the members from which a rationale for the consensus position will emerge. It is important that the Chair and RM capture this rationale so that it is included in the SRB findings within the report. The rationale provides insight to the management council members in the subsequent SRB briefings of their findings. In SRB findings of subsequent independent life-cycle reviews of the program/project, the rationale provide the basis for determining trends in the success criteria evaluations, which is another means of assessing the health and risk of the program/project.

If consensus cannot be reached, then the dissenter(s) is required to document their dissenting opinion(s) which, per NPR 7120.5D, must be included in the report. This applies to the key issues identified, as well as the evaluation of the success criteria.

Once the consensus working meeting is finished, the SRB Chair and RM revise/edit the draft report and it is subjected to a Peer Review (or quality review). Once the Peer Review is completed, the report is again revised/edited as appropriate by the Chair and RM; the Chair also prepares a briefing package summarizing the SRB findings. These documents are then circulated for comment to the SRB members. The resulting responses are adjudicated by the Chair (perhaps with the SRB member telecon if necessary) and the final revisions/edits are made to the SRB's report and briefing package. This should be accomplished within four weeks of the review. The SRB findings are now complete, its report prepared for distribution, and the Chair is ready to begin the debrief process of SRB findings.

6.5 Debriefing the Standing Review Board Findings

Debriefing the SRB findings is the responsibility of the Chair. Typically, at a minimum, the Chair will be accompanied at these debriefs by the RM and the independent cost assessment analyst, as appropriate. The Chair may also request the attendance of one (or more) of the SRB members who is the expert on an important risk item likely needing discussion. Copies of the SRB's final report are distributed to each venue (program/project and management council) in advance of the scheduled debriefs.

The specific course and number of debriefs given by the SRB Chair depends on whether it is a program or project review, and for a project, its categorization. The debrief possibilities are mapped out in Figure 6-2.

The green blocks are the SRB briefings, and the violet boxes indicate the dispositions/evaluations of the briefing bodies. The yellow decision boxes indicate conditional gates in the briefing processes, i.e., not all SRB reports are debriefed all the way up to the governing PMC (see SRB roadmaps in Section 3). Note that the debrief process is divided into three segments:

- a. The upper-left segment describes the SRB debriefing process for projects below the governing PMC (this process occurs for all project reviews);
- b. The upper-right segment describes the SRB debriefing process for programs below the governing PMC (this process occurs for all program reviews);
- c. The lower segment of the figure describes the briefing process to the governing PMC (this process occurs at all KDP's); all interim life-cycle reviews (those not preceding a KDP) are briefed to the MD PMC and, when the governing PMC is the Agency PMC, to the Agency PMC at the discretion of the DA.

The black spheres within the figure denote information provided at each briefing by organizations other than the SRB, typically the program/project organizations, but also the CMC assessment of the SRB findings. The ultimate outcome of this process, which occurs at each KDP, is the decision by the DA to approve/disapprove program/project transition to the next life-cycle phase or continuation (the blue decision diamond at the lower right-hand corner of the figure).

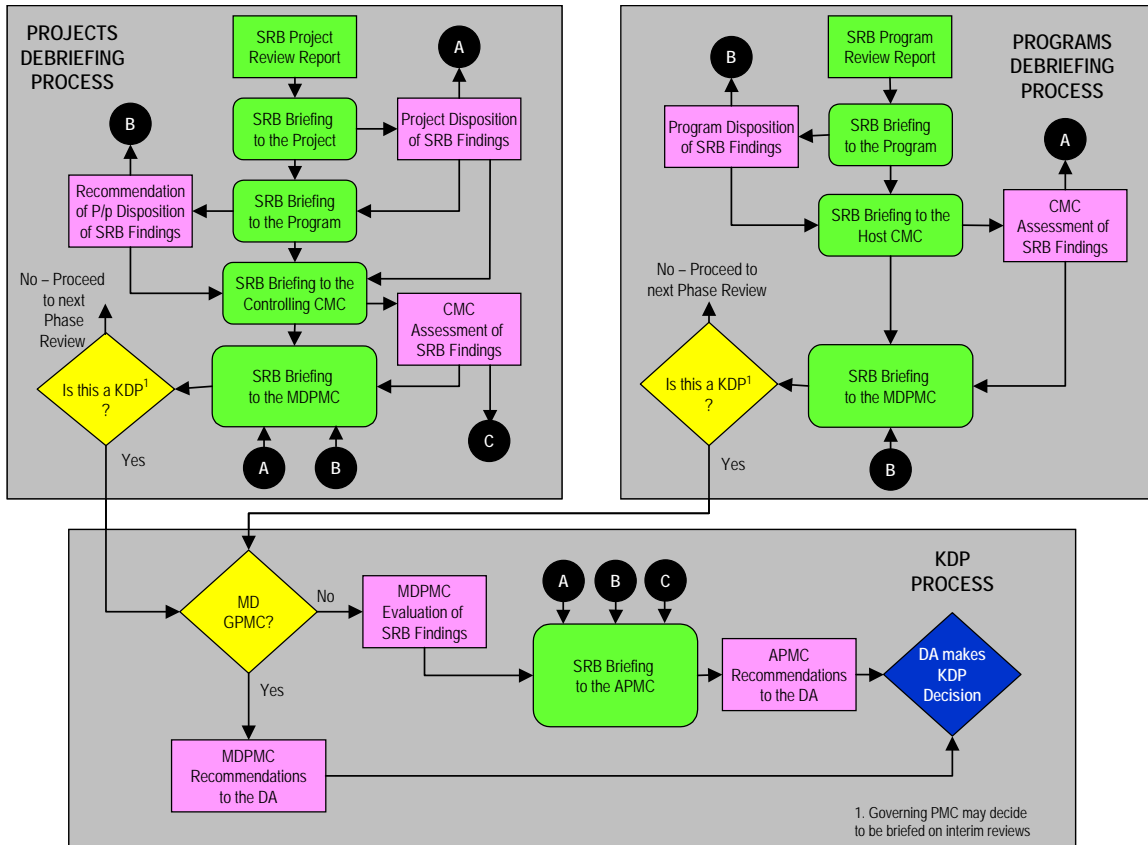


Figure 6-2. Reporting Process Flow

The format of SRB debriefs to the program/project can be either table-top or stand-up, usually mutually determined by the SRB Chair and program/project Manager. Debriefs to the various management councils are usually stand-up presentations. Rather than an ‘end-to-end’ briefing of the SRB findings, the preferred format is to proceed through the SRB briefing in a “point/counter-point” mode. Specifically, once the Chair begins to discuss the SRB issues, the program/project manager stands up after each issue to present the program/project’s response to the issue recommendations, which may be to accept them, accept them with reservations, or to propose to the management council that the recommendations be rejected. After the issues are briefed, the Chair then reviews the success criteria providing the rationale for each SRB assessment of compliance. If a Center/MD made a request for other review specific success criteria, the Chair may also provide the SRB’s assessment at this time. In conclusion, the Chair summarizes the recommendations of the SRB, and provides its overall assessment of the review as pass or fail. Any liens to a passing grade are also presented at this time. Once the last management council in the debrief process has been briefed, the SRB’s duties for the subject life-cycle review are complete.

Standing Review Board Handbook

Appendix A: Glossary

Advocate. A person in the direct chain-of-command of the program/project Decision Authority.

