Langley Research Center

Directive: LPR 7130

Effective Date: October 21, 2008
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PROJECT AND TASK REVIEW PROCEDURAL REQUIREMENTS

National Aeronautics and Space Administration

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Responsible Office: Systems Management Office

Preface

P.1   Purpose

a.   In 2007, NPR 7120.5, "NASA Space Flight Program and Project Management Requirements," and NPR 7123.1, "NASA Systems Engineering Processes and Requirements," were approved to define space flight program and project management requirements and systems engineering processes and requirements. These documents specified required reviews and products necessary for space flight programs and projects.

b.   This Langley Procedural Requirements (LPR) document establishes Langley Research Center (LaRC) requirements for performing project and task reviews. Detailed requirements for space flight program and project independent Life Cycle Reviews that comply with the agency-wide requirements specified in NPR 7120.5 and NPR 7123.1 are provided in LPR 7120.7, "Space-Flight Independent Life Cycle Reviews Procedural Requirements."

P.2   Applicability

a.   The requirements of this LPR apply to all technical programs, projects or tasks performed or managed by Langley Research Center. For vocabulary consistency, all projects, subprojects, and tasks discussed in this document will be called projects/tasks.

b.   The authority to waive the requirements of this document is the Langley Research Center Office of the Director.

P.3   Authority

a.   42 U.S.C. 2473(c)(1), Section 203(c)(1) of the National Aeronautics and Space Act of 1958, as amended.

P.4   Applicable Documents

   a. NPR 7120.5D, "NASA Space Flight Program and Project Management Requirements"

b. NPR 7120.7, "NASA Institutional Infrastructure and Information Technology Program and Project Management Requirements"

c. NPR 7120.8, "NASA Research and Technology Program and Project Management Requirements"

d. NPR 7123.1, "NASA Systems Engineering Processes and Requirements"

e. NPR 7150.2, "NASA Software Engineering Requirements"

f. LPR 7120.7, "Space-Flight Independent Life Cycle Reviews Procedural Requirements"

g. LAPD 1150.2, "Councils, Boards, Panels, Committees, Teams, and Groups"

h. CP-4754, "Quality Assurance (QA) for Software Development and Acquisition"

i. CP-6503, "Conducting a Center Management Council (CMC) Review"

P.5   Measurement/Verification

Compliance with this document is verified by forum/review complete e-memo, TQR report, or review report.

P.6   Cancellation

None

Original signed on file

Cindy L. Lee
Associate Director

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1.   Background

a.   Many different types of projects and project tasks are implemented at Langley Research Center (LaRC). As a general principle, all work done at LaRC will be reviewed in some manner. The extent of the review, the formality of the review, and the level of management involvement all need to be tailored to the needs of the specific work involved. This document provides broad center-wide requirements on the types of reviews and under what circumstances they would apply.

b.   The imperative, "shall" is used sparingly in this document and it highlights requirements levied on particular individuals or groups of individuals. Various forms of the verb "to be" (e.g., is, are, will) are used to describe descriptive material and expectations. The word "should" is used where the statement is recommended, but not required. The word "may" is used to give permission, but the statement is not required. The detailed structures of the items in the examples are not required, but provide guidance and should be tailored to the needs of the project/task. When "project(s)/task(s)" is used as the subject of an action, it indicates that the project manager or task lead (or designee) is responsible for execution of the action.

c.   The LaRC Systems Management Office (SMO) develops and maintains various review-related documents that may be of assistance to those planning and conducting reviews. These documents are available on NX (OCIO documentation management system) in the SMO Public collection that can be found at:
https://nx.larc.nasa.gov/dsweb/View/Collection-9082
or by navigating through the LaRC NX collections as follows:
                 Home » 1. Projects and Programs » SMO » SMO Public

   d.   A table of records generated by the various reviews is provided in Appendix B.

2.   Periodic Reviews

Periodic reviews are those that occur with regular frequency. Periodic reviews are generally attended by appropriate LaRC technical and programmatic staff and senior management. The agenda at the periodic reviews is controlled by the hosting organization. An overview of the principal periodic reviews held at LaRC is shown in Figure 1.
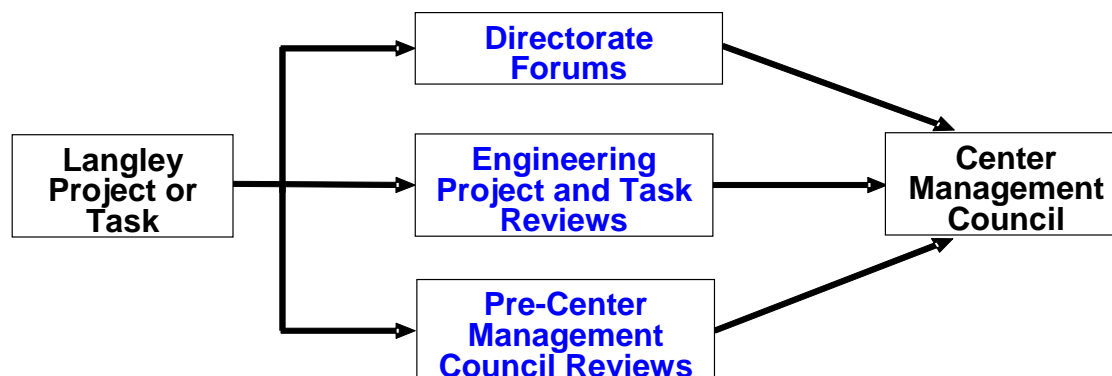

