

ELECTRONIC RECORDS ARCHIVES

CONFIGURATION MANAGEMENT PLAN
(CMP)

v5.0

for the

**NATIONAL ARCHIVES AND
RECORDS ADMINISTRATION**

**ELECTRONIC RECORDS ARCHIVES
PROGRAM MANAGEMENT OFFICE
(NARA ERA PMO)**

Final
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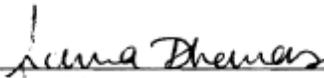
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CONFIGURATION MANAGEMENT PLAN (CMP)

1.0 Introduction

This document describes the Configuration Management (CM) activities to be performed in support of the Electronic Records Archive (ERA) Program. The ERA is a large-scale, comprehensive system designed to provide preservation of, and access to, Electronic Federal, Presidential, and Congressional Records in support of the mission of the National Archives and Records Administration (NARA). ERA is considered to be a software-intensive system and therefore a tailored version of the Institute of Electrical and Electronics Engineers (IEEE) Standard 828-2005, Standard for Software Configuration Management Plans, was used to guide the development of this plan. The tailoring of this standard as it applies to this document is specified in **Appendix A, IEEE Std. 828-2005 Document Tailoring**.

1.1 Purpose

The purpose of this document is to define the practices and procedures required to accomplish CM throughout the lifecycle of the ERA program. The intended audience for this document is the ERA Program Management Office (PMO), ERA contractor development team, NARA management, and other government management entities that have oversight responsibilities for the ERA Program. Documents reference via hyperlink requires ERA S drive access.

1.2 Overview

The ERA system will ingest, preserve, and provide access to the electronic records of all three (3) Branches of the U.S. Government. ERA is envisioned as a comprehensive, systematic, and dynamic means for preserving any kind of electronic record, free from dependence on specific hardware and/or software. The system will automate many of the electronic record lifecycle processes and make it easier to find and deliver electronic records in formats suited to customers' needs. The electronic records capabilities of the ERA system will be used in NARA's records centers as well as the National Archives and Presidential Libraries.

1.3 Scope

CM is a system engineering discipline that formalizes the management of the configuration of a system and controls changes to the system throughout its lifecycle. The key principles of CM ensure that all components of the system can be uniquely identified, managed, and that any previous version of the system can be readily reproduced. This Configuration Management Plan (CMP) applies to all software, hardware, Commercial Off The Shelf (COTS) products, documentation, physical media, and physical parts used by ERA and the ERA contractor development team to support various development activities, including engineering, implementation, testing, and configuration management.

1.3.1 Document Organization

Table 1-1, Document Organization, describes the sections and contents of the CMP.

| Section | Title | Content Summary |
|------------|---|---|
| 1.0 | Introduction | Describes the CMP purpose, overview, scope, CM Guidance, definitions and acronyms, and references |
| 2.0 | Configuration Management | Introduces and describes the CM organizations, roles and responsibilities, applicable policies, standards and procedures, management of the CM processes |
| 3.0 | Configuration Management Activities | Describes the objectives of configuration identification, configuration control, configuration status accounting, configuration audits and reviews, interface Control, and sub-contractor and vendor control. |
| 4.0 | Configuration Management Schedules | Describes the general CM activities schedule |
| 5.0 | Configuration Management Resources | Describes the CM organizational products, tools, support environment, personnel, and training. |
| 6.0 | Configuration Management Plan Maintenance | The CMP will be updated as per the WBS. |
| Appendix A | IEEE STD 828-2005 Document Tailoring | Details mapping between IEEE STD 828-2005 and the CMP |
| Appendix B | ERA Configuration Items List (CIL) | Provides a sample CIL |

Table 1-1: Document Organization

1.3.2 Configuration Item (CI) Control Levels

There are four (4) levels of CM control that Configuration Items (CIs) or work products are placed under.

- **Strict Control** – This is the highest level of CM control. Products placed under strict control are those items that are listed in the Integrated Schedule, require approval from the Configuration Control Board (CCB), and are versioned controlled. The formal Quality Management (QM) Peer Review procedure must be adhered to for documents under Strict Control.
- **Managed Control** – This is an intermediate level of CM control. Products placed under Managed Control are those items that are not listed in the Integrated Schedule, require signature approval from the Document Owner and/or the Contracting Officer Representative (COR), and are version controlled. A formal QM Peer Review of a document under managed control is at the discretion of a document owner.
- **Contractual Document Control**– These are contractually required documents prepared by the development contractor that are subject to Government review and approval,

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usually within 30 days of formal receipt. This data may be in hard copy, electronic (including electronic mail) copy, or any other form specified in the contract.

- **Other** – These items are products that do not require CM Control but are kept for historical purposes e.g., Meeting Minutes, Agendas, etc. Work Products do not require a formal QM Peer Review.

Note: Working Area – All drafts, or copies of documents under development, should be saved on H drive so they are subject to network back up.

A summary of the configuration control levels, their required reviews, and the approving change authority for changes at that level are provided in **Table 1-2, Configuration Management (CM) Control Levels**, below.

| Level of Control | Examples of Work Products | Required Review | Approval Authority |
|-----------------------|--|--|---|
| Strict | <ul style="list-style-type: none"> • Software • Requirements • Design • Management Plans | <ul style="list-style-type: none"> • Quality Assurance (QA) Review • QA Audit • Peer Review | <ul style="list-style-type: none"> • Program Director (PD) • CCB Chairperson • CCB Representatives |
| Managed | <ul style="list-style-type: none"> • Reports • Project Forms • Project Templates • Project Checklists • Project specific documents • Logs • Schedules • Standard Operating Procedures (SOPs) | <ul style="list-style-type: none"> • QA Review, when appropriate • QA Audit, when appropriate • Peer Review, when appropriate • Manager/Owner's Review | <ul style="list-style-type: none"> • Document Owner • COR (If required) |
| Contractual Documents | <ul style="list-style-type: none"> • CDRLs | <ul style="list-style-type: none"> • Document Chair • Designated Reviewers | <ul style="list-style-type: none"> • Document Chair |
| Work Products | <ul style="list-style-type: none"> • Drafts • Work products under development • Non-controlled items like Meeting Minutes | <ul style="list-style-type: none"> • As deemed necessary by the owner of the work product | <ul style="list-style-type: none"> • N/A |

Table 1-2: Configuration Management (CM) Control Levels

1.4 Configuration Management (CM) Guidance

The purpose of CM is to establish and maintain the integrity and control of the products of the ERA program throughout its lifecycle. CM is an integrated process for identifying, documenting, monitoring, evaluating, controlling, and approving all changes made during the lifecycle of the program to critical information that is shared by more than one (1) individual. CM is one of the best practices identified by the 16 Critical Software Practices published by the Software Program Managers Network and is a key to successful software acquisition. The IEEE Guide to Software Configuration Management (IEEE Std. 1042-1987) provides CM guidelines.

1.4.1 Provisions

- CIs are maintained in the CM repository and are accessible to the CM team and specified PMO staff.
- An identification scheme and change process for CIs is documented in this CMP and is applied to the CI.
- Baselines are established, and the status of those baselines are recorded and communicated to the affected groups and individuals.

1.4.2 Accountability

The overall responsibility for CM within ERA resides with the Program Director (PD). This responsibility is explicitly delegated to the CM Manager. Each project or sub-project within ERA includes coordination with CM. CM products shall be compatible with the ERA CMP, unless a specific waiver is provided by the ERA PD. The structure and responsibility of CM is described in the ERA CMP.