Agency Program Management Council (Agency PMC). The senior management group, chaired by the NASA Associate Administrator or designee, responsible for reviewing formulation performance, recommending approval, and overseeing implementation of programs and Category 1 projects according to Agency commitments, priorities, and policies.*

Approval. Authorization by a required management official to proceed with a proposed course of action. Approvals must be documented.*

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

Architecture. A term used to describe the structure and content of a NASA Program. It is not to be confused with program roadmap, which describes how/when the program architecture is executed.

Baseline Design. The mission design of a project, when it is sufficiently mature to comply with all requirements, has an implementation and operational schedule, and is consistent with approved/planned funding; within the project life-cycle, the baseline design is expected at or shortly before the end of the formulation phase, i.e., in time for a Preliminary Design Review.

Benefit. A strength identified by the SRB, which is clearly “better than expected” at that point in the program/project life-cycle, and offers definable value-added to NASA.

Categorization. A means of establishing Agency expectations of project managers relative to oversight council and planning detail; projects are either Category 1, 2, or 3, with Category 1 receiving the highest level of scrutiny (see Section 2.1.4 of NPR 7120.5D for a full explanation).

Center Management Council (CMC). The council at a Center that performs oversight of programs/projects by evaluating all program/project work executed at that Center.*

Concern. A weakness identified by the SRB; there are two levels of weakness: more significant weaknesses are Issues, while less significant weaknesses are Concerns; SRB concerns are typically documented and briefed to the programs/projects, but not specifically addressed with the management councils (unless asked).

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

Conflict of Interest (COI). Any relationship that is or appears to be not in the best interest of the organization. A conflict of interest would prejudice an individual’s ability to perform his or her duties and responsibilities objectively.

Convening Authority. The management official(s) responsible for convening a program/project review, establishing the Terms of Reference, including review objectives and success criteria, appointing the SRB chair, concurring in SRB membership, and receiving documented results of the review.*

Cost Analysis Data Requirement (CADRe). A formal document designed to help managers to understand the cost and cost risk of space flight projects. The CADRe consists of a Part A "Narrative," a Part B "Technical Data" in tabular form, both provided by the program/project to the ICE team. A "Project Life-Cycle Cost Estimate," produced by the project team, is appended as Part C, but the ICE team does not see Part C until it has produced its own independent estimate.*

* From NPR 7120.5D

Standing Review Board Handbook

Appendix A: Glossary

Critical Path Analysis (CPA). Critical path assessment, including verification of the primary schedule critical path and any other secondary critical paths that are less than the available schedule slack behind the primary critical path.

Decision Authority (DA). The Agency's responsible individual who authorizes the transition of a program/project to the next life-cycle phase.*

Entrance Criteria. The readiness requirements imposed by NPR 7123.1A on programs/projects for all life-cycle reviews; these criteria are used as a helpful reminder by programs/projects as they prepare for each life-cycle review.

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

Finding. A conclusion reached by the SRB based on examination or investigation.

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

Governance. The combination of processes and structures implemented by NASA in order to inform, direct, manage and monitor the activities of the organization toward the achievement of its objectives.

Host Center. The Center with defined responsibility for a program/project at the Acquisition Strategy Planning (ASP) meeting and documented in the Formulation Authorization Document (FAD).

Impairments. Impairments to individual objectivity and organizational independence may include personal conflicts of interest, scope limitations, restrictions on access to records, personnel, and properties, and resource limitations (funding).

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

Independence. Unbiased and outside the advocacy chain of the program/project. The freedom from conditions that threaten objectivity or the appearance of objectivity. Such threats to objectivity must be managed at the individual reviewer and organizational levels.

Independent Cost Analysis (ICA). An independent analysis of program resources (including budget) and financial management associated with the program content over the program's budget horizon, conducted by an impartial body independent from the management or advocacy chain of the program. ICA includes, but is not limited to, the assessment of cost estimates, budgets, and schedules in relation to the program and its constituent projects' technical content, performance, and risk. ICAs may include ICE, assessment of resource management, distribution and planning, and verification of cost-estimating methodologies. (ICAs are not life-cycle cost estimates but are assessments of the adequacy of the budget and management practices to accomplish the work scope through the budget horizon; as such, ICAs can be performed for programs/projects when a life-cycle ICE is not warranted.)*

* From NPR 7120.5D

Standing Review Board Handbook

Appendix A: Glossary

Independent Cost Estimate (ICE). An independent project cost estimate prepared by an office or other entity that is not under the supervision, direction, advocacy, or control of the project (or its chain of command) that is responsible for carrying out the development or acquisition of the program/project. An ICE is bounded by the project scope (total life-cycle through all phases), schedule, technical content, risk, ground rules, and assumptions and is conducted with objectivity and the preservation of integrity of the cost estimate. ICEs are generally developed using parametric approaches that are tailored to reflect the design, development state, difficulty, and expertise of team members.*

Independent Life-Cycle Review. The analysis of a proposed program or project by a (non-advocate) team composed of management, technical, and resources experts from outside the advocacy chain of the program or project. It provides Agency management with an independent assessment of the readiness of the program/project to proceed. NPR 7120.5D provides a complete list of program/project life-cycle reviews in Tables 2-5/2-6 and describes the purpose of each of these reviews.

Issue. A weakness identified by the SRB; there are two levels of weakness: more significant weaknesses are Issues, while less significant weaknesses are Concerns; SRB issues are documented and briefed to the programs/projects and the management councils; issues typically drive the SRB's success criteria assessment and ultimate determination of the pass/fail grade for each review.

Key Decision Point (KDP). The event at which the Decision Authority determines the readiness of a program/project to progress to the next phase of the life-cycle (or to the next KDP).*

Life-Cycle Cost (LCC). The total of the direct, indirect, recurring, nonrecurring, and other related expenses incurred, or estimated to be incurred, in the design, development, verification, production, operation, maintenance, support, and disposal of a project. The LCC of a project or system can also be defined as the total cost of ownership over the project or system's life-cycle from formulation through implementation. It includes all design, development, deployment, operation and maintenance, and disposal costs.*

Life-Cycle Phase. The life-cycle of NASA programs/projects is divided into phases, each of which defines the activities/achievements to be accomplished before proceeding to the next phase; at the highest level there are two phases for both programs and projects: the formulation phase, followed by the implementation phase; for programs the formulation phase entails pre-program acquisition, while the implementation phase involves program acquisition and operations; for projects the formulation phase entails pre-systems acquisition (Phases A and B), and the implementation phase involves system acquisition (Phases C and D), operations (Phase E), and decommissioning (Phase F).

Management Council. NASA maintains three levels of management councils to ensure the appropriate level of management oversight of programs/projects; proceeding from lowest to highest these councils are: 1) the Center Management Council (CMC), 2) the Mission Directorate Program Management Council (MDPMC), and 3) the Agency Program Management Council (APMC); the purpose of these councils is to assess the status of programs/projects and recommend to the next higher council, or the Decision Authority (DA) – as ultimately appropriate, recommendation for continuation/termination of programs/projects, typically at each KDP; for a more complete description of these management councils, consult Section 2.4 of NPR 7120.5D.

Mission Directorate Program Management Council (MDPMC). The senior management group, chaired by an MDAA or designee, responsible for reviewing project formulation performance, recommending approval, and overseeing implementation of Category 2 and 3 projects according to Agency commitments, priorities, and policies.*

Phase Requirements. NPR 7120.5D (Chapter 4) specifies requirements for each life-cycle phase of programs/projects that must be completed before proceeding to the next phase; these requirements are broken down into life-cycle review entrance criteria within each phase by NPR 7123.1A.