Figure 1. – Periodic Reviews

2.1   Directorate Forums

a.   All technical and programmatic directorates at LaRC shall hold regularly scheduled forums. The purpose is to ensure that directorate heads are fully aware of the work performed in their organizations. This enables them to facilitate information exchange within their directorates, to share relevant information across directorate lines, and to report appropriate information to the Center Management Council (CMC). A key management expectation of these forums is that the technical quality of the work is reviewed at greater depth than is seen at other, more generic reviews. Directorate forums are generally held weekly or bi-weekly by the respective directorates at LaRC. For technical directorates, the focus is on technical status and accomplishments. For programmatic organizations, the emphasis is on programmatic status and accomplishments, but technical issues are also included. Directorate forums are led by the Organizational Unit Manager (OUM) or the OUM's designee. The forum typically involves a presentation of project/task accomplishments and status from an individual or small team perspective. Generally, the presentations rotate through the branches or offices in the Directorate or through the Directorate activities, so that over time, all of the major activities in the Directorate have been presented.

b.   The OUM should assure that project/task teams that include software have contacted the head of the Mission Assurance Branch so that a "Software Assurance Classification Assessment" can be performed following CP-4754, "Quality Assurance (QA) for Software Development and Acquisition."

c.   Each directorate shall establish what record(s) are generated that provide evidence that their Directorate Forums were held.

2.2   Engineering Project and Task Review

a.   The LaRC Chief Engineer and the heads of the LaRC engineering directorates shall organize and run Engineering Project and Task Reviews (EPTRs). The purpose of this review is to identify project and task technical issues in a cross-disciplinary / cross-organizational forum; its objective is to resolve the collective issues with a view towards LaRC organization-wide optimization. This multi-day periodic review is held monthly and focuses on the technical aspects of the various projects and tasks being executed at LaRC. The EPTR is a formal venue for the heads of the technical directorates to assess the technical progress of the work being performed at LaRC. This consolidated review facilitates the identification and resolution of systemic issues associated with the performance of LaRC's engineering and technical activities. In addition, the EPTR provides the Project Chief Engineers with an opportunity to identify and request assistance in resolving both technical and organizational issues. The meetings are led and organized by the heads of the engineering directorates and the LaRC Chief Engineer. The heads of the engineering directorates, the Directorate Chief Engineers and the LaRC Chief Engineer select the projects/tasks to be reviewed each month using the guidance indicated in the flowchart of Appendix C. Typically, the Project Chief Engineer presents the work of the project/task. Attendance at the EPTR is encouraged from the heads of the programmatic directorates, the Safety and Mission Assurance Office (SMAO), and the SMO. Attendance is also open to participation from members of the projects/tasks being reviewed, program office managers, project/task managers, and branch heads. Presentation materials are maintained on NX at the following link: https://nx.larc.nasa.gov/dsweb/View/Collection-4634
or by navigating through the LaRC NX collections as follows:
 Home ➤ 1. Projects and Programs ➤ Engineering Project and Task Technical Review
Access to the site is controlled. Those interested in having regular access to the presentations should contact the LaRC Chief Engineer for authorization.

b.   The LaRC Chief Engineer shall maintain the agenda, presentations, and action items as records of each EPTR.

2.3   Pre-Center Management Council Review

a.   The purposes of the Pre-Center Management Council (PCMC) reviews are to identify project and task issues and to map approaches for resolving those issues prior to the CMC review. The PCMC is the forum where the programmatic directorates exercise their oversight and concurrence of the management details of the project.

Programmatic directorates shall organize and run PCMC reviews. PCMCs are generally held monthly by directorates that manage projects/tasks that report to the Center Management Council. Multiple directorates may hold joint PCMCs. The meetings are led by the heads of the programmatic directorates or their designees. The focus of the PCMC review is overall project performance. It is imperative that both the technical and programmatic aspects be integrated at these reviews so that the review provides for a preliminary assessment of project/task progress, risks, plans, and issues. The PCMC also provides the heads of the programmatic directorates an opportunity to identify and correct Center-wide issues that adversely impact LaRC's ability to manage the projects and tasks at the center. Attendance at the PCMC Review is encouraged from the heads of the engineering directorates, the LaRC Chief Engineer, the SMO, and the SMAO. Attendance is also open to participation from members of the projects/tasks being reviewed, program office managers, project/task managers, branch heads, and representatives from the Office of the Chief Financial Officer and the Office of Procurement.

b.   The Directorate running the PCMC shall maintain the agenda as a record of each PCMC.

2.4   Center Management Council Review

a.   The purpose of the CMC review is to enable LaRC senior management to oversee projects and tasks performed at the center by providing them with insight into project/task progress towards meeting center commitments. The CMC also provides a forum for senior leadership to address systemic issues that affect multiple projects/tasks.

b.   The LaRC CMC is authorized in LAPD 1150.2, "Councils, Boards, Panels, Committees, Teams, and Groups". CMC reviews are held according to LMS CP-6503, "Conducting a Center Management Council (CMC) Review". The descriptive information below places the CMC reviews in the context of other LaRC reviews and supplies additional current information regarding the CMC.

c.   The CMC review is held monthly and focuses on all aspects of performance for the projects/tasks assigned to the center. In addition, special purpose review meetings of the CMC may be called to address issues with specific projects. The Deputy Center Director and the Director of the SMO shall organize and run the CMC review in accordance with CP-6503, "Conducting a Center Management Council (CMC) Review." The CMC review is chaired by the Deputy Center Director. The Director of the SMO is the vice chair and sets the agenda for each month's meeting. The membership of the CMC comprises senior LaRC leadership, as specified in LAPD 1150.2, "Councils, Boards, Panels, Committees, Teams, and Groups." Generally, projects/tasks with high visibility or those that are at high risk report each month and those with medium visibility or risk report quarterly. Projects/tasks with low visibility or risk are generally included in summary briefings by their programmatic directorate on an annual basis.

d.   The CMC review serves as a consolidation of the directorate forums, the EPTR, and the PCMC reviews. At the CMC review, the LaRC Chief Engineer or designee summarizes important issues from the month's EPTR. The various directorate heads may also present relevant information they have obtained through the directorate forums and other means. The main portion of the CMC involves the review of individual projects/tasks. Generally the project manager or his/her designee gives the presentation except for consolidated summaries, which are usually presented by the head of the appropriate program directorate or his/her designee.

