



Langley Research Center

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INDEPENDENT LIFE CYCLE REVIEW PROCEDURAL REQUIREMENTS

National Aeronautics and Space Administration

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Responsible Office: Office of the Director**Preface****P.1 Purpose**

- a. NASA Procedural Requirement (NPR) 7120.5, “NASA Space Flight Program and Project Management Requirements,” and NPR 7123.1, “NASA Systems Engineering Processes and Requirements,” define spaceflight and ground systems program and project management requirements and systems engineering processes and requirements. These documents specify required reviews and products necessary for spaceflight and ground systems programs and projects. This Langley Procedural Requirements (LPR) document establishes Langley Research Center (LaRC) requirements and recommended practices for those and other aerospace project reviews that are managed by LaRC.

P.2 Applicability

- a. This LPR applies to all current and future LaRC-managed Agency-Level aerospace projects where LaRC is formally responsible for life cycle reviews. It does not apply to those projects that are not primarily focused on infrastructure (e.g., those covered by NPR 7120.7).
- b. This LPR may be applied to other LaRC investments at the discretion of the responsible manager or the LaRC Center Director.
- c. In this directive, all mandatory actions (i.e., requirements) are denoted by the term “**shall**.” The term “**should**” is used to denote recommended practices and expectations. The word “**may**” implies permission to take the relevant action. The word “**will**” is used to express a future expectation of fact. The word “**must**” is used as an emphatic statement in the appendices.
- d. In this directive, all document citations are assumed to be the latest version, unless otherwise noted.

P.3 Authority

- a. National Aeronautics and Space Act, 51 U.S.C. §20113.

P.4 Reference Documents

- a. NPR 7120.5, "NASA Space Flight Program and Project Management Requirements."
- b. NPR 7120.8, "NASA Research and Technology Program and Project Management Requirements."
- c. NPR 7123.1, "NASA Systems Engineering Processes and Requirements."
- d. NPR 8000.4, "Agency Risk Management Procedural Requirement
- e. NPR 8705.4, "Risk Classification for NASA Payloads."
- f. NASA/SP-2016-3706 Rev B, "NASA Standing Review Board Handbook,"
<https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20170000280.pdf>
- g. NASA/SP-2016-6105, "NASA Systems Engineering Handbook (Rev 2)."
<https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20170001761.pdf>
- h. NASA/SP-2016-3706, "NASA Space Flight Program and Project Management Handbook,"
<https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20150000400.pdf>

P.5 Measurement/Verification

- a. Compliance with this document is verified by submission to responsible LaRC officials of the products identified in this document.

P.6 Cancellation

- a. LPR 7120.7A, dated August 7, 2014
- b. LPR 7120.7B, dated November 9, 2019

Original signed on file

David Ledoux, Associate Center Director

Distribution:

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1. Overview

- 1.1 NASA Procedural Requirements (NPR) 7120.5 and 7123.1 detail Agency requirements for project management and systems engineering, respectively. The NASA Standing Review Board Handbook and the NASA Space Flight Program and Project Management Handbook provide guidance about life cycle reviews and project maturity. Combined, these documents provide extensive information relating to independent project life cycle reviews for NASA spaceflight and ground system projects.
- 1.2 At Langley Research Center (LaRC), we are responsible for managing a wide variety of projects, some of which are governed by NPR 7120.5, and many others that are not. This document establishes LaRC requirements and practices for LaRC-managed Independent Life Cycle Reviews (ILCRs) for NPR 7120.5 projects, NPR 7120.8 projects, and other projects as determined by the LaRC Center Director. Peer reviews, branch reviews, all project-run reviews, and other reviews that are not ILCRs are outside the scope of this document, although individuals running those reviews may adopt specific practices found here.
- 1.3 It is Agency practice to reserve the term Standing Review Board (SRB) for review boards governed by NPR 7120.5. Therefore, more generic terminology (i.e., Review Board) is used here. The term Review Team, referenced throughout, includes the Review Board plus Review Consultants and the Review Manager.
- 1.4 ILCRs are run according to an agreed-upon document known as the Terms of Reference (ToR). Information that is common to all the project's ILCRs are included in a baseline ToR. Review-specific details are documented in a Memorandum of Record (MoR) for that review. Projects that have already completed at least one ILCR at the time this version of the LPR is approved may continue to use review-specific ToR addenda for their remaining reviews. Requirements in this LPR referencing a MoR may be understood to reference a review-specific ToR addendum in those cases.
- 1.5 Appendices are included in this document that provide additional detailed guidance related to LaRC ILCR practices. Which of these practices is required, or required in some modified form, may be included in any agreed-upon ToR and review-specific MoR. This approach codifies LaRC practices, while allowing for convenient tailoring of the ILCRs on an individual project basis. The individuals developing and approving project-provided materials for ILCRs are responsible for ensuring that those materials are consistent with applicable NASA, Mission Directorate, and other Center requirements.

2. Requirements and Guidance

2.1 ILCR Planning

- 2.1.1 The LaRC Center Director, typically through delegation to the LaRC Center Chief Engineer, **will** determine if a project is required to have ILCRs governed by this LPR. The determination is documented in a Project Initiation Memorandum (see <https://pso.larc.nasa.gov/project-initiation/>).
- 2.1.2 The LaRC Chief Engineer **shall** assign one or more individuals to act as Review Manager to support the planning and conduct of ILCRs for projects required to have them.
- 2.1.3 The Review Manager **will** work with the project, sponsoring program office, Mission Directorate, and other stakeholders to identify candidate Review Chair nominees. The Review Chair is responsible for outbriefing review findings, approving the ToR and review-specific MoRs, and handling other matters as specified in the ToR. If the Mission Directorate requests a Deputy Review Chair the Review Manager **will** take corresponding steps to identify candidate Deputy Review Chair nominees.
- 2.1.4 If requested by the LaRC Chief Engineer, the Review Manager facilitates the selection of the Review Chair through actions such as:
 - (1) checking on nominees' availability and desire to participate (including checking with the nominees' supervisors, as appropriate),
 - (2) vetting for independence and conflicts (see Appendix C: Review Team Conflict Vetting),
 - (3) obtaining and distributing a short professional biography for each nominee.
- 2.1.5 The Review Manager works with the Convening Authorities to determine and document the final selection of the Review Chair.
- 2.1.6 The Review Manager, Review Chair, and the Project Manager, in consultation with the Convening Authorities, **shall** develop a Baseline ToR identifying the Review Team and covering the top-level ILCRs (e.g., MCR, SRR/MDR, PDR, CDR, SIR/PER, ORR, PSR...) that the project will conduct.
- 2.1.7 The Review Manager **shall** ensure that the Review Team is vetted for independence and conflicts (see Appendix C: Review Team Conflict Vetting).
- 2.1.8 The Baseline ToR **should** be developed based on the guidance in Appendix D: Baseline Terms of Reference Contents. The Baseline ToR contents **may** be tailored to meet the specific needs of the project being reviewed and its stakeholders.

- 2.1.9 The Baseline ToR is approved per the Project Initiation Memorandum (see <https://pso.larc.nasa.gov/project-initiation/>), which specifies management approval authority.
- 2.1.10 The LaRC management decision to develop a Center Independent Assessment (IA) **is** documented in the Project Initiation Memorandum (see <https://pso.larc.nasa.gov/project-initiation/>). If a Center IA is planned, it **will** be developed by a LaRC Independent Assessment Team (IAT) that is distinct from the ILCR Review Team.

