ELECTRONIC RECORDS ARCHIVES (ERA)

QUALITY MANAGEMENT PLAN (QMP v5.0)

(WBS # 1.7.1)

for the

NATIONAL ARCHIVES AND RECORDS ADMINISTRATION

ELECTRONIC RECORDS ARCHIVES PROGRAM MANAGEMENT OFFICE (NARA ERA PMO)

Final
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QUALITY MANAGEMENT PLAN

Signature Page

Program Director,

I recommend approval of the Quality Management Plan (QMP).

Virginia White, 7-1-09
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Kenneth Thibodeau, Date
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03/02/07	ERA.DC.QMP.4.0.DOC	Henry Onyeador	Refer to CR ERA00001297

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QUALITY MANAGEMENT PLAN (QMP)

1.0 Purpose

The purpose of this document is to provide details on a Quality Management (QM) strategy for information technology activities (software, hardware, and services) to be performed in support of the Electronic Records Archives (ERA) system. This document provides a basis for planning, performing, managing, monitoring, and measuring the ERA quality management activities.

The primary intent of the plan is to provide a basis for the Program Management Office (PMO) evaluation of quality. This plan affords the PMO a mechanism to preclude major deficiencies (deviations) in quality, provides input for annual contractor past quality evaluations, and enables decision making whether to exercise further contract options.

This *Quality Management Plan (QMP)* defines the QM principles and the QM activities to be performed during the lifecycle of the ERA system. It supplies a systematic method for identifying, tracking, and resolving all quality issues. It also describes the responsibilities and authorities for accomplishing the planned quality management activities and identifies the required coordination of quality management activities with other program activities.

The QMP is a program level document and is applicable to ERA quality activities in the acquisition lifecycle, as documented in the *ERA Acquisition Strategy (AS)* and the systems development lifecycle as defined in the **ERA Life Cycle Processes** section of the *ERA Life Cycle (ELC)* document. The QM methodology is based on a tailored version of Institute of Electrical and Electronics Engineers (IEEE)-STD 730-2002 IEEE Standard for Software Quality Assurance Plans and though a point-to-point format compliance was not achieved, the document is in full compliance with the content requirements of the standard. Refer to **Appendix A, QMP v3.0 Roadmap to IEEE Std. 730-2002** for a mapping of those items that were tailored.

1.1 Introduction

The *QMP* documents how the ERA PMO will plan, implement, and assess the effectiveness of its quality planning, quality assurance, quality control, and quality improvement activities. The following activities make up the quality system that will be used by the Quality Management Specialist (QMS) to manage and support ERA's PMO quality actions:

- Quality Planning (QP): The process that identifies the relevant quality standards and determines how to satisfy them,
- Quality Assurance (QA): Evaluating overall project performance on a regular basis to provide confidence that the ERA project will satisfy the relevant quality standards established during QP,
- Quality Control (QC): Monitoring specific ERA products to ensure they comply with relevant quality standards, and
- Quality Improvement (QI): To use output indicators to help identify better standards in order to increase ERA's effectiveness and efficiency.

The plan outlines QM activities to be performed in support of the National Archives and Records Administration (NARA) ERA system acquisition. QM activities are an integral part of the processes used to develop and deliver work products and services to the ERA PMO.

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 research records they want and easy for NARA to deliver those records in formats suited to customers' needs.

The success of the ERA PMO in building the ERA system will depend in large part on the maturity level of the program and program management with an emphasis on QM principles.

1.3 Scope

The scope of QM is to provide processes that are required to ensure the ERA PMO that the quality program implemented will satisfy the delivery of the ERA system and associated documentation. The overall management determines and implements the quality policy (guidance) as described in this document, objectives, and responsibilities; implementation is conducted under the mantles of Quality Planning (QP), Quality Assurance (QA), and Quality Control (QC), with the ultimate goal of producing a quality product while facilitating/fostering Quality Improvement (QI). Avoiding mistakes and reworks will save valuable time, effort, and resources. QM provides the tools, techniques, and methodologies to support every step in the ERA lifecycle.

1.4 Identification

Identified the tools and the software items (configuration items and the information required was provided when the ERA Configuration Control Board (CCB) ratified the ERA Concept baseline) and human resources required for the execution of the plan. See the **Configuration Identification** section of the *ERA Configuration Management Plan (CMP)* for more information on identification activities.

1.5 QM Guidance

The purpose of this section is to establish guidance for Quality Management (QM) for the ERA Program.

- The QMP will specifically identify the products and processes that are subject to QM review and audit.
- A QM team, headed by the QM Specialist, will be formed and that group will establish QM standards, practices, policies, conventions, metrics, and tools.
- QM will start concurrently with program management, and will continue throughout the program’s lifecycle.

- The QM team will regularly review products and processes according to a planned schedule, and will collect, maintain, and retain output QM records for the life of the product and process.
- All projects or sub-projects will provide schedule and other relevant information to the QM Specialist.
- The QM team will perform internal product assessments/audits to assess compliance with specifications, standards, customer requirements, or other criteria.
- Program management and the QM Specialist will be responsible for QM and the continual support for improvement to QM made by the QM team.
- Training for the ERA personnel in the standards, practices, conventions, metrics, and tools for the ERA QM will be provided by the ERA PMO.
- Quality measurement activities are documented in the *ERA Metrics Plan (MP)* and will be used by the Program Director (PD) to monitor QM activities. The QM team will assure that metrics are collected, and the QM team will verify that the measurement process is followed as part of their audits.
- Program management will regularly review quality assurance and quality control activities, and QM status and effectiveness. The *Program Management Plan (PMP)* will define the events and intervals for this review.
- All QM goals must be rational to be accepted and supported by the ERA PMO.
- ERA *QMP* will be baselined and placed under Configuration Management (CM) control.
- QM will work to foster constructive communications, provide feed back to detect and prevent development problems, control risks, discuss alternative solutions, and ensure quality is built-in to all products and services.

1.6 QM Principles

QM in the ERA program is based on principles established by the ERA PMO and NARA. In general, a QM principle can be described as a supporting rule or belief for leading and operating an organization.

The ERA PMO bases its activities on the following specific QA principles, and applies proven methodologies, tools, and techniques to carry out the quality program to attain quality and excellence:

- Total commitment from the Program Director (PD) and communication of that commitment;
- Empowerment of program team members to make improvements within their areas of expertise;
- A focus on the customer and the notion that achieving customer satisfaction is an ongoing process while still addressing the needs of all stakeholders;

- A commitment to continuous process and product improvement over the long term;
- Emphasis on monitoring, inspection, and prevention; and
- Independence in order to objectively present findings.

Note: The above principles are also essential for the Integrated Product and Process Development (IPPD).

1.7 Limitations and Constraints

A list of limitations and constraints as they may impact the administration of QM activities for the ERA program are discussed below.

- Multiple independent ERA development contractor teams may be selected for the development of individual components of the ERA system. ERA QM must ensure that adequate protection of contractor information and assets is provided during implementation of all QM activities throughout the entire lifecycle of the ERA system.
- ERA development contractor teams may be geographically distributed. ERA QM must ensure that the QM support environment and infrastructure will support QM activities for geographically distributed development.
- ERA will be developed in several increments with multiple system releases to provide increasing functionality to users within reasonable timeframes and to allow shorter periods for the evaluation of contractor progress and product suitability. ERA quality management must ensure that adequate QM activities are provided to support the incremental release of system components and functionality.

1.8 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
ADR	Architecture Design Review
AI	Action Item
AS	Acquisition Strategy
ATP	Acceptance Test Plan
BOM	Bill of Material
C&A	Certification and Accreditation
CAAD	Cost Analysis Assumption Document
CAR	Corrective Action Request
CCB	Configuration Control Board
CD-ROM	Compact Disk – Read Only Memory
CDR	Critical Design Review

ACRONYM	DEFINITION
CDRL	Contract Data Requirements List
CFSR	Contract Funds Status Report
CI	Configuration Item
CIN	Configuration Identification Number
CLIN	Contract Line Item Number
CM	Configuration Management
CMM	Capability Maturity Model
CMMI	CMM - Integration
CMP	Configuration Management Plan
CMT	Configuration Management Team
COBIT	Control Objectives for Information and related Technology
ConOps	Concept of Operations
COOP	Continuity of Operations Plan
CPR	Cost Performance Report
COTS	Commercial Off-the-Shelf
CR	Change Request
CSC	Configuration Software Component
CSU	Configuration Software Unit
CWBS	Contract Work Breakdown Structure
DBMS	Database Management System
DC	Development Contractor
DDR	Detailed Design Review
DoD	Department of Defense
DID	Data Item Description
DR	Deviation Request
EIA	Electronic Industries Alliances
ELC	ERA Life Cycle
ERA	Electronic Records Archives
EVMS	Earned Value Management System
FCA	Functional Configuration Audit
FP	File Plan
FOC	Full Operational Capabilities
GUI	Graphic User Interface
IBR	Integrated Baseline Review
ICD	Interface Control Document
IEC	International Engineering Consortium
IEEE	Institute of Electrical and Electronics Engineers
IOC	Initial Operational Capabilities
IP	Integrated Plan
IPPD	Integrated Product and Process Development
IPT	Integrated Product Team
IRD	Interface Requirement Document

ACRONYM	DEFINITION
IRS	Interface Requirements Specification
IS	Integrated Schedule
ISO	International Organization for Standardization
ISRR	Increment System Requirements Review
MNS	Mission Needs Statement
MP	Metrics Plan
MSR	Monthly Status Report
MTP	System Test Plan
N/A	Not Applicable
NARA	National Archives and Records Administration
NIST	National Institute of Standards and Technology
O&S	Operations and Support
OMB	Office of Management and Budget
OJT	On-the-job Training
ORR	Operational Readiness Review
PCA	Physical Configuration Audit
PD	Program Director
PDR	Preliminary Design Review
PM	Program Manager
PMO	Program Management Office
PMP	Program Management Plan
POST	Program Office Support Team
PR	Peer Review
PRP	Peer Review Process
PSD	Program Support Division
PTR	Program Trouble Report
PWS	Performance Work Statement
QA	Quality Assurance
QC	Quality Control
QDAG	POST QM Document Development and Approval Guidance
QI	Quality Improvement
QM	Quality Management
QMG	Quality Management Guidance
QMP	Quality Management Plan
QMS	Quality Management Specialist
QMT	Quality Management Team
QOP	Quality Operations Procedures
QP	Quality Planning
RD	Requirements Document
RFP	Request for Proposal
RID	Review Item Discrepancy
RKM	Risk Management Plan

ACRONYM	DEFINITION
RO	Risk Officer
RR	Requirements Review
RSRR	Release System Requirements Review
SA&D	System Analysis and Design
SCMP	Software Configuration Management Plan
SCMPR	Software Configuration Management Plan Review
SADD	System Architecture and Design Document
SDP	Software Development Plan
SDR	System Design Review
SED	System Engineering Division
SEMP	System Engineering Management Plan
SIP	System Integration Plan
SOP	Standard Operating Procedure
SOW	Statement of Work
SQA	Software Quality Assurance
SQAP	Software Quality Assurance Plan
SRD	Software Requirements Description
SRR	System Requirement Review
SSP	System Security Plan
SSR	Software Specifications Review
Std.	Standard
STEP508	Simple Tool for Error Prioritization for Section 508
STP	Software Test Plan
SyRS	System Requirement Specifications
TBD	To Be Determined
TO	Testing Officer
TPDMP	Training Program Development and Management Plan
TRA	Training Needs Assessment
TRR	Test Readiness Review
TSP	Testing Management Plan
UD	User Documentation
UDR	User Documentation Reviews
VDD	Version Description Document
VVP	Verification and Validation Plan
VRR	Verification Reports Result
VARR	Validation Reports Result
WBS	Work Breakdown Structure
XO	Executive Officer

Table 1-1: Acronyms List

2.0 Reference Documents

The standards, guidelines, documentation, and other Government documents used to develop the *ERA QMP* are described in the sections that follow.

2.1 ERA PMO Documentation

The following ERA PMO documentation was used to support the generation of this document unless superseded by current version.