e.   Within LaRC, uncontrolled CMC information, such as CMC charter, members, and presentation format templates can be found on NX at: https://nx.larc.nasa.gov/dsweb/View/Collection-9820 or by navigating through the LaRC NX collections to:
     Home » 1. Projects and Programs » SMO » SMO Public » CMC Public Documents
Presentations and other controlled information are available to CMC members and others requiring access to this information on NX at: https://nx.larc.nasa.gov/dsweb/View/Collection-6768 or by navigating through the LaRC NX collections to:
        Home » 3. Special Projects and Teams » Center Management Council
Individuals needing regular access to such information should contact the SMO office to be granted access permission.

f.   As set forth in CP-6503, the SMO shall maintain the agenda, action items, minutes, and presentations as records of the meeting.
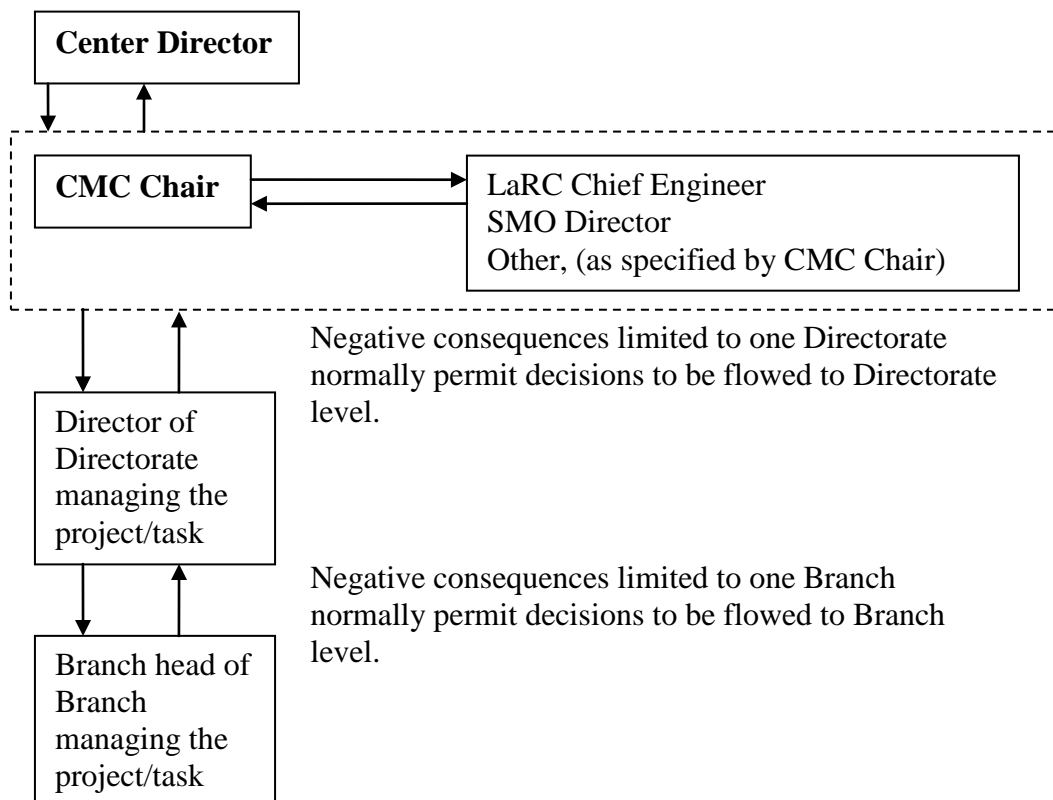
3.   Event-Driven Reviews

a.   Event-driven reviews are those that occur when a specified event is reached or when a deliverable has been completed. Event-driven reviews are generally scheduled and organized by the project/task team (or where applicable, by the project/task Standing Review Board as described in LPR 7120.7) with assistance from the LaRC Chief Engineer, the SMO, and appropriate directorate personnel.

b.   Facility projects/tasks subject to other LMS review requirements are out of scope of the event-driven review requirements described below.

c.   Within the constraints imposed by agency requirements, contractual obligations, and expectations of our customers, Figure 2 shows the authority and communication flow for determining the applicability of event-driven reviews to specific projects/tasks. The Center Director has ultimate authority for such determinations and rules on any conflicts stemming from decisions made at lower authority levels.

d.   Unless the Center Director specifically invokes the authority of Section 3, paragraph c, the CMC Chair makes determinations regarding the applicability of event-driven reviews to specific projects/tasks and rules on any conflicts made at lower authority levels. The CMC Chair may delegate this authority to the LaRC Chief Engineer, the SMO Director, or some other individual as specified by the CMC Chair. The extent of such delegation may vary. For instance, it may extend to specific projects for an indefinite time period or may extend to all projects for a specifically defined time period. Preferably, such delegations are in writing or are recorded as part of the minutes of the CMC. The CMC Chair may revoke or limit any such delegations at any time. The CMC Chair should inform the SMO Director of any such delegations or revocations so that the SMO can maintain a list of all active delegations. All relevant decisions made by the CMC Chair, the LaRC Chief Engineer, the SMO Director, and other individual(s) with such delegated authority (i.e., those named in the dashed-line box in Figure 2) are to be timely communicated to the others (in the dashed-line box). The CMC chair is responsible for communicating a summary of all such decisions to the Center Director on a regular basis.

e.   If a Director of a Directorate managing a project/task concludes that the effects of any negative consequences of a specific project/task are limited to that Directorate, the Director may make determinations regarding the applicability of event-driven reviews to that specific project/task. That Director is responsible for communicating such decisions to the CMC Chair and those to whom the CMC Chair has delegated such decision authority. The CMC Chair, or those with appropriate delegations, may override the decision of the Director.

f.   If a Branch Head of a Branch managing a project/task concludes that the effects of any negative consequences of a specific project/task are limited to that Branch, the Branch Head may make determinations regarding the applicability of event-driven reviews to that specific project/task. The Branch Head is responsible for communicating

such decisions to the Director of the Directorate of which the Branch is a part. The Director may override the decision of the Branch Head.