1.4.3 Policy Statements

- The CIL specifically identifies the items to be maintained under CM.
- CM will occur concurrently with project management, and will continue throughout the project's lifecycle.
- The QM function will regularly audit the baselines and the processes according to their procedures and schedules.
- A CCB is established to control the CIs.
- All projects or sub-projects shall provide adequate resources for CM.
- A CM team, headed by the CM Manager, exists and CM processes, library systems, and CM tools are maintained by that team.
- Training for ERA personnel on CM standards, processes, and tools for the ERA Program is provided by the CM team.
- Measurements are defined by the overall *Metrics Plan (MP)* and are used by the program manager to monitor PMO activities. The CM team ensures that CM metrics are collected, and the QM Team verifies that the measurement process is followed as part of their audits.
- Senior and project management reviews CM status and effectiveness. The *Program Management Plan (PMP)* defines the events and intervals for this review.

1.4.4 Assumptions

A list of assumptions is provided below, as they may impact the cost, schedule, or ability to perform configuration management activities for the ERA Program.

- Necessary funding and resources required to support CM activities will be available when needed.
- The schedule of CM activities and their task dependencies will be achieved.
- Access to contractor facilities, resources, and work products will be provided as required to allow reliable monitoring of contractor activities and work products.
- Interface with other organizations, e.g., Information Technology Support Services (ITSS) CCB, working groups, etc., will be available as needed to support ERA CM activities.
- Delivery of work products will be provided within a sufficient time frame to allow required CM activities to be performed.

1.4.5 Limitation

A limitation that may impact the administration of CM activities for the ERA program is discussed below.

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 configuration management must ensure that adequate CM activities are provided to support the incremental release of system components and functionality.

1.5 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 1-3, Acronyms List**, contains a list of acronyms used herein.

| ACRONYM | DEFINITION |
|---------|----------------------------------|
| ABL | Allocated Baseline |
| AS | Acquisition Strategy |
| CBL | Concept Baseline |
| CCB | Configuration Control Board |
| CDR | Critical Design Review |
| CDRL | Contract Data Requirements List |
| CI | Configuration Item |
| CIL | Configuration Item List |
| CM | Configuration Management |
| CML | Configuration Management Library |
| CMP | Configuration Management Plan |

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| ACRONYM | DEFINITION |
|---------|---|
| CMN | Common |
| COR | Contracting Officer Representative |
| COTS | Commercial Off The Shelf |
| CPP | Configuration Management PVCS Procedures |
| CR | Change Request |
| CSA | Configuration Status Accounting |
| ELC | ERA Life Cycle Document |
| EOP | Executive Office of the President |
| ERA | Electronic Records Archives |
| FBL | Functional Baseline |
| FCA | Functional Configuration Audit |
| FOC | Full Operational Capability |
| HWCI | Hardware Configuration Item |
| ICWG | Interface Control Working Group |
| IEEE | Institute of Electrical and Electronics Engineers |
| IRD | Interface Requirements Document |
| ITSS | Information Technology Support Services |
| IV&V | Independent Verification and Validation |
| LMC | Lockheed Martin Corporation |
| MCD | Master Configuration Document |
| MP | Metrics Plan |
| NARA | National Archives and Records Administration |
| OCR | Operations Change Request |
| Ops CCB | Operations Configuration Control Board |
| PAT | Product Acceptance Test |
| PBL | Product Baseline |
| PCA | Physical Configuration Audit |
| PD | Program Director |
| PDR | Preliminary Design Review |
| PM | Project Manager |
| PMO | Program Management Office |
| PMP | Program Management Plan |
| PSD | Program Support Division Director |
| PVCS | Polytron Version Control System |
| QA | Quality Assurance |
| QM | Quality Management |
| QMP | Quality Management Plan |
| RD | Requirements Document |
| RM | Release Manager |
| SCM | Software Configuration Management |
| SDR | System Design Review |
| SOP | Standard Operating Procedure |

| ACRONYM | DEFINITION |
|---------|-----------------------------------|
| SRR | System Requirements Review |
| Std | Standard |
| SyRS | System Requirements Specification |
| TBD | To Be Determined |
| TEP | Technical Review Process |
| TRA | Training Needs Assessment |
| UCM | Unified Change Management |
| WBS | Work Breakdown Structure |

Table 1-3: Acronyms List

1.6 References

The standards, guidelines, and documentation used to develop this CMP are described in the sections that follow.

1.6.1 ERA PMO Documents

The following ERA PMO documentation was used to support the development of this document using the versions listed below.

- ERA Life Cycle (ELC), Version 3.1
- Quality Management Plan (QMP), Version 5.0
- Program Management Plan (PMP), Version 3.0
- Acquisition Strategy (AS), Version 5.1

1.6.2 Standards and Guidelines

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

- IEEE Std. 610.12-1990, IEEE Standard Glossary of Software Engineering Terminology
- IEEE Std. 828-2005, IEEE Standard for Software Configuration Management Plans
- OMB Circular A-130, Management of Federal Information Resources

2.0 Configuration Management Elements

This section contains specific organizational information related to the management and organization of CM elements for ERA. The following CM elements will be discussed in the paragraphs below.

- CM Organization
- Roles and Responsibilities
- Organizational entities versus their responsibilities

- Applicable policies and procedures

2.1 Configuration Management Organization

The ERA PMO CM Organization consists of representatives from across the ERA PMO and ERA development contractor teams in each of the following roles.

- Program Director (PD)
- Assistant PD
- Program Support Division Director (PSD)
- Contracting Officer
- Contracting Officer Representative (COR)
- Configuration Control Board (CCB), (Reference the *CCB Charter*)
- Configuration Management (CM) Team
- Pre-Screening Group
- ERA Development Contractor Team
- Other CCBs, e.g., ITSS CCB
- Quality Management (QM) Team
- Testing Team
- Release Manager (RM)
- Operations Team
- Risk Management

The ERA CM Group consists of the CM Manager and CM Team members. See **Section 2.2** for description of CM Roles and their responsibilities. Additionally, the ERA CM Group will interface with other groups, including the ERA Pre-Screening Group, other CCBs, and the ERA Contractor Development CM Team as necessary.

The ERA PMO CM Organization is illustrated in **Figure 2-1, Configuration Management (CM) Organizational Relationships**. Within the ERA PMO CM Organization, the CM Manager oversees the CM Team and all CM activities and issues. The CM Manager reports CM activities and issues to the PD. The PSD reports CM activities and issues to the PD. The PD has the overarching responsibility for all CM activities for the ERA Program and delegates this authority as appropriate for the respective CM activities and tasks.