2.2 ILCR Preparation

- 2.2.1 Prior to the scheduled date of each ILCR, the Review Manager, supported by the Project Manager and Review Chair, **shall** develop a Memorandum of Record (MoR) based on the guidance in Appendix E: ILCR Memorandum of Record Contents. The project will provide the LaRC IAT with products on the timeline expressed in Appendix F.
- 2.2.2 The MoR **should** be completed by the Review Manager prior to the start of any center-led pre-review readiness assessments (e.g., the Technical and Safety and Mission Assurance Readiness Assessment and the Programmatic Readiness Assessment referenced in Appendix F: Center Readiness Assessment). Center-led pre-review readiness assessments are center-led meetings aimed as gauging the project's likely readiness for the upcoming ILCR. If there are outstanding issues in the MoR, they **may** be resolved in conjunction with any of the center-led pre-review readiness assessments.
- 2.2.3 Between 30 and 60 days prior to each ILCR, the LaRC Chief Engineer **should** conduct a Final Center Readiness Assessment based on the guidance in Appendix F: Center Readiness Assessment. The Final Center Readiness Assessment helps the LaRC Chief Engineer establish the Center's position on the Project's readiness to proceed with the planned ILCR. If the project is one in which LaRC serves as the Technical Authority but is responsible for little actual project work, the LaRC Chief Engineer **may** handle the Center Readiness Assessment in an *ad hoc* manner.
- 2.2.4 The LaRC Chief Engineer **will** inform the Center Director that the subject project is ready or is not ready to proceed with the review, after completion of the Final Center Readiness Assessment.
- 2.2.5 As required by NPR 7120.5, or if required by the Convening Authorities for projects not governed by NPR 7120.5, the Review Manager **will** conduct an Agency Review Readiness Assessment with the Review Chair, the Project Manager, the LaRC Chief Engineer, and additional appropriate stakeholders (i.e., any specifically requested by the Convening Authorities) to verify that the project, Review Team, the relevant Technical Authorities, and additional

appropriate stakeholders are ready to proceed with the review. The results of the Agency Review Readiness Assessment **will** be documented in a memo (See Appendix G: Review Readiness Assessment Memo) and distributed to the Convening Authorities.

2.3 ILCR Conduct

- 2.3.1 The ILCR **should** be conducted per the MoR. The Review Chair and Review Manager, in consultation with the Project, **may** deviate from the MoR during the conduct of the review when necessary to meet overall ILCR objectives.
- 2.3.2 Typically within two working days of ILCR completion, the Review Chair, supported by the Review Manager, **should** provide a written one-page “Snapshot Report” of the ILCR results. The need for and timing of the Snapshot Report **may** be adjusted by the Convening Authorities.
- 2.3.3 The Snapshot Report **should** include identifying information (project name, ILCR name and date, Project Manager, Review Chair, and Review Manager), a few sentences on an overview of the review process, a summary of the findings/recommendations, short lists of key strengths, issues, and concerns, and the plan forward (through a Key Decision Point (KDP), if applicable). See Appendix H: Snapshot Report Template for a template. The specific content of the Snapshot Report **may** be adjusted by the Convening Authorities.
- 2.3.4 The Review Manager **will** provide ILCR artifacts (e.g., Requests for Action (RFAs), Advisories, Individual Member Independent Reports (IMIRs), Review Team briefings, and reports) to the project as they become available. ILCR artifacts often contain timely and unique insights from Review Team members that are helpful to project teams.
- 2.3.5 The Review Manager, supported by the Review Chair, **should** publish a review report based on the guidance in Appendix I: ILCR Summary Report Contents. The necessity for such a report and its specific content **may** be adjusted by the Convening Authorities.

3. Records Management

- 3.1 The Project Manager **shall** maintain records associated with the ILCRs. These records include the Project Initiation Memo, the approved baseline ToR, MoR(s), review readiness assessment memo(s), all review-related material specified per the Baseline ToR or MoR(s), review reports, briefings, and IMIRs, Requests for Action (RFAs) / Advisories and their associated documentation, waivers and deviations, and decision memoranda pertaining to the project, typically after each Key Decision Point (KDP).

- 3.2 In cases where the Project and/or the Project Manager is outside of LaRC, the LaRC organization overseeing the work becomes responsible for maintaining the records of the ILCRs.

4. Waivers and Tailoring

- 4.1 Waivers from any requirements in this LPR **may** be obtained by written permission from the Center Director. Center Director written approval may be obtained as part of the Center Director approval of any relevant Project Initiation Memo, ToR, and/or other project review documentation. Waivers from, or tailoring of, any NASA-imposed requirements follow the appropriate NASA-specified procedure for obtaining a waiver or tailoring the requirement.

Appendix A: Definitions

Agency-Level Project – A project with its own WBS, identified at the NASA level as an independent project. Agency-level spaceflight projects are NPR 7120.5 projects. These projects are typically listed in the Agency Mission Program and Project List (AMPL).

Agency Readiness Assessment - A meeting of the Project Manager, the Review Chair, and a representative of the Technical Authority to assess the readiness of the Project to proceed with the ILCR. For the Projects covered by this LPR, LaRC is the Technical Authority and a Center Readiness Assessment is done to establish a Center position on readiness prior to Agency Readiness Assessment.

Center Readiness Assessment – A series of activities described in Appendix F that provide the LaRC Chief Engineer with a basis for developing a Center recommendation as to whether the Project is sufficiently mature to proceed to its ILCR. The Center Readiness Assessment includes a Technical and Safety and Mission Assurance Readiness Assessment and a Programmatic Readiness Assessment. It concludes with a Final Center Readiness Assessment that includes polling representatives from key Center organizations.

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 Review Chair, and concurring on Review Team membership. These officials receive the documented results of the review. For LaRC-led projects, these are typically the Mission Directorate Associate Administrator (MDAA) (or delegate) and the LaRC Center Director (or delegate).

Independent Assessment (IA) - An external evaluation of a project's programmatic health including an assessment of the project plan, risks, descopes, schedule, workforce and planned acquisitions. This assessment is included as part of the Center Programmatic Readiness Assessment.

Independent Assessment Team (LARC) – Team of individuals chosen by LaRC management to develop the Independent Assessment associated with the Independent Life Cycle Review. This team is distinct from the Review Team that will be performing the Independent Life Cycle Review.

Independent Life Cycle Reviews – A set of life cycle reviews, specified in one or more approved document(s), that employs an independent team of experts to assess the progress of a project against established success criteria. The conduct of independent life cycle reviews is governed by the approved documents. Independent life cycle reviews are distinguished from ad hoc reviews, which are usually limited to a single review on a special topic and may or may not be done by a team that is independent of the project.

Independent Review Team – See Standing Review Board.

Programmatic Readiness Assessment – A part of the Center Readiness Assessment sequence that focuses on the programmatic readiness of the Project for the upcoming ILCR.

Project – A specific investment having defined goals, objectives, requirements, life cycle cost, a beginning, and an end. A project also has a management structure and may have interfaces to other projects, agencies, and international partners. A project yields new or revised products.

Review Board (a.k.a. Review Panel) – Group of individuals charged with assessing the project. The Review Board includes only those individuals whose vote counts in any polling and/or whose concurrence is required for a Review Board consensus. If the Review Board is not an SRB, the extent to which the independence standards and procedures of the Standing Review Board Handbook are applied is decided on a case-by-case basis.

Review Chair – The Chairperson of the Review Team. The Review Chair outbriefs review findings, approves the ToR and review-specific MoRs, and handles other matters as specified in the ToR.

Review Consultant – An individual who is not a member of a Review Board, but who is asked to provide feedback to the Review Board. A Review Consultant may participate in closed-door discussions with the Review Board, but is not part of any consensus deliberations.

Review Manager – The individual assigned by the Center for managing the review and the associated review team. The Review Manager typically coordinates review matters with all the stakeholders, provides appropriate stakeholders with recommendations on review matters, manages internal review team communications, and ensures that the relevant rules and procedures are followed.

Review Panel – see Review Board.

Review Team – The Review Board plus any Review Consultants and the Review Manager.