Figure 2. – Authority and communication flow for applicability of event-driven reviews. Authorities flow down; communications flow up.

g.   An overview of the relationships between the various event-driven reviews held at LaRC is shown in Figure 3. Peer Reviews and Technical Quality Reviews focus on the technical quality of specific work products. Life Cycle Reviews evaluate the programmatic and technical state of the project/task. A project/task will often have Peer Reviews, Technical Quality Reviews, and Life Cycle Reviews.

h.   LaRC project/task teams are expected to internally review their programmatic and technical products prior to the conduct of independent reviews. Projects/tasks use Peer Reviews, as appropriate, to internally review their products prior to Technical Quality Reviews and Life Cycle Reviews. The extent and conduct of additional project internal reviews depend upon the circumstances and explicit requirements contained in LMS or NPR documents.

i.   When scheduling an event-driven review, project/task teams should check under "LaRC look-ahead" calendar under the "LaRC Calendars" on @LaRC to avoid potential conflicts with other major events whenever possible. The project/task team notifies the LaRC SMO of the date(s) selected for any event-driven review.

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                        │   Langley Project/Task   │
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Program, project,
subproject, task,
etc.

Requirements, design,
analysis, software, database,
trade study, report, etc.

In process   Prior to delivery

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          ┌──────────────┐         ┌──────────────────────────┐
          │  Peer /Ad    │ ──────▶ │ Technical Quality Review │
          │  Hoc Review  │         └──────────────────────────┘
          └──────────────┘
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┌─────────────────────────┐
│   Life Cycle Review      │
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     Customer/Partner
│        Review(s)              │
   (outside scope of this LPR)
└ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
```
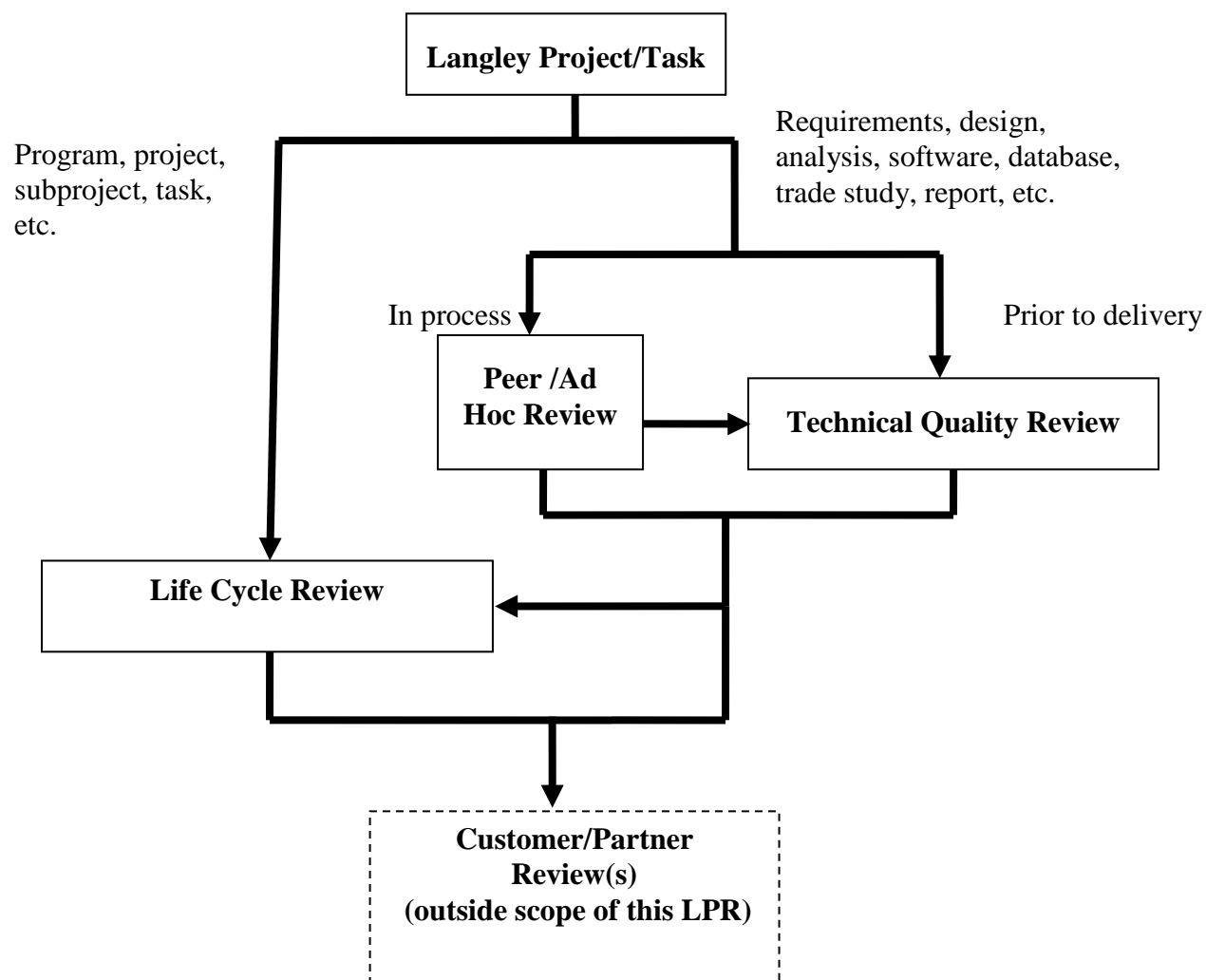
Figure 3. – Relationships and subject matter of event-driven reviews.

j.   Project/task leads are responsible for defining and planning their event-driven reviews in a review plan. Review planning is expected to be presented at the project/task 60-Day Review (see LPR 7120.7). If a 60-Day Review is not held for a project/task, review planning is expected to be presented at the highest level upcoming periodic review to which the project reports (where CMC is higher than PCMC review, which is higher than directorate forum). A review plan is expected prior to the project's entry into phase A (see LPR 7120.7). Significant changes to the review plan are expected to be reported at subsequent periodic reviews and Life Cycle reviews.

k.   The review plan and changes thereto are to be approved by the LaRC individual determining the applicability of event-driven reviews to specific projects/tasks (as described in paragraphs 3 c-h and Figure 2). At a minimum, the review plan includes: identification of relevant stakeholders, description of the various reviews planned by the project/task, and an integrated master schedule of reviews showing the inter-

relationships between the reviews. A template for a stand-alone review plan is available in the NX collection:
https://nx.larc.nasa.gov/dsweb/View/Collection-9766
or by navigating through the LaRC NX collections to:

Home » 1. Projects and Programs » SMO » SMO Public » Examples and Templates » Review Plan

The review plan may be part of another document, for instance a Project Implementation Plan, as long as the section containing the review plan includes the required elements and the document is approved by the relevant LaRC individual.

l.   A summary of the review plan including a description of the review strategy and key reviews that require customer involvement are to have customer approval as well as approval from the relevant LaRC individual as described above. The approval may be of a stand-alone review plan summary document or part of a more comprehensive document that includes the review plan summary.

3.1   Peer/Ad Hoc Reviews

a.   Peer reviews are the in-process technical examination of work products by technical peers (typically drawn from individuals working prior or subsequent project phases and/or other sides of interfaces) for the purpose of finding and eliminating defects early in the product development cycle. The project/task shall document what peer reviews will be performed by the project in the review plan.

b.   Ad Hoc reviews (including Tiger Teams) provide examination and consultation by technical experts on analysis and resolution of anomalies, non-conformances, and failures.

c.   Peer/Ad Hoc reviews are performed following defined procedures covering the preparation for the review, conducting the review itself, documenting results, reporting the results, and certifying the completion criteria. Details for conducting peer reviews for software products can be found in NPR 7150.2, "NASA Software Engineering Requirements", Sections 4.3 and 5.3.3.

d.   The project being reviewed shall maintain the review report as a record of the review.