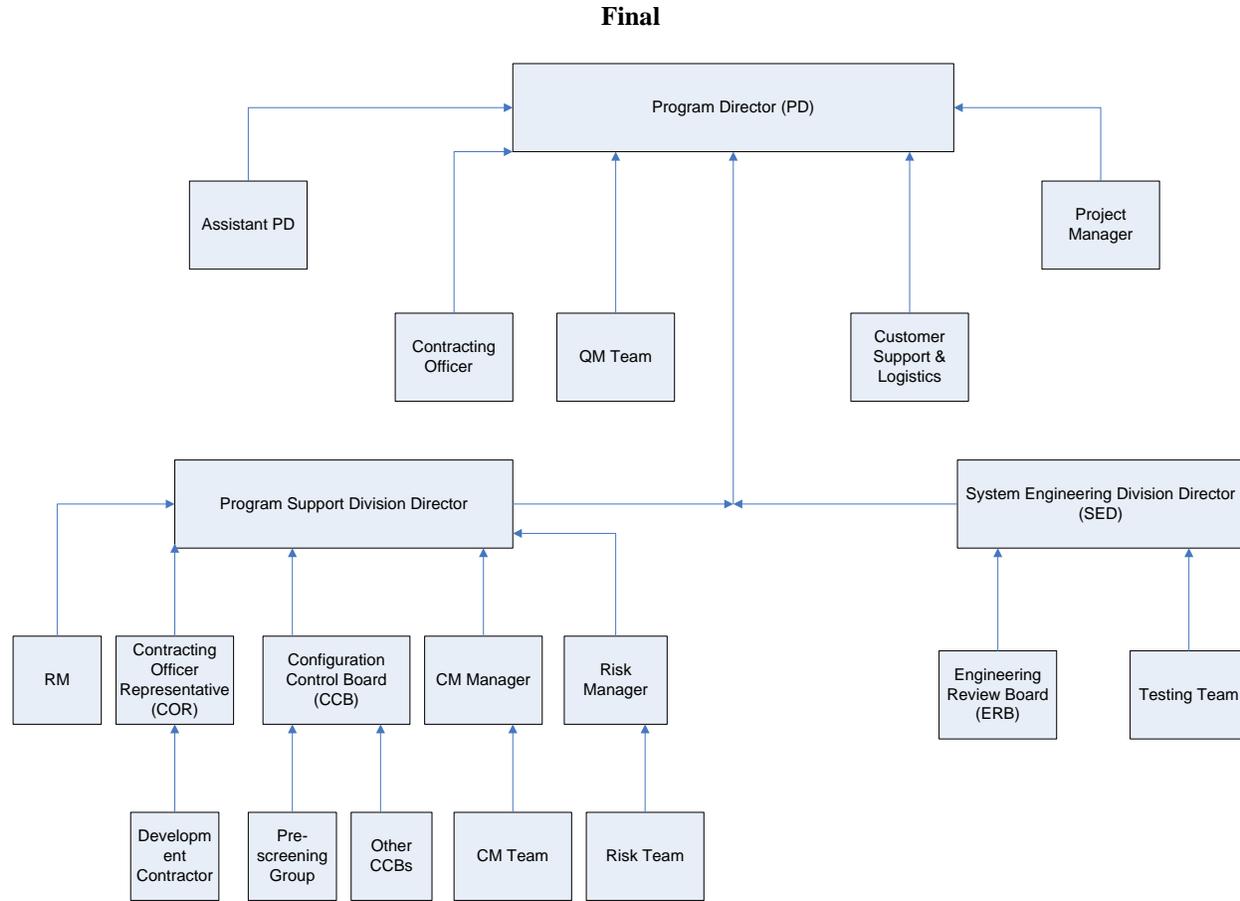


Figure 2-1: Configuration Management (CM) Organizational Relationships

For a system of this size, there is a need to support product interfaces, such as software-hardware and software-software interfaces. The organizational structure to support these interfaces will be addressed when additional details for interface requirements are specified. Currently, the Interface Requirements Document (IRD) identifies critical interfaces. Additionally, as discussed in **Section 3.7**, Interface Control Working Groups (ICWGs) will be established by ERA to manage and control changes to configuration items that interface with external systems.

Currently ERA does not interface with any outside systems so there is no need for an ICWG. The only internal interface is hardware sharing between the Base and EOP systems.

2.2 Configuration Management (CM) Roles and Responsibilities

The primary CM responsibilities for each of the ERA PMO CM Organizational roles, as identified in **Section 2.1**, are discussed in this section and are provided in **Table 2-1, Configuration Management (CM) Organization Roles and Responsibilities**. These responsibilities are defined for the entirety of the ERA lifecycle.

| Roles | Required Responsibilities |
|-------|---------------------------|
|-------|---------------------------|

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| Roles | Required Responsibilities |
|---|---|
| Program Director (PD) | <ul style="list-style-type: none"> • Provides oversight of CM activities to ensure successful program performance and compliance with program policies and federal regulations. • Ensures adequate resources are available for CM activities. • Ensures that support team leads and other persons in management or supervisory roles support the objectives of this CMP. • Designates the CCB membership and delegates CCB Chair authority to make configuration management decisions on behalf of the PD. • Resolves open CCB issues by making the final decision. |
| Assistant PD | <ul style="list-style-type: none"> • Supports the PD to provide overall program management and direction for ERA implementation. • Assists the PD to ensure that adequate CM staff supervision, staffing (hiring), and training are provided. |
| Program Support Division (PSD) Director | <ul style="list-style-type: none"> • Assists the ERA PD by providing leadership and program support for a wide range of analytical, management, and coordination duties. • Delegated by the PD to provide leadership and oversight of CM activities, processes, and tasks performed by the division staff and provides similar oversight of contractors. • Permanent member and Chairperson of the CCB and provides key leadership to the board for the effective review and evaluation of Change Requests (CRs). • Works closely with the Systems Engineering Division to ensure the successful implementation of CM activities for the ERA. • Reviews CM reports as necessary. |
| System Engineering Division (SED) Director | <ul style="list-style-type: none"> • Assists the ERA PD by providing oversight and leadership for all technical aspects throughout the lifecycle of the ERA program. • Permanent member of Pre-Screening Group and provides leadership to the board for the effective review and evaluation of Engineering Change Proposals (ECPs). • Ensures the successful implementation of CM activities for ERA within the SED. |

| Roles | Required Responsibilities |
|--|---|
| Contract Officer (CO)/Contract Officer Representative (COR) | <ul style="list-style-type: none"> • The Contracting Officer (CO) can delegate his or her responsibilities to the Contracting Officer Representative (COR). Some of the responsibilities are listed below. <ul style="list-style-type: none"> – Reviews and approves program work products. – Oversees contractors’ schedules, budget, and deliverables to ensure they meet contract requirements. – Reviews and evaluates project metrics to identify deficiencies and make corrections where necessary. – Identifies opportunities for improvement and develops strategies for improving processes. – Represents the interests of ERA PMO, stakeholders, and potential users. |
| Configuration Control Board (CCB) (See the <i>CCB Charter</i> or <i>Operations CCB Charter</i> for additional information) | <ul style="list-style-type: none"> • Ensures that proposed changes are evaluated with respect to their impact on program elements; including program cost, performance, schedule, and functionality. • Reviews change requests and change proposals to decide disposition. • Monitors and tracks the status of change requests and change proposals. • Ensures that only approved changes are implemented. • Designated by the PD to approve baselines and configuration items for each baseline and changes to baselines. • Determines priority for change requests and change proposals, e.g., emergency, urgent, or routine priorities. • Identifies and approves configuration items for each baseline. • Coordinates activities with other related CCBs as needed. |

