

ELECTRONIC RECORDS ARCHIVES

TECHNICAL REVIEW PROCESS (TEP)

(TOMP Version 2.0, Task 4.3.9)

for the

**NATIONAL ARCHIVES AND
RECORDS ADMINISTRATION**

**ELECTRONIC RECORDS ARCHIVES
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(NARA ERA PMO)**

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Prepared by:

Integrated Computer Engineering (ICE)
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TECHNICAL REVIEW PROCESS (TEP)

Signature Page

Program Director,

I recommend approval of the Technical Review Process (TEP).

Dyung Le,
ERA Program

Date

Virginia White,
ERA Program

Date

Approved,

Kenneth Thibodeau,
ERA Program Director

Date

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FINAL

TABLE OF CONTENTS

SIGNATURE PAGEi

DOCUMENT CHANGE CONTROL SHEET ii

1.0 INTRODUCTION.....1

1.1 PURPOSE.....1

1.2 ERA PROGRAM OVERVIEW2

1.3 DEFINITIONS AND ACRONYMS.....2

1.4 REFERENCES3

1.4.1 Standards.....3

1.4.2 ERA PMO Documentation.....3

2.0 TECHNICAL REVIEW PANEL.....3

2.1 REVIEW AGENDA5

2.2 REVIEW PREPARATION5

2.3 REVIEW GOALS AND CONDUCT.....6

2.4 REVIEW CLOSEOUT6

3.0 TECHNICAL REVIEWS.....7

3.1 REQUIREMENTS REVIEW7

3.1.1 Purpose.....7

3.1.2 Input.....7

3.1.3 Procedures.....8

3.1.4 Exit Criteria.....8

3.1.5 Output.....8

3.2 SYSTEM REQUIREMENTS REVIEW.....8

3.2.1 Purpose.....8

3.2.2 Input.....9

3.2.3 Procedures.....9

3.2.4 Exit Criteria.....9

3.2.5 Output.....9

3.3 SYSTEM DESIGN REVIEW10

3.3.1 Purpose.....10

3.3.2 Input.....10

3.3.3 Procedures.....10

3.3.4 Exit Criteria.....11

3.3.5 Output.....11

3.4 INCREMENT SYSTEM REQUIREMENTS REVIEW11

3.4.1 Purpose.....11

3.4.2 Input.....11

3.4.3 Procedures.....12

3.4.4 Exit Criteria.....12

3.4.5 Output.....12

3.5 RELEASE SYSTEM REQUIREMENTS REVIEW12

3.5.1 Purpose.....12

3.5.2 Input.....13

FINAL

TABLE OF CONTENTS

3.5.3	Procedures.....	13
3.5.4	Exit Criteria.....	13
3.5.5	Output.....	13
3.6	PRELIMINARY DESIGN REVIEW	14
3.6.1	Purpose.....	14
3.6.2	Input.....	14
3.6.3	Procedures.....	15
3.6.4	Exit Criteria.....	15
3.6.5	Output.....	15
3.7	CRITICAL DESIGN REVIEW	15
3.7.1	Purpose.....	16
3.7.2	Input.....	16
3.7.3	Procedures.....	16
3.7.4	Exit Criteria.....	16
3.7.5	Output.....	17
3.8	TEST READINESS REVIEW.....	17
3.8.1	Purpose.....	17
3.8.2	Input.....	17
3.8.3	Procedures.....	18
3.8.4	Exit Criteria.....	18
3.8.5	Output.....	18
3.9	OPERATIONAL READINESS REVIEW	19
3.9.1	Purpose.....	19
3.9.2	Inputs	19
3.9.3	Procedures.....	19
3.9.4	Exit Criteria.....	20
3.9.5	Output.....	20
4.0	METRICS AND MEASURES	20
5.0	REVIEWERS ROLES AND RESPONSIBILITIES BY TECHNICAL REVIEW TYPE	20
6.0	PLAN MAINTENANCE	28
	APPENDIX A: ERA TECHNICAL REVIEW ACTION ITEM LOG.....	A-1
	APPENDIX B: TECHNICAL REVIEW SUMMARY REPORT	B-1
	APPENDIX C: TECHNICAL REVIEW CHECKLIST.....	C-1

LIST OF TABLES

Table 1-1: Acronyms List.....	3
Table 5-1: Reviewers Roles and Responsibilities by Technical Review Type	28

FINAL

TECHNICAL REVIEW PROCESS (TEP)

1.0 Introduction

The technical review process is a systematic evaluation of a product by a team of qualified personnel that examines the acceptance of the product for its intended use and identifies discrepancies from specifications and standards. Technical reviews, as defined in Institute of Electrical and Electronics Engineers (IEEE) Std 1220-1998, *IEEE Standard for Application and Management of the Systems Engineering Process*, assess the maturity of the development effort, determine readiness to conduct acceptance testing, and determine whether the investment should be made to continue into production (i.e., become operational). Technical reviews may also provide recommendations of alternatives and examination of various alternatives, as defined in IEEE Std 1028-1997, *IEEE Standard for Software Reviews*. This allows the Electronic Records Archive (ERA) Program Management Office (PMO) and Program Director (PD) to review the evolving system and to approve the transition to the next activity in the life cycle. The objectives of the reviews, except for the Requirements Review (RR), are to assure the ERA PMO that the design will satisfy all aspects of the requirements. The objective of the RR, on the other hand, is to determine the adequacy of the requirements prior to their inclusion in the Request For Proposal (RFP).

1.1 Purpose

The purpose of this document is to define the individual technical review processes for the ERA PMO and the Development Contractor. This *Technical Review Process (TEP)* document presents the technical review process that supports the ERA technical deliverables throughout the development and maintenance life cycle. The review products discussed in this document will focus on such things as the adequacy of system requirements for the RFP, the completeness of the system requirements in terms of identification, whether the design of the system and its comprising hardware and software satisfies all aspects of the requirements, and the assurance of product completeness at each release and increment. Detailed information on the release and incremental approaches is found in the *ERA Life Cycle (ELC)* document. The following reviews will be described in greater detail in **Section 2.0, Technical Reviews**.

- Requirements Review (RR)
- System Requirements Review (SRR)
- System Design Review (SDR)
- Increment System Requirements Review (ISRR)
- Release System Requirements Review (RSRR)
- Preliminary Design Review (PDR)
- Critical Design Review (CDR)
- Test Readiness Review (TRR)

FINAL

- Operational Readiness Review (ORR)

1.2 ERA Program Overview

ERA will be a comprehensive, systematic, and dynamic means for preserving virtually any kind of electronic record, free from dependence on any specific hardware or software. The ERA, when operational, will make it easy for NARA customers to find records they want and easy for NARA to deliver those records in formats suited to customers' needs.