* From NPR 7120.5D

Standing Review Board Handbook

Appendix A: Glossary

Program. A strategic investment by a Mission Directorate or Mission Support Office that has a defined architecture and/or technical approach, requirements, funding level, and a management structure that initiates and directs one or more projects. A program defines a strategic direction that the Agency has identified as critical.*

Project. A specific investment identified in a Program Plan having defined requirements, a life-cycle cost, a beginning, and an end. A project yields new or revised products that directly address NASA's strategic needs.*

Reporting Venues. The means by which SRBs communicate their findings and recommendations to all relevant parties within the Agency; reporting venues include oral and table-top briefings to programs/projects, and stand-up briefings to all the pertinent management councils for the program/project.

Request for Action (RFA). A formal written request from the Standing Review Board that asks for additional information from, or action by, the program/project team.

Review Manager (RM). The review manager has the responsibility to ensure the objectivity, quality, integrity and consistency of each assigned independent review and will: define the scope of the review (with the convening authorities); facilitate the identification and approval of the Chair and team members; participate on the SRB as an authority in the programmatic aspects (compliance to NPR 7120.5D and generally accepted rules of good project management, cost, schedule, and risk), and in specific technical areas, if appropriate; facilitate the review process; ensure that the scope of the review is fully exercised; and be accountable for ensuring that the results of the review have been properly vetted, documented and reported.

Risk. The combination of the probability that a program or project will experience an undesired event and the consequences, impact, or severity of the undesired event, were it to occur. The undesired event may come from technical or programmatic sources (e.g., a cost overrun, schedule slippage, safety mishap, health problem, malicious activities, environmental impact, failure to achieve a needed scientific or technological objective, or success criterion). Both the probability and consequences may have associated uncertainties.*

Risk Assessment. An evaluation of a risk item that determines (1) what can go wrong, (2) how likely is it to occur, (3) what the consequences are, and (4) what are the uncertainties associated with the likelihood and consequences.*

Risk Management. An organized, systematic decision-making process that efficiently identifies, analyzes, plans, tracks, controls, communicates, and documents risk and establishes mitigation approaches and plans to increase the likelihood of achieving program/project goals.*

Roadmap. A term used to describe the execution sequence of an organization's responsibilities; roadmaps are used two ways in the SRB Handbook: 1) to describe the sequence of reviews conducted by an SRB during program/project life-cycles, and 2) to describe the planned implementation of a program architecture, i.e., a program roadmap.

Schedule. The time-phased sequence of activities performed by a program/project over its life-cycle; project schedules are particularly important since they are a means of measuring formulation/implementation progress and can reveal bottlenecks and/or resource drivers through critical path analyses; they are also essential to planning multi-years funding of budgets.

Slack. The unallocated funded reserve time (e.g., weeks) remaining in the project's schedule (typically before launch, but may also apply to time remaining before end of mission).

Stakeholder. An individual or organization having an interest (or stake) in the outcome or deliverable of a program/project.*

* From NPR 7120.5D

Standing Review Board Handbook

Appendix A: Glossary

Standing Review Board (SRB). The entity responsible for conducting independent life-cycle reviews of the program/project per the life-cycle requirements. The SRB is advisory and is chartered to objectively assess the material presented by the program/project at a specific review.*

SRB Chair. The independent leader of the SRB; the SRB Chair is nominated by the TA, approved by TAs, DAs, and AA PA&E (as specified in NPR 7120.5D), nominates the members of his/her Board, and usually presides over the program/project life-cycle reviews.

Success Criteria. That portion of the top-level requirements that defines what must be achieved to successfully satisfy NASA Strategic Plan objectives addressed by the program/project.*

Systems Engineering. A disciplined approach for the definition, implementation, integration, and operation of a system (product or service). The emphasis is on achieving stakeholder functional, physical, and operational performance requirements in the intended use environments over its planned life within cost and schedule constraints. Systems engineering includes the engineering processes and technical management processes that consider the interface relationships across all elements of the system, other systems, or as a part of a larger system.*

Technical Authority. The individual who specifically maintains technical responsibility over establishment of, changes to, and waivers of requirements in a designated area.*

Terms of Reference (ToR). A document specifying the nature, scope, schedule, and ground rules for an independent review or independent assessment*; each SRB has a Baseline ToR, and multiple Addendum ToRs; the Baseline ToR defines the scope of the SRB and its activities; the Addendum ToRs specify the detailed schedule and activities of the SRB for each of the program/project life-cycle reviews.

* From NPR 7120.5D

Standing Review Board Handbook

Appendix B: Acronyms

AA	Associate Administrator
APA	Allowance for Program Adjustment
CADRe	Cost Analysis Data Requirement
CDR	Critical Design Review
CERR	Critical Events Readiness Review
CMC	Center Management Council
CPA	Critical Path Assessment
DA	Decision Authority
DoD	Department of Defense
DR	Decommissioning Review
EEE	Electrical, Electronic, and Electromechanical
FRR	Flight Readiness Review
GFY	Government Fiscal Year
ICA	Independent Cost Analysis
ICE	Independent Cost Estimate
IPAO	Independent Program Assessment Office
ISA	Independent Schedule Assessment
ITAR	International Traffic in Arms
KDP	Key Decision Point
LCC	Life-Cycle Cost
LCCE	Life-Cycle Cost Estimate
LRR	Launch Readiness Review
MCR	Mission Concept Review
MD	Mission Directorate
MDAA	Mission Directorate Associate Administrator
MDPMC	Mission Directorate Program Management Council
MDR	Mission Definition Review
MSO	Mission Support Office
NSC	NASA Safety Center
NESC	NASA Engineering and Safety Center
NPD	NASA Procedural Directive
NPR	NASA Procedural Requirement
ORR	Operational Readiness Review
OSMA	Office of Safety & Mission Assurance
P/SDR	Program System Definition Review
P/SRR	Program System Requirements Review

Standing Review Board Handbook

Appendix B: Acronyms

PA&E	Program Analysis & Evaluation
PAR	Program Approval Review
PDR	Preliminary Design Review
PFAR	Post-Flight Assessment Review
PIR	Program Implementation Review
PLAR	Post-Launch Assessment Review
PM	Program/Project Manager
PMC	Program Management Council
PPAR	Preliminary Program Approval Review
PRA	Probability Risk Assessment
PRR	Production Readiness Review
PSR	Program Status Review
R&A	Research and Analysis
RFA	Request for Action
RID	Review Item Discrepancy
RM	Review Manager
SAR	System Acceptance Review
SDR	System Definition Review
SIR	System Integration Review
S&MA	Safety & Mission Assurance
SMO	Systems Management Office
SMSR	Safety and Mission Success Review
SRB	Standing Review Board
SRR	System Requirements Review
TA	Technical Authority
TMC	Technical, Management, and Cost
ToR	Terms of Reference
TPM	Technical Performance Measure
TRL	Test Readiness Level
WBS	Work Breakdown Structure

Standing Review Board Handbook

Appendix C: Ethics and Independence

Because independent reviews are essential to mission success of NASA programs and projects due to the technical complexity of our projects and missions, NASA expects review organizations and individual reviewers to follow ethical principles. Driven first by ethical principles, independence establishes a foundation for credibility of reviewers' work.