Final

| Roles | Required Responsibilities |
|-------------------|---|
| CM Manager | <ul style="list-style-type: none"> • Designated by the PD to execute and direct CM activities for the ERA program. • Works with the ERA PD and the PSD Director to ensure that adequate resources and funding are available to perform CM activities. • Develops the CMP during the initial system development phase and revises the plan as necessary throughout the lifecycle. • Oversees CMP implementation and development of detailed CM policy and procedures. • Establishes the CM environment. • Ensures CM Team and program personnel receive adequate training to perform their CM activities. • Provides support to the CCB and the Pre-Screening Group. • Conducts CM audits according to industry standards and tracks audit action items to closure. • Prepares and submits standard reports to document the status of CM activities to the ERA PD, Project Manager (PM), and affected personnel. • Reviews CM status accounting and metric reports. • Reviews and monitors the development contractor's CM activities. • Identifies CM project risks, provides related data to the ERA Risk Officer, and implements appropriate risk management measures. • Identifies opportunities for CM process improvement and develops strategies and implementation plans. |

| Roles | Required Responsibilities |
|---|---|
| Configuration Management (CM) Team | <ul style="list-style-type: none"> • Establishes the ERA Configuration Management Library (CML). • Assists with the administration and management of CM tools and the management of the CM environment. • Maintains and documents system configuration items and baselines and records and reports configuration history for CM items. • Ensures that change requests are initiated, recorded, reviewed, approved, and tracked according to the CMP and other relevant documented procedures. • Provides support to the CCB and Pre-Screening Group. • Assists in conducting CM audits. • Collects CM metrics and prepares CM metrics reports. • Collects configuration status accounting data and prepares reports. • Supports PMO activities with any required CM data. • Supports the coordination of CM activities with the development contractor's CM team. • Supports various system reviews as required, to include, but not limited to, the System Requirements Review (SRR), System Design Review (SDR), and the Critical Design Review (CDR). |
| Development Contractor | <ul style="list-style-type: none"> • Responsible for all CM activities internal to the actual system integration. • Responsible for delivering the products necessary to create the ERA baselines and releases. • Responsible for creation and implementation of an internal CMP that is compliant with contractual standards. • Ensures that subcontractor development and CM activities are compliant with internal and contractual CM standards. |
| Pre-Screening Group | <ul style="list-style-type: none"> • Assists in the technical evaluation of change proposals. • Conducts impact analysis of change proposals. • Evaluates the cost, performance, and schedule impact of change proposals, and provides a recommendation to the CCB. |
| Other CCBs | <ul style="list-style-type: none"> • As system design and development proceeds, it may be necessary for ERA to establish multiple CCBs to manage the system (e.g., Ops CCB) and/or to handle varying levels of CM control. |

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| Roles | Required Responsibilities |
|-------------------------------------|---|
| Quality Management (QM) Team | <ul style="list-style-type: none"> • Audits CM program for compliance with documented procedures and standards and reports results to the ERA PD and affected personnel. • Ensures CM audits are conducted on all baselines. • Participates in the Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA). • Verifies approved changes are implemented in accordance with documented plans, standards, and procedures. |
| Testing Team | <ul style="list-style-type: none"> • Responsible for using the appropriate testing and CM tools when performing all test activities. • Assists in the development and identification of relevant CIs, such as test plans, scripts, data, releases for testing, and test environments. • Submits Change Requests (CRs) and/or Discrepancy Reports against releases of the system and modifications to CIs that are the results of enhancements and/or defects identified during testing. • Verify that changes are implemented to CIs. |
| Release Manager | <ul style="list-style-type: none"> • Proactively manage the Operational Software Release process. • Schedule Releases for implementation. • Coordinate Releases with PMO functional areas such as testing, security, and QM. • Coordinate and communicate the resolution of release issues with the PMO and prime contractor. • Review deployment schedule with the contractor and communicate to QM when Release verification can occur. • Notify CM when installation is complete. |
| Operations Team | <ul style="list-style-type: none"> • Assist CM in conducting Physical Configuration Audits to include, but not limited to, Baseline Engineering drawings i.e., Floor plans, Rack Elevations, "As-Built drawings" (Fire, Security Configurations, etc.) • Assist with Site Tours during PCA at the Rocket Center, WV/ABL facility. • Follow the necessary CM processes and procedures wherever applicable • Review pending deployments and/or releases and provide disposition (approval or disapproval) • Ensure releases have not effected Operational Capability • Establish standardized operating procedures consistent with ERA broad policies and objectives; |

Table 2-1: Configuration Management (CM) Organization Roles and Responsibilities

2.3 Organizational Entities versus Responsibilities

Specific CM activities and their level of responsibilities are shown in **Table 2-2, Roles vs. Responsibilities Matrix**, for each of the ERA PMO CM Organizational roles as identified in **Section 2.1**. Details of CM activities are defined in **Section 3.0**.

| Responsibilities | PD | COR | QM | CCB | CM | Contractor | Pre-Screening Group | Users/ Testers |
|-------------------------|------|------|---------|------|---------|------------|---------------------|----------------|
| Baseline Definition | | | | R, A | O, R | | | |
| Impact Analysis | | | | A | | | O, R, A | |
| Change Request | O | O | O | R, A | O, R | O | O | O |
| Configuration ID | A | | R | | O | | | |
| Software Development CM | | | R | A | R | O, R | | |
| Formal Audits/Reviews | | R, A | O, R, A | | O, R, A | | | |
| Status Accounting | A, R | R | R | | O | | | |

Table 2-2: Roles vs. Responsibilities Matrix

Key: O = Originate, R = Review, A = Approve

2.4 Applicable Policies and Procedures

Listed below are policies and procedures that have an impact on the execution of this plan.

2.4.1 ERA Policies

The following policies direct the development of the CMP:

- NARA Information Technology System Development Life Cycle Handbook (NARA 805)

2.4.2 ERA PMO Procedures

The ERA PMO has identified and developed procedures to govern the daily execution and management of the PMO and will continue to do so as needed. As these procedures are implemented, they continue to be reviewed to determine their impact on the execution of this plan. All the Standard Operating Procedures (SOPs) are posted on the S drive ([S:\ERAPMO\ERA Standard Operating Procedures \(SOPs\)](S:\ERAPMO\ERA Standard Operating Procedures (SOPs))) and housed in the CM repository.

2.5 Management of the CM Process

CM has an established and documented process to manage necessary changes, ensuring that all impacts to operations and support are addressed. Some of the benefits of CM from an industry view are as follows.

- CIs are defined and documented in the CIL and provide a known basis for making changes.
- CIs are correlated with their associated requirements.
- Proposed changes are identified and evaluated; change activity is managed using a defined process.
- Incorporation of changes to the CIs are verified and recorded throughout the lifecycle of the ERA Program.
- The ERA QM team is responsible for the independent surveillance of the CM activities to ensure compliance with the CM plan.
- Risk management has been incorporated as a critical element of the ERA Program Management process. Risks are identified by the CM team and managed and tracked by ERA Risk Management Team.

3.0 Configuration Management Activities

CM activities include all functions and tasks required in managing the CIs of ERA as specified in the scope of this plan. Both technical and managerial CM activities will be identified and controlled through implementation of the following CM processes.

- Configuration Identification
- Configuration Control
- Configuration Status Accounting
- Configuration Audits and Reviews
- Interface Control
- Subcontractor/Vendor Control
- Release Management and Delivery
- CM support to other PMO activities, as required

3.1 Configuration Identification

Configuration identification forms the cornerstone upon which all CM activities are based. Configuration identification is an element of CM that is concerned with selecting the CIs for a system or product, assigning unique identifiers and naming conventions, and recording their functional and physical characteristics in technical documentation. A CI is defined as an aggregation of hardware, software, or both that is designated for CM and treated as a single entity in the CM process (IEEE Std 610.12-1990). This section specifies the configuration identification activities to be performed during the ERA lifecycle, including identifying CIs, naming CIs, and acquiring CIs.

3.1.1 Identifying Configuration Items

Configuration identification activities identified for the ERA program include the selection of CIs, baseline management, and the unique identification of CIs (e.g., the numbering or naming CIs). The following paragraphs will specify configuration identification activities for the ERA program.

- ERA Baselines
- System CIs
- Configuration Identification Documents

3.1.1.1 Identifying ERA Baselines

A baseline is a logical grouping of CIs that constitute the system. Baselines provide a fixed reference to specify the CIs at a particular milestone event or point in time. A baseline establishes an approved standard upon which subsequent work can be made. After an initial baseline is established, changes to the baseline can only be performed through a formal change request process as identified in **Section 3.2**. The ERA CIs, both internal and external, are listed in the CIL, which is located in Polytron Version Control System (PVCS) Version Manager.