1.3 Definitions and Acronyms

The technical terms used in this plan are defined in IEEE Std 610.12-1990, *IEEE Standard Glossary of Software Engineering Terminology*. **Table 1-1, Acronyms List**, contains a list of acronyms used herein.

ACRONYM	DEFINITION
AI	Action Item
CCB	Configuration Control Board
CDR	Critical Design Review
CI	Configuration Item
CM	Configuration Management
CMP	Configuration Management Plan
CP	Change Proposal
CR	Change Request
ELC	ERA Life Cycle
ERA	Electronic Records Archive
HWCI	Hardware Configuration Item
ICD	Interface Control Document
IEEE	Institute of Electrical and Electronics Engineers
IRD	Interface Requirements Document
ISRR	Increment System Requirements Review
MP	Metrics Plan
NARA	National Archives and Records Administration
ORR	Operational Readiness Review
PD	Program Director
PDR	Preliminary Design Review
PMO	Program Management Office
QM	Quality Management
QMP	Quality Management Plan
RD	Requirements Document
RFP	Request for Proposal
RQM	Requirements Management Plan

FINAL

ACRONYM	DEFINITION
RR	Requirements Review
RSRR	Release System Requirements Review
SDR	System Design Review
SME	Subject Matter Expert
SRR	System Requirements Review
Std	Standard
TEP	Technical Review Process
TOMP	Task Order Management Plan
TR	Technical Review
TRR	Test Readiness Review
TSP	Testing Management Plan

Table 1-1: Acronyms List

1.4 References

The standards and ERA documents used to develop the TEP are described in the sections that follow.

1.4.1 Standards

The standards used in preparation of this document are listed below.

- IEEE Std 610.12-1990, IEEE Standard Glossary of Software Engineering Terminology
- IEEE Std 1028-1997, IEEE Standard for Software Reviews
- IEEE Std 1220-1998, IEEE Standard for Application and Management of the Systems Engineering Process

1.4.2 ERA PMO Documentation

The following ERA PMO documentation was used to support the generation of this document.

- ERA Life Cycle (ELC), version 1.1
- Testing Management Plan (TSP), version 2.1
- Metric Plan (MP), version 1.2
- Configuration Management Plan (CMP), version 1.5
- Quality Management Plan (QMP), version 2.0

2.0 Technical Review Panel

The Technical Review (TR) Panel is made up of the ERA PMO staff. The TR Panel is a team of appropriate experts appointed by the PD to guarantee the integrity and consistency of the

FINAL

technical review process. The TR Panel is responsible for evaluating the review products, overseeing each review, preparing minutes and a summary report, and making recommendations to the PD for decision-making and approval.

The producer of a product begins the technical review process by informing the TR Panel's Review Leader that the product is complete and ready for review. The Review Leader then evaluates the product for readiness before sending out a review agenda and distributing the product for review. With the exception of the Requirements Review (RR) and the Operational Readiness Review (ORR), the Development Contractor is responsible for conducting the technical reviews while the appropriate ERA PMO staff (e.g., system engineers, requirements engineers, testing engineers, Quality Management (QM) specialists, and Configuration Management (CM) specialists) and the Independent Verification & Validation (IV&V) team will attend.

The TR Panel consists of key member roles that are present for all reviews and advisory members that may be invited by the Review Leader. The members filling these roles may vary, as necessary, based on the type of review being conducted. The following key member roles are established for technical reviews:

- **Chair** – The PD or a designee serves as the Chair. The Chair is the decision maker and determines if the review objectives have been met, reviews minutes and summary reports, and approves products;
- **Review leader** – The Review Leader serves as the facilitator for the review, performs administrative tasks (e.g., schedules and announces the review, prepares and distributes review agenda), and ensures planned reviews are conducted in an orderly manner;
- **Scribe** – The Scribe captures minutes, action items, decisions, and recommendations made during the review; and
- **Technical staff** – The designated technical representatives (e.g., systems engineers, requirements engineers, testing engineers, QM specialists, CM specialists, operations and support) review and evaluate the products.

The following advisory member roles can be established for technical reviews:

- **Management staff** – Management (e.g., Program Manager, Executive Officers, and Contracting Officer's Representative) can participate in the technical review for the purpose of identifying issues that require management resolution;
- **Risk management staff** – Risk Officers can participate in the technical review for the purpose of identifying and capturing risks that require mitigation;

FINAL

- **IV&V Team** – IV&V can participate in the technical review process for the purpose of evaluating the products, observing the proceedings, and raising questions as necessary; and
- **Customer or user representative** – Customers or user representatives can serve as Subject Matter Experts (SMEs). The Review Leader determines their participation prior to the review.

2.1 Review Agenda

A review agenda provides the TR Panel and product producer an understanding of what is to be accomplished during the review. Technical reviews will be consistent with the stated input listed for each review. Technical review announcements will require a published agenda. The Review Leader will distribute the agenda, product, and any supporting documentation ten (10) working days in advance to allow for adequate review time. Minimally, the agenda will include:

- A list of attendees,
- A statement of objectives for the technical review,
- The product to be examined, and
- A current anomalies or issues list for the product.

When the TR Panel convenes, the review leader will present an overview of the review procedures and the product. The review procedures and product description can also be included with the technical review announcement. Minimally, input to the technical reviews will include:

- An agenda,
- Documented review procedures,
- Product undergoing review,
- Relevant review reports, and
- Any regulations, standards, guidelines, plans, and procedures against which the product is to be examined.

2.2 Review Preparation

Each TR Panel member will examine the product and other review inputs prior to the review. The PMO will ensure that the review is performed as required by contract. To this end, the PMO will:

- Plan time and resources required for reviews, including support functions;
- Provide funding and facilities required to plan, define, execute, and manage the reviews;
- Provide training and orientation on review procedures; and
- Ensure that the TR Panel possesses appropriate level of expertise and knowledge sufficient to comprehend the product under review.

FINAL

2.3 Review Goals and Conduct

The technical reviews will accomplish the following goals:

- Evaluate the product and determine if:
 - The product is complete;
 - The product conforms to the applicable regulations, standards, guidelines, plans, and procedures;
 - Changes to the product are properly completed and affect only the specified areas;
 - The product is acceptable for its intended use; and
 - The product is ready for the next activity in the life cycle;
- Identify system (i.e., hardware and software) anomalies;
- Generate a list of action items;
- Generate Change Requests (CRs) when necessary;
- Document the review (e.g., minutes, action items, summary report); and
- Provide recommendation to the PD for moving to the next phase.