Spaceflight Project – A project that involves a system operating in Earth orbit or beyond Earth orbit. Spaceflight projects develop and operate a wide variety of spacecraft, launch vehicles, in-space facilities, communications networks, instruments, and supporting ground systems.

Standing Review Board (SRB) – The Review Board for defined life cycle reviews of NPR 7120.5 Programs and NPR 7120.5 Projects. SRBs are required to be independent of projects (see NPR 7120.5 and the Standing Review Board Handbook for details on independence) and are intended to contain substantially the same individuals for the duration of the reviews in their scope.

Technical and Safety and Mission Assurance Readiness Assessment – A part of the Center Readiness Assessment sequence that focuses on the technical and safety and mission assurance readiness of the Project for the upcoming ILCR (See Appendix F).

Appendix B: Acronyms

APL – Applied Physics Laboratory
 CA – Convening Authority
 CS – Civil Servant
 CD – Center Director
 CE – Chief Engineer
 CMC – Center Management Council
 CO – Contracting Officer
 COR – Contracting Officer Representative
 DA – Decision Authority
 DPMC – Directorate Program Management Council
 ESD – Earth Science Division
 FAR – Federal Acquisition Regulations
 IAT – Independent Assessment Team
 IA – Independent Assessment
 ILCR – Independent Life Cycle Review
 IMIR – Individual Member Independent Report
 JPL – Jet Propulsion Laboratory
 KDP – Key Decision Point
 LaRC – Langley Research Center
 LPR – Langley Procedural Requirements
 MDAA – Mission Directorate Associate Administrator
 MM – Mission Manager
 MoR – Memorandum of Record
 NASA – National Aeronautics and Space Administration
 NPR – NASA Procedural Requirements
 OCC – Office of the Chief Counsel
 OP – Office of Procurement
 PE – Program Executive
 PI – Principal Investigator
 PM – Project Manager
 PMC – Program Management Council
 RFA – Request for Action
 RM – Review Manager
 SMA – Safety and Mission Assurance
 SME – Subject Matter Expert
 SRB – Standing Review Board
 ToR – Terms of Reference
 WBS – Work Breakdown Structure

Appendix C: Review Team Conflict Vetting

Introduction

The Review Team, including the Review Chair are vetted for conflicts of interest prior to final selection. The conflict vetting process depends upon whether the candidate member of the Review Team is a Civil Servant (CS). Those Review Team members brought on by contract are vetted for conflicts through the contract by which their services are obtained. Proposed CS members are vetted through the LaRC Office of Chief Counsel (OCC), in coordination with the Review Manager (RM). The details will be considered separately below.

In all cases, the vetting is expected to be updated at least once per year. Most LaRC-managed projects have sufficiently short time frames that re-vetting is more appropriately done during the preparations for each life cycle review. In that case, the re-vetting is typically documented in an appendix to the MoR or the post-review report.

A critical component needed for the OCC to conduct the conflict of interest evaluation is a list of contractors, subcontractors, partners, and vendors who have worked or are expected to work on the project. The list is provided by the Project and should include contractors, subcontractors, partners, and vendors to the depth at which the Review Team is expected to assess the work. While that assessment normally does not extend to the component or part level, if the use of a particular vendor's part or component is critical to the Project or important enough to come up during Project presentations, then that vendor is included on the list. The list should be updated as needed, but always prior to any re-vetting of Review Team members. Questions regarding the level at which contractors, subcontractors, partners, and vendors are identified for conflict vetting purposes are resolved by the RM in consultation with the LaRC OCC.

Civil Servants

To meet the requirement for individual Review Team member independence from the project being reviewed, CS individuals are vetted for positional and personal conflicts. The discussion below describes how the appropriate portions of Standing Review Board Handbook, sections 3.2 and Appendices C and D, are implemented at LaRC for CS employees.

Upon identification of candidate CS Review Team members, the RM investigates whether the candidate has done or is expected to do work for the Project or is in the chain of command for making management decisions about the Project. Specific details are collected for any positive responses. The RM is encouraged to consult with the LaRC OCC for suggestions on how to proceed in questionable cases. Review Team membership does not need to be pursued for all originally identified Review Team members.

To document conflict vetting, a table similar to the example in Table 1 below is produced. The table includes the names of the CS candidates who are still being

considered for Review Team membership. The table also includes affiliation, contact information, and details of any candidate's involvement with the project. The last column includes space for the OCC to notate whether or not each candidate has been cleared of conflicts and is considered independent and the date of the OCC evaluation.

Candidate Name	NASA Center or other Affiliation	Contact Information	Not independent because performed project work or is in command chain for project management decisions	OCC Conflict Evaluation and Date
Candidate One	NOAA	Candidate.One@noaa.gov	No	
Candidate Two	NASA LaRC	Candidate.Two@nasa.gov	See Note 1.	
Candidate Three	NASA LaRC	Candidate.Three@nasa.gov	See Note 2.	
NOTES: 1. Worked on original proposal, but have not worked on Project since project approval. 2. Flew as test pilot for subsystem testing. Was not involved in subsystem design or evaluation beyond duties as pilot for subsystem testing flights.				

Table 1. Example Table for CS Review Candidate Conflict Vetting

For the OCC to vet for personal conflicts, the Project-provided list of contractors, subcontractors, and vendors is required. Each prospective (or existing, in the case of re-vetting) CS Review Team member must have either an Office of Government Ethics (OGE) Form 450 or Standard Form (SF) 278 on file. The LaRC OCC will handle logistics of obtaining the appropriate completed form if one is not on file for any candidate (or existing) Review Team member. The RM should neither receive nor review the completed OGE 450 or SF 278 forms. However, the RM may work with the LaRC OCC to determine who hasn't filed the appropriate forms, to encourage prompt filing, and to discuss potential conflicts that exist after OCC review of the appropriate forms.

The OCC may contact the RM to discuss any matters related to the vetting that they believe are best worked prior to formal completion of the evaluation.

After vetting, the LaRC OCC will return the table of CS employees with notations as to whether they have been cleared of conflicts and the date of the OCC evaluation. If any CS employees are not cleared of conflicts, the RM may discuss possible mitigation strategies with the LaRC OCC. Whether the decision is to pursue mitigation strategies, or remove the candidate from consideration, it is done in consultation with those directly involved in forming the Review Team at that point in time. The table may be updated to include new candidates or information and/or to remove candidates no longer being considered. The final table for the particular review or vetting cycle is retained as part of the Project records, usually as an appendix to the appropriate MoR or as an appendix or attachment to the review report.

For reviews that are not subject to NPR 7120.5, there may be situations in which the requirement for positional independence from the Project is relaxed by those convening

the review. In those cases, the above practice is modified to match the requirements of those convening the review and the modified vetting is carefully documented so it is well understood what sorts of conflicts the vetting of the Review Team members considered.

Non-CS

Non-CS Review Team members are typically obtained via contract. If that is not the case (e.g., a potential Review Team member is volunteering and paying his or her own expenses), contact the LaRC OCC for help regarding establishing a gratuitous service agreement and following the process to ensure the appropriate conflict checks have been done and appropriate forms have been signed. Refer to the Standing Review Board Handbook Section 3 and appendices C and D for detailed information.

For cases in which potential Review Team member(s) come from the Jet Propulsion Laboratory (JPL), a Federally Funded Research and Development Center, or the Applied Physics Laboratory (APL), a University Affiliated Research Center, the RM should contact the appropriate office (NASA Management Office (NMO) for JPL and the Marshall Space Flight Center Office of Procurement for APL) to determine the cognizant Contracting Officer (CO) for Standing Review Board (SRB) activities for JPL and APL. The RM then works with the CO to develop an appropriate Statement of Work (SOW). All required checks and forms are normally part of the contract task and retained as part of the contract records.