3.2   Technical Quality Reviews

a.   Project/task leads shall plan for technical quality reviews (TQRs) for all of their appropriate deliverables. Project/task leads shall ensure that planned TQRs are completed prior to delivering the subject of the review.

b.   TQRs focus on the technical quality of specific deliverables. Some possible examples of subject matter for a TQR include: a technical or programmatic recommendation, an analysis, a trade study, a technical report, and an engineering database. The level of scrutiny varies with the risk incurred through the use of the

deliverable. Three broad classes of deliverables and their associated review structure are defined below. However, hybrid reviews may be appropriate for deliverables that straddle these classes.

c.   TQRs generally fall into one of three classes: minor deliverables; major deliverables; and key deliverables. Characteristics and examples of each class are provided in Table 1.

d.   Project/task leads negotiate with the OUM of the organization managing the project/task to determine what deliverables are subject to TQRs and what the corresponding class is for each deliverable. Project/task leads and the OUM balance the added value of each TQR with the burden imposed by the TQR. The expected level of scrutiny that a particular deliverable is to receive at a Life Cycle Review may also be considered in determining the necessity for a TQR. Requests for additional TQRs or changes to the selected class for a TQR may be made by the LaRC Chief Engineer, the LaRC Deputy Director for Programs in SED, the SMO Director, or the OUM of an organization in which the work is being performed. Project/task concerns with any such request are raised to the OUM of the organization managing the project/task. If the OUM cannot resolve the issue with the requester, the CMC Chair decides the issue. Further appeals may be made to the Center Director.

e.   Requirements for TQRs are discussed in secs. 3.2.1-3.2.4 below. Additional guidance can be found in Appendix D.

Table 1. Technical Quality Review Classes

Class Name	Characteristics	Examples
Minor Deliverables	Interim or time-limited. Minor deliverables are expected to be superseded by subsequent or consolidated deliverables in the near future.	Minor releases, minor updates, interim or preliminary data reports, CFD code calibration/checkout, component engineering reports, trade-study segments
Major Deliverables	Long, but finite lifetime, impact/drive local decisions, may impact minor customer decisions	Major database releases, system/subsystem engineering reports, trade studies, analyses
Key Deliverables	Archival quality, intended for long-term use, significantly impact/drive customer decisions	Project recommendations and their supporting trade studies and analyses, final releases of databases, databooks for customer Life Cycle Reviews, final system engineering reports

3.2.1 TQR Planning

a.   In general, each project/task team should develop a review plan that includes TQRs. In particular, the plan should indicate which deliverables are subject to which class of review and how the reviews fit into the overall schedule. Inclusion of a TQR planning table similar to the notional one shown in Figure 4, "Technical Quality Review Planning Table", may help achieve this goal. In the notional TQR planning table, the ID number is a project/task assigned number to aid the project/task in tracking its deliverable reviews. The schedule ID corresponds to the same-numbered item in the project schedule. The entries in the notional TQR planning table are for example purposes only.

b.   To limit overhead, reviews of related products may be grouped together and reviewed either collectively or individually, by the same review panel. The project/task has the responsibility of providing the review materials to the reviewers and ensuring that all the reviewers and approvers are aware of delivery due dates for all products undergoing review. The review plan sets out how the TQRs of the various deliverables are to be performed. In cases where a common meeting place is required, the project/task team is responsible for the logistics of the review.

Technical Quality Review Planning Table						
ID No.	Schedule ID	Deliverable	Level of Review	Approver Level	Technical Review Date	Delivery Date
043	4650	Separation Dynamics Software Package	Key	Multiple Directorates	2/8/20XX	2/18/20XX
044	4652	Separation Dynamics Calibration Report	Minor	Branch	3/17/20XX	3/25/20XX
045	4655	Separation Dynamics Analyses	Major	Directorate	5/8/20XX	5/14/20XX
046	4656	Separation Dynamics Final Report	Key	Multiple Directorates	7/19/20XX	7/29/20XX
047	5501	Separation Mechanism Conceptual Design	Minor	Branch	5/25/20XX	6/1/20XX
048	5503	Separation Mechanism Conceptual CAD Models	Minor	Branch	6/5/20XX	6/12/20XX
049	5505	Separation Mechanism Conceptual Design Analyses	Minor	Branch	7/4/20XX	7/10/20XX
050	5145	Seals Critical Function Performance Test Plan	Minor	Branch	12/29/20XX	1/7/20XY
051	5504	Design Analysis Cycle 1 Report	Major	Directorate	5/23/20XY	6/1/20XY
052	5146	Seals Critical Function Performance Test Report	Minor	Branch	8/29/20XY	9/3/20XY
053	4923	Seals System Arc Jet Test Plan	Minor	Branch	6/26/20XY	7/2/20XY
054	4924	Arc Jet Test Coupons	Minor	Branch	7/25/20XY	8/1/20XY