The ERA CM establishes four (4) types of baselines.

- Concept baseline (CBL)
- Functional baseline (FBL)
- Allocated baseline (ABL)
- Product baseline (PBL)

All baselines will be reviewed, established, and approved by the ERA CCB or Operations CCB (Ops CCB) as needed. See the *CCB Charter* and *Operations CCB Charter* for additional information about the CCB authority. Changes to baselines are submitted as change requests and are dispositioned by the ERA CCB or Ops CCB as indicated.

The four (4) baselines identified for ERA are described below.

- **Concept Baseline (CBL)** The CBL documents the activities performed during concept exploration and baselines the related program management plans and procedures developed during the initiation of the program. The CBL began with the “Needs Exploration” and “Concept Exploration” phases and is established at contract award via approval of the official list of CIs by the CCB.
- **Functional Baseline (FBL)** The FBL contains the approved technical documentation that establishes the functional and performance characteristics, interoperability requirements, and verification requirements for the system’s CIs. The FBL begins at the completion of the CBL and is formally established at the completion of the System Requirements

Final

Review (SRR) and delivery of accompanying documentation to the CM Team. Approval of the official list of CIs for the FBL is performed by the CCB at the completion of SRR.

- **Allocated Baseline (ABL)** The ABL contains the approved specifications for governing the development and verification of the system CIs. The ABL represents the next logical progression from the functional baseline and represents the link between the design process and the development process. The ABL begins at the conclusion of SRR and is formally established at the completion of Product Acceptance Test (PAT). Approval of an official list of CIs for the ABL is performed by the CCB at the completion of PAT.
- **Product Baseline (PBL)** The PBL contains the approved documentation for defining a CI during the production, operation, and maintenance phase of the system's lifecycle. The PBL is established when total increment functionality has been accomplished at the completion of each increment. The PBL encompasses all releases for the present increment and each prior increment. The final increment will provide ERA with Full Operational Capability (FOC). Approval of an official list of CIs for the PBL is performed by the CCB at the completion of PCA.

The *ERA Acquisition Strategy (AS)* identifies an incremental approach to manage acquisition risk and to release components into the system faster. ERA will be implemented in as many as five (5) separate increments. Each increment will have multiple system releases, usually two (2) or three (3) releases. Multiple system releases provide users with increasing functionality within reasonable timeframes and allows the PMO to evaluate contractor progress and product suitability. See the *ERA AS*, Section 3.2, Incremental Acquisition Approach, for additional information regarding multiple releases of ERA.

Figure 3-1, ERA Program Milestones and Baselines, illustrates the baselines which are established at the completion of the milestones as they occur throughout increments of the ERA lifecycle.

Final

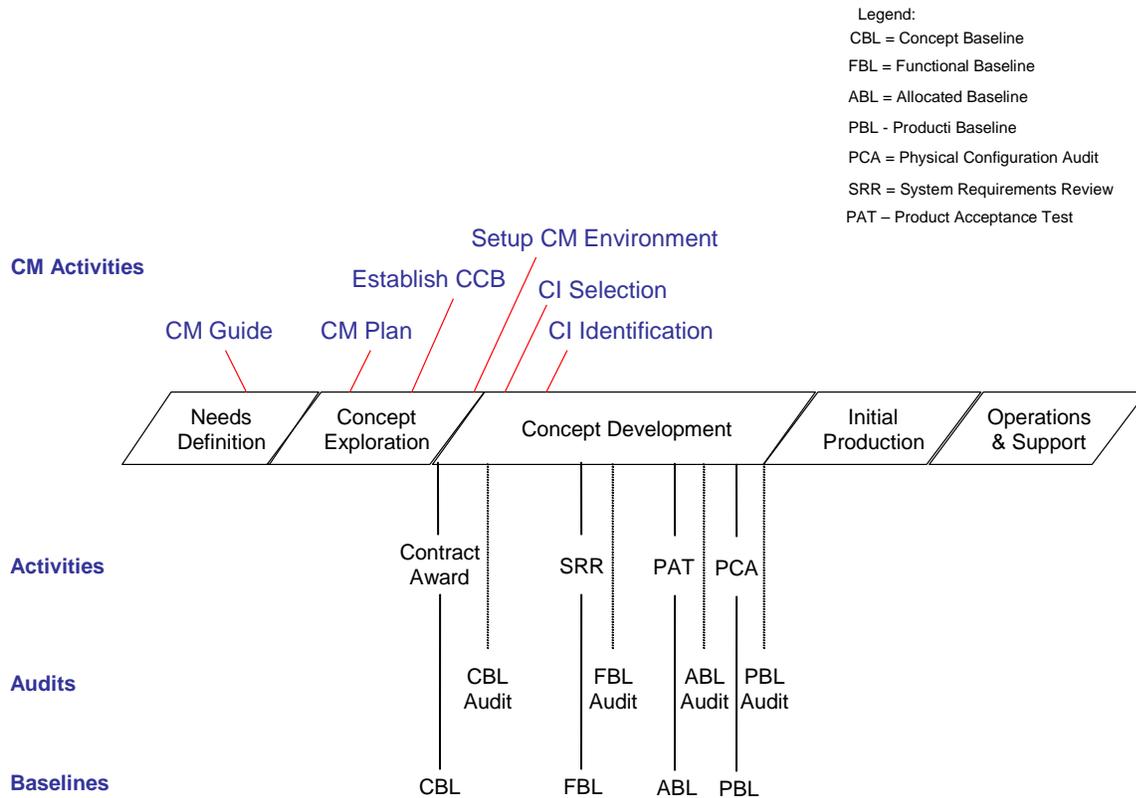


Figure 3-1: ERA Program Milestones and Baselines

3.1.1.2 Identifying System Configuration Items

System architecture identifies the structure and relationships of system activities, components, and elements within the ERA system. The structure to support the logical identification of system components and their relationships is provided in **Figure 3-2, ERA System Architecture**, and described in the following paragraphs:

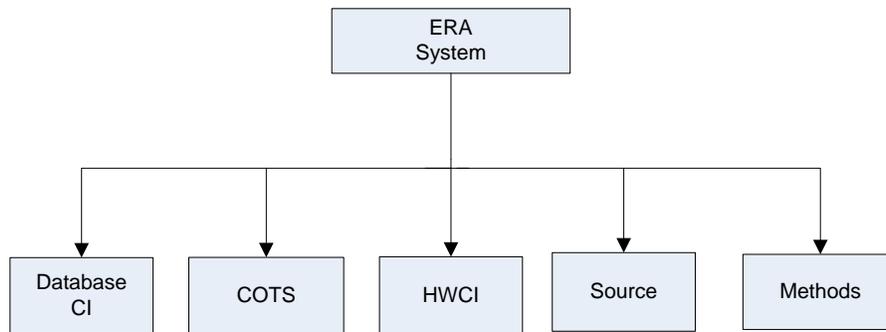


Figure 3-2: ERA System Architecture

Final

ERA System – The ERA system is the highest level of composition and represents the collection of Hardware Configuration Items (HWCIs), COTS CIs, database CIs, and Methods that are required to accomplish the complete functionality of the ERA system.

The ERA system is decomposed into nine (9) functional segments that represent major capabilities of ERA, and two (2) major activities; testing and support. ERA functional segments are illustrated in **Figure 3-3, ERA Functional Segments**. See the *Requirements Document (RD)* Section 2.7, Requirements Categorization, for a detailed description of the major capabilities for each package.