For cases in which the services of potential Review Team members are to be secured through some other contract, the RM should work with the LaRC Office of Procurement (OP) to determine the most appropriate contract mechanism. The RM must work closely with the OP and the CO/COR to ensure that all of the required contract clauses and procedures are in place prior to developing a SOW. Details of the required forms and procedures can be found in the Standing Review Board Handbook (in particular, section 3 and Appendices C and D). Documentation of the conflict checking, any mitigation plans, copies of non-disclosure forms, and other necessary forms are maintained as part of the official contract records.

Occasionally, a potential Review Team member may be employed by an on-site contractor at a NASA center. Whether that individual may become a member of the Review Team depends upon details of the specific circumstances. The RM should work with the LaRC OCC and the CO/COR for the contract on which the individual works to ensure that any proposed approach for supporting the Review Team is appropriate for the specific circumstances and the applicable contract includes the appropriate clauses. (The LaRC OP can help identify the responsible CO/COR for contracts, even if the contract is not at LaRC.) For reviews governed by NPR 7120.5, the details required by the Standing Review Board Handbook (section 3.2 and Appendices C and D) apply. For reviews not governed by NPR 7120.5, and therefore not strictly subject to the conflict avoidance procedures of the Standing Review Board Handbook, some level of conflict checking is still required to ensure potential organizational and personal conflicts are properly addressed in accordance with Federal Acquisition Regulations (FAR). The RM should work with the LaRC OCC and OP regarding the conflicts review process. At a

minimum, the RM should work with the CO/COR to ensure that serving as a reviewer is within the scope of an individual's task and that any organizational or personal conflicts of interest that could arise from an individual's participation in the review are properly addressed. When a contractor employee serves as a member of a project Review Team, the participation of the contractor employee in the review typically limits the contracting company's ability to perform future work related to the Project that is the subject of the review. The CO/COR contacts the contracting company to determine if this is acceptable. Finally, if, in unusual cases, a personal conflicts of interest review with respect to the potential Review Team member has not been conducted through the contract process, the potential Review Team member will need to provide a self-certification that he/she has no personal conflicts with respect to the Project-provided list of contractors, subcontractors and vendors.

Review Team Member Self-Certification

As a further precaution, prior to reviews, it is a recommended practice for the RM to ask all Review Team members to consider their personal situations relative to the Project-provided list of contractors, subcontractors, and vendors and report to the RM if they have any ethics conflicts/concerns regarding participating in the review. CS Review Team members with concerns are referred to the LaRC OCC for a determination as to whether a Review Team member's participation in the upcoming review would create an ethics issue, and if so, how that issue might be mitigated. Contractor employee Review Team members must work through their employers and the CO regarding potential ethics and conflicts concerns. Any mitigation activities that involve how the review is managed should be communicated to the RM, Review Chair, and the Convening Authorities.

Appendix D: Baseline Terms of Reference Contents

Typical contents of a Baseline Terms of Reference with brief explanations are enumerated below. The detailed contents and arrangement may be tailored to meet the needs of the specific project.

1. Introduction

- 1.1. Purpose – Explain baseline ToR and role of Review Team
- 1.2. Scope – Identify types of reviews covered by ToR and those not covered by this ToR
- 1.3. Change Authority / Responsibility – Who needs to approve the document and changes?
- 1.4. Applicable Documents – These documents include specifications, models, standards, guidelines, handbooks, and other special publications that are applicable to the extent specified in the ToR. [Note that Applicable Documents have their requirements incorporated by reference. These documents must be referenced at least once in the text.] Typical Applicable Documents include:
 - 1.4.1. NPR 7120.5, *NASA Space Flight Program and Project Management Requirements* or NPR 7120.8, *NASA Research and Technology Program and Project Management Requirements*
 - 1.4.2. NPR 7123.1, *NASA Systems Engineering Processes and Requirements*
 - 1.4.3. NPD 1000.5, *Policy for NASA Acquisition*.
 - 1.4.4. NPR 8000.4, *Agency Risk Management Procedural Requirements*
 - 1.4.5. NASA/SP-2014-3705, *NASA Space Flight Program and Project Management Handbook*
- 1.5. Reference Documents – These documents contain supplemental information to guide the user in the application of this document. Typical Reference Documents include:
 - 1.5.1. *NASA Standing Review Board Handbook (NASA/SP-2016-3706 Rev B)*
 - 1.5.2. *NASA Systems Engineering Handbook (NASA/SP-2016-6105 Rev 2)*
 - 1.5.3. LPR 7120.7, *Independent Life Cycle Review Procedural Requirements*.
 - 1.5.4. [Any cost and schedule handbooks or other relevant documents]

2. Description and Governance

- 2.1. The Project is an [assigned mission or Announcement of Opportunity] Project within [Program Name], which is managed by [Program Name] Program Office at [Center name] for the [Division Name] Division of the [Directorate name] Mission Directorate of NASA.
- 2.2. The Project is managed for NASA by the Langley Research Center (LaRC) [or other description if appropriate]. LaRC is also the Technical Authority for both Engineering and Safety and Mission Assurance.
- 2.3. The Project has been designated a Category [NPR7120.5 category], Class [NPR 8705.4 Class] mission by NASA. The governing Program Management Council is the [Directorate Name] Directorate Program Management Council (DPMC).

The [Directorate Name] MDAA is the Decision Authority. The Convening Authorities are the [Directorate Name] MDAA and the LaRC Center Director.

2.4. The life cycle reviews will be one-step reviews [or explain if not].

2.5. The Project's primary goal is [key objectives and brief description].

3. Review Team

3.1. Specify whether team is a consensus board of Civil Servants (CS), a consensus board with expert consultants, or a non-consensus board

3.2. Identify Review Team members and relevant areas of expertise and skills. Include a skills matrix if appropriate. Professional bios can be in an appendix.

3.3. Identify conflict vetting actions for Review Team Members [typically something like: The LaRC Office of Chief Counsel (OCC) has reviewed the financial disclosure forms submitted by the Civil Servant (CS) employees on the Review Team. The review disclosed no conflict of interests for any of the employees with the companies listed.]

4. Independent Life Cycle Review (ILCR) Planning

4.1. Listing of planned ILCRs covered by ToR

4.2. Life Cycle Review Planning Meeting and Memo of Record

Details of the individual reviews will be addressed at a ILCR planning meeting prior to each ILCR.

One or more ILCR planning meetings will be held one to three months prior to the start of each ILCR. The purpose of the meeting(s) is (are) to discuss and get agreement on review execution with a focus on tailoring of the review as needed. Invitations to the meeting will include representatives from the project (e.g., the PI), the Review Team (e.g., Review Chair and/or RM), the funding organization (e.g., Mission Manager (MM) and Program Executive (PE)), and the technical authority (e.g., LaRC Chief Engineer). Others may participate as appropriate. Following the ILCR planning meeting(s) and any follow-on electronic discourse, the RM will prepare a memo of record (MoR) that will be sent to the participants highlighting decisions and recommendations impacting the review and/or deviations from Agency policy and procedures. Typical MoR contents are described in LPR 7120.7, Appendix E: Life Cycle Review Memorandum of Record Contents. The representatives of the funding organization and the technical authority are responsible for disseminating the MoR to the appropriate levels in their respective management chains. The MoR will serve as a reference point for finalizing and documenting review-specific information leading up to the Review Readiness Assessment described below. Updates to the MoR may be documented as part of the Review Readiness Assessment.

Between ILCRs led by the independent Review Team, the Project Manager, PE, MM, Review Chair, and RM will work together to determine which, if any, [Project Name] internal reviews or subsystem reviews are necessary and appropriate for

independent Review Team member (or subset) participation.

5. ILCR Conduct

5.1. Center Readiness Assessment

The LaRC Chief Engineer will conduct a Center readiness assessment to determine if the Project will be ready to proceed with the review based on the guidance in LPR 7120.7, Appendix F: Center Readiness Assessment. This assessment should be completed prior to the required Review Readiness Assessment (section 5.2).