055	1216	Design Analysis Cycle 2 Report	Key	Multiple Directorates	12/26/20XY	1/15/20XZ
056	4925	Seals System Arc Jet Test Report	Major	Directorate	9/28/20XY	10/3/20XY

Figure 4. – Example Technical Quality Review Planning Table

3.2.2 Conducting TQRs

a.   The time frames discussed below for completion of the various TQRs refer only to the calendar time between the receipt of the deliverable by the review panel and the completion of the review (including the review report). The reviews themselves are not expected to occupy all of the intervening time. To achieve the required turnaround, the review panel must be selected and prepared prior to the scheduled availability of the deliverable for review.

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b.   Although some TQRs may require the panel members to meet face-to-face and discuss issues, most TQRs are expected to involve only electronic or telephonic communication between the panel members.

c.   Differences in the review classes are reflected in the time spent on the review, the content of the review panel, and the approver level required for sending the deliverable off the center.

d.   During a TQR, one or more panel members may recommend that a product should be reviewed at a higher level. If this occurs, the panel Review Lead/Chair notifies the LaRC Chief Engineer, the heads of the relevant directorates and the project/task manager so that the issue can be resolved at the appropriate level. However, because TQRs typically involve tight time schedules, the reviewers should continue with the review at their level. If it is later determined that a higher level of review is warranted, the technical quality review done at the lower level will be used to feed the review at the higher level.

3.2.2.1   TQRs for Minor Deliverables

TQRs for minor deliverables are typically completed within 1-2 days. The minor deliverable review panel typically consists of a small number of reviewers including one or more Branch Heads/Lead Discipline Engineers (subject matter experts), one of whom typically acts as the Review Lead/Chair, and possibly a Directorate Chief Engineer, and/or a Project Chief Engineer. Upon completion of the review and the review report, the reviewed minor deliverables may be released for delivery to the customer with the approval of the Review Lead/Chair.

3.2.2.2   TQRs for Major Deliverables

TQRs for major deliverables are typically completed within 1-3 days. The review panel typically consists of a modest number of reviewers including a Subject Matter Expert (SME) as the Review Lead/Chair, one or more additional SMEs, head(s) of appropriate directorate offices or their designees, a Directorate Chief Engineer, and a Project Chief Engineer. Upon completion of the review and the review report, the reviewed major deliverables may be released for delivery to the customer with the approval of the directorate head involved in, or cognizant of the review.

3.2.2.3   TQRs for Key Deliverables

TQRs for key deliverables are typically completed within 3-5 days. The review panel typically consists of reviewers including a SME as the Review Lead/Chair, one or more additional SMEs, head(s) of appropriate directorate offices or their designees, a Directorate Chief Engineer, and a Project Chief Engineer. For key deliverables, the approval to release the reviewed product to the customer requires the signature of at least two directorate heads involved in or cognizant of the review. The project is responsible for providing a copy of the signed review report/release approval to the LaRC Center Director or designee prior to releasing the deliverable. After submitting this copy the project does not have to wait for further approvals.

3.2.3 Review Report

a.   In all cases, the output of a TQR is a review report generated and signed by the Review Lead/Chair. The purpose of the review report is to provide a documented basis for the approver to release the deliverable. Hence, the level of detail expected in the review report varies with the class of the deliverable and may be negotiated on a case-by-case basis to satisfy the needs of the approver. In general, the review report summarizes the findings and recommendations of the review panel, including any unresolved dissenting opinions. The Review Lead/Chair provides a copy of the written report to the LaRC Chief Engineer, the responsible OUM, the Directorate Chief Engineer, and the lead for the project/task. The report can include project/task team comments on the findings and recommendations.

b.   The project/task team is responsible for placing the review report under project/task configuration management as part of or linked to the reviewed item. In addition, the LaRC Chief Engineer shall archive the review report in a center-based archive. If appropriate, the LaRC Chief Engineer should also archive a copy of the reviewed product in the center-based archive.

3.2.4 Deliverable Approval