After the technical review is held, the producer will update the product(s) based on the CR process that is described in the *ERA Configuration Management Plan (CMP)*. The producer of the product is then responsible for turning over the marked up copies of everything distributed at the review, the Technical Review Action Item (AI) Log, and attendee signatures to the QM team. The QM team will track the action items to closure. The action item log appears in **Appendix A, Technical Review Action Item (AI) Log**. Additionally, minutes and a Technical Review Summary Report will be generated to document the review and submit recommendations (e.g., accept product without further modification, reject the product due to severe errors, accept the product provisionally and minor errors must be corrected) to the PD. Furthermore, through consensual means the TR Panel also will recommend proceeding to the next activity in the life cycle or not proceeding to the next activity. The summary report format appears in **Appendix B, Technical Review Summary Report**.

2.4 Review Closeout

A technical review will be considered complete when the review goals have been accomplished and the review output exists. Minimally, review output will consist of documented evidence that identifies:

- The TR Panel members;
- The product reviewed;
- Specific inputs to the review;
- Review objectives and whether they were met;
- A list of resolved and unresolved review product anomalies;
- A list of management issues, technical issues, and issues that impact the review;
- Action item's status (open, closed), ownership and target date (if open), or completion date (if closed);

FINAL

- CR status (approve, defer, or disapprove) which is controlled by the Configuration Control Board (CCB);
- Any recommendations made by the TR Panel; and
- Whether the product meets the applicable regulations, standards, guidelines, plans, and procedures.

3.0 Technical Reviews

This section describes in detail the reviews listed in **Section 1.1, Purpose**. Each technical review discussion includes the following sections: Purpose, Input, Procedures, Exit Criteria, and Output. Refer to the *ERA ELC* document for a diagram of where technical reviews fit in the ERA life cycle processes and activities.

Technical reviews are conducted to assess the degree of completion of technical efforts related to major milestones before proceeding with further technical effort.

3.1 Requirements Review

The Requirements Review (RR), which is part of the acquisition process, is an ERA PMO activity conducted to systematically evaluate requirements before they are affixed to the RFP.

3.1.1 Purpose

The purpose of the RR is to ascertain the adequacy of the requirements in defining the proposed characteristics and functionality of the ERA system for inclusion in the RFP. The RR will assess each requirement for the following reasons.

- Understandability – Is each individual requirement and the set of requirements understandable?
- Completeness – Do the requirements describe a complete product? Do they cover quality and performance characteristics?
- Verifiability – Can each of the requirements be verified?
- Consistency – Are the requirements consistent?
- Traceability – Will the requirements be traceable throughout the development life cycle?
- Testability - Can each of the requirements be tested?

3.1.2 Input

Input to the RR will include the following:

- Requirements Document (RD), and
- Published Agenda

FINAL

3.1.3 Procedures

The RR reviewers are responsible for ensuring the following:

- That the refined requirements are necessary and sufficient (from both a functional and technical point of view) for the RFP, and
- That any assumptions and/or issues are documented and a plan is established to follow-up on these items.

3.1.4 Exit Criteria

The RR will be considered complete when:

- Minutes and the review summary report are published,
- All CRs are dispositioned with “Approved for current release,” “Immediate/emergency change,” “Deferred,” or “Disapproved with explanation” resolution status, and
- The PD accepts the RR Technical Review Summary Report and approves the RD.

3.1.5 Output

Output from the RR will include the following:

- Minutes,
- RR Technical Review Summary Report completed and signed by all attendees,
- Technical Review AI Log signed by the QM representative,
- Completed Technical Review Checklist (See **Appendix C, Technical Review Checklist**), and
- Approved RD.

3.2 System Requirements Review

A System Requirements Review (SRR) resolves, finalizes, and formalizes the requirements of systems and subsystems. In the technical review process, the SRR follows the RR. The Development Contractor is responsible for conducting the SRR.

3.2.1 Purpose

The purpose of the SRR is to ascertain the adequacy of the Development Contractor’s efforts in focusing on the completeness of system requirements in terms of their identification, definition, and determination of the initial direction and progress of the Development Contractor’s system engineering management effort.

FINAL

The SRR is conducted when the system functional requirements have been decomposed and allocated to the system level design.

3.2.2 Input

Input to the SRR will include the following:

- System Requirements Document (e.g., system requirements specification),
- Interface Requirements Document (IRD) (e.g., interface requirements specifications), and
- Published Agenda.

3.2.3 Procedures

The SRR reviewers are responsible for ensuring the following:

- That a significant portion of the system functional requirements have been established,
- That any assumptions and/or issues are documented and a plan is established to follow-up on these items, and
- That the approach integrates well with existing functionality.

3.2.4 Exit Criteria

The SRR will be considered complete when:

- Minutes and the review summary report are published;
- All CRs are dispositioned with “Approved for current release,” “Immediate/emergency change,” “Deferred,” or “Disapproved with explanation” resolution status;
- Requirements to hardware, software, and operations are allocated; and
- The PD approves the System Requirements document, IRD, and accepts the SRR Technical Review Summary Report.

3.2.5 Output

Output from the SRR will include the following:

- Minutes,
- SRR Technical Review Summary Report completed and signed by all attendees,
- Technical Review AI Log signed by the QM representative,
- Completed Technical Review Checklist, and
- Requirements, decomposed and allocated to the system level design.

FINAL**3.3 System Design Review**

The System Design Review (SDR) is conducted to evaluate the optimization, traceability, correlation, completeness, and risks associated with the allocated program/design requirements, including the corresponding test requirements in fulfilling the performance requirements specified in the system/subsystem design description (i.e., functional configuration identification). In the technical review process, the SDR follows the SRR. The Development Contractor is responsible for conducting the SDR.

3.3.1 Purpose

The purpose of the SDR is to ensure that the ERA PMO and the Development Contractor concur that the proposed system design meets baseline functionality and performance requirements. The key factors to evaluate are:

- The Development Contractor's readiness to move into the further development phases;
- If risks, impacts, and mitigation plans are identified;
- Whether design meets baseline requirements and scalability; and
- Operational/support requirements.

The SDR is conducted when the system definition effort has proceeded to the point where system characteristics are defined and the configuration items are identified.