5.2. Review Readiness Assessment

A Review Readiness assessment meeting will be held approximately 30 to 60 days prior to the ILCR. The required attendees at this meeting are the Project Manager or Principal Investigator, the Review Chair and the LaRC Chief Engineer (designated Engineering Technical Authority representative). The PE and MM will also be invited to participate in the readiness assessment meeting. After the readiness assessment, the RM prepares and distributes a memo documenting the meeting (see Appendix G: Review Readiness Assessment Memo).

5.3. Review Assessments

Review criteria are assigned colors consistent with the color assessment scale enumerated in the table below.

Table: Review Criteria Color Assessments

Successful	G	Status is Satisfactory
Somewhat Successful	Y	Status is Cautionary There are known findings which may compromise project success; however, there are mitigation approaches identified to address those findings. The Project Manager / Principal Investigator is vested with the authority and/or resources required to implement the mitigations.
Unsuccessful	R	Status is Unsatisfactory There are known issues which will likely preclude project success. Mitigation approaches have either not been identified, or the Project Manager / Principal Investigator is not vested with the authority and/or resources required to implement the mitigations.
Unable to Assess		Topic was not covered or material was so limited or incomplete that assessment was unable to be made.

5.4. Post-Review Products

- 5.4.1. Preliminary briefing to Project and interested center and program individuals (may be oral only, i.e., no charts)
- 5.4.2. Snapshot/Quicklook briefing to sponsoring organization, Center, and Project (if required by the organization), includes one-page Snapshot report
- 5.4.3. LaRC Special CMC (and others as appropriate) (includes preliminary KDP briefing)
- 5.4.4. Other pre-KDP briefings as required by program office and mission directorate
- 5.4.5. KDP (or DPMC) briefing, as required
- 5.4.6. Requests for Action and Advisories
 - RFAs are handled using the procedure in LPR 7120.7 Appendix J: Requests for Action (RFAs). A tailored version of NASA Form LF-86 may be used to capture the RFAs. RFAs will be distributed according to the schedule for each ILCR.
 - An advisory is an observation or suggestion offered by the Review Team for which formal tracking and closure by the Project is not required. However, as a courtesy to the Review Team, at the following ILCR, the Project should report what actions (if any) they took in response to any advisories.
- 5.4.7. Individual Member Independent Report (IMIR) – Collected IMIRs are included as attachment/appendix to Final Report
- 5.4.8. Final Report includes summary of above with detailed attachments/appendices
- 5.5. Review Archives – Project is responsible for archiving all review material
- 6. Key Review Stakeholders and Contact Information – The list should include key project personnel and all those who sign the ToR and identifiable delegates who are responsible for pre-reading it and other material.
- 7. Appendices
 - 7.1. Acronyms and Abbreviations
 - 7.2. Professional biographies of the Review Team
 - 7.3. Vetting information appropriate for open disclosure – e.g., a statement from the Office of Chief Counsel that the entire board is free of conflicts
 - 7.4. Other review-related information that isn't formally documented elsewhere may be appropriate for inclusion in the appendices.
 - 7.5. Any review-related waivers or deviations should be captured in the appendices.

Appendix E: ILCR Memorandum of Record Contents

A Memorandum of Record (MoR) from the Review Chair, Review Manager, and Project Manager to the Convening Authorities for the project documents review-specific details. The MoR is typically preceded by one or more planning meetings that include invitations to the Review Chair, Review Manager, appropriate project personnel as determined by the Project Manager, the project's Program Executive and Mission Manager, and the LaRC Chief Engineer. Typical contents of a Memorandum of Record with brief explanations are enumerated below. The detailed contents and arrangement may be tailored to the needs of the specific project and review.

1. High-level Project Summary
2. Review planning meetings held and key participants
3. Review Objectives and Expected Maturity State (e.g., from NPR 7120.5 Table 2-5)
4. Review Entrance Criteria (e.g., from NPR 7123.1 Appendix G and NPR 7120.5 Table I-4 and I-5)
5. Review Success Criteria (e.g., from NPR 7123.1 Appendix G and NPR 7120.5 Table 2-5)
6. Review package (e.g., NPR 7120.5 Table I-4 and I-5 items plus extras from NPR 7123.1 Appendix G)
7. Timeline and Logistics
8. Anticipated splinter sessions and applicable logistics
9. Summary of activities related to the review of lessons learned and best practices appropriate for the upcoming life cycle phase of project development to ensure planning for the next life cycle phase adequately incorporates knowledge from past projects.
10. Closure status of any RFAs
11. Anticipated SRB participation
12. Miscellaneous items

Appendix F: Center Readiness Assessment

The Center Readiness Assessment includes a number of activities that lead up to a Final Center Readiness Assessment in which the LaRC Chief Engineer polls representatives from key Center organizations on their opinions for proceeding with the ILCR. The recommended flow of center activities leading up to and beyond a Final Center Readiness Assessment is illustrated in Figure F-1. The detailed timing of the activities may be tailored to fit the timing of the associated ILCR. While there is a preference for appending some of the activities to existing regularly scheduled meetings (as indicated in Figure F-1), this is not required. If at any point along the timelines illustrated in Figure F-1 there is strong evidence that the Project will not be ready for its scheduled ILCR, that evidence should be brought to the attention of the LaRC Chief Engineer. After consideration of the situation, the LaRC Chief Engineer may discuss the evidence and concerns with LaRC Senior Staff, Project and Program Management, and other review stakeholders to determine if a recommendation should be made to the Decision Authority to delay the ILCR.

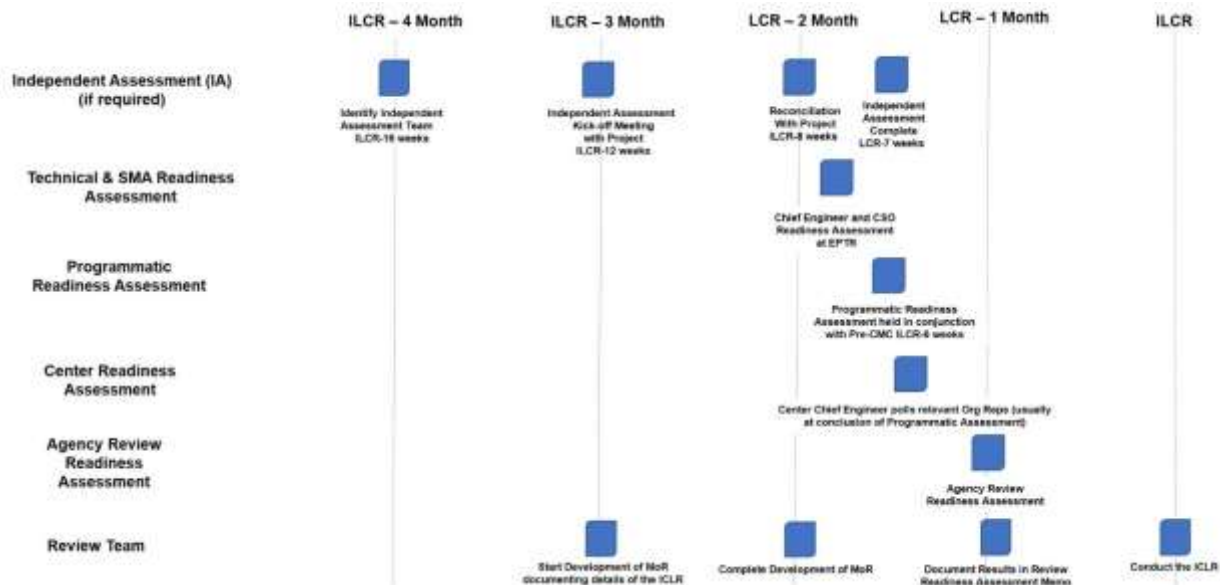


Figure F- 1

The intended outcomes of the Center Readiness Assessment process are as follows:

1. Ensure the project has met or will meet the entrance criteria for the associated ILCR. These criteria will be documented in a Memorandum of Record (MoR) (see Appendix E).
2. Ensure the Project team has reviewed and are following applicable lessons learned and Center best practices.
3. Develop the Center position on review readiness that will be presented by the Center Chief Engineer at the Agency Review Readiness Assessment meeting.