a.   The deliverable approval is the formal approval that the project needs to release the deliverable to the customer. The format of an approval is intended to be flexible for all classes of technical quality review. The approval may be on paper, electronic, or other archival format. A valid approval clearly identifies the approver and his/her position; references the deliverable, and clearly indicates that the approver believes the product is ready to deliver to the customer. The deliverable approval is typically based on the approver considering the review report and possibly other material. In cases where other standardized forms serve the same purpose, a copy of the completed, signed form may be considered as the deliverable approval. For other cases, an example completed approval document that may be used for a major deliverable is provided in the NX collection:
https://nx.larc.nasa.gov/dsweb/View/Collection-9441
or by navigating through the LaRC NX collections to:
Home » 1. Projects and Programs » SMO » SMO Public » Examples and Templates »
 Technical Quality Reviews (TQR)

b.   Separate copies of the deliverable approvals are maintained by the project and the LaRC Chief Engineer.

3.3   Life Cycle Reviews

a.   Life Cycle Reviews assess the readiness of a program/project/task to proceed. NASA requirements for Life Cycle Reviews depend upon whether the program/project is designated as a formal NASA project and if so, what type of program/project. Formal NASA programs/projects are identified in the NASA Meta-Data Manager database.

NASA space flight and ground system programs/projects are required to follow NPR 7120.5D, "NASA Space Flight Program and Project Management Requirements." NASA research and technology programs/projects are required to follow NPR 7120.8, "NASA Research and Technology Program and Project Management Requirements." As of this writing, NPR 7120.7, "NASA Institutional Infrastructure and Information Technology Program and Project Management Requirements" is in development and will control the reviews for institutional infrastructure and information technology programs and projects. The review plan describes the project's planned Life Cycle Reviews.

b.   Depending upon organizational structure and project/task complexity, both a parent program/project/task and a child project/task may have their own 60-Day and independent Life Cycle Reviews.

c.   Life Cycle Reviews for space-flight and ground system programs and projects are described in detail in LPR 7120.7.

d.   Infrastructure programs, projects, or tasks follow their governing LaRC requirements documents.

e.   Other programs, projects, or tasks start with LPR 7120.7 and tailor the reviews as appropriate within constraints imposed by agency requirements and other LMS requirements.

f.   Tailoring of the reviews to suit the needs of specific projects or tasks is encouraged. However, waivers are needed if LaRC and/or NASA requirements will not be met. Members of the SMO will assist in obtaining appropriate waivers for matters affecting reviews. Sufficient time should be set aside for obtaining any desired waivers.

g.   The project shall maintain the Terms of Reference, the presentation materials, and the review report for each project life cycle review.

Appendix A - List of acronyms

Acronym	Meaning
CMC	Center Management Council
EPTR	Engineering and Project Task Review
LaRC	Langley Research Center
LPR	Langley Procedural Requirements
NESC	NASA Engineering and Safety Center
NPR	NASA Procedural Requirements
NX	OCIO documentation management system
OUM	Organizational Unit Manager
PCMC	Pre-Center Management Council
QA	Quality Assurance
SMAO	Safety and Mission Assurance Office
SME	Subject Matter Expert
SMO	Systems Management Office
ToR	Terms of Reference
TQR	Technical Quality Review

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Appendix B –Table of Records Generated

Review or Meeting	Section	Record(s) Generated	Party Responsible for Maintaining Records
Directorate Forum	2.1.c	Directorate dependent (but some document providing evidence that the meeting was held is expected)	Directorate holding forum
EPTR	2.2.b	Agenda, Action Items, Presentations	LaRC Chief Engineer
Pre-CMC	2.3.b	Agenda	Directorate running the meeting
CMC	2.4.f	Agenda, Action Items, Minutes, Presentations (see CP-6503)	Systems Management Office
	3.j, 3.k, 3.l	Review Plan	Project being reviewed
	3.k, 3.l	Review Plan Approvals	Project being reviewed
Peer Review	3.1.b	Review Report	Project being reviewed
TQR	3.2.3.b	Review Report	Project and LaRC Chief Engineer
TQR	3.2.4.b	Deliverable Approval	Project and LaRC Chief Engineer
Project Life Cycle Review	3.3.g	Terms of Reference, Presentation Materials, Review Report	Project being reviewed

Appendix C – EPTR Project Selection Guidance

Notes refer to flow chart below

NOTE 1:
CMC presentation requirements are determined by the System Management Office

NOTE 2:
Airborne Project may be flying on a sounding rocket, helicopter, airplane, or other flight vehicle.

Because of the coordination required with other organizations, these type projects should report to the EPTR unless they have flown before.

NOTE 3:
Frequency of regular EPTR presentations is at the discretion of the EPTR Board Chairperson with input from the Project, responsible OUM, and Directorate Chief Engineers.

NOTE 4:
Directorate Chief Engineer will determine if a funded proposal has sufficient engineering element requiring budget and schedule oversig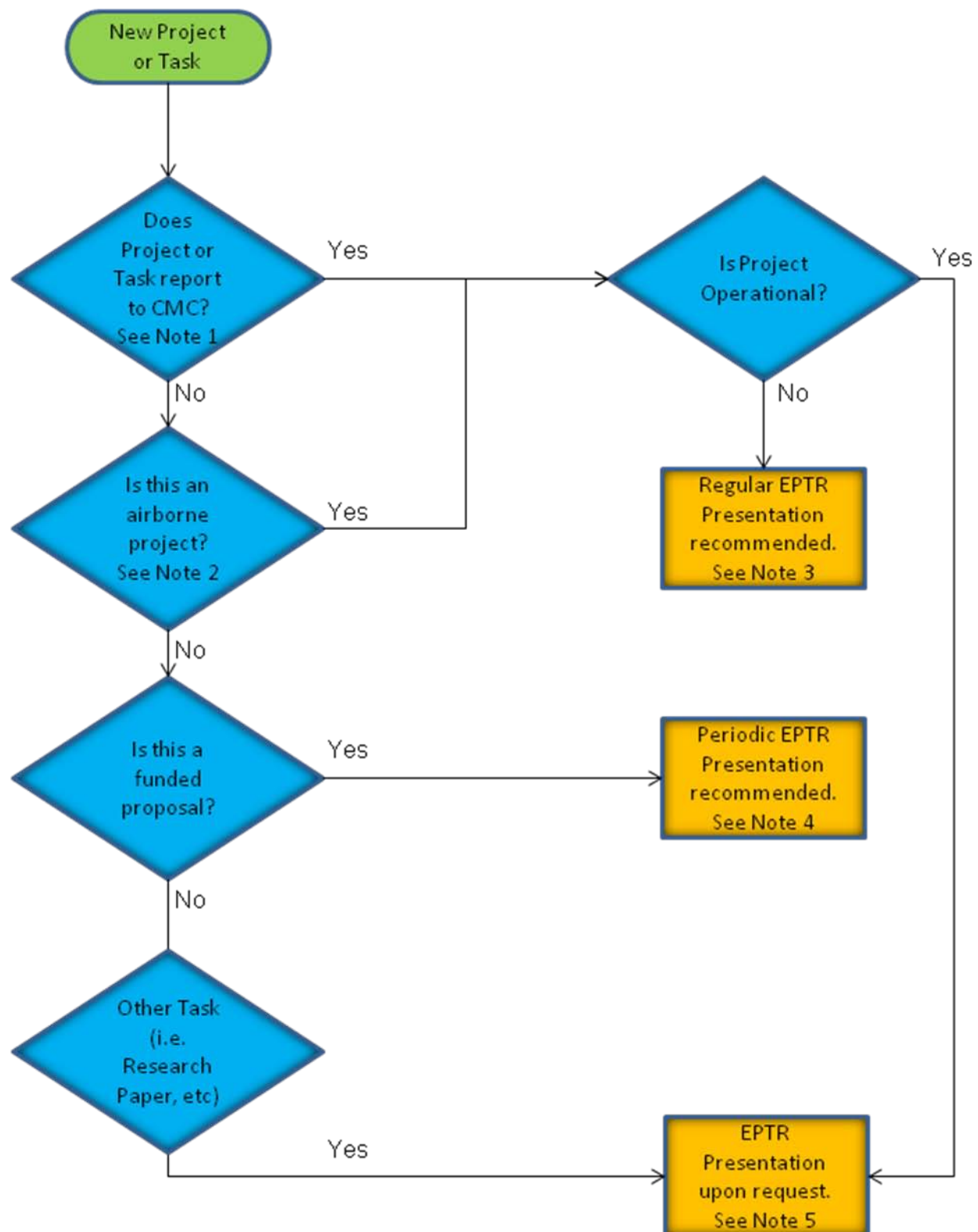ht that will require EPTR reporting. Those selected do an introductory EPTR at the start of the project. Then one month prior to the required Program Office Review, present to the EPTR to give the center the opportunity to help with issues or concerns. EPTR presentations may be requested in between to address issues or concerns.