3.3.2 Input

Input to the SDR will include the following:

- System Design documents (e.g., interface design document);
- System Requirements documents;
- Published Agenda; and
- Successful completion of all CRs with "Approved for current release," "Immediate/emergency change," "Deferred," or "Disapproved with explanation" resolution status related to the previous review.

3.3.3 Procedures

The SDR reviewers are responsible for ensuring the following:

- That system characteristics are defined and the configuration items are identified,
- That any assumptions and/or issues are documented and a plan is established to follow-up on these items,
- That alternative approaches have been identified and an explanation as to why a certain choice was made is documented,

FINAL

- That the approach describes all affected system requirements and high level modifications, and
- That the approach integrates well with existing functionality.

3.3.4 Exit Criteria

The SDR will be considered complete when:

- Minutes and the review summary report are published;
- All CRs are dispositioned with “Approved for current release,” “Immediate/emergency change,” “Deferred,” or “Disapproved with explanation” resolution status; and
- The PD approves the System Design documents, System Requirements, and accepts the SDR Technical Review Summary Report.

3.3.5 Output

Output from the SDR will include the following:

- Minutes,
- SDR Technical Review Summary Report completed and signed by all attendees,
- Technical Review AI Log signed by the QM representative, and
- Completed Technical Review Checklist.

3.4 Increment System Requirements Review

An Increment System Requirements Review (ISRR) resolves, finalizes, and formalizes the requirements of systems and subsystems for the defined increment. The ISRR is held near the beginning of each increment. The Development Contractor is responsible for conducting the ISRR.

3.4.1 Purpose

The purpose of the ISRR is to ascertain the adequacy of the Development Contractor’s efforts in focusing on the completeness of system requirements in terms of their identification, definition, and determination of the initial direction and progress of the Development Contractor’s system engineering management effort for the defined increment. The ISRR is conducted when the system functional requirements have been allocated to that increment.

3.4.2 Input

Input to the ISRR will include the following:

- System Requirements documents (e.g., system requirements specification),

FINAL

- IRD (e.g., interface requirements specifications), and
- Published Agenda.

3.4.3 Procedures

The ISRR reviewers are responsible for ensuring the following:

- That the system functional requirements have been allocated to that increment,
- That any assumptions and/or issues are documented and a plan is established to follow-up on these items, and
- That the approach integrates well with existing functionality.

3.4.4 Exit Criteria

The ISRR will be considered complete when:

- Minutes and the review summary report are published;
- All CRs are dispositioned with “Approved for current release,” “Immediate/emergency change,” “Deferred,” or “Disapproved with explanation” resolution status;
- Requirements to hardware, software, and operations are allocated; and
- The PD approves the System Requirements documents, IRD, and accepts the ISRR Technical Review Summary Report.

3.4.5 Output

Output from the ISRR will include the following:

- Minutes,
- ISRR Technical Review Summary Report completed and signed by all attendees,
- Technical Review AI Log signed by the QM representative, and
- Completed Technical Review Checklist.

3.5 Release System Requirements Review

A Release System Requirements Review (RSRR) resolves, finalizes, and formalizes the requirements of systems and subsystems for the defined release. In the technical review process, the RSRR follows the ISRR. The Development Contractor is responsible for conducting the RSRR.

3.5.1 Purpose

The purpose of the RSRR is to ascertain the adequacy of the Development Contractor’s efforts in focusing on the completeness of system requirements in terms of their identification, definition,

FINAL

and determination of the initial direction and progress of the Development Contractor’s system engineering management effort for the defined release. The RSRR is conducted when the system functional requirements have been allocated to a release.

3.5.2 Input

Input to the RSRR will include the following:

- System Requirements documents (e.g., system requirements specification),
- IRD (e.g., interface requirements specifications), and
- Published Agenda.

3.5.3 Procedures

The RSRR reviewers are responsible for ensuring the following:

- That the system functional requirements have been allocated to a release,
- That any assumptions and/or issues are documented and a plan is established to follow-up on these items, and
- That the approach integrates well with existing functionality.

3.5.4 Exit Criteria

The RSRR will be considered complete when:

- Minutes and the review summary report are published;
- All CRs are dispositioned with “Approved for current release,” “Immediate/emergency change,” “Deferred,” or “Disapproved with explanation” resolution status;
- Requirements to hardware, software, and operations are allocated; and
- The PD approves the System Requirements documents, IRD, and accepts the RSRR Technical Review Summary Report.

3.5.5 Output

Output from the RSRR will include the following:

- Minutes,
- RSRR Technical Review Summary Report completed and signed by all attendees,
- Technical Review AI Log signed by the QM representative, and
- Completed Technical Review Checklist.

FINAL**3.6 Preliminary Design Review**

A Preliminary Design Review (PDR) is a technical review or a series of reviews of the basic design approach for each Configuration Item (CI), or aggregate of CIs, or for a functionally related group of CIs and will be held prior to the start of detailed design. The PDR ensures that a sufficient level of detail for each release has been provided to allow detailed design to begin, and that the design meets all the functional requirements allocated to that release. In the technical review process, the PDR follows the RSRR. The Development Contractor is responsible for conducting the reviews.

3.6.1 Purpose

The purpose of a PDR is to give the Government its first opportunity to closely observe and approve the Development Contractor's hardware and software design. The Development Contractor is expected to describe all design changes made with respect to the original design disclosed in the system and to provide rationale for the changes. The Development Contractor may also provide a hardware or hands-on demonstration of some of the preliminary designs to better illustrate important aspects. The PDR is conducted after preliminary design efforts, but before start of critical design.

The PDR review will focus on:

- Evaluating the progress, consistency, and technical adequacy of the selected top-level design and test approach;
- The compatibility between software requirements and preliminary design;
- The preliminary version of the operation and support documents; and
- Determining its compatibility with performance and engineering specialty requirements of the Hardware Configuration Item (HWCI) development specification.

3.6.2 Input

Input to the PDR will include the following:

- Software Requirements documents;
- Preliminary Design Documents;
 - System Design documents, and
 - IRDs;
- Published Agenda;
- Successful completion of all CRs with “Approved for current release,” “Immediate/emergency change,” “Deferred,” or “Disapproved with explanation” resolution status related to the previous review; and
- Acceptance of all applicable requirements.

FINAL**3.6.3 Procedures**

The PDR reviewers are responsible for ensuring that:

- The description of processing is not too detailed so as to make it impossible to map back to the functional description presented in the allocated requirements. The preliminary design reflects and depicts the main processing flows;
- The major relationships between modules are clearly defined;
- All design assumptions, constraints, and issues are documented;
- The design follows documentation standards; and
- All related modifications have been presented and they are consistent with other preliminary designs and requirements, if applicable.