With reference to Figure F-1, the Center-developed Independent Assessment (IA) requires the most lead time. Whether a Center IA is to be performed for the upcoming ILCR is documented in the Project Initiation Memo. If a Center IA is planned, members of the Independent Assessment Team (IAT) are identified approximately 4 months prior to the ILCR. The IAT has a kickoff meeting with the project approximately 12 weeks prior to the ILCR. The IAT completes its initial round of work and initiates reconciliation with the Project approximately 8 weeks prior to the ILCR with the intent that the assessment be completed approximately 7 weeks prior to the ILCR. The results of the Center IA are presented at the Programmatic Readiness Assessment meeting held in conjunction with the project's pre-CMC, approximately 6 weeks prior to the ILCR.

Approximately 3 months prior to the ILCR, the RM and Review Chair start development of a MoR that will document the detailed criteria and operations of the upcoming ILCR. MoR development is typically accompanied by one or more major telecoms including representatives from the Review Team, Project, and other important stakeholders. MoR development and distribution is targeted for approximately 2 months prior to the ILCR.

Technical and Safety and Mission Assurance Readiness Assessment:

At the Technical and Safety and Mission Assurance Readiness Assessment, the Project CE and CSO will present the following:

1. Current status on whether the project is meeting the required Entrance Criteria as documented in the MoR
 - a. This assessment will include the status of the required review products as documented in the MoR
2. Summary of the technical team's review of and adherence to applicable lessons learned and the Center's engineering best practices
3. CE and CSO assessment/recommendation of the project's readiness for the ILCR with associated rationale

Following the presentations, the appropriate branch/organization leads will be asked to comment on whether their members of the project team are following or deviating from the applicable lessons learned and engineering and safety and mission assurance best practices associated with their branch/organization.

The information considered at this meeting is expected to inform the recommendations from the appropriate engineering directorates and the Office of Safety and Mission Assurance that will be offered for consideration in establishing the Center position on review readiness.

To take advantage of an existing periodic meeting that is regularly attended by most of those needed at the Technical and Safety and Mission Assurance Assessment, the last EPTR meeting more than one month prior to the ILCR is targeted as a convenient forum for the assessment. When the EPTR forum (date/time) is used for this meeting, a separate meeting invitation will be issued so that the review is separate from the project CE's normal EPTR presentation.

Programmatic Readiness Assessment:

The Programmatic Readiness Assessment follows the Technical and Safety and Mission Assurance Readiness Assessment.

At the Programmatic Readiness Assessment, a representative of the IAT is expected to present the results of the IA. During and/or after the ensuing discussion, Project personnel may present material related to the IA and the Project's own analyses. Following discussion of the IA, Project personnel are expected to present:

1. Final assessment of the whether the project is meeting the required Entrance Criteria as documented in the MoR.
 - a. This assessment will include the status of the required review products as documented in the MoR.
 - b. This assessment may leverage the information provided by the CE and CSO in their assessment at the EPTR and may focus on updates to the information.
2. Summary of the Project team's cost and schedule analyses and adherence to applicable programmatic lessons learned and best practices.
3. Project manager's assessment/recommendation of the project's readiness for the ILCR.

To take advantage of an existing periodic meeting that is regularly attended by most of those needed at the Programmatic Readiness Assessment, the Pre-CMC meeting associated with the Project's Product Unit is targeted. The timing of the pre-CMC in relation to the EPTR also allows for an update to the information presented by the CE and CSO. Any LaRC IA should be timed so that the assessments have been published and provided to the sponsoring Product Unit for review prior to the Programmatic Readiness Assessment.

Final Center Readiness Assessment:

Typically, immediately following the Programmatic Readiness Assessment, the LaRC Chief Engineer (or delegee) polls representatives of the following Center organizations to establish their independent assessment of the readiness of the Project for the ILCR:

1. Each technical directorate supporting Project development.
2. Office of Safety and Mission Assurance.
3. Other stakeholder/ mission support organizations as designated by Center Chief Engineer.
4. Sponsoring Product Unit.

The intent is that representatives of the organizations above will be present at the Programmatic Readiness Assessment and prepared to provide their organization's recommendation on the project's readiness to proceed to the ILCR.

If for some reason the LaRC Chief Engineer believes that the polling would best be done as part of a separate face-to-face meeting, a telecom, or as separate private communications, the LaRC Chief Engineer may choose to do so. The plans for the

polling should be communicated as part of the invitations to the Programmatic Readiness Assessment. Factors which should be considered in determining the appropriate forum for the polling include Project NPR 7120.5 Category and NPR 8705.4 Class, Project life cycle cost, Project overall risk posture, Center level of involvement, and logistical realities associated with personnel availability and schedules. The results of the polling are given considerable weight in forming the Center position on Project readiness for the upcoming ILCR. Other factors that may contribute to the Center's position are:

1. Whether the review MoR has been completed and distributed.
2. The Chief Engineer's assessment of whether required review products will be available per the approved MoR, and if not, the importance of any missing or delayed products on the review.
3. The ability of the IAT to complete their programmatic assessments.
4. The compliance of Center personnel with applicable recommendations from approved lessons learned and best practices.

The LaRC Chief Engineer communicates his/her assessment of Project review readiness to the LaRC Center Director and Deputy Center Director prior to the Agency Review Readiness Assessment meeting. Any recommendation to not proceed with the scheduled ILCR should be discussed with the Project and the Project stakeholders. Rescheduling of the ILCR is preferable to going into the Agency Review Readiness Assessment with a negative recommendation.

The Agency Review Readiness Assessment is conducted approximately 30 days prior to the ILCR. The Review Manager documents the results of the Review Readiness Assessment in a memo provided to the Convening Authorities. A favorable assessment leads to the ILCR being conducted as planned. An unfavorable assessment is conveyed to the Decision Authority for a determination of the path forward.

Appendix G: Review Readiness Assessment Memo

Immediately following a decision associated with the Review Readiness Assessment, a Review Readiness Assessment Memo is prepared and circulated. Typical contents and format are enumerated below. If the MoR has been updated, an updated MoR is attached.

Memorandum

Date: [Date of the Memo]

To: Convening Authorities for the Project: [Appropriate Mission Directorate] and Langley Research Center (LaRC)

From: [Name], [Project Name] Standing Review Board (SRB) Chair
[Name], [Project Name] Review Manager
[Name], [Project Name] [Project Manager or Project Principal Investigator]
[Name], LaRC Chief Engineer
[Name], [Project Name] [Project Program Executive and/or Mission Manager] [both optional]

Subject: [Project Name] [Review Name] Readiness Assessment

Executive Summary

The [Project Name] [Review Name] Readiness Assessment was held on [Date of the Assessment]. [Name], the [Project Name] SRB Chair, [Name], the [Project Name] [Project Manager or Principal Investigator], and [Name], the LaRC Chief Engineer (representing the Technical Authority) agreed that [Project Name] [is / is not] ready to proceed with their planned [Review Name] activities leading to a site visit [Dates of planned site visit].

Project Overview

[Project Name] is classified as a Category [NPR 7120.5 category], Class [NPR 8705.4 Class] mission.

[Project Name] is [manner in which it was selected, e.g., an Announcement of Opportunity (AO) selected mission] within the [Program Name], with project management responsibility at [organization managing the Project]. The [Program Name] is located at NASA [Center] and is responsible for overall program management. The [Program Name] reports to the [Division and Mission Directorate, e.g., Earth Science Division (ESD) within the NASA SMD at NASA Headquarters].