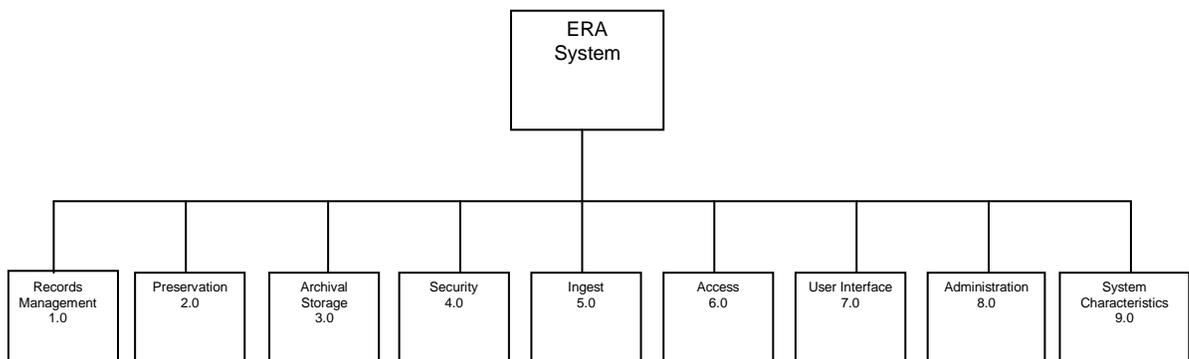


Figure 3-3: ERA Functional Segments

System Configuration Items (CIs) – CIs are an aggregation of reasonably mature hardware, software, COTS, or database components that combine together to perform a specific function or functions. A CI may be related to a specific segment or may be a primary sub-level to the general ERA system that might include components that are a distinct part of a CI. There are four (4) types of CIs that have been identified for the ERA system and they are discussed below.

Hardware Configuration Item (HWCI) – An HWCI is an aggregation of hardware components that is designated for CM and is treated as a single entity.

Source – A source is an aggregation of software components that is designated for CM and treated as a single entity.

Commercial Off The Shelf (COTS) CI – A COTS product CI is pre-packaged computer software that performs a specific function or functions. Examples of COTS CIs include operating system software, networking software, database software, etc. Selected COTS CIs that are designated for CM are treated as a single item.

Final

Database Configuration Item – A database CI is a collection of interrelated data that is organized and stored within electronic files. Select databases CIs that are designated for CM are treated as a single item.

Methods- A method consists of a sequence of statements to perform an action, a set of input parameters to customize those actions, and an output value (called return value) of some kind. Methods can provide a mechanism for accessing (for both reading and writing) the data stored in an object or a class.

3.1.1.3 Identifying Configuration Identification Documents

Configuration identification documents are technical documents that support the configuration and development of a CI throughout the lifecycle of the system. These technical documents are developed through increasing levels of detail as the system evolves. Technical documents are used to establish baselines at specific milestones throughout the lifecycle of the system. Four (4) types of technical documents identified for the ERA program are listed below and discussed in the following paragraphs.

- Specifications
- Drawings and Parts Lists
- Technical Manuals
- Management Plans and Procedures

Specifications - Specifications state the functions and capabilities that a system must provide and the constraints that are applied to the system. Specifications can be documented in several ways including; textual descriptions, graphical models or drawings, and mathematical models. Approved specifications for the ERA program will be placed under CM control e.g., Requirements Document.

Drawings and Parts Lists - An engineering drawing is a pictorial representation that depicts the functional and physical characteristics of a CI. A parts list is a list of all parts required for the development of a CI. Approved engineering drawings and parts lists for the ERA program will be placed under CM control e.g., Master Configuration Document (MCD) and COTS Inventory Report.

Technical Manuals - Technical manuals describe the operation, installation, administration, and maintenance of the system. Technical manuals are generally contract deliverables and will be controlled and maintained under CM control to ensure that they are compatible with the CIs that they describe. Examples of technical manuals include:

- System Administrative Guide,
- System Operational Guide, and
- System Maintenance Manuals.

Management Plans and Procedures - Management plans and procedures describe the various activities required for the management of the ERA program. These documents define the organization, policies, procedures, standards, schedules, and resources that are required to provide for the execution of these activities. These documents include PMO generated and contractor deliverables, and are placed under CM control as they are accepted by the ERA PMO. Examples of management plans include:

- Program Management Plan,
- Software Development Plan,
- Configuration Management Plan,
- Quality Management Plan, and
- Acceptance Test Plan.

3.1.2 Naming Configuration Items (CIs)

A naming convention, combined with labels, is used to uniquely identify the CIs and Work Products that are placed under CM control for the ERA program. The naming convention uniquely identifies each item and their different versions.

The naming convention for the CIs is organized into two (2) parts: CI type and the type of file. File names consist of a combination of the file or CI title with an underscore between each word in the title and file type extension, as shown **Table 3-1, Examples of File or CI**. These CIs are tagged with version labels as detailed in **Section 3.1.2.1**.

| File or CI Title | Name Identifiers |
|---------------------------------|--|
| Configuration Management Plan | Configuration_Management_Plan.doc |
| ERA Progress Report to Congress | ERA_Progress_Report_To Congress Report.doc |

Table 3-1: Examples of File or CI

3.1.2.1 Labeling ERA CIs

The following paragraphs describe the labeling conventions for documentation CIs for the ERA program. **Table 3-2, Labeling Standards**, details the ERA labeling convention.

| Type of Baseline | Type of Deliverable | Document Acronym | Version Number of the Deliverable | Date of the Deliverable |
|------------------|---------------------|------------------|-----------------------------------|-------------------------|
| nBL | nnnn | AAA (e.g., PMP) | vX.X | mm/dd/yy |

Table 3-2: Labeling Standards

nBL_nnnn_aaa_vx.x_mm/dd/yy

where “n”BL defines the type of baseline:

| Type | Baseline |
|------|------------|
| A | Allocated |
| C | Concept |
| F | Functional |
| P | Product |

Where “nnnn” defines the type of deliverable:

Strict
Managed
CDRLX (Contractor Deliverables)

Where ‘X’ defines the number of the Contract Data Requirements List (CDRL)

Where “AAA” defines the document acronym: e.g., CMP, PMP, QMP and TMP.

Where “vx.x” defines the version number of the deliverable, e.g., v1.0, v2.2, etc. (not applicable for monthly deliverables)

And where mm/dd/yy defines the month, day, and year of the deliverable.

3.1.2.2 Labeling ERA Releases

For software releases that are received from the contractor, the ERA PMO will assign the following labels.

The use of Naming conventions identifies each release with a unique Build/Release Identifier. The software build/release identifier will consist of "ERA_" for the program name, an Increment Number, Release Number, and Incremented Software Update Number(s). There are currently five (5) types of builds/releases for which different naming conventions exist:

- ERA Base (Increment 1) software builds and PTR drops
- EOP Increment 2 software drops and PTR drops
- Increment 3 software sprints / builds and PTR drops
- CMN (Common) software builds
- COTS software releases.

Operations and Maintenance (O&M-Increment 1) and EOP (Increment 2) will follow the same naming convention as they have for past builds/drops, while Increment 3 CRI and OPA sprints and BASE builds also identify the specific project being built. The CMN and COTS SW release naming conventions remain unchanged.