3.6.4 Exit Criteria

The PDR will be considered complete when:

- Minutes and the review summary report are published;
- All CRs are dispositioned with “Approved for current release,” “Immediate/emergency change,” “Deferred,” or “Disapproved with explanation” resolution status;
- The compatibility of the physical and functional interfaces is established; and
- The PD approves the System Requirements documents, System Design documents, IRD, and accepts the PDR Technical Review Summary Report.

3.6.5 Output

Output from the PDR will include the following:

- Minutes,
- PDR Technical Review Summary Report completed and signed by all attendees,
- Final versions of all preliminary design documents,
- Technical Review AI Log signed by the QM representative, and
- Completed Technical Review Checklist.

3.7 Critical Design Review

A Critical Design Review (CDR) is a technical review or a series of reviews of the basic design approach for each CI or aggregate of CIs or for a functionally related group of CIs, and will be held prior to the start of detailed design. The CDR ensures that a sufficient level of detail for each release has been provided to allow detailed design to begin and that the design meets all the functional requirements allocated to that release. In the technical review process, the CDR follows the PDR. The Development Contractor is responsible for conducting the CDR.

FINAL**3.7.1 Purpose**

The purpose of the CDR is to determine the acceptability of the detailed design, performance, test characteristics (of the design solution), and the adequacy of the operation and support documents. Further, the CDR determines whether the critical design (of the CIs under review) satisfies cost, schedule, and performance requirements, and establishes detail design compatibility among the CI and other items of equipment, facilities, computer software, and personnel.

3.7.2 Input

Input to the CDR will include the following:

- Critical Design Documents – Final Versions,
 - Preliminary Design Documents, and
 - ICDs,
- Published Agenda, and
- Successful completion of all CRs related to the previous review with an “Approved for current release,” “Immediate/emergency change,” “Deferred,” or “Disapproved with explanation” resolution status.

3.7.3 Procedures

The CDR reviewers are responsible for ensuring that:

- The description of processing is detailed enough to make it possible to map back to the functional description presented in the allocated requirements. The critical design must still reflect and depict the main processing flows;
- The detailed relationships between modules are clearly defined;
- All design assumptions and issues are documented;
- The design follows documentation standards; and
- All related modifications have been presented and they are consistent with other critical designs and requirements, if applicable.

3.7.4 Exit Criteria

The CDR will be considered complete when:

- Formal identification of specific software documentation that will be released for coding and testing is established;
- Minutes and the review summary report are published;

FINAL

- All CRs are dispositioned with “Approved for current release,” “Immediate/emergency change” resolution status, “Deferred,” or “Disapproved with explanation”; and
- The PD approves Critical Design Documents, Preliminary Design Documents, Interface Control Document, and accepts the CDR Technical Review Summary Report.

3.7.5 Output

Output from the CDR will include the following:

- Minutes,
- CDR Technical Review Summary Report completed and signed by all attendees,
- Technical Review AI Log signed by the QM representative, and
- Completed Technical Review Checklist.

3.8 Test Readiness Review

The Test Readiness Review (TRR) provides an independent evaluation and assessment of the system’s readiness for testing to program managers and project engineers. TRRs will be held for each release and increment at the completion of system testing. In the technical review process, the TRR follows the CDR. The Development Contractor is responsible for conducting the TRR.

3.8.1 Purpose

The purpose of the TRR is to provide management with the assurance that the product under development has reached the degree of completeness and validity to ensure that the ERA PMO is ready to begin acceptance testing (formal and monitored). The scope of the TRR is to inspect the test products and test results from the completed test phase for completeness and accuracy, and to verify that test procedures, test cases, test scenarios, test scripts, environment, and test data have been prepared for the next test phase.

The TRR is the Government’s decision milestone in determining the completion of unit, integration, and system tests. The Development Contractor will demonstrate that all deficiencies were corrected or provide satisfactory explanation to the contrary. The TRR will be conducted on a release and incremental basis as established in the *ERA Testing Management Plan (TSP)*.

3.8.2 Input

Input to the TRR will include the following:

- *ERA TSP* and an acceptance test plan (when created);
- Published Agenda;
- Development Contractor’s TRR Package Documentation;
 - Software/Interface requirements changes;

FINAL

- Design changes;
- Test plans, test cases, procedures, and results; and
- Problem/Change reports;
- Notification by the Development Contractor that they are ready for the Government to conduct the TRR; and
- Test data has been obtained or prepared for testing.

3.8.3 Procedures

The TRR reviewers are responsible for ensuring that:

- All functions which need be tested are being tested;
- Test cases, inputs, and actual results are documented completely;
- Meaningful error message text and error actions are relevant; and
- Expected results agree.

3.8.4 Exit Criteria

The TRR will be considered complete when:

- Minutes and the review summary report are published;
- All CRs are dispositioned with “Approved for current release,” “Immediate/emergency change,” “Deferred,” or “Disapproved with explanation” resolution status;
- The PD approves the acceptance test plan, TRR Package Documentation, and accepts the TRR Technical Review Summary Report; and
- All discrepancies determined by the ERA PMO to be within the scope of the contract have been corrected. On some occasions the ERA PMO may want to proceed with a conditional acceptance of the TRR.

3.8.5 Output

Output from the TRR will include the following:

- Minutes,
- TRR Technical Review Summary Report completed and signed by all attendees,
- Changes/Comments to the *ERA TSP* or acceptance test plan (when created),
- Test results,
- Corrective action plans,
- Technical Review AI Log signed by the QM representative, and
- Completed Technical Review Checklist.

FINAL**3.9 Operational Readiness Review**

An Operational Readiness Review (ORR) is intended to determine the status of completion of the specific actions that will be satisfactory and accomplished prior to the PD executing an operational go-ahead decision. In the technical review process, the ORR follows the TRR. The ORR conducted by the ERA PMO and the Development Contractor will support the ORR, as needed.

3.9.1 Purpose

The purpose of the ORR is to accomplish, in an incremental fashion during the development phase, initial reviews to assess the risk in exercising the operational go-ahead decision. Timing of the incremental ORRs is a function of program posture and is not specifically locked into other reviews. The ORR is performed to decide if the system is in a suitable condition to become an operational release.

The ORR verifies that necessary approved requirements documentation is in place and that procedures, personnel, equipment, and systems support the approved requirements. It provides the verification process that management needs to be assured that the system is ready to operate.