1.0 Ethics

1.1 Introduction

The ethical principles presented in this section provide the foundation, discipline, and structure that influence the application of independence standards for independent reviews. Because the information presented in this section deals with fundamental principles, this section does not contain requirements.

Conducting reviews in accordance with ethical principles is a matter of personal and organizational responsibility. Ethical principles apply in preserving reviewer independence, taking on only work that the reviewer is competent to perform, performing high-quality work, and following the applicable independence standards. Integrity and objectivity are maintained when reviewers perform their work and make decisions that are consistent with the broader interest of those relying on the reviewers' report.

1.2 Ethical Principles

The ethical principles contained in the following sections provide the overall framework for application of independence standards. Each principle is described, rather than set forth as a series of requirements, so that reviewers can consider the fact and circumstances of each situation within the framework of these ethical principles.

The ethical principles that guide the work of reviewers who conduct reviews in accordance with the independence standards are:

- a. Integrity;
- b. Objectivity;
- c. Proper use of government information, resources, and position; and
- d. Professional behavior.

1.2.1 Integrity

Confidence in NASA is maintained and strengthened by reviewers performing their responsibilities with integrity. Integrity means reviewers must conduct their work with honesty, keeping the Agency's interests, and those of its stakeholders, at the forefront and acting without consideration of personal or home-organization gain. Reviewers may encounter pressures to change their findings or recommendations to inappropriately achieve personal or organizational gain. In resolving those conflicts and pressures, acting with integrity means that reviewers place priority on their responsibilities to the Agency's and stakeholders' interests, and the fact that they are acting for the Agency, not themselves, must be clear to all those observing the review process. Integrity also means offering advice reflecting the reviewer's expertise, whether or not the advice is likely to be welcomed by the project, program or higher management. The purpose of the review process is to find problems early so that they can be addressed at the lowest possible cost. The reviewers must understand and embrace the fact that their role involves being the bearer of bad news, and that they are doing the program/project and Agency a service by raising issues.

1.2.2 Objectivity

The credibility of reviewing is based on reviewers' objectivity in performing their responsibilities. Objectivity includes being independent in fact and appearance when providing review services, maintaining an attitude of impartiality, having intellectual honesty, and being free of conflicts of interest. Avoiding conflicts that may, in fact or appearance, impair reviewers' objectivity in performing the review is essential to retaining credibility.

Standing Review Board Handbook

Appendix C: Ethics and Independence

Maintaining objectivity includes a continuing assessment of relationships with review entities⁷ and other stakeholders. NASA's governance structure enables the technical authority within a Center to be sufficiently independent of a program/project as long as they are not supporting the program/project directly.

1.2.3 Proper Use of Government Information, Resources, and Position

NASA information, resources, or positions are to be used for official purposes and not inappropriately for the reviewer's personal or professional gain or in a manner contrary to law or detrimental to the legitimate interest of the program/project or the review organization. This concept includes the proper handling of sensitive or classified information or resources. Reviewers may be required to review embargoed data in which case the reviewer will be asked to sign a non-disclosure agreement prior to accessing the data.

In the NASA environment, the reviewer's right to the transparency of information has to be balanced with the proper use of that information. In addition, many programs/projects are subject to laws and regulations dealing with the disclosure of information, e.g., International Traffic in Arms (ITAR) regulations. To accomplish this balance, reviewers must exercise discretion in the use of information acquired in the course of their duties. Improperly disclosing any such information to third parties is not an acceptable practice and may be a federal offense.

Misusing the position of reviewer for personal gain violates a reviewer's fundamental responsibilities. A reviewer's credibility can be damaged by actions that could be perceived by an objective third party with knowledge of the relevant information as improperly benefiting a reviewer's personal financial interest or those of an immediate or close family member; an organization for which a reviewer serves as an employee; or an organization with which the reviewer is negotiating concerning future employment.

1.2.4 Professional Behavior

High expectations for the reviewing profession include compliance with laws and regulations and avoidance of any conduct that might bring discredit to reviewers' work, including actions that would cause an objective third party with knowledge of the relevant information to conclude that the reviewers' work was professionally deficient. Professional behavior includes reviewers putting forth an honest effort in performance of their duties and professional services in accordance with relevant technical and professional standards.

2.0 Independence

Since independence is fundamental to Standing Review Boards, it was decided that guidance on independence should be written for the Agency to follow. NPR 7120.5D defines independence as "unbiased and outside the advocacy chain of the program/project." This section attempts to define this statement in more detail.

2.1 Introduction

This section establishes general standards for independence. These general standards, along with the overarching ethical principles presented in section 1, establish a foundation for credibility of reviewers' work. This section is applicable to the review organization and its individual reviewers.

2.2 Impairments to Independence

In all matters relating to the review work, the review organization and the individual reviewer should be free from personal, external, and organizational impairments to independence, and should avoid the appearance of such impairments of independence.

Reviewers and review organizations should maintain independence so that their opinions, findings, conclusions, judgments, recommendations, and request for actions will be impartial and viewed as impartial by knowledgeable

⁷ "Review entities" include the program/project and the programmatic decisional chain of command.

Standing Review Board Handbook

Appendix C: Ethics and Independence

objective third parties. Reviewers should avoid situations that could lead knowledgeable objective third parties to conclude that the reviewers are not able to maintain independence and thus are not capable of exercising objective and impartial judgment on all issues associated with conducting the review and reporting on the work.

When evaluating whether the independence impairments exist either in fact or appearance with respect to the entities for which review organizations perform review services, reviewers and review organizations should take into account the three general classes of impairments to independence—personal, external, and organizational.

If an impairment to independence is identified after the review report is issued, the review organization should assess the impact on the review. If the review organization concludes that it did not comply with these standards, it should determine the impact on the reviewers' report and notify entity management, those charged with governance, and persons known to be using the review report about the independence impairment and the impact on the review. The review organization should make such notifications in writing.

2.2.1 Personal Impairments

Reviewers participating on a review assignment should be free from personal impairments to independence. Personal impairments of reviewers result from relationships or beliefs that might cause reviewers to limit the extent of the inquiry, limit disclosure, or weaken or slant review findings in any way. Individual reviewers should notify the appropriate officials within their review organizations if they have any personal impairment to independence. Examples of personal impairments of individual reviewers include, but are not limited to, the following:

- a. Immediate family or close family member who is a senior manager of the reviewed entity, or, as an employee of the reviewed entity, is in a position to exert direct and significant influence over the entity or the program/project under review;
- b. Financial interest that is direct, or is significant/material though indirect, in the reviewed entity or program/project;
- c. Responsibility for managing an a portion of the program/project or making decisions that could affect operations of the program/project being reviewed; for example, serving as a director or other senior position of the program/project being reviewed, or as a member of management in any decision making or supervisory function for the program/project under review;
- d. Preconceived ideas towards individuals, groups, organizations, or objectives of a particular program/project that could bias the review;
- e. Biases, including those resulting from political, ideological, or social convictions that result from membership or employment in, or loyalty to, a particular type of policy, group, organization, or level of government; and
- f. For contractors seeking employment or civil servants seeking a competitively selected position during the conduct of the review with a reviewed organization.

Review organizations and reviewers may encounter many different circumstances or combinations of circumstances that could create a personal impairment. Therefore, it is impossible to identify every situation that could result in a personal impairment. Accordingly, review organizations should include, as part of their quality control system, procedures to identify personal impairments and help ensure compliance with independence standards.