- Acquisition Strategy (AS) Version 4.0
- Configuration Management Plan (CMP) Version 2.3
- Cost Analysis Assumption Document (CAAD) Version 2.0
- ERA Lifecycle (ELC) Version 3.1
- File Plan (FP) Version 1.0
- Metrics Plan (MP) Version 3.0
- Mission Needs Statement (MNS)
- Peer Review Process (PRP) Version 1.1
- Program Management Plan (PMP) Version 2.3
- Quality Operations Procedures (QOP) Version 0.01
- Requirements Document (RD) Version 3.0
- Risk Management Plan (RKM) Version 3.0
- Testing Management Plan (TSP) Version 2.1
- Training Needs Assessment (TRA) Version 2.1
- ERA Work Breakdown Structure (WBS) and Schedule Version 4.0

2.2 Standards and Guidelines

The standards and guidelines referenced in this document are listed below.

Office of Management and Budget (OMB) Circular NO. A-119, Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities (Revised)

IEEE Std. 730–2002, IEEE Standard for Software Quality Assurance Plans

IEEE Std. 828-2005, IEEE Standard for Software Configuration Management Plans

IEEE Std. 829–1998, IEEE Standard for Software Test Documentation

IEEE Std. 830-1998, Recommended Practice for Software Requirements Specifications

IEEE Std. 610.12-1990, IEEE Standard Glossary of Software Engineering Terminology

IEEE Std. 1012-2004, IEEE Standard for Software Verification and Validation

IEEE Std. 1016-1998, IEEE Recommended Practices Software Design Descriptions

IEEE Std. 1028-1997, IEEE Standard for Software Reviews

IEEE Std. 1061-1998, IEEE Standard for a Software Quality Metrics Methodology

IEEE Std. 1062-1998, IEEE Recommended Practice for Software Acquisition

IEEE Std. 1063-2001, IEEE Standard for Software User Documentation

IEEE Std. 1233-1998, IEEE Guide for Developing System Requirements Specifications

IEEE Std. 1540-2001, IEEE Standard for Software Life Cycle Processes – Risk Management

IEEE/Electronic Industries Alliances (EIA) 12207.2-1997, IEEE/EIA Guide, Industry Implementation of International Organization for Standardization (ISO)/ International Engineering Consortium (IEC) 12207:1995, (ISO/IEC 12207) Standard for Information Technology – Software life cycle processes – Implementation Considerations

IEEE/EIA J-STD-016 Standard for Information Technology, Software Life Cycle Processes, Software Development, Acquirer-Supplier Agreement

ISO 15939, Software Engineering – Software Measurement Process

ISO 15489-1:2001 - Information and Documentation – Records Management

ISO 15504-7:1998 - Information Technology – Software Process Assessment – Part 7: Guide for use in process improvement

ISO 14721:2003 - Reference Model for an Open Archival Information System

Governance, Control and Audit for Information and Related Technology, Control Objectives for Information and related Technology (COBIT)

National Institute of Standards and Technology (NIST) Special Publication 800-18, Guide for Developing Security Plans for Information Technology Systems, December 1998

NIST Special Publication 800-37, Guide for the Security Certification and Accreditation of Federal Information Systems, May 2004.

The Access Board Section 508 Standards

2.3 Other Government Documents

- OMB Exhibit 300 – Capital Asset Plan and Business Case

3.0 Management

This section contains organizational information that specifically influences the quality of the ERA system and will address the following:

- Organization,
- Tasks,
- Roles and responsibilities, and
- QA Estimated Resources.

3.1 Organization

Good system development practices require a measure of independence for the Quality Management Team (QMT). This independence provides a key strength to Quality Management; that is QM has the freedom, if the quality of the product is being jeopardized, to report this possibility directly above the level of the project. While in practice this rarely occurs, for almost all problems are correctly addressed at the project level, the fact that the QM team can go above the project level gives it the ability to keep many of these problems at the project level. The organizational elements of the ERA organization, as it relates to QM, consist of the following representatives.

- PD - responsible for ensuring the independence of the QM function,
- Executive Officer (XO) – responsible for supporting QM activities,
- Project Manager – ensures that all assigned ERA tasks follow all applicable laws, directives, methods, processes and practices.
- QMS - responsible for implementing the *ERA QMP*,
- QM Team - responsible for supporting the QMS in implementing ERA policies and procedures,
- Risk Officer (RO) - responsible for mitigating program risks,
- Development Contractor (DC) - responsible for performing all quality activities as specified,
- Program Support Division (PSD) Director – responsible for coordinating and overseeing processes performed by division staff,
- Configuration Management (CM) Team - responsible for coordinating configuration audits with the QMS,
- System Engineering Division (SED) Director – responsible for ensuring that releases are delivered on time and within budget, and
- Testing Officer (TO) - responsible for managing test cycles and resolve test problems.
- Operations - to manage the orderly operation, maintenance and support of the system while providing day-to-day accountability.

The ERA organizational structure can be located in the following folder (S:\ERAPMO\ERA Program Management\Administration\Organization Structure) on the S drive.

The PD has overall responsibility for Quality Management for the ERA and delegates the authority to discharge this responsibility to the various members of the organization. For additional roles and responsibilities please refer to **Table 3-2, PMO QM Organization Roles and Responsibilities Table**.

The QMS will execute the approved QMP following the processes and procedures identified in the QMP. The QMS is responsible to the PD through the XO and has that authority to ensure its organizational freedom and objectivity when evaluating and monitoring products and processes of both the ERA-PMO and the contracting organizations. As such the QMS will report its findings directly to the PD and initiate follow-up activities to ensure adequate and complete resolution of identified problems.

3.2 Tasks

The ERA QM has the responsibility for developing and implementing an appropriate and effective quality management plan (QMP). QM task span across the entire ERA program and the scheduling of QM task is driven by ERA integrated schedule. QM tasks within ERA program are designed to uncover defects, monitor activities during program phases and to assists in detecting, isolating, preventing, and correcting deficiencies in a timely manner within cost constraints. Other QM tasks include confirmation of both internal and external compliances to program requirements are being met. QM is responsible for auditing engineering changes, process modifications, configuration management process, and deviations throughout the program life cycle. QM is responsible for establishing a program which implements and maintains an independent audit program to verify that ERA processes, solutions, products, and services fully satisfy ERA requirements.

During project phase, QM tasks can be performed concurrently until a task is completed. A task is considered completed when the required report e.g., QM Reports, Checklists, Process Audits/Assessment Reports, etc. are satisfactorily completed or action items have been closed. The activities listed below are performed by using the checklists in Appendix C, Assessment Tools for Quality Management.
The following reviews, processes, and evaluations identify those tasks for conducting and documenting QA reviews, assessments/audits, problem reporting, and process improvement:

- Review of Software Products
- Evaluate Software Tools
- Evaluate Facilities
- Evaluate Software Products Review Process
- Evaluate Project Planning
- Evaluate System Requirements Analysis Process
- Evaluate System Design Process
- Evaluate Software Requirements Analysis Process
- Evaluate Software Development Library Control Process
- Evaluate Subcontractor Control Process
- Evaluate Software Implementation and Unit Testing Process
- Evaluate Unit Integration and Testing
- Evaluate Configuration Item (CI) Integration Testing and System Qualification Process
- Evaluate End Item Delivery Process
- Evaluate Software Corrective Action Process
- Evaluate Media Certification Process
- Evaluate Non-Deliverable Software Certification, Non-Developmental Software and Storage and Handling Process
- Verify Project Reviews and Audits
- Verify Quality Management
- Process Improvement

QM tasks also include following-up on required traceability analysis and evaluations, identifying and helping in mitigating program risk, and providing program management and ERA PMO members with visibility into ERA lifecycle activities. These tasks apply to each phase of the ERA lifecycle, and are triggered by events (e.g., delivery of the System Requirements Specification (SyRS) triggers QM review of the Requirements Document). This plan establishes program guidelines that produce complete, accurate, and easily understood products within the framework of the ERA lifecycle model.

Before the QMS can assign a particular task that product must meet minimum entry criteria as listed below:

- The product that is to be reviewed, assessed or audited is complete and conforms to consensus based standards for content and format;
- Prior milestones are satisfied as identified in the appropriate planning documents; and
- Required supporting documentation is available.

Table 3-1, Lifecycle Phases and QM Tasks, shows the ERA lifecycle phases, QM tasks, and the organizational elements related to the corresponding QM tasks. Refer to **Figure 5-1, ERA Lifecycle Processes** in the *ERA PMP* for additional information on lifecycle phases, milestones, and activities. Note that the iterative nature of the ERA lifecycle will require selected QM tasks to be performed for each increment/release.

Lifecycle Phase	PMO Tasks (identified in the ELC)	QM Tasks	Organizational Element								
			PD	XO	QM	QM Team	RO	DC	SED Dir	TO	PSD Dir	CM
Requirements & Design	Requirements Analysis	Review System requirements specification document	A		R	S	R	O	R	P		S
		Review Interface requirements specification	A		R	S		O	R		S	
	Develop System Design	Review System architectural and design document	A		R	S	R	O	R	P		S
		Review Interface Control Document	A		R	S		O	R	R		
	Plan Testing	Review Acceptance Plan (Draft) document			R	S		O	A	P	S	S
		Review System Test Plan (Draft) document			R	S		O	A	P	S	S
	Develop Design Documents	Review Preliminary design documents			R	S		O	A	R		S
		Review Critical design documents			R	S		O	A	R		S
	Quality Management	Conduct Assessment/Audits		S	O/P	S						
		Generate Assessment/Audit reports	A	S	O	S					R	
		Identify and mitigate program risks.		S	O	S	R					
Implementation & Test	Code Software and Test Components	Review component test results			R			O		R		
		Review test documentation			R			O		R		
		Review Code/Unit Test documents			R			O		P		
	Perform Integration Testing	Review Test Readiness Review documentation			R			O	R	R		S
		Witness Integration Testing			P	S		O		S		
		Review test case results			R	P		O		R/S		
		Review test documentation			R	P		O		R/S		
	Perform System Testing	Review Test Readiness Review documentation			R	P		O	R	R/S		S
		Witness System Testing			R	P		O		S		
		Review test case results			R	P		O		R/S		
	Perform Acceptance Testing	Review test documentation			R	S				O		S
		Review Test Readiness Review documentation			P			O	R	R		S
		Witness and Perform Acceptance Testing.			R	P		O		P/S		

Lifecycle Phase	PMO Tasks (identified in the ELC)	QM Tasks	Organizational Element									
			PD	XO	QM	QM Team	RO	DC	SED Dir	TO	PSD Dir	CM
		Assist in coordinating Acceptance Testing	R	P		O		P				
		Review test case results			R	P		O		P		
	Quality Management	Conduct Assessment/Audits		S	O/P	S						
		Generate Assessment/Audit reports	A	S	O	S					R	
		Identify and mitigate program risks.		S	O	S	R					
	Release Management	Identify the release for deployment.			R/S			P		P/R		O/R
	Configuration Management	Conduct Physical Configuration Audit	A		R/S					S	S	O/P
		Conduct functional configuration audit	A		R/S					S	S	O/P
		Validate product acceptance	A		R				S	S		S
Installation & Checkout	Prepare Site	Review Final Site Layout Drawings	A		R				P		S	
	Perform System Installation	Review Installation package	A		R	P		S	R	S/R		
	Perform Operational Testing	Conduct Operational Readiness Review	A		R	S		S	R	O	P	
		Conduct Operational Testing	A		R			S	S	P		S
		Review Operational Testing results	A		P			S	S	S		S
		Conduct Assessment/Audits	A		O/P	S						S
Operations & Support	Process Anomaly Reports		A		R	P		S		S		S
	Process Change Requests		A		R	S	S	S	S	S		P
	Provide Support (Help Desk)				R			S	P			S
	Assess Security		A		R	S		S	S	S		S

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Table 3-1: ERA Lifecycle Phases and QM Tasks

Key – A = Approve, O = Originate, P=Perform, R = Review, S = Support

3.3 Roles and Responsibilities

Table 3-2 PMO QM Organization Roles and Responsibilities, list the functional responsibilities for each member as it relates to QM.