3.9.2 Inputs

Input to the ORR will include the following:

- Preliminary Site Plan,
- Facilities Requirements Assessment,
- Training Plan,
- Maintenance Document,
- Repair/Replace Procedures,
- Operations and user manuals,
- Operational Readiness Review Document,
- Published Agenda,
- Transition Plan,
- Deployment Plan,
- Approved Operations and Support Plan,
- Estimated level of effort and schedule requirements,
- Established objectives and milestones for the review, and
- Background and reference information on third-party software and hardware.

3.9.3 Procedures

The ORR reviewers are responsible for ensuring the following:

- That the facility conforms with applicable standards and regulatory requirements,

FINAL

- That the facility operates safely and efficiently, and
- That all necessary background and reference information for the facility and equipment are documented.

3.9.4 Exit Criteria

The ORR will be considered complete when:

- Minutes and the review summary report are published;
- All CRs are dispositioned with “Approved for current release,” “Immediate/emergency change,” “Deferred,” or “Disapproved with explanation” resolution status; and
- The PD approves ORR inputs and accepts the ORR Technical Review Summary Report.

3.9.5 Output

Output from the ORR will include the following:

- Minutes,
- ORR Technical Review Summary Report completed and signed by all attendees,
- Technical Review AI Log signed by the QM representative, and
- Completed Technical Review Checklist.

4.0 Metrics and Measures

The ERA PMO has selected performance metrics to provide insight into the development and operation of the ERA system with metrics collection beginning during the development process and continuing through the remainder of the ERA system development life cycle. Specific activities associated with the TEP are subject to metrics collection by the QM specialist. Metrics collection and reporting process are described in detail in the **Metrics Collection and Use** section of the *ERA Metrics Plan (MP)* document.

5.0 Reviewers Roles and Responsibilities by Technical Review Type

Table 5-1, Reviewers Roles and Responsibilities by Type of Technical Review, lists the primary roles and responsibilities of each reviewer by type of technical review.

FINAL

Type of Review	Reviewers	Role/Responsibilities
Requirements Review	SME	<ul style="list-style-type: none"> • Review Requirements • Ensure requirements are adequately defined • Attend requirements review/Provide feedback • Sign Technical Review AI Log • Sign Technical Review Summary Report
	Development team representative, Technical staff, CM representative, Test team representative, and IV&V team	<ul style="list-style-type: none"> • Review Requirements • Attend review/Provide Feedback • Ensure the requirements cover major functionality • Sign Technical Review AI Log • Sign Technical Review Summary Report
	QM Representative	<ul style="list-style-type: none"> • Review Requirements • Ensure document conforms to Project Standards • Ensure Paper package is complete • Attend review/Provide feedback • Sign Technical Review AI Log • Track AIs to closure • Ensure the review forms are completed and filed with the hard copy mark-up documents • Sign Technical Review Summary Report
System Requirements Review	SME	<ul style="list-style-type: none"> • Review System Requirements • Ensure Development Contractor adequately defines system requirements • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Sign Technical Review Summary Report
	Development team representative, Technical staff, CM representative, Test team representative, and IV&V team	<ul style="list-style-type: none"> • Review System Requirements • Attend Technical review/Provide Feedback • Ensure the requirements cover major functionality • Sign Technical Review AI Log • Sign Technical Review Summary Report

FINAL

Type of Review	Reviewers	Role/Responsibilities
	QM Representative	<ul style="list-style-type: none"> • Review System Requirements • Ensure document conforms to Project Standards • Ensure document package is complete • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Track AIs to closure • Sign Technical Review Summary Report • Ensure the Technical review forms are completed and filed with the hard copy mark-up documents
System Design Review	SME	<ul style="list-style-type: none"> • Review System Design • Ensure system design meets functional requirements • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Sign Technical Review Summary Report
	Development team representative, Technical staff, CM representative, Test team representative, and IV&V team	<ul style="list-style-type: none"> • Review System Design • Attend Technical review/Provide feedback • Ensure system design meets major functionality • Ensure that a technical understanding of requirements has been reached and technical direction is provided • Sign Technical Review AI Log • Sign Technical Review Summary Report
	Tech Support	<ul style="list-style-type: none"> • Review System Design • Attend Technical review/Provide feedback • Ensure that the allocated requirements represent a complete and optimal synthesis of the system requirements • Ensure that the technical program risks are identified, ranked, avoided, and reduced • Gain understanding of program functionality • Sign Technical Review AI Log • Sign Technical Review Summary Report

FINAL

Type of Review	Reviewers	Role/Responsibilities
	QM Representative	<ul style="list-style-type: none"> • Review System design • Ensure system design conforms to Project Standards • Attend Technical review/ Provide feedback • Sign Technical Review AI Log • Track AIs to closure • Ensure the Technical Review AI Log is complete and filed with the hard copy mark-up documents • Sign Technical Review Summary Report
Increment System Requirements Review	SME	<ul style="list-style-type: none"> • Review System Requirements • Ensure Development Contractor adequately defines system requirements • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Sign Technical Review Summary Report
	Development team representative, Technical staff, CM representative, Test team representative, and IV&V team	<ul style="list-style-type: none"> • Review System Requirements • Attend Technical review/Provide Feedback • Ensure the requirements cover major functionality • Sign Technical Review AI Log • Sign Technical Review Summary Report
	QM Representative	<ul style="list-style-type: none"> • Review System Requirements • Ensure document conforms to Project Standards • Ensure document package is complete • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Track AIs to closure • Sign Technical Review Summary Report • Ensure the Technical review forms are completed and filed with the hard copy mark-up documents
Release System Requirements Review	SME	<ul style="list-style-type: none"> • Review System Requirements • Ensure Development Contractor adequately defines system requirements • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Sign Technical Review Summary Report

FINAL

Type of Review	Reviewers	Role/Responsibilities
	Development team representative, Technical staff, CM representative, Test team representative, and IV&V team	<ul style="list-style-type: none"> • Review System Requirements • Attend Technical review/Provide Feedback • Ensure the requirements cover major functionality • Sign Technical Review AI Log • Sign Technical Review Summary Report
	QM Representative	<ul style="list-style-type: none"> • Review System Requirements • Ensure document conforms to Project Standards • Ensure document package is complete • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Track AIs to closure • Sign Technical Review Summary Report • Ensure the Technical review forms are completed and filed with the hard copy mark-up documents
Preliminary Design Review	SME	<ul style="list-style-type: none"> • Review Preliminary Design • Ensure preliminary design meets functional requirements • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Sign Technical Review Summary Report
	Development team representative, Technical staff, CM representative, Test team representative, and IV&V team	<ul style="list-style-type: none"> • Review Preliminary Design • Attend Technical review/Provide feedback • Ensure design meets major functionality • Sign Technical Review AI Log • Sign Technical Review Summary Report
	Tech Support	<ul style="list-style-type: none"> • Review Preliminary Design • Attend Technical review/Provide feedback • Ensure common routines are being used accurately • Gain understanding of program functionality • Sign Technical Review AI Log • Sign Technical Review Summary Report