The primary goal of [Project Name] is to significantly improve knowledge of [include more general project goals and description].

Participation in the Meeting

Participants in the telecom meeting were:

[Name], [Project Name] Standing Review Board (SRB) Chair
[Name], [Project Name] Deputy Standing Review Board (SRB) Chair [Optional]
[Name], [Project Name] Review Manager
[Name], [Project Name] [Project Manager or Project Principal Investigator]
[Name], LaRC Chief Engineer
[Name], [Project Name] [Program Executive]
[Name], [Project Name] [Mission Manager]
[Name], [Project Name] Chief Engineer
[Name], [Project Name] Mission Assurance Manager
Additional [Project] personnel: [Names]
Additional LaRC personnel: [Names]

Meeting Preparation

Prior to the meeting, the principal parties were given the opportunity to suggest modifications to the review details agreed upon during the [Review Name] Planning Meeting[s] and subsequent electronic correspondence as documented in the Memorandum of Record (MoR). [Details of further discussion, if any: e.g., Further discussion occurred at the Readiness Assessment with discussion of the site-visit agenda continuing afterwards. The updated MoR documenting the review plans is attached.]

Evidence of Readiness

During the meeting [the [Program Office] presented a short overview of the project parameters and] the [Project Name] Project Manager presented their progress towards providing the material in the [Review Name] Information Package and meeting the Review Entrance Criteria as documented in the MoR. The [Project Name] Project Manager also summarized the project activities related to the review of lessons learned and best practices appropriate for the upcoming life cycle phase of project development. The presentation materials are available upon request.


The following topics were of special interest during the discussion.

1. [First Item]
2. [Second Item]
3. [Third Item]

At the conclusion of the meeting, [Name], the [Project Name] SRB Chair, [Name], the [Project Name] [Project Manager or Principal Investigator], and [Name], the LaRC Chief Engineer agreed that the [Project Name] project [is / is not] ready to proceed with their planned [Review Name] activities leading to a site visit [site visit dates].

Appendix H: Snapshot Report Template

This appendix contains a template that may be used for a typical Snapshot report. The goal is to keep the report to a single page.

 <p>National Aeronautics and Space Administration</p>	<p>Snapshot Report for the [Project Name] [Review Name] Date [Review Chair Name] – Review Chair [Review Manager Name] – Review Manager [Project Manager Name] – Project Manager</p>
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Review Overview:

[Project Name] is a/an [assigned/competed] mission within the [Program Office Name] for the [Mission Directorate Name]. It is classified as Category [NPR7120.5 category], Class [NPR 8705.4 Class].

Purpose: Review of [Project name] readiness to proceed into [Phase ID or description of work ahead].

Preparation: Reviewed project provided documentation and participated in electronic sessions [provide details if appropriate].

Site Visit: [Date]. Engaged in open and thorough discussion with key project personnel regarding project status, challenges and readiness to proceed.

Summary Findings:

The [Project Name] [give overall summary of what was provided]

Key Strengths/Issues/Concerns/Observations:

- Strengths
 - [itemize key strengths]
- Issues
 - [itemize issues]
- Key Concerns and Observations
 - [itemize key concerns and observations]

Plan Forward:

- ⇒ Quick Look Report: [Date]
- Pre-KDP-C Briefing to LARC CMC: [Date]
- [KDP phase or other description] Briefing to [Mission Directorate Name]: [Date]

Appendix I: ILCR Summary Report Contents

Typical contents of an ILCR Summary Report with brief explanations are enumerated below. The detailed contents and arrangement may be tailored to the needs of the specific project and review.

1. Executive Summary
 - 1.1. Review Timing and Location
 - 1.2. Review Team/Chair Overall Recommendation(s)
2. Project Overview
 - 2.1. Category
 - 2.2. Class
 - 2.3. Program/Mission Directorate
 - 2.4. Primary Goal(s)
3. Deviations from the ToR and MoR (including any Review Team updates)
4. Key Findings
 - 4.1. Strengths (something that has been observed by the Review Team to be better than expected at the associated point in the life cycle)
 - 4.2. Weaknesses (including any recommendations for resolution)
 - 4.2.1. Issues – An issue is a deficiency or set of deficiencies taken together that are judged to substantially affect the ability of the Project to meet requirements within the planned cost and schedule. A set of deficiencies may be multiple concerns that, taken together, create a major weakness. Issues can be found against the Project or against other organizations that affect the ability of the Project to be successful. A major, significant weakness is an issue.
 - 4.2.2. Concerns – A concern is a minor weakness or deficiency substantial enough to be worthy of note and brought to the attention of the Project for mitigation consideration, but not a discriminator in and of itself that affects the ability of the Project to be successful.
 - 4.3. Observations – An observation is anything noted during the course of the review that bears mentioning in the report, but is not currently sufficiently substantial to be considered as an issue, concern or strength. It may involve a recommendation. Typically, observations are noted for the benefit of the Project.
 - 4.4. Cost and Schedule Assessment Summary
 - 4.5. Criteria Assessment (color assessments and comments)
 - 4.6. Summary of Requests for Action (RFAs) and Advisories
5. Actions
 - 5.1. Actions from the LaRC Center Management Council (CMC)
 - 5.2. Actions from the Directorate Program Management Council (DPMC)
6. Auxiliary Documents
 - 6.1. MoR, Updated MoR
 - 6.2. RFAs and Advisories
 - 6.3. Independent Member Individual Reports (IMIRs)

- 6.4. Cost and Schedule Assessment (details provided by Programmatic Assessment Team)
- 6.5. Snapshot Report
- 6.6. Review Team slides from the LaRC CMC briefing
- 6.7. Review Team slides from the DPMC briefing

Appendix J: Requests for Action (RFAs)

The use of a closed-loop procedure for RFAs generated by a project review is recommended. Below is an example procedure that may be used. LF-86 is an RFA form that may be used with this procedure. The specific form and the procedure are optional. If the procedure and/or form meet the needs of the Project, they may reference this appendix in their project documents (e.g., Terms of Reference). If minor modifications are desired, this appendix may be referenced with the modifications noted in the project documents. For instance, the procedure below allows all Review Team members to sponsor RFAs. However, contract clauses for non-CS consultants may not allow this, in which case, RFA sponsors may be limited to Civil Servant Review Board members. If major modifications to the below procedure, or a new procedure is desired, the new procedure should be included in the project documents.