Roles	Required Functional Responsibilities
Program Director (PD)	• Establishing a quality program committed to excellence by making staff and other resources available as needed to support QM • Reviewing and Approving the QM Plan. • Ensure the independence of the QM function. • .Ensuring that resolutions and follow-ups on any quality issues raised by QM are enforced. • Providing product release authority
Executive Officer (XO)	• Support QM activities by confirming QM responsibilities and authority. • Ensure that the QM staff has the appropriate QM skills and training. • Ensure compliance with QM program audits • Ensure that the QMP is updated or revised, as needed, to reflect the state of quality activities in the program and delegate the task of updating or revising the document to the QMS.
Lead QM Specialist (QMS)	• Ensure that training is provided to program teams on QM Program, QM processes (peer reviews), and key process tools (metrics). • Implement, with teams, processes and procedures that fit program size, scope, and priorities and meet quality standards. • Provide new and transfer team members a “hands-on”

Roles	Required Functional Responsibilities
	introduction to program processes and organizational goals necessary to perform their role(s): - Ensure Quality Improvement Awareness; - Ensure walkthroughs are conducted by contractor QM team. - Perform Inspections (Audits); - Ensure Peer review process; and - Collaborate with contractor QM team to ensure defects are tracked. • Develop and maintain QM Plan for ERA • Identify and mitigate program risks. • Perform process and product audits/assessments and reviews to ensure compliance with standards and procedures. • Report deviations from documented policies, processes, procedures, and standards to program management, and work with the program teams to develop an action plan to correct deviations.
QM Team	• Participate in audits. • Coordinate with customers, stakeholders, and program team members in understanding ERA policies and procedures. • Support the QMS in developing and implementing ERA policies and procedures. • Communicate with other NARA programs and Program Managers (PMs) and others who may propose improvements to QM practices.

Roles	Required Functional Responsibilities
	• Identify areas for process improvement. • Participate in the Operations Change Control Board (OCCB). • Receives notification from the Release Manager to review the deployment release packages • Review the deployment release packages for accuracy. • Notify the Release Manager after review of the deployments
Risk Officer	• Assist in mitigating program risks identified by the QMS and/or QM Team. • Monitor risk management performance of ERA staff and report status to the PD.
Development Contractor **Note**: The development contractor QA activities and tasks will be documented in their individual WBS.	• Participate in reviews and audits. • Perform all quality activities as specified by the standards, policies, and procedures applicable to the program. • Implement development contractor QMP.
System Engineering Division Director	• Ensure that releases are delivered on time and within budget, and that they comply with quality standards. • Reviewing and commenting on the *ERA QMP* • Ensure that support team leads and other persons in management roles support the objectives of this QMP. • Implementing the Quality Program in accordance with this QMP. • Resolving and following-up on any quality issues

Roles	Required Functional Responsibilities
	raised by QM related to engineering activities • Identifying, implementing, and evaluating the quality factors to be implemented in the system.
Testing Officer	• Ensure testing is conducted per the test plan and other test documentation. • Reviewing and commenting on the ERA QMP • Implementing the quality program in accordance with this QMP • Resolving and following-up on any quality issues raised by QM relating to testing activities. • Ensure entry criteria are achieved prior to Acceptance Test start. (see Ensure exit criteria… below) • Perform Acceptance Testing of the delivered product. • Ensure exit criteria are achieved prior to Acceptance Test signoff. Refer to the Acceptance Test Entrance and Exit Criteria section of the *ERA TSP*. • Implementing the test practices, processes, and procedure as defined in *ERA TSP*.

Roles	Required Functional Responsibilities
Program Support Division Director	• Coordinate and oversee the Verification and Validation Plans, CM, Risk Management, Release Management, Communications, and Organizational Change Management processes performed by PMO staff. • Reviewing and commenting on the *ERA QMP* • Implementing the quality program in accordance with this QMP • Resolving and following-up on any quality issues raised by QM relating to program support activities. • Work closely with the System Engineering Division to ensure the successful implementation of ERA.
CM Team	• Coordinate configuration audit responsibilities with the QMS. • Implementing the quality program in accordance with this QMP • Reviewing and commenting on the *ERA QMP* • Store records (reviews) and artifacts (audits) generated by QM activities. • Conduct Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA) as per the integrated Schedule. • Ensure CM Audits are conducted on all baselines Implementing the CM practices, processes, and procedures as defined in *ERA CMP*.
Operations	• Provides the Operations Report to the QM Team. • Submits generated Standard Operating Procedures

Roles	Required Functional Responsibilities
	(SOP) to the QM Team for review.
Project Manager	• Provides management guidance to the QM Team; • Identifies required tasks as needed by QM; and • Ensures that all assigned ERA tasks follow all applicable laws, directives, methods, processes, and practices.
Release Management	• Informs QM when a production deployment is ready for verification review; • Provides assistance to QM for specific requests from QM for a quality review of a production deployment; • Receives confirmation from QM of deployment reviews and reply to issues found as needed.

Table 3-2: PMO QM Organization Roles and Responsibilities Table

3.4 Quality Assurance Estimated Resources

Reference the *ERA Work Breakdown Structure (WBS) and Schedule* for information on the allocation of resources for QA and QC tasks. The OMB Exhibit 300 submission package describes the anticipated cost of the ERA QM effort.

4.0 Documentation

The documentation that describes and supports the ERA system or the development process shall be created and updated periodically throughout the development cycle. The following sections describe the purpose of the documentation and the minimum documentation requirements for this plan. All documents will be checked for accuracy and adequacy through reviews (e.g., peer reviews) and contractor work product audits. Reference **Section 6.0, Reviews and Audits,** for additional information.

All documentation governing the planning, development, verification and validation, implementation, use, and maintenance of the ERA system are subject to QM review as defined in this QM plan. All documents will undergo a peer review in accordance with the Peer Review Process outlined in *ERA Peer Review Process (PRP)* document. This plan defines the requirements for document production quality criteria used to determine the quality of each document in terms of achieving its purpose, covering the intended subject and scope, and providing appropriate level of detail.

4.1 Purpose

Documentation is necessary to ensure ERA activities are planned, monitored, and controlled to verify the adequacy of processes used to satisfy software requirements. The following is a sampling of contractor work products required to ensure the quality of the ERA program. These work products are described in more detail in the sections that follow. For a complete list of contractor work products, please refer to the Configuration Item List (CIL) which is located at **S:\ERAPMO\ERA Configuration Management\Activities\CIL**.

System Requirements Specification (SyRS)	Operations and Support (O&S) Plan
System Architecture and Design Document (SADD)	Risk Management Plan (RKM)
Requirements Specifications	System Security Plan (SSP)
System Test Plan	Certification and Accreditation (C&A) Plan
Award Fee Plan	Continuity of Operations Plan (COOP)
Training Program Development and Management Plan (TPDMP)	Integrated Plan (IP)
Trusted Facility Manual	Quality Management Plan (QMP)
Configuration Management Plan (CMP)	User Documentation (UD)

4.2 Minimum Documentation Requirements

To ensure that the implementation of the software satisfies the technical requirements, **Table 4-1, Minimum Documentation, Lifecycle Phase, Desired Characteristics, and Consensus Standard,** identifies the minimum documentation (work products) required, as well as the lifecycle phase, desired characteristics and the consensus standard (including DIDs and/or guidelines) for each document.

Deliverable Documentation	Lifecycle Phase	Desired Characteristics	Consensus Standard, DID, Guideline
System Requirement Specification (SyRS)	Development-Requirements	• Correctness • Consistency	IEEE Std. 1233-1998, Standard for System Requirements Specification; and

Deliverable Documentation	Lifecycle Phase	Desired Characteristics	Consensus Standard, DID, Guideline
		• Completeness • Accuracy • Readability • Testability • Conforms to Standard	J-STD-016-1995 Section F.2.2
System Architecture and Design Document (SADD)	Development-Requirements	• Correctness • Consistency • Completeness • Accuracy • Readability • Testability • Conforms to Standard	IEEE Std. 12207.2-1997, Standard for Information Technology; and DI-IPSC-81432
Requirements Specifications	Development-Requirements	• Correctness • Consistency • Completeness • Accuracy • Readability • Testability • Conforms to Standard	IEEE Std. 1233-1998, Guide for Developing System Requirements Specifications; IEEE Std. 830-1998, Recommended Practice for Software Requirements Specifications
System Test Plan	Requirements & Design Phase	• Traceability • Adequacy • Completeness • Consistency • Conforms to Standard	IEEE Std. 829-1998 IEEE Standard for Software Test Documentation, and Department of Defense (DoD) Standard 5000.2-R, Test and Evaluation System Test Plan
Award Fee Plan	Requirements &	• Adequacy	Award Fee Plan Template, Section J-8 of

Deliverable Documentation	Lifecycle Phase	Desired Characteristics	Consensus Standard, DID, Guideline
	Design Phase	• Completeness • Consistency • Conforms to Standard	the RFP
Training Program Development and Management Plan (TPDMP)	Requirements & Design Phase	• Adequacy • Completeness • Conforms to Standard	EIA/IEEE J-STD-016 Standard for Information Technology, Software Life Cycle Processes, Software Development, Acquirer-Supplier Agreement; and DI-ILSS-81070 Training Program Development and Management Plan
Trusted Facility Manual	Requirements & Design Phase	• Adequacy • Completeness • Conforms to Standard	DI-MGMT-80033/T
Configuration Management Plan (CMP)	Requirements & Design Phase	• Adequacy • Completeness • Consistency • Conforms with Standard	IEEE Std. 828-2005 Standard for Software Configuration Management Plans, and DI-CMAN-80858/F
Operation and Support (O&S) Plan	Development	• Adequacy • Completeness • Consistency • Conforms to Standard	Data Item Description (DID) DI-ILSS-80095
Risk Management Plan (RKM)	Requirements & Design Phase	• Adequacy • Completeness • Consistency • Conforms with Standard	IEEE Std. 1540-2001, Standard for Software Life Cycle Processes – Risk Management

Deliverable Documentation	Lifecycle Phase	Desired Characteristics	Consensus Standard, DID, Guideline
System Security Plan (SSP)	Development	• Adequacy • Completeness • Consistency • Complies with Standard	NIST Special Publication 800-18, *Guide for Developing Security Plans for Information Technology Systems*, December 1998, NIST Special Publication 800-53 (Recommended Security Controls for Federal Information Systems); DoDI 8500.2 (Information Assurance (IA) Implementation); and Director of Central Intelligence Directive (DCID) 6/3 (Protecting Sensitive Compartmented Information Within Information Systems)
Certification and Accreditation (C&A) Plan	Development	• Adequacy • Completeness • Consistency • Complies with Standard	NIST Special Publication 800-37, *Guide for the Security Certification and Accreditation of Federal Information Systems*, May 2004; NSTISSI No. 1000, NIACAP, April 2000; NIST SP800-18, Guide for Developing Security Plans for Information Technology Systems, December 1998; and NCSC-TG-031, Certification and Accreditation Process Handbook for Certifiers, July 1996
Continuity of Operations Plan (COOP)	Development	• Adequacy • Completeness • Consistency	FEMA Federal Preparedness Circular (FPC) 65, dated 15 June 2004; DFAS 3020.26R; and

Deliverable Documentation	Lifecycle Phase	Desired Characteristics	Consensus Standard, DID, Guideline
			NIST Special Publication 800-34, Contingency Planning Guide for Information Technology Systems, dated June 2002.
Integrated Plan (IP)	Development-Requirements	• Adequacy • Completeness • Consistency • Conforms with Standard	TBD
Quality Management Plan (QMP)	Development	• Adequacy • Completeness • Consistency • Conforms with Standard	IEEE Std. 730-2002, Standard for Software Quality Assurance Plans
User Documentation (UD)	Development	• Adequacy • Completeness • Consistency • Conforms with Standard	IEEE Std. 1063-2001, IEEE Standard for Software User Documentation

Table 4-1: Minimum Documentation, Lifecycle Phase, Desired Characteristics, and Consensus Standard

For a more detailed list of the development contractor deliverables/non-deliverables (work products) as well as the evaluation method to be used and if the work product will receive a QM and/or Independent Verification and Validation review, refer to **Appendix B.**
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4.2.1 System Requirements Specification (SyRS)

The SyRS document contains the ERA program requirements baseline, allocated as needed to system components and will be reviewed by the ERA PMO according to **Section 6.2.1 System Requirements Review (SRR)**. The SRR resolves, finalizes, and formalizes the requirements of systems and subsystems.