When the review organization identifies a personal impairment to independence prior to or during a review, the review organization should take action to resolve the impairment in a timely manner. In situations in which the personal impairment is applicable only to an individual reviewer on a particular review, the review organization may be able to eliminate the personal impairment. For example, the review organization could remove the reviewer from any work on that review or request the reviewer to eliminate the cause of the personal impairment if he/she wish to continue in the current capacity.

Standing Review Board Handbook

Appendix C: Ethics and Independence

2.2.2 External Impairments

Review organizations should be free from external impairments to independence. Factors external to the review organization may restrict the work or interfere with reviewers' ability to form independent and objective opinions, findings, and conclusions. External impairments to independence occur when reviewers are deterred from acting objectively and exercising professional skepticism by pressures, actual or perceived, from management or employees of the reviewed entity or oversight organizations. For example, under the following conditions, reviewers may not have complete freedom to make an independent and objective judgment, thereby adversely affecting the review:

- a. External interference or influence that could improperly limit or modify the scope of a review or threaten to do so, including exerting pressure to inappropriately reduce the extent of work performed in order to reduce cost or fees;
- b. External interference with the selection or application of review procedure or in the selection of information to be reviewed;
- c. Unreasonable restrictions on the time allowed to complete a review or issue the report;
- d. Externally imposed restrictions on access to records, employees, or other individuals needed to conduct the review;
- e. External interference over the assignment, appointment, and compensation of review personnel;
- f. Restrictions on funds or other resources provided to the review organization that adversely affect the review organization's ability to carry out its responsibilities;
- g. Authority to overrule or to inappropriately influence the reviewers' judgment as to the appropriate content of the report;
- h. Threat of replacing the reviewers over a disagreement with the contents of an review report or the reviewers' conclusions; and
- i. Influences that jeopardize the reviewers' continued employment for reasons other than incompetence, misconduct, or the need for review services.

Review organizations should include policies and procedures for identifying and resolving external impairments as part of their quality control system for compliance with independence standards.

Note that the SRB process has checks and balances that inherently prevent external impairments through the approval and convening authorities.

2.2.3 Organizational Independence

The ability of review organizations to perform work and report the results objectively can be affected by placement within government, and the structure of the government entity being reviewed. Whether reporting to third parties externally or to top management within the reviewed entity internally, review organizations should be free from organizational impairments to independence with respect to the entities they review. Impairments to organizational independence result when the review function is organizationally located within the advocacy chain of the areas under review or when the reviewer is assigned or takes on responsibilities that affect operations of the area under review. Impairments to organizational independence result when a member performs duties within the decisional chain of command of the program or project.

Standing Review Board Handbook

Appendix D: Chair and Review Manager Approval Letter Example

February 2, 2007

Office of Program Analysis and Evaluation

TO: Associate Administrator
Associate Administrator for Exploration Systems Mission Directorate
Associate Administrator for Program Analysis and Evaluation
Chief Engineer
Director, Johnson Space Center

FROM: Director, Independent Program Assessment Office

SUBJECT: Project ABC Standing Review Board Chair Nomination, Review Manager Assignment, and Independence Verification

The Independent Program Assessment Office (IPAO), per NASA Procedural Requirement (NPR) 7120.5D, NASA Program and Project Management Processes and Requirements, has coordinated the nomination process for the Chair of the Standing Review Board (SRB) of the ABC Project with the approving and concurring organizations. The nomination resulting from this process is for Mr. John Doe.

Mr. Doe began his career with NASA in 1963 by planning activities for Gemini and Apollo flights. He was a Flight Director in Mission Control for early Space Shuttle flights and became Chief of the office in 1985. In 1989, he was named the Assistant Director for the Space Shuttle Program for the Mission Operations Directorate. He served as the Deputy Manager for Program Integration with the Space Shuttle Program and as the Director of the Phase I Program of Shuttle-Mir dockings before being named Space Shuttle Program Manager in August 1995. Mr. Doe was the International Space Station Manager from 1999 through 2002.

I have reviewed the "Review and Assessment Independence Standards" submitted by Mr. Doe and have concluded that the independence standards have been met with the following disclosures:

1. Prior to retiring in 2002, Mr. Doe held various positions as a superior to ABC project personnel within the Johnson Space Center's Mission Operations Directorate.
2. In 2006, Mr. Doe provided approximately 175 hours of review support to the Constellation Program, including the Constellation Operations Improvement activity.
3. Mr. Doe has provided a small amount of consulting support to the Ares Project.

After discussions with Mr. Doe and the ABC Project Office, it is felt that with these disclosures, he can perform free of any conflict of interest and that these issues do not affect his independence, integrity, or objectivity as the SRB Chair. The IPAO Review Manager will maintain vigilance to assure that no bias or prejudice is shown.

Mr. Michael A. Smith has been assigned as the IPAO Review Manager for the ABC SRB. Mr. Smith has over 21 years of aerospace experience with NASA. He has worked for the Space Shuttle Program as a Payload Safety Engineer in Houston and as an onsite Quality Engineer at the United Space Alliance Palmdale Facility. Between 1988 and 1993, Mr. Smith supported the Mission Evaluation Room during Shuttle flights. Mr. Smith was the Safety and Mission Assurance lead for the X-38 Project. In 2003, he moved to the IPAO as the Risk Assurance Manager providing risk assessments and support for IPAO reviews. Mr. Smith has served as a team member on numerous IPAO reviews including: X-37 Special Review, Hubble Robotic Servicing Non-Advocate Review, Living with a Star Program Implementation Review, and the Solar Dynamic Explorer Non-Advocate Review. Mr. Smith also served as the Review Manager for the independent review of the Innovative Partnership Program.

I request your approval/concurrence of Mr. John Doe as the ABC Project SRB Chair and Mr. Michael A. Smith as the Review Manager. If you have any questions concerning this letter or the credentials of Mr. John Doe, please

Standing Review Board Handbook

Appendix D: Chair and Review Manager Approval Letter Example

contact Michael A. Smith, Review Manager, at 757-864-9111/michael.a.smith@nasa.gov or myself at 757-864-4800/mark.p.saunders@nasa.gov.

Mark Saunders

Approved by:

Dr. Scott N. Pace
Associate Administrator
Office of Program Analysis & Evaluation
NASA Headquarters

Dr. Scott J. Horowitz
Associate Administrator
Exploration Systems Mission Directorate
NASA Headquarters

Mr. Michael L. Coats
Director
NASA Johnson Space Center

Mr. Rex D. Geveden
Associate Administrator
NASA Headquarters

cc:
Office of Program Analysis and Evaluation

- TBD

Exploration Systems Mission Directorate

- TBD

Johnson Space Center

- TBD

Concurred by:

Mr. Christopher J. Scolese
Chief Engineer
NASA Headquarters

Standing Review Board Handbook

Appendix E: Membership Approval Letter Example

February 22, 2007

Office of Program Analysis and Evaluation

TO: Associate Administrator
Associate Administrator for Exploration Systems Mission Directorate
Associate Administrator for Program Analysis and Evaluation
Chief Engineer
Director, Johnson Space Center

FROM: Chair, ABC Project Standing Review Board (SRB)

SUBJECT: ABC Project Standing Review Board Nomination Letter and Independence Verification

The Chair of the ABC SRB, with the assistance of the Review Manager, per NASA Procedural Requirement (NPR) 7120.5D, NASA Program and Project Management Processes and Requirements, has coordinated the nomination process for the members of the Standing Review Board (SRB) for the ABC Project with the approving and concurring organizations. The nominations resulting from this process are contained in Attachment 1.