The Increment 1 system releases employ the following nomenclature:

where:

P_ = ERA program name, always ERA_

i. = Increment Number (e.g., 1) followed by a period

r. = Release Number (e.g., 1, 2) followed by a period

b. = Build Number (e.g., 1, 2) followed by a period

d = PTR Drop Number (e.g., 1, 2, 7)

n = Delta - out-of-cycle Drop (alphabetic character)

e.g., ERA_1.2.2.9x = ERA Increment 1, Release 2, Build 2, Drop 9, 24th out-of-cycle (also called Patch or Delta) x

The Increment 2 system releases follow the nomenclature below:

where:

P_ = ERA program name, always ERA_

i. = Increment Number (e.g. 2) followed by a period

r. = Release Number (e.g., 1) followed by a period

d. = Drop Number (e.g., 1, 2, 3) followed by a period

f = Planned Follow-on PTR Drop (e.g., 1, 2, 3)

n = Delta - out-of-cycle Drop (alphabetic character)

e.g., ERA_2.1.7.2b = ERA Increment 2, Release 1, Drop 7, PTR drop 2, 2nd out-of-cycle

Note: Beginning with the Increment 2, Release 1, Drop 8 Drops, no follow-on Drops were scheduled; therefore, these planned Drops are always followed by ".0." Subsequent out-of-cycle Drops, therefore, employ an alphabetic character following the "0."

e.g., ERA_2.1.11.0b = ERA Increment 2, Release 1, Drop 11, initial drop, 2nd out-of-cycle

Final

The Increment 3 system releases follow one (1) of two (2) nomenclatures. The first is used by the CRI and OPA applications:

where:

P_ = ERA program name, always ERA_

PRJ_ = Specific I3 Project (e.g., CRI_, OPA_)

i. = Increment Number (e.g., 3) followed by a period

r. = Release Number (e.g., 1, 2) followed by a period

s. = Sprint Number (e.g., 1, 2, 3) followed by a period

f = Planned follow-on PTR Drop Number (e.g., 1, 2, 3)

d = Delta - out-of-cycle Drop (alphabetic character)

e.g., ERA_OPA_3.2.5.3 = ERA OPA Increment 3, Release 2, Sprint 5, Drop 3

ERA_OPA_3.2.6.1a = ERA OPA Increment 3, Release 2, Sprint 6, Drop 1, 1st Delta

For the Increment 3 Base replan, the program returned to the nomenclature used in Increment 1 with the addition of the Base I3 Project:

where:

P_ = ERA program name, always ERA_

PRJ_ = Specific I3 Project (e.g., BASE_

i. = Increment Number (e.g., 3) followed by a period

r. = Release Number (e.g., 2) followed by a period

b. = Build Number (e.g., 1, 2, 3, 4) followed by a period

d = Drop Number (e.g., 1, 2, etc); scheduled weekly PTR Drops

n = Delta - out-of-cycle Drop (alphabetic character)

e.g., ERA_BASE_3.2.1.0 = ERA Increment 3, Base Replan, Release 2, Build 1, Drop 0

ERA_BASE_3.2.4.6b = ERA Increment 3, Base Replan, Release 2, Build 4, Drop 6, 2nd out-of-cycle drop

3.1.3 Labeling COTS and CMN Software Releases

The Common and COTS SW system Releases use the following format:

where:

PRJ_ = Common or COTS SW (e.g., CMN_, COTS_)

yy. = Two (2) -digit year number (e.g., 09, 10, 11) followed by a period

mm. = Two (2)-digit month number (e.g., 01-12) followed by a period

w = Single-digit week number (e.g., 1-5)

n = Delta - out-of-cycle Drop (alphabetic character)

CMN_09.01.2a = A delta CMN Release for week 2 of January, 2009

COTS_10.01.2 = A planned COTS SW Release for week 2 January, 2010; week 2 is the monthly COTS SW release containing the security patches

COTS_09.05.5 = A planned COTS SW Release for week 5 of May, 2009

3.1.3.1 Labeling ERA HWCI

Labels for HW are done by LMC and are accounted for in the Master Configuration Document (MCD). The MCD is under LMC CM Control. Per Nara Policy items over 3k are tagged by Ops team per the ERA Procurement and Asset Tagging process.

3.1.4 Acquiring Configuration Items (CIs)

The CM staff maintains the Configuration Management Library (CML), which is the authoritative repository for the storage of the CIs. The CML contains all software and document CIs and any associated metadata, which is the data that describes the CIs within the repository. The CML contains the metadata for physical media stored within the physical library, including the storage location of the item. The CM staff provides access to authorized users. Applying changes to CIs under strict control stored within the CML must follow the change control process as discussed in **Section 3.2**.

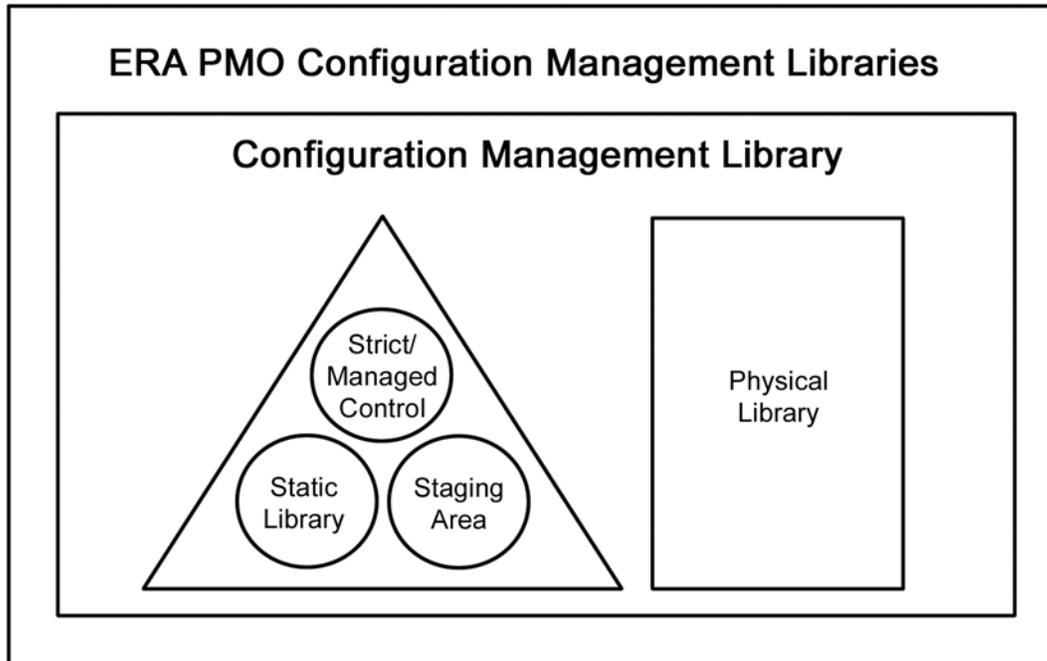


Figure 3-4: ERA Configuration Management Libraries

The CML is divided into four (4) separate areas; an area for items that are placed under strict/managed control, the static library, staging area, and physical library. These areas are discussed in the following paragraphs:

- **Strict/Managed Control Area** – The Strict/Managed control area is an area of the CML that maintains the integrity of the CIs for the ERA system. Currently, ERA uses the PVCS tool to maintain CIs.
- **Static Library** – The static library is the area where items are placed for general information and review. Items that are placed in the static library can be modified by the CM Team only. The specific location of the static library may depend on the context of its use, and will reside on a shared drive as “read-only.” The path for the Static Library For Base CDRLs is
 - : <S:\ERAPMO\ERA Configuration Management\Deliverables\LMC CDRLs>
- For EOP CDRLs:
 - <S:\ERAPMO\ERA Configuration Management\Deliverables\EOP CDRLs>
- For Inc 3 CDRLs:
 - <S:\ERAPMO\ERA Configuration Management\Deliverables\Inc 3>
- **Staging Area** – The staging area is the area where CIs are kept prior to be checked into PVCS Version Manager.