4.2.2 System Architecture and Design Document (SADD)

The SADD is a development contractor(s) supplied document that identifies the major system components and assigns requirements to them. It contains the system level design and the requirements allocation schema. Additionally, the SADD contains the rationale for the allocation of requirements to the products and subsystems described. It will also assist system engineers to meet the specifications described in the SyRS. The SADD will be reviewed by the ERA PMO according to **Section 6.2.2 System Design Review (SDR)**. The 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).

4.2.3 Requirements Specifications

Requirements Specifications are produced for each level of the system breakdown structure with the lowest level being reviewed at Preliminary Design Review.

4.2.4 System Test Plan

The System Test Plan addresses and provides guidance for the testing management activities to be performed in support of system acquisition and to identify the items being tested, the features to be tested, the tests to be performed, and the personnel responsible for each test.

4.2.5 Award Fee Plan

The Award Fee Plan sets forth procedures and guidelines that will be used in evaluating the technical performance of the development contractor(s) during development and operation.

4.2.6 Training Program Development and Management Plan (TPDMP)

The Training Program Development and Management Plan (TPDMP) detail's the processes, schedules, and milestones for the contracts deliverables.

4.2.7 Trusted Facility Manual (TFM)

The Trusted Facility Manual (TFM) addresses various administrative responsibilities and processes that enable the proper and secure use of the ERA System. The TFM does not address unprivileged user functions. The goal is to achieve a secure and stable system by documenting a

set of configuration settings and procedures that can be consistently followed by authorized administrators.

4.2.8 Configuration Management Plan (CMP)

The CMP defines the baselines, functions, responsibilities, practice, and procedures to accomplish Configuration Management throughout the life cycle of the ERA Program. The Contractor(s) CMP will describe the approach and processes for performing CM for all work products produced during the entire systems engineering lifecycle.

4.2.9 Operations and Support (O&S) Plan

The contractor(s) Operations and Support (O&S) Plan describes the approach to performing O&S throughout the entire systems engineering lifecycle. It will include computer operations, hardware and software maintenance (including Commercial Off-the-Shelf (COTS) software), system availability, Help Desk Support, facility build-out and maintenance, establishing and maintaining system instances, and any relative documentation, reports and metrics.

4.2.10 Risk Management Plan (RKM)

The Contractor(s) Risk Management Plan describes its risk organization and approach to risk management including risk identification, risk characterization, risk mitigations, risk tracking, risk control, and risk officer responsibilities. It will also include the processes, measures, and tools used for risk management.

4.2.11 System Security Plan (SSP)

This document is listed but not described in the Request for Proposal (RFP). The System Security Plan (SSP) provides an overview of the security requirements of the system and describes the controls in place or planned for meeting those requirements. The SSP also delineates responsibilities and expected behavior of all individuals who access the system.

4.2.12 Certification and Accreditation (C&A) Plan

This document is listed but not described in the RFP. The Certification and Accreditation (C&A) Plan describes the process of assessing the management, operational, and technical security controls in an information system in support of security accreditation to determine the extent to which the controls are implemented correctly, operating as intended, and producing the desired outcome with respect to meeting the security requirements of the ERA system. The results of the security certification are used to reassess the risks and update the system security plan, thus providing the factual basis to render a security accreditation decision.

4.2.13 Continuity of Operations Plan (COOP)

The Continuity of Operations Plan (COOP) identifies potential impacts that threaten ERA and provides a framework for building resilience and effective responses that safeguard the interest of key ERA system stakeholders.

4.2.14 Integrated Plan (IP)

The Integrated Plan (IP) captures the core activities and related processes necessary for the Contractor to achieve ERA program requirements. It describes how the Contractor will complete the work defined in the Contractor(s) WBS. The plan will encompass all activities for all increments of the ERA system.

4.2.15 Quality Management Plan (QMP)

The Quality Management Plan (QMP) defines the QA principles and the QA activities to be performed during the lifecycle of the ERA system. It supplies a systematic method for identifying, tracking, and resolving all quality issues. It also describes the responsibilities and authorities for accomplishing the planned quality assurance activities and identifies the required coordination of quality assurance activities with other program activities.

4.2.16 User Documentation (UD)

The user documentation (UD) shall guide the user in installing, operation, managing, and maintaining software product. The UD will describe the data control inputs, input sequences, options, program limitations, and all other essential information for the software product. The documentation will identify and describe all ERA error messages and the corrective actions required to resolve these errors.

5.0 Standards, Practices, Conventions, and Metrics

To verify the delivery of a fully conforming, high-quality product, every individual assigned to the project will participate in quality assurance. This section identifies the standards, practices, conventions, and metrics used by QM to verify that the quality assurance provisions of this QMP and applicable standards, practices, conventions, and metrics are met.

5.1 Purpose

The ERA PMO is responsible for identifying standards, practices, conventions, and metrics for lifecycle management of records that will be implemented in the ERA system. Product and process measurements are essential to QM; and if not generated, there is no way to tell if quality goals are being maintained. Metrics collected from quality activities are intended to identify weak areas in the process, measure system quality and product characteristics, and monitor the status of the work products. Metrics and associated procedures are documented in the **Metrics Collection and Use** section of the *ERA Metrics Plan (MP).* This section of the *ERA MP* provides details regarding metrics definition, collection, and reporting.

Table 5-1, Standards, Practices, Conventions, and Metrics, lists the minimum standards, practices, conventions, statistical techniques to be used as well as the quality requirements and metrics used to ensure system acquisition activities, including their compliance standard.

Standards	Applicable Standard	Compliance
• Records Management Standards	ISO 15489-1:2001 Information and Documentation – Records Management ERA File Plan NARA Records Schedule	Refer to ISO 15489-1:2001 Information and Documentation – Records Management ERA File Plan NARA Records Schedule
• Information Transfer Standards	ISO 14721:2003 Reference Model for an Open Archival Information System	Refer to ISO 14721:2003 Reference Model for an Open Archival Information System
• Project Standards	Consensus-based Standards as defined by OMB Circular A-119 (Revised)	Refer to OMB Circular A-119 (Revised)
• Test Documentation Standards	IEEE Std. 829-1998 Standard for Software Test Documentation (includes component, integration, system and acceptance test documentation)	Refer to IEEE Std 829-1998
• Measurement and Analysis Standards	ISO/IEC 15939 Software Engineering – Software Measurement Process	Refer to ISO/IEC 15939 Software Engineering Software Measurement Process.
• Product Control Standards	Control Objectives for Information and related Technology (COBIT)	Refer to COBIT
Practices	**Applicable Standard**	
• Capability Maturity Model (CMM) and Capability Maturity Model - Integration (CMMI)	Provides guidance for improving the organization's processes and ability to manage the development and maintenance of products and services.	Refer to CMMI Model Levels 2 & 3
Conventions	**Applicable Standard**	**Compliance**
• Requirement numbering Conventions	Reference the *ERA Requirements Document (RD)*	Refer to ERA Requirement Document (RD)
• Naming Conventions	Reference the **Naming Configuration Items** section in the *ERA Configuration*	Refer to ERA Configuration

	Management Plan (CMP)	Management Plan(CMP)
• Documentation Conventions	Reference the **Naming Configuration Items (CIs)** section of the *ERA Configuration Management Plan (CMP)*	Refer to ERA Configuration Management Plan(CMP)
• Testing Conventions	*Reference the ERA Testing Management Plan (TSP)*	Refer to ERA Testing Management Plan(TSP)
• Action Item Form Naming Conventions	Reference the ERA Rational ClearQuest tool for information	Refer to ERA Configuration Management Plan(CMP)
• Configuration Item Naming Conventions	Reference the **Naming Configuration Items** section in the *ERA Configuration Management Plan (CMP)*	Refer to ERA Configuration Management Plan(CMP)
Quality Requirements	**Applicable Standard**	**Compliance**
• Quality Inspections	IEEE 1028-1997	Formal inspection of the RD, SyRS, and Interface Requirements Document (IRD) for six (6) characteristics; correct, feasible, necessary, prioritized, unambiguous, and verifiable.
Reviews	**Applicable Standard**	**Compliance**

• Joint Reviews • Technical Reviews • Project Management Reviews • Test Readiness Reviews • Preliminary Design Reviews • Critical Design Reviews • Operational Readiness Reviews	IEEE Std. 1028-1997	Formal reviews will not be held until entry criteria have been met. Refer to **Section 3.2 Tasks** for information on minimum entry criteria for each product. Exit criteria must be met prior to continuing to the next phase of the lifecycle. Refer to **Section 6.2 Minimum Reviews and Audits** for information on exit criteria for each review.
Audits	**Applicable Standard**	**Compliance**
• Quality Audits • Functional Configuration Audit • Physical Configuration Audit	*ERA Quality Operations Procedures (QOP)* IEEE Std. 1028-1997 ERA Configuration Management Audit Plan (CAP)	Formal audits will not be held until entry criteria have been met. Refer to **Section 3.2 Tasks** for information on minimum entry criteria for each product. Exit criteria must be met prior to continuing to the next phase of the lifecycle.

Table 5-1: Standards, Practices, Conventions, and Metrics

5.2 Content

Table 5-2, Basic Technical, Design, and Programming Activity Standards, lists the basic technical, design, and programming activities involved, such as documentation, variable and module naming, programming, inspection, and testing and includes their compliance standard.

Standards	Compliance
• Program Documentation Standard	Refer to **Table 4-1** for a list of the minimum list of program documentation standards. Standards will be agreed to prior to contract signing and incorporated into the contract. Compliance with agreed upon standards will be made a mandatory term of the contract. The contract will state that the Contractor is responsible for adhering to all applicable standards.
• Design Standards	IEEE Std. 1016-1998 Recommended Practices Software Design Descriptions. Standards will be agreed to prior to contract signing and incorporated into the contract. Compliance with agreed upon standards will be made a mandatory term of the contract. The contract will state that the Contractor is responsible for adhering to all applicable standards.
• Coding Standards	Coding standards will be agreed to in the first Increment development option. Compliance with agreed upon standards will be made a mandatory term of the contract. The contract will state that the Contractor is responsible for adhering to all applicable standards.
• Test Standards and Practices	Refer to **Table 5-1** for a list of the minimum list of test standards and practices. Standards will be agreed to prior to contract signing and incorporated into the contract. Compliance with agreed upon standards will be made a mandatory term of the contract. The contract will state that the Contractor is responsible for adhering to all applicable standards.
• Quality assurance product and process metrics	Product and process metrics and their standards will be agreed to prior to contract signing and incorporated into the contract. Compliance with agreed upon standards will be made a mandatory term of the contract. The contract will state that the Contractor is responsible for adhering to all applicable standards.
• Commentary Standards	Commentary standards will be agreed in the first Increment development option. Compliance with agreed upon standards will be made a mandatory term of the contract. The contract will state that the Contractor is responsible for adhering to all applicable standards.

Table 5-2: Basic Technical, Design, and Programming Activity Standards

5.3 Metrics

The following measurements will be made and used to determine the cost and schedule status of the QM activities:

- QM milestone dates (planned)
- QM milestone dates (completed)
- QM work scheduled (planned)
- QM work completed (actual)
- QM effort expended (planned)
- QM effort expended (actual)
- QM funds expended(planned)
- QM funds expended(actual)
- Number of noncompliance items open
- Number of noncompliance items closed
- Total Number of noncompliance items

QM is responsible for reporting these measurements to the PD on a monthly basis. See QM Overall Status Report document located on the S drive (S:\ERAPMO\ERA Quality Management\Activities\QM Overall Status Report).

6.0 Reviews and Audits

QM reviews are used to determine if the program is using the processes, procedures, standards, and plans to help prevent or remove defects from work products and processes. Audits are used to identify deviations in process performance, identify noncompliance items, validate process improvement, and to provide reports to management. For more information on the reporting process, refer to **Section 8.0, Problem Reporting and Corrective Action**.