A skills matrix (Attachment 2) has been completed to demonstrate how various team members will apply their expertise and knowledge.

The ABC project will conduct a System Requirements Review (SRR) beginning on April 7, 2007. The review team may be augmented as risk areas or issues are identified.

The IPAO has reviewed the "Independence Self Assessments" submitted by the nominated team members. Several disclosures have been noted (Attachment 3). With one exception, these disclosures are considered to have no effect on member independence. Member Three, has disclosed a potential conflict of interest that has been researched by the IPAO. At this time, this is not considered to affect the independence of the review team or the individual. The review manager, Michael A. Smith, will continue to monitor this relationship and will notify the convening authorities if independence is compromised.

I recommend that this SRB be approved for the ABC Project.

If you have any questions concerning this letter, please contact Michael A. Smith, ABC SRB Review Manager at 757-864-9111/michael.a.smith@nasa.gov or myself at xxx-xxx-xxxx/John.X.Doe@internetprovider.com.

Mr. John Doe, ABC SRB Chair

Standing Review Board Handbook

Appendix E: Membership Approval Letter Example

Approved by:

Dr. Scott N. Pace
Associate Administrator
Office of Program Analysis & Evaluation
NASA Headquarters

Dr. Scott J. Horowitz
Associate Administrator
Exploration Systems Mission Directorate
NASA Headquarters

Mr. Michael L. Coats
Director
NASA Johnson Space Center

Mr. Rex D. Geveden
Associate Administrator
NASA Headquarters

cc:
Office of Program Analysis and Evaluation

- TBD

Exploration Systems Mission Directorate

- TBD

Johnson Space Center

- TBD

Concurred by:

Mr. Christopher J. Scolese
Chief Engineer
NASA Headquarters

Standing Review Board Handbook

Appendix E: Membership Approval Letter Example

Attachment 1 List of SRB Members

Member One, Standing Review Board Chair (For reference only)

Mr. One retired in 2002 as manager of the International Space Station program office for NASA. He was named Space Station manager in April 1999 after serving as manager of the Space Shuttle program for nearly four years. He began his career with NASA in 1963, planning activities for Gemini and Apollo Flights at what was then known as the Manned Spacecraft Center. He was a flight director in Mission Control for early Space Shuttle flights and became chief of the office in 1985. In 1989, he was named assistant director for the Space Shuttle Program for the Mission Operations Directorate. He served as deputy manager for Program Integration with the Space Shuttle Program and director of the Phase I Program of Shuttle-Mir dockings before being named Space Shuttle program manager in August 1995.

Member Two, Program Management

Mr. Two retired from United Space Alliance in 1998. He joined Rockwell in June 1985 and served in several positions in California until December 1988. He was named vice president and then president of the Satellite Systems Division, building the global positioning systems until April 1987. He became the vice president for business and advanced development for the space systems division until his transfer to Houston in January 1989. Prior to retirement, he served as vice president for strategic and business planning responsible for the acquisition of the remaining Shuttle operations contracts.

From May 1981-June 1985, Mr. Two served as the program manager of the National Space Transportation Systems program (Space Shuttle) at the Johnson Space Center in Houston, Texas. During the period after Apollo from March 1973- July 1975, he was responsible for the development and use of the four command and service module spacecraft used in Skylab and participated in the first discussions with the Soviet Union in 1970 regarding compatible rendezvous and docking systems. He led the American effort as technical director for the Apollo-Soyuz Test Project, negotiating, planning, and conducting the first international space mission with the Soviet Union in July 1975. During the 60s and early 70s, he was a flight director in the JSC mission control center for most of the Gemini and Apollo manned and unmanned flights, responsible for the total safety and success of these flights. He played key roles in most of the flights, especially in the safe return of Apollo 13.

- Member Three, Mission Design/Navigation**
- Member Four, Systems Engineering, Integration/Test**
- Member Five, Technical (Mechanical, Aerothermal, Thermal)**
- Member Six, Technical (Avionics, Telecom)**
- Member Seven, Technical (ACS, Propulsion)**
- Member Eight, Technical (Software)**
- Member Nine, V&V, Risk Management**
- Member Ten, Safety and Mission Assurance**
- Member Eleven, Launch Services**
- Member Twelve, Mission Operations and Training**
- Member Thirteen, Schedule Analyst**
- Member Fourteen, Cost Estimator**
- Member Fifteen, Review Manager**

Standing Review Board Handbook
Appendix E: Membership Approval Letter Example

Attachment 2
 SRB Skill Matrix

Team Members P – Primary responsibility S – Secondary Responsibility	Affiliation	Skill Set														
		Team Mgmt & Reporting	Programmatic						Technical Development					Operations		
			Agency Vision & Goals	Program Management	Risk Management	Safety & Mission Assurance	Schedule	Cost/Funding	Mission Analysis	Systems Engineering	Electronics Engineering	Software Engineering	Validation & Verification	Launch & Flight Ops	Flt Planning/Crew Ops	Resources/Facilities
Member One, Chair	Tbd	P	P	S	S	S	S	S	S	S	S	S	S	S	S	S
Member Two, Prog Mgmt	Tbd		S	P	S	S	S	S								
Member Three, Mssn Dsgn	Tbd								P	S				S		
Member Four, Sys Engr	Tbd		S	S						P	S	S	S	S		S
Member Five, Techn	Tbd								S	P		S				
Member Six, Techn	Tbd					S					P	S				
Member Seven, Techn	Tbd								S	P			S			
Member Eight, Techn	Tbd									S	S	P	S	S		
Member Nine, Risk Mgmt	Tbd		S	S	P	S										
Member Ten, SMA	Tbd				S	P										
Member Eleven, Lnch Srvs	Tbd													P		
Member Twelve, MOS	Tbd													P	P	P
Member Thirteen, Schedule	Tbd						P	S					S			S
Member Fourteen, Cost	IPAO		S	S			S	P	S	S				S		S
Member Fifteen, Rvw Mgr	IPAO	P	S	S												

Standing Review Board Handbook

Appendix E: Membership Approval Letter Example

Attachment 3 Independence Verification

<u>Name</u>	<u>IPAO Status</u>	<u>Disclosures</u>
Member One, Chair	No conflicts. One disclosure noted for recent past work.	Mr. One has served as a consultant to the Exploration Program office on mission operations planning.
Member Two	No conflicts identified. Several disclosures which do not affect Mr. Two's independence are noted.	Mr. Two currently receives a pension from Boeing, a partial owner of USA, the current Mission Operations Director support contractor. Mr. Two supports two organizations which advocate for NASA and human space flight. Mr. Two's son currently works in the Flight Director's Office.
Member Three	No conflicts	None
Member Four	No conflicts	None
Member Five	A potential conflict has been identified; however, this is considered manageable and will be watched by the review manager during the conduct of the review.	Mr. Five is manager of the L-3 Communication Titan Corporation office in Houston, which provides engineering support to the Johnson Space Center Engineering Directorate. Titan is occasionally tasked to provide engineering models and simulations in support of crew training capability and software capabilities. Tasks are indirectly funded by the Mission Systems Level III Project Office through Mission Operations Director to Engineering. L-3 Titan is providing no support directly to the Constellation Mission Systems Level III Project Office and is not directly funded by that project office.
Member Six	No conflicts	None
Member Seven	No conflicts	None
Member Eight	No conflicts	None
Member Nine	No conflicts	None
Member Ten	No conflicts	None
Member Eleven	No conflicts	None
Member Twelve	No conflicts	None
Member Thirteen	No conflicts	None
Member Fourteen	No conflicts	None
Member Fifteen, RM	No conflicts	None