NOTE 5:
EPTR Presentations may be requested at anytime by the Project, EPTR Board Chairperson, the responsible OUM, the Directorate Chief Engineers, or Branch Management.

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New Project or Task

Does Project or Task report to CMC? See Note 1 — Yes

Is Project Operational? — Yes

No

Regular EPTR Presentation recommended. See Note 3

Is this an airborne project? See Note 2 — Yes

No

Is this a funded proposal? — Yes

Periodic EPTR Presentation recommended. See Note 4

No

Other Task (i.e. Research Paper, etc) — Yes

EPTR Presentation upon request. See Note 5

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Appendix D – Guidance for TQRs

The guidance herein applies only to Technical Quality Reviews for key, major and minor deliverables including data, hardware and software. It does not apply to ad hoc reviews that may be requested by the project to address particular technical issues of concern.

The guidance covers both the panel conducting the reviews and the project/task team whose products are under review. Although LPR 7130 contains the procedural requirements, this appendix does not. Its purpose is to ensure that the expectations for TQRs are understood by the panel and the project/task team.

Review Criteria

As stressed in the LPR, "**TQRs focus on the technical quality of specific deliverables**." This is interpreted to mean that the technical aspects of the deliverables meet the customer's expectations.
The primary criteria for assessing whether the technical quality is acceptable are:
1. Does the deliverable meet its technical requirements?
2. Were the appropriate technical practices followed in producing the deliverable?
3. Are all technical caveats and concerns about the deliverable pertinent to its intended use identified and prominently attached to the deliverable?

Requirements

The project/task team should present the formal or derived requirements for their deliverable, with clear traceability of derived requirements to the relevant formal requirements.

If any derived requirements have not been communicated to and/or approved by the customer, then the panel should comment on the appropriateness of these unapproved, derived requirements.

Practices

The project/task team should identify the applicable institutional standards (e.g., NASA standards, NASA-approved standards, NPRs, and LPRs) for their work. If there are no applicable standards, then the project/task team should discuss the heritage of the practices that they followed (e.g., individual or team judgment, undocumented practices for the branch/directorate/center, documented practices for the branch/directorate/center, NASA handbooks, and other documented industry or technical community practices).
The project/task team should describe the reviews and independent activities used to verify the deliverables (e.g., verification of transformations of data from one format to another, and peer review of models and simulations).

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The panel should assess the project/task team's compliance with the relevant practices and the impacts upon the deliverable of any deviations from the relevant practices. The panel should note any instances wherein the relevant practices are inadequate for meeting the technical requirements. The panel should assess the acceptability of the verification activities.

Caveats and Concerns

The project/task team should discuss their own caveats and concerns about the deliverable and the manner in which these are conveyed to the customer.

The panel should assess the gravity of these concerns and the effectiveness of the manner by which they are conveyed to the customer. The panel should identify any additional caveats and concerns that should be conveyed to the customer.

Review Format

The review should place as small a burden as necessary on the project/task team. Per sec. 3.2.2 of LPR 7130, the review should require a face-to-face meeting only when necessary for an effective review by the panel or for efficient discussion of the deliverable by the project/task team.

The project/task team is not expected to prepare a formal presentation with polished charts for the review. They may use whatever format or media is best suited to discussing the deliverable.

Panel Report

As stated in LPR 7130, the panel report should summarize the findings and recommendations of the panel. The report should be organized in such a fashion that the findings and recommendations of the panel as a whole (as well as any dissenting opinions of the panelists) are clearly delineated. Additional information, such as individual comments from panel members, may be included in the report as backup information.

The findings should include the panel's assessment of all the review criteria described above. The most prominent recommendation should be whether the panel approves (in the case of minor or major deliverables for which the panel itself has approval authority) or recommends (in the case of key deliverables for which the panel is making a recommendation to the approving officials) release for technical use of the deliverable.