6.1 Purpose

The iterative lifecycle of the ERA will require QM to perform the identified reviews and audits multiple times during development, test, installation, operations and maintenance. For example, Requirements Reviews (RRs) and design reviews will take place for the ERA system, and again for each increment and each release. The QM Team will witness Acceptance Testing for each

The QM Team is responsible for conducting process evaluations to ensure that review and audit processes are being followed, and perform product evaluations to ensure documents follow required standards for technical adequacy. The reviews and audits identified below are conducted according to the *ERA WBS and Schedule.*

- System Requirements Review
- System Design Review
- Increment System Requirements Review

- Preliminary Design Review
- Critical Design Review
- Functional Configuration Audit
- Physical Configuration Audit
- In-process Audits (quality assessments)
- Managerial Reviews
- Configuration Management Plan Review
- Test Readiness Review
- Operational Readiness Review
- Other Reviews and Audits:
  - Program Management Plan Reviews
  - Peer Reviews
  - Informal Walkthrough
  - User Documentation Reviews
  - Process Improvement Reviews
  - Internal Assessment/Audits
  - Post-Implementation Review
  - Section 508 Compliance Review
  - Bill of Material(BOM) Inspection
  - ERA Sites Inspections
  - Rack Schematic verification

The work products generated during the ERA lifecycle, as shown in **Table 3-1, Lifecycle Phases and QM Tasks**, are reviewed and/or audited on a planned basis to determine the extent of progress, and to evaluate the adequacy of the work and its conformance to requirements and standards. Reviews and audits serve the purpose of providing an objective assessment and are to be used by management as a QM tool for identifying areas for improvement and technical adequacy. The QM team participates in technical and managerial reviews, and conducts process audits with respect to plans and schedules. Corrective action from non-compliance (requirements) or non-conformance (contractual) are documented and addressed in **Section 8.0, Problem Reporting and Corrective Action**.

6.2 Minimum Reviews and Audits

This section identifies the minimum set of reviews and audits that must be conducted. The iterative nature of the ERA lifecycle will require reviews and audits for the Increment and for each of the Releases since each will go through a complete lifecycle. **Table 6-1, Minimum Reviews/Audits and Lifecycle Phase**, lists the minimum reviews and audits in this section, and the lifecycle phase in which they are conducted. An asterisk (*) denotes those technical reviews that are part of an iterative process in the development lifecycle, as addressed in the *ERA ELC*. The technical review will focus on such things as the adequacy of system requirements, 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.

Minimum Reviews/Audits	Lifecycle Phase
System Requirements Review (SRR) *	Development-Requirements
System Design Review (SDR) *	Development-Design
Increment System Requirements Review (ISRR)*	Development-Design
Preliminary Design Review (PDR) *	Development-Design
Critical Design Review (CDR) *	Development-Design
Functional Configuration Audit (FCA)	Test
Physical Configuration Audit (PCA)	Installation
In-Process Audits	Throughout the lifecycle
Managerial Reviews	Throughout the lifecycle
Configuration Management Plan Review	Development-Design
Test Readiness Review (TRR) *	Development-Test
Operational Readiness Review (ORR) *	Development-Test

Table 6-1: Minimum Reviews/Audits and Lifecycle Phase

6.2.1 System Requirements Review (SRR)

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.

The purpose of the SRR is to determine if the system definition is sufficiently mature to progress to subsystem definition.

The SRR is conducted when the system functional requirements have been decomposed and allocated to the system level design. The SRR will verify the system-level requirements as presented in the SyRS.

QMs role in this review is to assess the degree of completion of the technical efforts related to this review, see Appendix C, Assessment Tools for Quality Management, for the list of questions that will be used for this review. The technical review process, which includes the inputs, procedures, exit criteria, and outputs are described in more detail in the sections below.

6.2.1.1 Input

Input to the SRR will include the following:

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

6.2.1.2 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.

6.2.1.3 Exit Criteria

The SRR will be considered complete when:

- Minutes and the review summary report are published;
- All RIDS 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.

6.2.1.4 Output

Output from the SRR will include the following:

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

6.2.2 System Design Review (SDR)

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 (see **Section 6.2.1**). The Development Contractor is responsible for conducting the SDR.
The purpose of the SDR is to verify the system design and allocation information presented in the SADD. It will also ensure that the ERA PMO and the Development Contractor concur that the proposed system design meets baseline functionality and performance 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.

QMs role in this review is to assess the degree of completion of the technical efforts related to this review, see Appendix C, Assessment Tools for Quality Management, for the list of questions

that will be used for this review. The technical review process, which includes the inputs, procedures, exit criteria, and outputs are described in more detail in the sections below.

6.2.2.1 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 RIDs with "Approved for current release," "Immediate/ emergency change," "Deferred," or "Disapproved with explanation" resolution status related to the previous review.

6.2.2.2 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,
- That the approach describes all affected system requirements and high level modifications, and
- That the approach integrates well with existing functionality.

6.2.2.3 Exit Criteria

The SDR will be considered complete when:

- Minutes and the review summary report are published;
- All RIDs 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.

6.2.2.4 Output

Output from the SDR will include the following:

- Minutes,
- SDR Technical Review Summary Report completed and signed by all attendees,

- Technical Review Action Item (AI) Log signed by the QM representative, and
- Completed System Design Review Checklist.

6.2.3 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.

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.

QMs role in this review is to assess the degree of completion of the technical efforts related to this review, see Appendix C, Assessment Tools for Quality Management, for the list of questions that will be used for this review. The technical review process, which includes the inputs, procedures, exit criteria, and outputs are described in more detail in the sections below.

6.2.3.1 Inputs

Input to the ISRR will include the following:

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

6.2.3.2 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.

6.2.3.3 Exit Criteria

The ISRR will be considered complete when:

- Minutes and the review summary report are published;
- All RIDs 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.

6.2.3.4 Outputs

Output from the ISRR will include the following:

- Minutes,
- ISRR Technical Review Summary Report completed and signed by all attendees,
- Technical Review Action Item (AI) Log signed by the QM representative, and
- Completed Increment System Requirements Review Checklist.

6.2.4 Preliminary Design Review (PDR)

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 lowest level of requirements specifications. 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 Increment System Requirements Review (ISRR). The Development Contractor is responsible for conducting the PDR.

The purpose of each PDR is to ensure that:

- The subsystem definition is sufficiently mature to meet ERA Program Master Schedule criteria
- Component allocations and component specifications are reasonable and provide a sound subsystem concept
- Subsystem risks have been assessed and mitigated to an appropriate level to continue development
- Trade-study data are adequate to substantiate that subsystem requirements are achievable
- Decisions made in arriving at the subsystem configuration definition are well supported by analysis and technical data
- The “design-to” baseline is documented in the appropriate subsystem and lower-level requirements specifications and in a subsystem design description

QMs role in this review is to assess the degree of completion of the technical efforts related to this review, see Appendix C, Assessment Tools for Quality Management, for the list of questions that will be used for this review. The technical review process, which includes the inputs, procedures, exit criteria, and outputs are described in more detail in the sections below.

6.2.4.1 Inputs

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 RIDs 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.

6.2.4.2 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.

6.2.4.3 Exit Criteria

The PDR will be considered complete when:

- Minutes and the review summary report are published;
- All RIDs 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.

6.2.4.4 Outputs

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 Action Item (AI) Log signed by the QM representative, and
- Completed Preliminary Design Review Checklist.

6.2.5 Critical Design Review (CDR)

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. It is at the CDR that the design description for each of the lowest level requirements is reviewed. 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 (see **Section 6.2.4**). The Development Contractor is responsible for conducting the CDR.

The purpose of the CDR is to ensure that:

- Each detailed component definition is sufficiently mature to meet the measure of effectiveness/measure of performance criteria
- Component specifications are reasonable and provide a sound component concept
- Component and related lifecycle process risks have been assessed and mitigated to an appropriate level
- Trade-study date are adequate to substantiate that detailed component requirements are achievable
- Decisions made in arriving at the detailed component definition configuration are well supported by analysis and technical data
- The "build-to" baseline is documented in the appropriate subsystem and lower-level design descriptions.

QMs role in this review is to assess the degree of completion of the technical efforts related to this review, see Appendix C, Assessment Tools for Quality Management, for the list of questions that will be used for this review. The technical review process, which includes the inputs, procedures, exit criteria, and outputs are described in more detail in the sections below.

6.2.5.1 Inputs

Input to the CDR will include the following:

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

6.2.5.2 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.

6.2.5.3 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;
- All RIDs 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.

6.2.5.4 Outputs

Output from the CDR will include the following:

- Minutes,
- CDR Technical Review Summary Report completed and signed by all attendees,
- Technical Review Action Item (AI) Log signed by the QM representative, and
- Completed Detailed Design Review Checklist.

6.2.6 Functional Configuration Audit (FCA)

The purpose of FCA is to verify that each CI has adequately achieved the performance and functional characteristics as specified in the system documentation. The ERA PMO CM conducts FCA and the FCA team reviews the documentation listed in the FCA Checklist to verify that all functional parameters were tested and the results were satisfactory. The FCA is held at the end of the development lifecycle, following the completion of PAT in accordance with the integrated schedule. The test results are checked for their completeness and accuracy. The CM Team is responsible for conducting the FCA. Any Waivers and Deviations identified will be noted in the CM teams audit report. For information on the FCA Report, refer to the **Audit Reports** section in the ERA CMP.

6.2.7 Physical Configuration Audit (PCA)

The purpose of PCA is to verify that the product being delivered is identical to the product that had been tested and verified, and to ensure that the configuration identification documentation presented during the audit accurately represents the "as-built" product. The PCA is held at the successful completion of FCA in accordance with the integrated schedule. The CM Team is responsible for conducting the PCA. Any Waivers and Deviations identified will be noted in the CM teams audit report. For information on the PCA Report, refer to the **Audit Reports** section in the ERA CMP.

6.2.8 In-Process Audits

In-process audits (quality assessments) are conducted on a sample of the designs that are held to verify the consistency of the design, including the following:

- Product configuration and content versus design documentation,
- Interface specifications (hardware and software) for each level of the System Breakdown Structure,
- Design implementation versus functional requirements, and
- Functional requirements versus test descriptions.

6.2.9 Managerial Review

Managerial Reviews are periodic assessments of the execution of the activities and items as specified by the QM Plan. All QM activities (see **Table 6-2, Managerial Review Activities and Responsible Organization**) are evaluated and findings are documented, including any exceptions to the process stated in the QM plan, which may result in recommended changes or improvements to the plan. Managerial reviews assess the adequacy of the ERA QM program and are accomplished through the following.

Activity	How activity is performed?	Responsible Organization
Periodic review of quality performance reports.	The Executive Officer (XO) will conduct periodic reviews on QM activities to verify the adequacy of the work completed according to the planned minimum required reviews and audits (see **Section 6.2** for that list)	Executive Officer (XO)
Scheduled program reviews	The XO and PD will review QM activities at the scheduled program review meetings to verify the adequacy of work completed according to the planned (minimum required) reviews and audits (see **Section 6.2** for that list)	PD and XO

Table 6-2: Managerial Review Activities and Responsible Organization

6.2.10 Configuration Management Plan (CMP) Review

The CMP review and internal assessment/audit, as described in **Section 6.3.6**, is held to evaluate the adequacy and completeness of the Configuration Management (CM) methods, specifications, and standards defined in the *ERA CMP*. The QM Team and PD will use collected metrics and performance measurement data to evaluate whether additional activities must be added to the *ERA CMP*. See **Appendix A, ERA PMO Metrics Descriptions**, located in the *ERA MP*, under column headings "Change Request Inventory" for a list of data items that will be tracked by the QM Team. For additional metrics data being collected related to CM activities and reported in the QM Status Report, reference **Section 8.0, Problem Reporting and Corrective Action**.

If CM is not following the procedures and policies outlined in the *ERA CMP*, the QM Team will identify corrective actions. The QM Team and the CM Team will agree on the schedule for implementing the corrective actions.

6.2.11 Test Readiness Review

The Test Readiness Review (TRR) provides an independent evaluation and assessment of the system's readiness for testing to PMs and project engineers. Currently, according to integrated schedule, TRR for increment 1 was held for release 2 at the completion of system testing. In the technical review process, the TRR follows the CDR (see **Section 6.2.5)**. The Development Contractor is responsible for conducting the TRR.

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 deviations 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 TSP*.