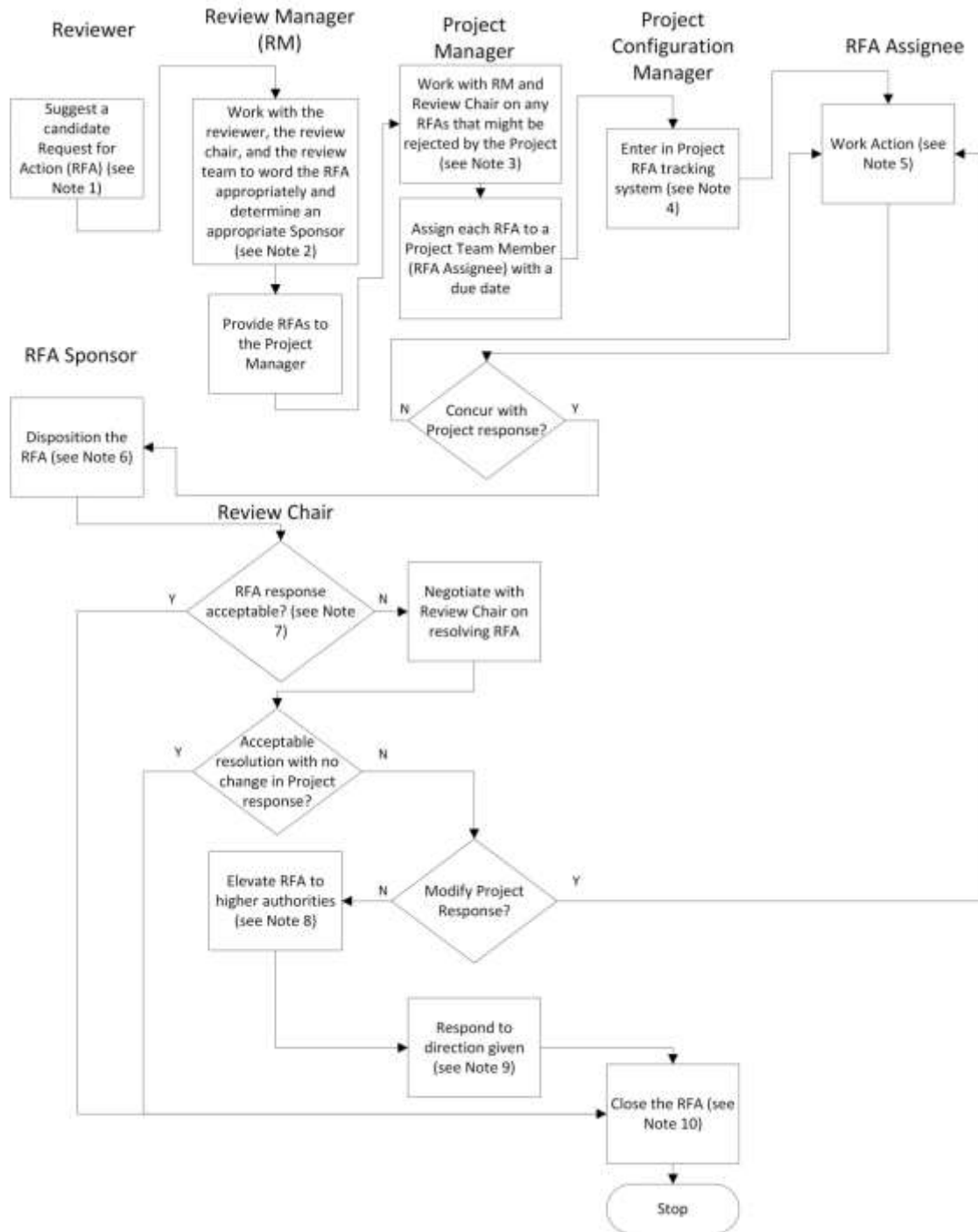


Figure J- 1 Suggested RFA Process

Note 1 – Who can suggest and sponsor RFAs

Candidate RFAs can only be sponsored by a Review Team member. However, it is appropriate for a Review Team member to suggest a candidate RFA brought to their attention by any individual, providing that the Review Team member supports the candidate RFA and, if accepted, is willing to sponsor the RFA and

take responsibility for assessing the Project's response. Any individual who believes that a serious Project risk is not being addressed by the Review Team may raise that risk through the appropriate institutional technical authority chain and/or to the NASA Engineering and Safety Center (NESC). If required, the NASA Engineering and Safety Center (NESC) may also be engaged to assist the project in conducting an independent assessment or analysis to address Project risks.

Note 2 – RFAs as a Review Team product

The resultant set of RFAs are a Review Team product with the Review Chair having final authority over the details. Generally, the Review Manager (RM) works with Reviewers suggesting RFAs, the Review Chair, and the rest of the Review Team to develop the wording of a final set of RFAs and to determine an appropriate Review Team RFA Sponsor for each one. Submitted RFAs may be combined, reworked or removed at this phase. Some candidate RFAs may be resolved quickly through informal interaction with the Project. The RM and the Review Chair are encouraged to pursue this route where appropriate. It is also recommended that candidate RFAs be shared with the Project and that appropriate discussions take place to ensure that each RFA is understood as intended. Final RFAs should be within the scope of the review, meet an appropriate importance threshold that justifies formal tracking, and should include a well-defined action that when completed will close the RFA. The Review Chair has final authority on candidate RFAs and is responsible for determining the suitability of each candidate RFA. Any Reviewer unsatisfied with the decision of the Review Chair may register Formal Dissent and raise the issue through the appropriate institutional technical authority chain and/or to the NESC.

Note 3 – Project rejection of RFAs

The Project may reject specific RFAs. The Project supports any rejection with reasons for the rejection. The Review Chair may accept the Project's rejection, re-write any rejected RFAs to address the Project's concerns, or elevate the RFA through the Technical Authority process. However, as with any response to an RFA, the Project is encouraged to work the resolution of the RFA (whether that is a rejection by the Project or an action taken by the Project) in collaboration with the RFA Sponsor and the Review Chair. Rejected RFAs are included in the total RFA count and are included in the review report as a rejected RFA. For tracking purposes, they are typically assigned to the Project Configuration Manager.

Note 4 – RFA tracking by the Project

Each Project is responsible for developing and maintaining its own Project RFA tracking process. The records of all RFAs (including closed and rejected ones) are maintained by the Project. The RFA tracking process should include periodic (e.g. weekly, monthly) checking to determine if any RFAs are past due. The

Project Manager is responsible for taking steps to address any past-due RFAs (e.g. assigning the RFA to a different individual).

Projects are encouraged to employ an electronic routing scheme for handling RFAs.

Note 5 – Informal discussion and working of RFAs

Informal discussion and provisional informal concurrence with all parties is encouraged prior to updating and formally submitting the RFA response. Formal non-concurrences should be entered only after the involved parties have made a concerted effort to resolve their differences. Records associated with RFAs are maintained by the Project.

Note 6 – Timely Sponsor dispositions and alternatives

The RFA Sponsor disposes the RFA by concurring with the response, not concurring with the response, or indicating that the issue is no longer significant. In the event that the RFA Sponsor does not act on the RFA in a timely manner (typically less than 30 days), the Review Chair may act in place of the RFA Sponsor or assign a different Review Team member as the RFA Sponsor.

Note 7 – Review Chair consideration of response

The Review Chair considers the RFA response and the RFA Sponsor's disposition of the RFA. The Review Chair may override an RFA Sponsor's disposition. If the Review Chair believes that the issue is still significant and has not been adequately addressed by the Project's response, the Review Chair negotiates with the Project Manager to find an acceptable resolution. In circumstances where the Review Chair is no longer performing the duties of the Review Chair, the LaRC Chief Engineer may act in place of the Review Chair.

Note 8 – Elevation of irreconcilable disagreements

If an acceptable resolution to an RFA cannot be negotiated between the Review Chair and the Project Manager, the Review Chair elevates the RFA to the next higher level of authorities. On the Project Manager's side, the higher authority would typically involve the Project's customer, funder, or other entity being supplied with the Project's product(s). On the Review Chair's side, the higher authority would typically involve a Center technical or other institutional authority. Contact the LaRC Chief Engineer for help identifying the appropriate individuals.

Note 9 – Response to imposed direction

The Project responds to direction provided by the authorities that resolved the RFA issue.

Note 10 – RFA closure

Closure of an RFA requires approval of the RFA Sponsor and the Review Chair.

In appropriate circumstances, alternates, as discussed in Notes 6 and 7, may approve instead. For RFAs requiring higher authority intervention, the higher authority above the Review Chair may act in place of the Review Chair.

Appendix K: Advisories

Advisories are a mechanism for a review team to advise the Project of one or more recommended actions. The action(s) may include suggestions or options the Project might want to consider, warnings of potential future adverse events based on reviewer experiences, or an emphasis on some aspect of future work for which there is some concern. Unlike RFAs, Advisories do not have formal closed-loop closures. However, there is an expectation that the Project will report on what it did or didn't do (with brief explanations) with each Advisory. This reporting back to the review team may take place either before or as part of the next life cycle review.