FINAL

Type of Review	Reviewers	Role/Responsibilities
	QM Representative	<ul style="list-style-type: none"> • Review Preliminary design • Ensure design conforms to Project Standards • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Track AIs to closure • Sign Technical Review Summary Report • Ensure the Technical Review AI Log is complete and filed with the hard copy mark-up documents
Critical Design Review	SME	<ul style="list-style-type: none"> • Review Critical design • Ensure critical design adequately addresses functional requirements • Verify the adequacy and completeness of the critical design • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Sign Technical Review Summary Report
	Development team representative, Technical staff, CM representative, Test team representative, and IV&V team	<ul style="list-style-type: none"> • Review Critical design • Ensure Critical design adequately addresses functional requirements • Review test results from items fabricated during this phase • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Sign Technical Review Summary Report
	Tech Support	<ul style="list-style-type: none"> • Review Critical design • Ensure Critical design accurately addresses processing • Verify that interfaces between system elements are properly designed • Verify that all documentation has been completed • Attend Technical review/Provide feedback • Gain understanding of program functionality • Sign Technical Review AI Log • Sign Technical Review Summary Report

FINAL

Type of Review	Reviewers	Role/Responsibilities
	QM Representative	<ul style="list-style-type: none"> • Review Critical Design • Ensure Critical design adequately addresses functional requirements • Ensure Critical design package is complete and conforms to Project Standards • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Track AIs to closure • Sign Technical Review Summary Report • Ensure the Technical Review AI Log is complete and filed with the hard copy mark-up documents
Test Readiness Review	SME	<ul style="list-style-type: none"> • Review prior test results • Review/identify known problems • Review test procedures • Verify software build • Ensure tool configuration and calibration status • Ensure that there is adequate test coverage of the functional requirements • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Sign Technical Review Summary Report
	Development team representative, Technical staff, CM representative, Test team representative, and IV&V team	<ul style="list-style-type: none"> • Review Test Readiness materials and Results • Ensure adequate test converge of the functional requirements • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Sign Technical Review Summary Report
	Tech Support	<ul style="list-style-type: none"> • Review Test Readiness review materials and Results • Ensure Test Readiness review accurately reflects processing • Attend Technical review/Provide feedback • Gain understanding of program functionality • Sign Technical Review AI Log • Sign Technical Review Summary Report

FINAL

Type of Review	Reviewers	Role/Responsibilities
	QM Representative	<ul style="list-style-type: none"> • Review Test Readiness review materials and Results • Ensure adequate test converge of the functional requirements • Ensure Test Readiness review package is complete and conforms to Project Standards • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Track AIs to closure • Sign Technical Review Summary Report • Ensure the Technical Review AI Log is complete and filed with the hard copy mark-up documents
Operational Readiness Review	SME	<ul style="list-style-type: none"> • Review Operational Readiness review materials and Results • Ensure Operational readiness review adequately estimates level of effort • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Sign Technical Review Summary Report
	Development team representative, Technical staff, CM representative, Test team representative, and IV&V team	<ul style="list-style-type: none"> • Review Operational Readiness materials and Results • Ensure Operational Readiness review has an approved Implementation Plan • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Sign Technical Review Summary Report
	Tech Support	<ul style="list-style-type: none"> • Review Operational Readiness review materials and Results • Ensure Operational Readiness review accurately reflects processing • Ensure Operational Readiness review meets objectives and milestones • Attend Technical review/Provide feedback • Gain understanding of program functionality • Sign Technical Review AI Log • Sign Technical Review Summary Report

FINAL

Type of Review	Reviewers	Role/Responsibilities
	QM Representative	<ul style="list-style-type: none"> • Review Operational Readiness review materials and Results • Ensure Operational Readiness review defines team membership • Ensure Operational Readiness review package is complete and conforms to Project Standards • Attend Technical review/Provide feedback • Sign Technical Review AI Log • Track AIs to closure • Sign Technical Review Summary Report • Ensure the Technical Review AI Log is complete and filed with the hard copy mark-up documents

Table 5-1: Reviewers Roles and Responsibilities by Technical Review Type

6.0 Plan Maintenance

The ERA PD is responsible for this plan. As a part of process improvement (e.g., IV&V assessments, lessons learned, QM assessments), the TEP and the overall technical review approach will continue to evolve. The plan will be updated as needed to maintain current and sufficient CM activities. The plan will be placed under CM control following its initial approval by the ERA PMO. Updates to the TEP will be controlled by the CCB.

FINAL

APPENDIX A: ERA Technical Review Action Item Log

_____	_____	_____
Start Time	a.m./p.m.	Date
_____	_____	_____
End Time	a.m./p.m.	Project
_____	_____	_____

Section 1: Work Product Information

Product Reviewed:

Author:

Review Scribed By:

- Product Type (Check one): ___ Requirements, ___ Design, ___ Code, ___ Test, ___ Operations
- Documents only: # of pages _____
Other size measurement (optional): _____

We concur that this Technical Review has been completed.

_____	_____	_____
(Team Leader)	(Author)	(QM Specialist)
_____	_____	_____
(Reviewer)	(Reviewer)	(Reviewer)

Please submit this completed form with the review subject document or artifact to the QM Specialist for this project.

FINAL

Section 2: Defects, Issues, and Action Items

Item No.	Page No.	Problem Description/Resolution	Severity (check one)	Reviewer	Assigned To	Comp
1			<input type="checkbox"/> Critical <input type="checkbox"/> High <input type="checkbox"/> Intermediate <input type="checkbox"/> Low <input type="checkbox"/> Action Item <input type="checkbox"/> Defect <input type="checkbox"/> Issue			
2			<input type="checkbox"/> Critical <input type="checkbox"/> High <input type="checkbox"/> Intermediate <input type="checkbox"/> Low <input type="checkbox"/> Action Item <input type="checkbox"/> Defect <input type="checkbox"/> Issue			
3			<input type="checkbox"/> Critical <input type="checkbox"/> High <input type="checkbox"/> Intermediate <input type="checkbox"/> Low <input type="checkbox"/> Action Item <input type="checkbox"/> Defect <input type="checkbox"/> Issue			

Columns: **Item#** = sequential number of action item. **Page** = Page number(s) of work product where the problem was found.
 Defect Severity: (Critical), (High), (Intermediate), (Low). **Comp**(lete) = enter "Yes" or "100%" when complete.