QM's role in this review is to assess the degree of completion of the technical efforts related to this review; see Appendix C, Assessment Tools for Quality Management, for the list of questions that will be used for this review. The technical review process, which includes the inputs, procedures, exit criteria, and outputs are described in more detail in the sections below.

6.2.11.1 Inputs

Input to the TRR will include the following:

- *ERA TSP* and an acceptance test plan;

- Published Agenda;
- Acceptance Test Plan (ATP);
- Development Contractor's TRR Package Documentation;
  - Software/Interface requirements changes;
  - Outstanding Risks/issues
  - Waivers & Deviation with workarounds
  - Requirement Matrix listing (passed/failed/not covered)
  - 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.

6.2.11.2 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.

6.2.11.3 Exit Criteria

The TRR will be considered complete when:

- Minutes and the review summary report are published;
- All RIDs 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.

6.2.11.4 Outputs

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 Action Item (AI) Log signed by the QM representative, and
- Completed Test Readiness Review Checklist.

6.2.12 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 (see **Section 6.2.12**). The ORR conducted by the ERA PMO and the Development Contractor will support the ORR, as needed.

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 the 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.

QMs role in this review is to assess the degree of completion of the technical efforts related to this review, see Appendix C, Assessment Tools for Quality Management, for the list of questions that will be used for this review and to identify the readiness of the product to move to the next phase of the lifecycle. The technical review process, which includes the inputs, procedures, exit criteria, and outputs are described in more detail in the sections below.

6.2.12.1 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
- System Test Plan
- Test Procedure
- Test cases
- 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.

6.2.12.2 Procedures

The ORR reviewers are responsible for ensuring the following:

- That the facility conforms with applicable standards and regulatory requirements,
- That the facility operates safely and efficiently, and
- That all necessary background and reference information for the facility and equipment are documented.

6.2.12.3 Exit Criteria

The ORR will be considered complete when:

- Minutes and the review summary report are published;
- All RIDs 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.

6.2.12.4 Outputs

Output from the ORR will include the following:

- Minutes,
- ORR Technical Review Summary Report completed and signed by all attendees,
- Technical Review Action Item (AI) Log signed by the QM representative, and
- Completed Operational Readiness Review Checklist.

6.3 Other Reviews and Audits

Other possible QM reviews may be included but are not limited to those described in the following sections. In the event deviations are identified during these reviews, refer to **Section 8.0, Problem Reporting and Corrective Action (Section 8.2 Deficiency Reporting)** for additional information on the reporting process. **Table 6-3, Other Review, Criteria for Adequacy, and Compliance Standard**, lists the other reviews to be used, including their criteria for adequacy, and compliance standard. These reviews are discussed in the following sections.

Other Reviews	Criteria for Adequacy	Compliance Standards
Program Management Plan Review	• Conform to Standard • Complete	IEEE Std. 1028-1997 Standard for Software Reviews

Other Reviews	Criteria for Adequacy	Compliance Standards
	• Consistent • Adequate	
Peer Reviews (PR)	• Satisfies specifications • Satisfies quality attributes • Conforms to Standards	IEEE Std. 1028-1997 Standard for Software Reviews
Informal Walkthrough	• Satisfies specifications • Satisfies quality attributes • Conforms to Standards	IEEE Std. 1028-1997 Standard for Software Reviews (Walkthrough)
User Documentation Reviews (UDR)	• Conform to Standard • Complete • Consistent • Adequate • Correct • Useable	IEEE Std. 1063-2001 Standard for Software User Documentation
Process Improvement Reviews	TBD	ISO/IEC 15504-7:1998 Information Technology – Software Process Assessment – Part 7: Guide for use in process improvement
Internal Assessment/Audits	TBD	IEEE Std. 1028-1997 Standard for Software Reviews
Post-Implementation Review	• Processes and products conform to Standards • Processes conform to Plans	IEEE Std. 1028-1997 Standard for Software Reviews (Management Reviews)
Section 508 Compliance Review	• Processes and products conform to Standards • Product satisfies specifications	The Access Board Section 508 Standards

Table 6-3: Other Reviews, Criteria for Adequacy, and Compliance Standard

6.3.1 Program Management Plan (PMP) Reviews

The *ERA PMP* reviews support execution of program management best practices, continuous process improvement, and implementation of quality principles. The QM Team will compare

the *ERA PMP* with the corresponding practices to ensure that the program team is adhering to the documented procedures and policies, and to examine the necessity for plan modifications. The QM Team will use collected metrics and performance measurement data to evaluate whether additional activities must be added to the PMP.

In the event of discrepancies, the QM Team will identify corrective actions. The QM Team and the PMO will agree on the schedule for implementing the corrective actions.

6.3.2 Peer Reviews

QM methodologies are integrated sets of tools and techniques. The peer review process is the initial methodology choice for QM when assessing ERA PMO generated documentation. The tools include, but are not limited to, process review checklists (See Appendix C, Assessment Tools for Quality Management,), standards, forms and documentation (See **Appendix B, Document Deliverables Quality Control Edit Checklist** in the *ERA POST Quality Management Document Development and Approval Guidance (QDAG),* which is a tool to ensure consistency among ERA PMO deliverables). The Peer Review (PR) is a general method for reviewing development work products in order to eliminate defects as early in the development lifecycle as possible.

The PR is an iterative process, supporting continuous improvement in achieving the plan mission as stated in the *ERA Mission Needs Statement (MNS).* Each PR is a planned formal meeting conducted by staff with the sole purpose of uncovering quality problems. The type of product being reviewed dictates who will attend; the review chair (facilitator) exercises discretion concerning whom to invite. A complete PR process description can be found in the *ERA Peer Review Process (PRP)* document.

6.3.3 Informal Walkthrough

Informal walkthrough ensures that developers/testers are looking over each others work in a less threatening environment than a peer review or other technical reviews. The purpose of a walkthrough is to improve the quality of a work product by discovering potential problems. A walkthrough, when done properly, is seen as a positive contribution to the author of the work product; it is not seen as criticism or a negative activity or threat.

6.3.4 User Documentation Reviews (UDR)

The User Documentation Review (UDR) is to ensure that the structure and information content provides minimum requirements, technical substance, and addresses editorial and stylistic considerations.

6.3.5 Process Improvement Reviews

The Process Improvement Reviews lend support to the whole QM concept in that they are held to evaluate metrics from the development effort. Process Improvement is successful when an effective process emerges or evolves that can be characterized as: practical, documented, enforced, trained, measured and improvable. Their findings provide information needed to

determine if processes need to be modified to prevent or reduce quality related problems in the future of the program or in new efforts. This type of review generates process improvement recommendations.

6.3.6 Internal Assessments/Audits

A product assessment/audit is an independent examination of work product(s) to assess compliance with specifications, standards, customer requirements, or other criteria. Product assessments/audits are used to ensure that the work product was evaluated against agreed upon standards, procedures, or other requirements; that deviations are identified, documented and tracked to closure; and to verify corrections.

A process assessment/audit is a systematic and independent examination, to determine whether quality activities and related results comply with planned standards, policies, and procedures and whether these are implemented effectively and are suitable to achieve ERA's objectives. Refer to the **Internal Assessments/Audits** section of the *ERA QOP* for more detailed information.

6.3.7 Post-Implementation Review

The Post-Implementation Review is held at Initial Operational Capability (IOC) and Full Operational Capability (FOC), and the conclusion of the program, to assess the development activities and to provide recommendations for appropriate actions. It compares all planning information with metrics collected on work completed, effort expended, and funds expended and uses the resulting analysis to determine improvements needed in areas such as resource utilization and quality systems. The ERA PMO Executive Officer will be responsible for ensuring that the appropriate resources are available to conduct this review. A Post-Implementation Review Report will be generated after the review.

6.3.8 Section 508 Compliance Review

The purpose for the Section 508 Compliance review is to verify that Federal departments and agencies that develop, procure, maintain, or use electronic information technology to ensure that Federal employees and members of the public with disabilities have access to and use of information and data, comparable to that of employees and members of the public without disabilities. Simple Tool for Error Prioritization for Section 508 (STEP508) is a new compliance tool that prioritizes the repairs you should make to ensure that your website is compliant with accessibility requirements of Section 508. The responsibility of ensuring that the system is in compliance with Section 508 rest with the testing team who will test the system with Section 508 test cases in collaboration with the QM team.

7.0 Test

Testing prior to piloting or deployment ensures that QC of the product is sufficient to support the planned functionality that unresolved problems are known, and workarounds are developed before the cost deployment is incurred. The management of all testing activities is described in detail in the **Management and Software Quality Assurance (SQA) Review** section of the *ERA*

TSP. There is no QM testing scheduled to be performed outside of that already planned for the program. The QM Team's responsibilities include, but are not limited to the following:

- Ensuring that the test environment and related test tools are calibrated, certified, and documented prior to testing;
- Witnessing Testing;
- Reviewing plans, procedures, and reports for compliance to contract requirements and ERA standard procedures; and
- Certifying testing results on all deliverables products.

Note: Calibration is the comparison of a device against a known standard in order to establish the accuracy or error of the device. Certification involves conducting a dry run of the equipment to be used in any test as a pre-cursor to formal testing to ensure its accuracy, i.e., it is the verification that the tool works as expected prior to its use in a formal test.

8.0 Problem Reporting and Corrective Action

This section describes the procedures to be followed for reporting, tracking, and resolving problems identified in both software/hardware items and system development and maintenance processes. Problems encountered during planning and development may result from defects in software, hardware, and supporting and development processes. Because of this diversity, the determination of the sources of a problem and the appropriate corrective action requires a centrally controlled system for monitoring problems and determining root causes.

The QM Team will address the following in order to support the problem reporting and corrective action process. For an example of the problem reporting process workflow, see **Appendix D, Problem Report Process Workflow Diagram**. Each of these areas is described in detail in the following sections.

- Problem reporting
- Deviation process
- Corrective action process
- QM feedback mechanisms
- Metrics and measures

Note: Over the next year the ERA PMO will develop an overall consolidated problem reporting process and will evolve to another tool for the process.

8.1 Problem Reporting

The ERA PMO will record and manage QM discrepancies (deviations) in the ERA Rational ClearQuest database. A status report is provided on a regular basis to the PD, division heads, Integrated Product Team (IPT) teams, and other affected groups. The purposes of these reports are to delineate those areas where:

- Processes are being followed correctly and are working effectively,

- Processes are being followed but are not working effectively, and
- Processes are not being followed.

The frequency and process for posting these reports will be consistent with the reporting guidance contained in the **Reporting** section of the *ERA PMP*. The content of these reports will be as follows:

- Accomplishments for the reporting period, e.g., completed QA reviews or audits;
- Activities for the reporting period, e.g., specific QM activities accomplished or current activity compared to scheduled tasks; and
- Issues and/or problems during the reporting period (e.g., issues that surfaced during QA reviews or audits) are reported to Program Management for review.
- Status of open issues or problems

The focus of the program management meetings is the overall status of the program, the opportunity for information sharing across the integrated parts of the program, and to address issues which have been raised through the problem reporting of the individual program teams.

8.2 Deviation Process

During the conduct of QM activities, deviations are identified in both the software/hardware work products as well as in adherence to program standards, policies, and procedures. These deviations must be itemized, documented, tracked to closure, and reported by the QM team.

A Deviation Request (DR) occurs when a specific requirement is not satisfied or partially satisfied. The DR Form is used to request a deviation from all ERA programs, policies, and procedures. The QM Team plays a supporting role in the DR process in the following ways:

- Reviews DRs,
- Assigns a number to the DR for tracking,
- Forwards DRs to the authorized personnel or committee for review,
- Notifies the PD when the DR will be presented for review and approval,
- Notifies the owner of the DR status,
- Opens a Corrective Action Request (see **Section 8.3** below for additional information) to track compliance activities until complete, and
- Places a copy of the DR in the QM Deviation Process file, located on the S drive, when a DR is approved.

The ERA CCB is the responsible group for authorizing and implementing software problem reporting and corrective actions, and submission to unresolved issues to management for resolution. The ERA CCB is composed of representatives from the ERA PMO and from NARA user organizations; refer to **Table 2-1, CM Organization Roles and Responsibilities** in the *ERA CMP* for additional information.