Standing Review Board Handbook
Appendix F: Baseline/Addendum Terms of Reference Template

Baseline Terms of Reference (ToR)

for the
ABC Program/Project

Date

Submitted by:

Name
Review Manager
Organization

Concurred by:

Name
Organization

Approved by:

Name
Organization

Approved by:

Name
Organization

Approved by:

Name
Organization

Standing Review Board Handbook**Appendix F: Baseline/Addendum Terms of Reference Template**

Terms of Reference Change Log

Date	Event/Change	Concur	Approve	Approve	Approve

Standing Review Board Handbook

Appendix F: Baseline/Addendum Terms of Reference Template

Baseline ToR

1.0 Purpose

- Describe at a high level the functional purpose and objectives of the SRB
- Document the agreement between the approving/concurring authorities as specified in NPR 7120.5D (Table 2-3 Standing Review Board Protocols).

2.0 Governance

- Identify the governing authorities of the SRB as specified in NPR 7120.5D.

3.0 Project Description

- Describe the top-level objectives of the project.

4.0 Scope

- Document all life-cycle reviews the SRB will attend/assess, as well as a minimum set of support assessments the SRB will be expected to perform: for example, independent cost estimate, probability risk assessment, etc.
- Document any reviews identified in NPR 7120.5D that will not be done by the SRB and why.

5.0 Contact List

- Identify primary points of contact concerning the SRB activities. For example, Program Executive, Program Manager, SRB Chair, SRB Review Manager.

6.0 Notional Review Schedule

- Provide a high-level schedule of the program/project life-cycle reviews (consistent with the reviews defined in the ToR's scope above).
- Identify for each review the products and venues associated with each.

Standing Review Board Handbook

Appendix F: Baseline/Addendum Terms of Reference Template

Addendum ToR

Appendix A – First Specific Review

1.0 Purpose

- Define the specific life-cycle review for this addendum ToR.
- Define the specific purpose/objectives for this review.

2.0 Project Description

- Describe the top-level objectives of the project (or any change in content or budget since the Baseline ToR).

3.0 Contact List

- Identify primary points of contact concerning the SRB activities. For example, Program Executive, Program Manager, SRB Chair, SRB Review Manager.

4.0 Team Membership Roles

- Define the specific members required to participate in this review.
- Define each member's role including prerequisite review attendance.

5.0 Review Entrance Criteria

- Refer to NPR 7123.1 for specific review entrance criteria and NPR 7120.5 for phase requirements.

6.0 Review Success Criteria

- Include Mapping of the NPR 7123.1 Exit Criteria into the NPR 7120.5D Success Criteria for this specific review.

7.0 Review Products

- Define the specific SRB review products required from this review.
- Summarize the expected content of each of these products.

8.0 Detailed Review Schedule

- Provide a detailed SRB schedule for this review, including all of the reporting venues.
- Include the tentative reporting dates.

Standing Review Board Handbook

Appendix G: Request for Action Guidelines and Template

Lessons Learned from the RFA Process

RFA Development

“Living” RFA - results from a lack of clarity in which the answer to the original RFA leads to additional questions from the originator/sponsor and an inability to close the RFA until the newly unanswered question is resolved. Thought must be given in the generation of the RFA to define the action clearly and succinctly.

“Prescriptive” RFA - gives the appearance of a directive versus an action to resolve a specific problem. Such requests limit the ability of the project to find creative solutions to the problems at hand and are to be avoided.

“Recreational” RFA - no specific due date can be defined and consequently a general timeframe is assigned (i.e., 30 days, 60 days, etc) as a due date. The rationale and criticality of the action to be responded to also is not clear. The RFA can unintentionally become a “recreational” RFA that does nothing more than divert valuable resources and time away from where they could be better utilized.

RFA Status Categories

Current: has not had a response submitted by the project to disposition the RFA, or has not been closed by the originator/sponsor. Needed due date has not past.

Past-due: has not been responded to by the due date, or the originator/sponsor has not assigned a closure disposition to the RFA based on information received or assigned risks.

Critical: the nature of the RFA causes immediate concern of incurring a medium to high criticality safety, technical or programmatic risk, or the assigned due date for response has passed reaching a predefined critical event.

Closed: has been mutually agreed upon by the project, RFA originator/sponsor, and review chair as having suitable disposition to close the action.

RFA Disposition

1. Closed loop closure of all RFAs is required.
2. All RFAs shall have a defined date by which the project response is due.
 - Date shall be determined by the Review Chair after consultation with the project manager
 - Requires timely action while allowing a reasonable period to prepare a meaningful response.
3. Review Chair shall denote those RFAs which are considered “critical.”
4. Review Chair and RFA originators shall review RFA responses for acceptability within 2 weeks of receipt.
 - Review Chair shall notify the project manager of the review board approval or rejection of the responses through the RFA System.
 - In the case of incomplete or unacceptable responses, the board shall provide rationale and supporting information to clarify the issue and guide the project as it reconsiders its response.
5. If mutually acceptable approach to closure of the RFA cannot be obtained, either party may elevate the issue for resolution.

RFA Due Date Establishment

1. Assignment of the due date shall be made during, or immediately following the review.
2. Assigned as a result of joint discussions between the project and review team.

Standing Review Board Handbook

Appendix G: Request for Action Guidelines and Template

3. Due date for an RFA that represents a deficiency relative to the current review would typically be 2 - 4 weeks, or less, depending on criticality.
4. Due dates will be tied to a specific project life-cycle event after which an increased safety, technical or programmatic risk will be introduced.
5. In no case will a due date go beyond the next scheduled critical milestone review.
6. Requests that extend beyond this timeframe are considered as work in process and will be included in the review team's report.

Standing Review Board Handbook

Appendix G: Request for Action Guidelines and Template

Project Name:

Review:

Review Date:

RFA Number:

Reviewer Section

Name:

Organization:

Phone Number:

Email Address:

Response Type: Request For Action Request For Information Comment

If RFA is selected, indicate the severity of the issue: Mission Critical Major Minor

Problem Description or Comment:

Requested Action or Information:

Standing Review Board Handbook

Appendix G: Request for Action Guidelines and Template

Project Section

This RFA is: Accepted Rejected Consolidated with RFA(s) # _____

Reason for rejection (if rejected):

RFA Number:

Assignee Section

Name:

Organization:

Phone Number:

Email Address:

Action Taken or Information:

Attachments:

RFA Closure Concurrence Section

Reviewer: _____ Signature: _____ Date: _____

Review Board Chair: _____ Signature: _____ Date: _____

RFA Status Section

Date Received: _____ **Date Assigned:** _____

Date of Assignee's Response: _____ **Date Closed:** _____

Standing Review Board Handbook
Appendix H: Written Report Template Example

Program/Project Name

X Review
SRB Final Report

Prepared and Presented
by
The Program/Project Standing Review Board Name

Date Final Report is published

Standing Review Board Handbook
Appendix H: Written Report Template Example

SIGNATURE PAGE

Review Chair Name
Standing Review Board Chair

Review Manager Name
Standing Review Board Review Manager

Standing Review Board Handbook

Appendix H: Written Report Template Example

TABLE OF CONTENTS

Signature Page	
References and Key Review Documents	
1. EXECUTIVE SUMMARY	
2. CHARTER	
3. REVIEW APPROACH.....	
3.1. Review Scope and Objectives.....	
3.2. Team Members	
3.3. Review Approach.....	
3.4. Review Products.....	
4. PROGRAM/PROJECT OVERVIEW.....	
4.1. Program or Project Description	
4.2. Program Architecture or Mission Description.....	
4.3. Master Schedule and Funding Summary	
5. FINDINGS, ASSESSMENTS, AND RECOMMENDATIONS.....	
5.1. Alignment with Agency Strategic Goals and Objectives	
5.1.1. Status of Preceding Review Findings.....	
5.1.2. Strengths	
5.1.3. Weaknesses	
5.1.3.1. Issues (Observations, Recommendations, and Timing)	
5.1.3.2. Concerns (Possible Fixes and Timing)	
5.1.4. Criterion Assessment (Green, Yellow, Red, or Unable to Assess)	
5.2. Technical Adequacy.....	
5.2.1. Status of Preceding Review Findings.....	
5.2.2. Strengths	
5.2.3. Weaknesses	
5.2.3.1. Issues (Observations, Recommendations, and Timing)	
5.2.3.2. Concerns (Possible Fixes and Timing)	
5.2.4. Criterion Assessment (Green, Yellow, Red, or Unable to Assess)	
5.3. Schedule Adequacy	
5.3.1. Status of Preceding Review Findings.....	
5.3.2. Strengths	
5.3.3. Weaknesses	
5.3.3.1. Issues (Observations, Recommendations, and Timing)	
5.3.3.2. Concerns (Possible Fixes and Timing)	
5.3.4. Criterion Assessment (Green, Yellow, Red, or Unable to Assess)	
5.4. Budget Adequacy	
5.4.1. Status of Preceding Review Findings.....	
5.4.2. Strengths	
5.4.3. Weaknesses	
5.4.3.1. Issues (Observations, Recommendations, and Timing)	
5.4.3.2. Concerns (Possible Fixes and Timing)	
5.4.4. Criterion Assessment (Green, Yellow, Red, or Unable to Assess)	
5.5. Resource Adequacy.....	
5.5.1. Status of Preceding Review Findings.....	

Standing Review Board Handbook

Appendix H: Written Report Template Example

- 5.5.2. Strengths
- 5.5.3. Weaknesses
- 5.5.3.1. Issues (Observations, Recommendations, and Timing)
- 5.5.3.2. Concerns (Possible Fixes and Timing)
- 5.5.4. Criterion Assessment (Green, Yellow, Red, or Unable to Assess)
- 5.6. Risk Management Adequacy**
- 5.6.1. Status of Preceding Review Findings.....
- 5.6.2. Strengths
- 5.6.3. Weaknesses
- 5.6.3.1. Issues (Observations, Recommendations, and Timing)
- 5.6.3.2. Concerns (Possible Fixes and Timing)
- 5.6.4. Criterion Assessment (Green, Yellow, Red, or Unable to Assess)
- 5.7. Management Approach**
- 5.7.1. Status of Preceding Review Findings.....
- 5.7.2. Strengths
- 5.7.3. Weaknesses
- 5.7.3.1. Issues (Observations, Recommendations, and Timing)
- 5.7.3.2. Concerns (Possible Fixes and Timing)
- 5.7.4. Criterion Assessment (Green, Yellow, Red, or Unable to Assess)
- 6. CONCLUSION**
- 6.1. Summary of NPR 7120.5D Success Criteria Assessments**
- 6.2. Summary Assessment of Host Center/ Mission Directorate Review Objectives (optional).....**
- 6.3. Pass/Fail Recommendation (with qualifiers as necessary)**

APPENDICIES

- Appendix A. Summary of Recommendations**
- Appendix B. ICE/ICA Assessment Results.....**
- Appendix C. Schedule Assessment Results (optional)**
- Appendix D. Special Assessment Results (optional)**
- Appendix E. SRB Biographical Information.....**
- Appendix F. Acronym List.....**

Note: the RM can provide the basic template for the SRB Report

Standing Review Board Handbook

Appendix I: Briefing Report Sample Outline

Briefing Presentation

Chart 1:	Title Page
Chart 2:	Briefing Agenda
Chart 3:	SRB Participating Membership (Name, Affiliation, Role/Skill Area)
Chart 4:	SRB Review Process
Chart 5:	Program/Project Description (Governance, Key Plan Documents, Dates, Budget)
Chart 6:	Program Architecture/Project Mission Description
Chart 7:	Program/Project Master Schedule
Chart 8:	Program/Project Funding Profile
Chart 9a-9n:	Summary of Previous Review Findings
Chart 10:	Strengths and Agency Benefits
Chart 11a:	Alignment Issues (for each Issue: Issue Statement, Observations, Recommendations)
	Technical Adequacy Issues
	Resource Issues
	Risk Management Issues
Chart 11n:	Management Approach Issues
Chart 12a:	Schedule Assessment Approach
	Schedule Assessment Results
Chart 12n:	Schedule Issues
Chart 13a:	ICE/ICA Approach
	Cost Assessment Results
Chart 13n:	Cost Issues
Chart 14:	Review Success Criteria Evaluation (Stoplight Chart)
Chart 15:	Host Center Project Review Objectives Evaluation (optional)
Chart 16:	Overall Recommendation (Pass/Fail) and Summary of SRB Findings

Back-up Charts

Chart Aa-An:	Summary of Issues Recommendations
Chart Ba-Bn:	Concern (for each Concern: Concern Explanation, Suggested Fixes)
Chart Ca-Cn:	Special Assessment Results (optional)
Chart D:	Acronyms

Note: the RM can provide the basic template for the SRB Report Briefing.

Standing Review Board Handbook

Appendix J: Notional SRB Review Schedule Example

	Months before Program/Project Life-Cycle Review								<<< Review Week >>>	Weeks after Program/Project Life-cycle Review											
	-N	-6	-5	-4	-3	-2	-1		1	2	3	4	5	6	7	8	9	10	11	12
1. Preparation Activities																					
Addendum ToR/Review Schedule/Assignments																					
Observer attendance at internal Project reviews																					
Library compilation of Project documentation																					
Membership review of Project documentation																					
2. Support Assessments																					
Independent Cost Estimate																					
Independent Schedule Assessment																					
3. Life-cycle Review																					
SRB pre-Review Caucus (optional)																					
Life-cycle Review																					
Post-review Caucus																					
Verbal debrief to Project																					
4. SRB Consensus Assessment																					
Draft Integration of SRB Findings																					
SRB review of Draft Findings/2nd Vote																					
Peer Review of SRB Report Briefing																					
Preparation of Final Report																					
5. Reporting																					
Debrief of Final Report to Project																					
SRB Findings Briefing to CMC																					
Debrief of Findings to Program																					
SRB Findings Briefing to DPMC																					
Window for Briefing to APMC (Programs and Cat. 1&2 projects)																					