FINAL

APPENDIX B: Technical Review Summary Report

Section 1: Review Identification

Start Time _____ a.m./p.m.

Project _____

End Time _____ a.m./p.m.

Date _____

Location _____

Review Scribed By: _____

Section 2: Product Identification

Material Reviewed _____

Producer: _____

Product Type (check one): _____ Requirements, _____ Design, _____ Code, _____ Test, _____ Operations

Section 3: Product Appraisal

Accepted: _____ as is () _____ with minor modification ()

Recommendation: _____ proceed to next life cycle activity ()

Not Accepted: _____ major revision () _____ minor revision ()

do not proceed to next life cycle activity ()

Section 4: Supplementary Material Attached

Action Item Log () _____ Minutes () _____

Other (describe) _____

Technical Review Panel:

(Chair)

(Producer)

(Scribe)

(QM Specialist)

(Reviewer)

(Reviewer)

(Reviewer)

(Reviewer)

(Reviewer)

FINAL

APPENDIX C: Technical Review Checklist

Disclaimer: This checklist is not intended to be comprehensive, but to convey a representative set of checklist questions. Checklist refinement will likely occur when the technical review process begins.

TECHNICAL REVIEW PROCESS CHECKLIST				
Yes	No	Part	N/A	GENERAL CONTENT
				Have all of the pre-conditions been met?
				Has the review been scheduled?
				Has an agenda been prepared and distributed?
				Is the product to be reviewed ready for review?
				Have all action items been satisfied and corrections made?
				Has an in-house technical review been conducted?
				Were action items captured and due dates assigned?
				Has the reviewer had adequate time to review item in question?
Yes	No	Part	N/A	REQUIREMENTS REVIEW
				Are requirements at a low enough level of detail to sufficiently develop preliminary designs?
				Are the requirements consistent with each other?
				Are the requirements modular? Can they accommodate change?
				Are there duplicate requirements?
				Are the requirements traceable?
				Are the requirements needed by the customer?
				Are the requirements testable?
				Are the requirements realistic?
Yes	No	Part	N/A	SYSTEM REQUIREMENTS REVIEW
				Are system requirements at a low enough level of detail to sufficiently develop preliminary designs?
				Are all assumptions and/or issues documented?
				Are all constraints identified?
				Have alternative approaches been identified and an explanation as to why a certain choice was made?
				Do system requirements satisfy ERA's expectations?
				Are all system requirements traceable to a function or functions defined in the System Architecture?
				Have all system requirements been validated in accordance with the PMO system guidance?
				Is each interface traceable to an associated set of requirements?
				Is the functional analysis complete to a level equivalent to system requirements development?

FINAL

TECHNICAL REVIEW PROCESS CHECKLIST				
Yes	No	Part	N/A	SYSTEM DESIGN REVIEW
				Has the RD been updated per SRR results and baselined by the project for SDR?
				Have external interface requirements been described in the IRD?
				Has ERA architecture been documented in the System Design documents?
Yes	No	Part	N/A	INCREMENT SYSTEM REQUIREMENTS REVIEW
				Are system requirements at a low enough level of detail to sufficiently develop preliminary designs for this increment?
				Are all assumptions and/or issues documented?
				Have alternative approaches been identified and an explanation as to why a certain choice was made?
				Do system requirements satisfy ERA's expectations for this increment?
				Are all system requirements traceable to a function or functions defined in the System Architecture?
				Have all system requirements been validated in accordance with the PMO system guidance?
				Is each interface traceable to an associated set of requirements?
				Is the functional analysis complete to a level equivalent to system requirements development?
Yes	No	Part	N/A	RELEASE SYSTEM REQUIREMENTS REVIEW
				Are system requirements at a low enough level of detail to sufficiently develop preliminary designs for this release?
				Are all assumptions and/or issues documented?
				Have alternative approaches been identified and an explanation as to why a certain choice was made?
				Do system requirements satisfy ERA's expectations for this release?
				Are all system requirements traceable to a function or functions defined in the System Architecture?
				Have all system requirements been validated in accordance with the PMO system guidance?
				Is each interface traceable to an associated set of requirements?
				Is the functional analysis complete to a level equivalent to system requirements development?
Yes	No	Part	N/A	PRELIMINARY DESIGN REVIEW
				Is the processing description detailed enough to make it possible to map back to the functional description in the requirements?

FINAL

TECHNICAL REVIEW PROCESS CHECKLIST				
				Does the draft unit test plan cover appropriate functionality?
				Are the major relationships between modules clearly defined?
				Are all design assumptions and issues documented?
				Does the design follow documentation standards?
				Have all related modifications been presented and consistent with other preliminary designs and requirements?
Yes	No	Part	N/A	CRITICAL DESIGN REVIEW
				Is the processing description detailed enough to make it possible to map back to the functional description in the requirements?
				Does the integration test plan cover major functionality?
				Are the detailed relationships between modules clearly defined?
				Are all design assumptions and issues documented?
				Does the design follow documentation standards?
				Have all related modifications been presented and consistent with other critical designs and requirements?
				Have all system and subsystem test procedures been completed?
Yes	No	Part	N/A	TEST READINESS REVIEW
				Are all functions (that need be tested) being tested?
				Has the test environment been configured?
				Have all test tools been demonstrated prior to use?
				Has all test equipment been calibrated?
				Have all test procedure changes been documented and agreed to?
				Have all software versions been identified and verified?
				Are test cases, test scenarios, inputs, expected results, and actual results being documented completely?
				Are error message text and error actions relevant?
				Does the program, as written, properly utilize inputs (outputs)?
				Has all test data been obtained/built for testing?
				Are the software components ready for turnover to the test group?
				Are resources available for testing?
Yes	No	Part	N/A	OPERATIONAL READINESS REVIEW
				Is the facility constructed in accordance with the approved design?
				Can the facility be operated safely and efficiently?
				Will the facility be operated, maintained, and supported by trained and competent personnel?
				Will the facility be designed and operated in conformance with applicable standards and regulatory requirements?
				Are all activities formally and adequately documented?

FINAL

TECHNICAL REVIEW PROCESS CHECKLIST				
				Is the Staffing plan adequate for the scope of work?
				Is the operational/implementation schedule reasonable?
				Is the existing hardware, with planned upgrades, sufficient for the task?