8.3 Corrective Action Process

The corrective action process describes the system used to document, track, and resolve problems identified within the ERA program. This process is intended to be used by all ERA staff members and stakeholders within ERA when originating, replying to, or coordinating a Corrective Action Request (CAR). Quality Management (QM) is responsible for this process. Corrective action is defined as an action taken to correct the occurrence of noncompliance, nonconformance and other conditions adverse to the quality of the ERA system.

8.4 QM Feedback Mechanisms

The QMS will schedule a meeting with program management to discuss status, address issues, and plan work for the next period. The key points of these discussions will be documented and the reporting mechanism to program management. Meeting minutes of these discussions will be stored in the ERA Rational ClearCase tool and according to the **General Administration** section of the *ERA File Plan (FP).* The *ERA FP* describes the categories of records to be filed.

8.5 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 lifecycle. Specific activities associated with technical reviews are subject to metrics collection by the QMS. Metrics collection process is described in detail in the **Metrics Collection and Use** section of the *ERA MP* document. The applicable standard for software quality metrics, see IEEE Std. 1061-1998, IEEE Standard for a Software Quality Metrics Methodology.

QM activities are reported on a regular basis to the PD, program management, development teams, and other affected groups. These status reports delineate areas where evaluation is raising issues concerning system configuration or system functionality, as well as those areas where evaluation is changing to accommodate the changes in system requirements or design. The following metrics will be tracked by the QM Team and reported to the PD:

- Numbers of product and process audits and activity reviews compared to the plan,
- Completion of milestones of QM activities compared to the plan,
- Number of deviation requests submitted, closed, and year-to-date,
- Status of AIs open/closed/on-hold,
- Number of non-conformance or non-compliance items,
- Status of non-conformance and non-compliance items identified,
- Number of days to correct and close a non-conformance or non-compliance item,
- Number of peer reviews compared to the plan.

For more information on the contents of the ERA Program Monthly Status Report, refer to the **Reporting** section defined in the *ERA PMP*. Each major participant in the ERA Program provides a Status Report in support of program communication and information flow.

9.0 Tools, Techniques and Methodologies

This section identifies the tools, techniques, and methodologies to be used to support QM. **Table 9-1, Tools, Techniques, and Methodologies by Lifecycle Phase,** contains the lifecycle phases and their related tool(s), techniques, and the methodologies. Tools related to Process Improvement will be added in a future update. A definition of each area is listed below.

- Tools – are used to aid in the evaluation of program quality
- Techniques – are technical and managerial procedures that aid in the evaluation and improvement of quality
- Methodologies – are integrated sets of tools (checklists, standards, forms, and documentation) used to review development work products

During the Operations phase of the lifecycle, modifications may be made to the ERA system. These modifications may be in the form of corrections or in the form of new functionality. These maintenance activities will be accomplished according to the same standards and procedures used during the development phase.

Lifecycle Phase	Tools	Techniques	Methodologies
Requirements & Design	• Microsoft Access • Microsoft Word • Rational	• Peer Reviews • Walkthroughs • Audits • Problem/Deviation Reporting	• Action Item Form (ClearQuest) • Change Request/Proposal Form (ClearQuest) • Peer Review Action Item Tracking System Database Users Guide • Peer Review Action Item Log Form • Assessment/Audit Checklist and Report
Implementation & Test	• Microsoft Access • Microsoft Word • Rational	• Peer Reviews • Walkthroughs • Audits • Problem/Deviation Reporting	• Action Item Form (ClearQuest) • Change Request/Proposal Form (ClearQuest) • Peer Review Action Item Tracking System Database Users Guide • Peer Review Action Item Log Form • Assessment/Audit Checklist and Report
Installation & Checkout	• Microsoft Word • Rational	• Audits • Problem/Deviation Reporting	• Action Item Form (ClearQuest) • Change Request/Proposal Form (ClearQuest) • Assessment/Audit Checklist and Report
Operations & Support	• Microsoft Word • Rational	• Audits • Problem/Deviation Reporting	• Action Item Form (ClearQuest) • Change Request/Proposal Form (ClearQuest) • Assessment/Audit Checklist and Report

Table 9-1: Tools, Techniques, and Methodologies by Lifecycle Phase

10.0 Media Control

Computer program media is defined as those media on which computer data are stored such as Compact Disk – Read Only Memory (CD-ROM), RAM disks, or tape cartridges. Media control covers storage, handling, packaging, shipping, and external distribution of hardware/software and associated documentation. The *ERA CMP* provides information on Media Control in the **Acquiring Configuration Items (CIs)** section. Library management is the underlying process for ingesting, maintaining and disseminating the contents of the libraries. The CM team is responsible for ensuring that media control activities are carried out in accordance with ERA CMP.

The QM team shall review the following media control activities to ensure that they are being implemented in a manner consistent with the *ERA CMP*:

- Proper handling of media to prevent physical, electrostatic, or environmental damage while stored;
- Proper packaging for shipment to prevent physical, electrostatic, or environmental damage during transit;
- Proper labeling, storage, tracking, and release of all media and documents;
- Action to prevent mismatched or unmarked media from being stored or shipped; and
- Verification that the correct media is being shipped.
- Regularly scheduled backup of the media

The software media control methods and facilities are identified in Appendix C, Assessment Tools for Quality Management,. Quality will conduct ongoing evaluations of the media control process to verify that the process of controlling the media is effective and in compliance with the ERA CMP.

11.0 Supplier Control

The supplier control activities are to ensure the selection of qualified supply contractor(s). To ensure that the products provided by supply contractor(s) meet established requirements, the ERA PMO will participate in and approve RR results, design review results, and conduct acceptance testing.

Prior to the purchase of software to support the development effort, QM and the project members will define and provide complete requirements to the supplier/vendor. The software tool evaluation process will be used. The use of voluntary consensus standards, whenever practicable and appropriate, is required by OMB Circular NO. A-119, Revised February 10, 1998.

11.1 Supplier Policy

Potential Contractor(s) of critical, complex, or costly items or services will, prior to the award of a contract, be evaluated to ascertain that they have the capability to provide items or services that consistently conform to technical and quality requirements of the procurement. The ERA PMO

will ensure that the goods or services provided by the Contractor(s) are acceptable for the intended use.

11.2 Supplier Evaluation Procedure

The ERA PMO must determine if the prospective Contractor(s) have a QMP that ensures the quality of the requested items or services. Refer to the **Software** and **Hardware** sections of the *ERA Cost Analysis Assumption Document (CAAD)* document for summary of the hardware and software (COTS) currently identified for the ERA system. The hardware and software summaries detail the equipment and software necessary to operate the system as currently configured through the lifecycle analyzed.

See Appendix C, Assessment Tools for Quality Management, for a list of sample questions from the Contractor(s) Evaluation Checklists. . These QM checklists are used to assess the performance, capabilities, and that the Contractor(s) staff is knowledgeable of the processes, per IEEE Std. 1062-1998 IEEE Recommended Practice for Software Acquisition.

Prior to the evaluation, background information that pertains to the procurement will be obtained by the assessment team. The information will include:

- Description of the items and its requirements;
- Description of the QM requirements;
- Required quantity and delivery schedule;
- Description of any measurement or test equipment requirements;
- Description of any critical process, or material requirements;
- Knowledge of the seller's quality history; and
- Names of key seller personnel.

12.0 Records Collection, Maintenance, and Retention

QM activities are documented by records and reports that provide a history of product quality throughout the development lifecycle. Measurement data collected will be reviewed for trends and process improvement. All QM records are collected and maintained on the Shared drive for the lifecycle of the ERA system. All documentary materials that control, report, and demonstrate execution of the QM function will be managed as records of the PMO. The QMS and QM team members will collect and retain adequate and proper records of QM activities. All QM reports and audit and review reports are considered to be federal records and as such will be managed in accordance with the NARA records schedule and the *ERA FP*.

The CM Team maintains applicable files and reports as listed below and stores them in the Configuration Library. See **Table 12-1, QM Documents and Storage Location**, for their exact location, as listed under the heading "Where Stored."

Table 12-1, QM Documents and Storage Location, lists the proper records of QM activities and the person(s) responsible for maintaining that information.

Documentation Required	Frequency	Where Stored S:\ERAPMO\	Responsible Person	Documentation Description
Peer Review Action Item Log Forms Quality Review Record	Ad hoc	ERA Quality Management\Administration\Peer Review Action Item Form	QM Team	Captures results of peer reviews, Action Items (AIs), Defects, and Issues.
Deliverable Review Comment Forms	Ad hoc	ERA Quality Management\Administration\ERA Documentation Review Comment Form Template	QM Team	Captures review comments from Government reviewers.
Assessment/Audit Checklists	Every 6 months	ERA Quality Management\Administration\Assessment-Audit Checklist Template	QM Team	Checklist is used to identify deviations in process performance.
ERA Assessment/Audit Report	Every 6 months	ERA Quality Management\Administration\Assessment-Audit Report Template	QM Team	Report is used to report the findings of the assessment/audit.
QM Process Review Checklist	Ad hoc	ERA Quality Management\Administration\QM Process Review Checklist Template	QM Team	Checklist is used to uncover defects in processes that are used to develop ERA product.
QM Overall Status Report	Ad hoc	ERA Quality Management\Administration\QM Overall Status Report Template	QM Team	Report is used to track QM milestones, work scheduled, effort expended, funds expended, and number of noncompliance items.
CDRL Evaluation Checklist	Ad hoc	ERA Quality Management\Administration\CDRL Evaluation Checklist Template	QM Team	Checklist is used to evaluate contractor CDRLs for content compliance.

Table 12-1: QM Documents and Storage Location

13.0 Training

Required skills to perform and support QM activities for the ERA Program have been identified in **Table 13-1, QM Training Needs,** in order to implement this ERA QMP. The list of training

requirements is expected to change as development of the ERA program continues to expand. The training schedule will be compatible with the project schedule. In some cases, training will be conducted as On-the-Job Training (OJT).

Training	Type of Training	Description	Level	Vendor(s)	Position
Reviews **	Classroom/OJT	Training on how to conduct reviews.	Basic	TBD	QM Team
Code Reviews	Classroom/OJT	Training on the peer review process	Basic	Vendor	QM Team
Process Assessment and Audits	Classroom/OJT	Training on how to conduct development lifecycle processes, assessments and audits.	Basic	TBD	QM Team
Problem Reporting and Corrective Action	Classroom	Training on how to generate problem reports and record corrective actions.	Basic	Vendor-Rational	CM Team
Records Collection, Maintenance, and Retention	Classroom	Training on how to collect records, maintain records and how to create a retention schedule.	Basic	NARA	QM Team
Tools	Classroom/OJT	Training on how to use tools necessary to conduct quality assurance.	Basic	Vendor-Rational	CM Team
Testing	OJT	Training on Testing Methodologies	Basic		Testing Team

Training	Type of Training	Description	Level	Vendor(s)	Position
Code, Media, and Supplier Control	Classroom/OJT	Training on code, media and supplier control	Basic		CM and QM teams
QA Management	Classroom/OJT	Training in project management	Basic	Vendor	QM Team
Metrics	Classroom/OJT	Training on data collection and analysis	Basic	Vendor	QM Team
Risk Management And Analysis	Classroom/OJT	Training on the Risk Management Process	Basic	Vendor	Risk Management Team

Table 13-1: QM Training Needs

Additionally, training needs for the ERA PMO QM team have been identified and are discussed in the *ERA Training Needs Assessment (TRA)* document. Specific QM areas of training are identified in Appendix B, ERA PMO Training Needs Assessment Criteria Summary, Table II, Process Training (Quality Management) of the *ERA TRA* document. The QMT will continue to work with the Training Officer to reassess and update the training needs assessment for quality management personnel projected throughout the complete lifecycle of the ERA program.

****** Refer to IEEE Std. 1028-1997 IEEE Standard for Software Reviews, for the types of reviews that might be part of the review training.

14.0 Risk Management

The ERA program has developed a risk management plan as identified in the *ERA Risk Management Plan (RKM)*. The QM Team is responsible for identifying and assessing risks that arise during any phase of the ERA lifecycle covered by the *ERA QMP*. The risks include technical, economic, schedule, and managerial which are evident during the lifecycle phase. Each risk will be justified and the level of risk (low, medium, and high) assessed. The QM Team will report risks and required risk management data to the ERA Risk Management Officer. The risk process for QM is covered in the **Risk Monitoring and Control** section of the *ERA Risk Management Plan (RKM)*. This section states that risk monitoring and control is an on-going process of keeping track of identified risks, reviewing and evaluating the effectiveness of the implementation of risk review plans, monitoring residual risks, identifying new risks, and reporting risks. QM reporting will confirm that the identified risks are managed in accordance with the provisions of the program's risk management plan, and that associated action items are reported, managed, and followed through to closure.

15.0 Glossary

Table 15-1, Glossary of QMP Terms, contains a glossary of terms unique to this QMP.

Terms	Term Description
Action Item	Something agreed to be done as a result of a discussion at a meeting and usually recorded in the minutes of that meeting.
Configuration Item	A hardware, software, or composite item at any level in the system hierarchy designated for CM.
Configuration Management	Technical and administrative activities concerned with the creation, maintenance and controlled change of configuration throughout the life of the product.
Electronic Information Technology	Includes information technology and any equipment or interconnected system or subsystem of equipment that is used in the creation, conversion, or duplication of data or information. The term electronic and information technology includes, but is not limited to, telecommunications products (such as telephones), information kiosks and transaction machines, World Wide Web sites, multimedia, and office equipment such as copiers and fax machines. The term does not include any equipment that contains embedded information technology that is used as an integral part of the product, but the principal function of which is not the acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information.
Quality Assurance	Are all planned and systematic activities implemented in the quality system to provide confidence that the ERA project will satisfy the quality standards agreed upon during QP?
Quality Control	Monitoring specific ERA products to validate that they comply with appropriate quality standards agreed upon during QP.
Quality Improvement	To use output indicators to help identify better standards and other practices in order to increase ERA's effectiveness and efficiency.
Quality Management	That aspect of the overall management function that determines and implements the quality policy (guidance)
Quality Planning	The process that identifies the relevant quality standards and determines how to satisfy them
Voluntary Consensus Standard	Standards that are developed or adopted by voluntary consensus standards bodies, both domestic and international.

Table 15-1: Glossary of QMP Terms

16.0 Plan Maintenance

The ERA QMS is responsible for the development and maintenance of this plan. The plan will be updated as needed to maintain current and sufficient quality management activities. The plan

will be placed under CM control following its initial approval by the ERA PMO. Updates to the *ERA QMP* will be controlled by the OCCB.

Appendix A: QMP v3.0 Roadmap to IEEE Std. 730-2002

IEEE 730-2002 Sections	ERA QMP v3.0 Sections	Comments
4 Software Quality Assurance Plan		
4.1 Purpose	1.0 Purpose	
----------	1.1 Introduction	Tailored to Augment ERA standards
----------	1.2 ERA Program Overview	
----------	1.3 Scope	
----------	1.4 QM Guidance	
----------	1.5 QM Principles	
----------	1.6 Limitations and Constraints	
----------	1.7 Definitions and Acronyms	
4.2 Reference Documents	2.0 Reference Documents	
----------	2.1 ERA PMO Documents	Tailored to ERA Standards
----------	2.2 Standards and Guidelines	Tailored to ERA Standards
4.3 Management	3.0 Management	
4.3.1 Organization	3.1 Organization	
4.3.2 Tasks	3.2 Tasks	
4.3.3 Roles and Responsibilities	3.3 Roles and Responsibilities	
4.3.4 Quality Assurance Estimated Resources	3.4 Quality Assurance Estimated Resources	
4.4 Documentation	4.0 Documentation	
4.4.1 Purpose	4.1 Purpose	
4.4.2 Minimum documentation requirements	4.2 Minimum Documentation Requirements	
4.4.2.1 Software Requirements Description (SRD)	4.2.1 System Requirements Specification (SyRS)	Tailored to ERA Standards
4.4.2.2 Software Design Document (SDD)	4.2.2 System Architecture and Design Document (SADD)	Tailored to ERA Standards
----------	4.2.3 Requirements Specification	Tailored to ERA Standards
----------	4.2.4 System Test Plan	Tailored to ERA Standards
4.4.2.3 Verification and Validation Plans	4.2.16 Verification and Validation Plan(VVP)	Tailored to ERA Standards
4.4.2.4 Verification and Validation Results Report	4.2.17 Verification and Validation Results Reports VVRR	Tailored to ERA Standards
4.4.2.5 User Documentation	4.2.18 User Documentation	Tailored to ERA Standards
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	4.2.5 Award Fee Plan	
----------	4.2.6 Training Program	

IEEE 730-2002 Sections	ERA QMP v3.0 Sections	Comments
4.4.2.6 Software Configuration Management Plan (SCMP) ---------- ---------- ---------- ---------- ---------- 4.4.3 Other documentation	Development and Management Plan (TPDMP) 4.2.7 Facilities Plan 4.2.8 Configuration Management Plan (CMP) 4.2.9 Operations and Support Plan 4.2.10 Risk Management Plan 4.2.11 System Security Plan 4.2.12 Certification and Accreditation Plan 4.2.13 Continuity of Operations Plan 4.2.14 Integrated Plan 4.2.15 Quality Management Plan	 Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards
4.5 Standards, Practices, Conventions, and Metrics 4.5.1 Purpose 4.5.2 Content	5.0 Standards, Practices, Conventions, and Metrics 5.1 Purpose 5.2 Content 5.3 Metrics	 Tailored to ERA Standards
4.6 Software reviews 4.6.1 Purpose 4.6.2 Minimum Requirements 4.6.2.1 Software Specifications Review (SSR) ---------- ---------- 4.6.2.2 Architecture Design Review (ADR) 4.6.2.3 Detailed Design Review (DDR) 4.6.2.4 Verification and Validation Plan Review 4.6.2.5 Functional Audit 4.6.2.6 Physical Audit 4.6.2.7 In-process audits 4.6.2.8 Managerial Reviews 4.6.2.9 Software	6.0 Reviews and Audits 6.1 Purpose 6.2 Minimum Reviews and Audits 6.2.1 System Requirements Review (SRR) 6.2.2 System Design Review (SDR) 6.2.3 Increment System Requirements Reviews 6.2.4 Preliminary Design Review (PDR) 6.2.5 Critical Design Review (CDR) 6.2.6 Verification and Validation Plans Review 6.2.7 Functional Configuration Audit 6.2.8 Physical Configuration Audit 6.2.9 In-process Audits 6.2.10 Managerial Reviews 6.2.11 Configuration Management Plan Review	 Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards

IEEE 730-2002 Sections	ERA QMP v3.0 Sections	Comments
Configuration Management Plan Review (SCMPR) 4.6.2.10 Post-Implementation Review 4.6.3 Other Review an Audits ---------- ---------- ---------- ---------- ---------- ---------- ---------- ---------- ----------	6.2.12 Post-Implementation Review 6.3 Other Reviews and Audits 6.3.1 Program Management Plan Review 6.3.2 Peer Reviews 6.3.3 Informal Walkthrough 6.3.4 User Documentation Reviews (UDR) 6.3.5 Process Improvement Reviews 6.3.6 Internal Assessment/Audits 6.3.7 Test Readiness Review (TRR) 6.3.8 Operational Readiness Review (ORR) 6.3.9 Section 508 Compliance Review	Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards
4.7 Test	7.0 Test	
4.8 Problem Reporting and Corrective Action ---------- ---------- ---------- ---------- ----------	8.0 Problem Reporting and Corrective Action 8.1 Problem Reporting 8.2 Deviation Process 8.3 Corrective Action Process 8.4 QM Feedback Mechanisms 8.5 Metrics and Measures	Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards Tailored to ERA Standards
4.9 Tools, Techniques, and Methodologies	9.0 Tools, Techniques, and Methodologies	
4.10 Media Control	10.0 Media Control	
4.11 Supplier Control ---------- ----------	11.0 Supplier Control 11.1 Supplier Policy 11.2 Supplier Evaluation Procedures	Tailored to ERA Standards Tailored to ERA Standards
4.12 Records Collection, Maintenance, and Retention	12.0 Records Collection, Maintenance, and Retention	
4.13 Training	13.0 Training	
4.14 Risk Management	14.0 Risk Management	
4.15 Glossary	15.0 Glossary	
4.16 SQAP Change Procedure and History	16.0 Plan Maintenance	ERA Standard Augment Section
Appendices	Appendix A: QMP v3.0 Roadmap to IEEE Std. 730-2002	

IEEE 730-2002 Sections	ERA QMP v3.0 Sections	Comments
	Appendix C: Assessment Tools for Quality Management	

Appendix B: Work Products

Contractor Deliverable	Evaluation Method	QM Review	IV&V Review
Award Fee Plan	Document Review	YES	NO
Certification and Accreditation (C&A) Plan	Document Review	YES	NO
Configuration Management Plan (CMP)	Document Review	YES	YES
Continuity of Operations Plan (COOP)	Document Review	NO	NO
Contract Data Requirements List (CDRL)	Document Review	NO	NO
Contract Funds Status Report (CFSR)	Document Review (Monthly)	NO	NO
Contract Work Breakdown Structure (CWBS)	Document Review (Monthly)	NO	NO
Cost Performance Report (CPR)	Document Review (Monthly)	NO	NO
Deliverable Technical Data and Computer Software	Document Review (Monthly)	YES	NO
Disposition/Scheduling and Template Management Prototype and Demonstration	Joint Review	YES	NO
Earned Value Management System (EVMS)	Document Review (Monthly)	NO	NO
Facilities Plan	Document Review	YES	NO
Integrated Baseline Review (IBR)	PMO Review	YES	NO
Integrated Help Desk ConOps	Document Review	YES	NO
Integrated Plan (IP)	Document Review	NO	NO
Integrated Schedule (IS)	Document Review (Bi-Weekly)	NO	NO
Life-Cycle Cost Analysis (LCC)	Document Review	NO	NO
Monthly Status Report	Document Review (Monthly)	NO	NO
Monthly Status Review (MSR)	Joint Review (Monthly)	NO	NO
Operations and Support Plan	Document Review	YES	YES
Performance Work Statement (PWS)	Document Review	YES	NO
Program Management Plan (PMP)	Document Review	YES	NO
Quality Management Plan (QMP)	Document Review	YES	YES
Risk Management Plan (RKM)	Document Review	YES	YES
Security Plan	Document Review	YES	NO
System Architectural Design Description (SADD)	Document Review	YES	YES
System Design Review (SDR) Briefing	Joint Review	YES	NO
System Engineering Management Plan (SEMP)	Document Review	YES	NO
System Operations Acceptance Test			
System Requirements Review (SRR) Briefing	Joint Review	YES	NO
System Requirements Specification (SyRS)	Document Review	YES	YES

Contractor Deliverable	Evaluation Method	QM Review	IV&V Review
System Test Plan (MTP)	Document Review	YES	YES
Training Program Development and Management Plan (TPDMP)	Document Review	YES	NO
Transition Plan	Document Review	YES	NO
Updated Cost/Price	Document Review	NO	NO
Updated DD-254	Document Review	NO	NO

Appendix C: Assessment Tools for Quality Management

Appendix C is a list of all checklists used in performing quality management functions.

Project Planning Process Audit Checklist
Software Requirements Review Checklist
Software Development Library Review Checklist
Subcontractor Control Review Checklist
Software Implementation and Unit Testing Review Checklist
Unit Integration and Testing Review Checklist
CI Integration Testing and System Qualification Review Checklist
End-Item Delivery Review Checklist
Software Corrective Action Review Checklist
Media Certification Review Checklist
Non-Deliverable Software Certification
Systems Requirements Review Checklist
System Design Review Checklist
Increment Systems Requirements Review Checklist
Preliminary Design Review Checklist
Detailed Design Review Checklist
Test Readiness Review Checklist
Operational Readiness Review Checklist
Peer Review Checklist
Problem Reporting Process Review Checklist
ERA Contractor(s) Evaluation Checklist (Sample)
ERA Contractor(s) Performance Checklist (Sample)
ERA Code Review/Inspection Checklist

Note: All checklists listed can be obtained by clicking on the following link:
S:\ERAPMO\ERA Quality Management\Administration\QM Task Checklist

Appendix D: Problem Reporting Process Workflow Diagram