Final

- **Physical Library** – The physical library stores and maintains physical work products, such as CDs, facility drawings, or signed copies of accepted documents. A protected and secured area is designated by the CM Manager to store and maintain items placed in the physical library.

Currently, ERA is using PVCS Version Manager to maintain the CML. The *ERA CM PVCS Procedures (CPP)* document describes the procedures for reproducing, storing, accessing, and retrieving CIs. The Rational tools that ERA is using are:

- ClearQuest for change control management,
- Requisite Pro for requirements management,

A discussion of the rational tools that will be used to support specific CM activities within the ERA environment is provided in **Section 5.2**.

3.2 Configuration Control

Configuration control is a formal process for which a change to a CI is systematically proposed, evaluated, approved or disapproved, and implemented. Configuration control is an important process for regulating the configuration of system baselines and configuration items and ensuring that only approved changes are implemented. Configuration control ensures that system baselines are accurate and known throughout the lifecycle of the system. Currently, configuration control activities are processed and managed through Rational ClearQuest and the output of configuration control activities are collected and reported in configuration status accounting and metrics reports (see **Section 3.4.4**). The change control process as identified for the ERA program is discussed in the **Section 3.2.1**.

3.2.1 Configuration Control Process

Configuration control is the process for evaluating, coordinating, and deciding on the disposition of proposed changes to the CIs, and implementing the approved changes to baselined software and associated documentation and data. The configuration control process ensures that changes that have been proposed are classified and evaluated, approved or disapproved, and those that are approved are implemented, tested, verified, and incorporated into a new baseline.

Changes to software and associated documentation are classified according to the impact of the change and the approval authority needed. Depending on the scope, schedule, or cost there will be a hierarchy of people who can approve the changes. This hierarchy is defined in the CCB and Ops CCB Charter. Changes in scope or changes to current operational baseline require the approval of the appropriate CCB as defined ERA CCB charters and processes.

For ERA system there are two (2) types of Configuration Control Processes:

- [Dev Configuration Control Process](#)
- [ERA Operations Configuration Control Process](#)

Changes covered under the Dev Configuration Control Process:

- Deviations and Waivers: A deviation is granted for temporary, short-term relief of a requirement whereby future builds/deliveries will be in compliance. A waiver is granted for permanent relief of a requirement. Deviation and Waivers are approved by the CCB.
- Scope Changes: Any changes to the requirements must be approved by the CCB.
- ERA Operations Configuration Control Board Process
Any changes to the production system must be reviewed and approved by the Ops CCB
 - Emergency Fixes
 - When an Operations Change Request (OCR) is identified for an emergency fix, the change needs immediate action and will not allow enough time to follow all Configuration Control Processes. For example, if a system breaks down and the user cannot access the system, then we cannot wait for a change evaluation, CCB Meeting, change disposition, and so on. Correcting this type of difficulty is referred to as an emergency fix. The focus is to resolve the customer's needs immediately. The notification is sent by submitter to CCB Chair, Project Manager, Systems Engineering, CM Lead, and Operations Lead. After the fix is implemented, the Change Request (CR) is submitted and the Ops CCB process is followed through for historical purposes and audits.
 - Urgent Fixes
 - Issues that fall short of true emergency fixes (i.e., Significant loss of system operations or functionality and that require immediate action as above), but still require immediate attention and Ops CCB review and approval prior to implementation in advance of a regularly scheduled release. Out Of Board are usually considered as Urgent Fixes.
 - Maintenance Releases:
 - Maintenance releases are scheduled updates to the production system and fixes to address defects and are also subject to Ops CCB approval.

3.2.2 Version Control Overview

Version control is the process of managing and maintaining multiple revisions of a CI. Version numbers are planned for all types of CIs and document files needed for a program or project.

Strict Control CIs: Changes to Strict Control CIs are disposition through the CCB and tracked through Rational ClearQuest and Serena PVCS.

Managed CIs: Serena PVCS Version Manager is used to track changes to Managed CIs, such as program processes, procedures, user guides, standards documents, and Work Products (i.e. meeting minutes and agendas).

Version control is used to track changes to the CIs. It provides traceability to the documents by allowing:

- Reproducibility of previous versions of CIs, and
- Traceability to document the relationship between CIs.

The **version number** is listed on the cover page of a document. The version number is used to identify a specific set of updates to a CI. Version numbers are planned for all types of CIs and document files needed for a program or project.

Revision number is an instance of a versioned file that can be recreated. PVCS Version Manager automatically tracks the revision beginning with the initial check-in of the file. As a user updates the file and checks it into Version Manager, a new revision is created for the file as shown in **Figure 3-5, File Revisions**. As shown below, the file “shifter.rh” has four (4) revisions: 1.0, 1.1, 1.2, and 1.3. The revision number tracks and maintains the revision history of a file throughout the lifecycle of the file.



Figure 3-5: File Revisions

3.3 Major or Minor Document Updates

A major or minor document update includes updates to documentation CIs. The CI version number is the version number (Version 1.0) on the cover page of a document. It is used to indicate the progressive updates to a document. Changes to CIs can be either major or minor.

A major document update may include documentation of new program activities or extensive rework and is indicated by an increment to the next whole number, for example, 7.0 to 8.0 (these

numbers are version numbers listed on the front page of the document). The document owner determines whether the updates are major or minor.

A minor document update to documents may include, but is not limited to, spelling, grammar corrections, enhancements, or clarification. A minor release is indicated by an increment of .1; for example, 7.4 to 7.5 (these numbers are version numbers listed on the front page of a document).

3.4 Configuration Status Accounting

Configuration Status Accounting (CSA) is the CM activity that provides information about the current status of approved CIs and the progress and status of proposed and approved changes to the CIs. Configuration status accounting activities collect data that can be used to measure various aspects of program effectiveness and to assess product completeness and quality. The four (4) primary types of configuration status accounting reports identified for the ERA program are listed below and discussed in the following sections.

- CI List
- CR Reports
- Audit Reports
- CM Metric Reports

3.4.1 Configuration Item (CI) List

The Configuration Item List (CIL) is a list of CIs and it includes attributes of a CI, e.g., Title, Version Number etc. The CIL is a living document. The CM team reviews the CIL on a monthly basis and may add new CIs or modify them as appropriate during the course of the program. The PMO determines CI owners. Designated CI owners are responsible for maintaining CIs. The Government Point of Contact (POC) and the Program Office Support Team (POST) POC are documented in the CIL. The CIL is used to track the delivery of Internal CIs and CDRLs listed in the Integrated Schedule and are cross referenced to the contents of PVCS. **Appendix B** provides a sample segment of the CIL.

3.4.2 Change Request (CR) Reporting

A CR is used to request a change to a CI that has been baselined and placed under CM control. ERA uses ClearQuest to document the submission of a request, track its status, and document the evaluation of the potential impact of a change to the affected CIs. CR reports provide useful information about the quality of the product, trends in CR reporting, and the general quality of the configuration control process. The CR report that has been identified for the ERA program is discussed in the following paragraphs.

- States (State based reports)
- CBL Audit
- FBL Audit

- ABL Audit
- PBL Audit

3.4.2.1 States

State reports show that the number of CRs exist within a selected category (State) over a specified period of time, (e.g., weekly, monthly, per release, per increment) for the following categories.

- CR Submitted
- CR Reviewed
- Assigned
- Opened
- Resolved
- Reviewed

3.4.2.2 Concept BaseLine (CBL) Audit

The Concept BaseLine (CBL) is a foundation of CM. Attention to detail is analyzed in the system, and is to be a developed and focused effort that is required to take the system from concept to operations. The CBL Audit is performed at the completion of Contact Award.

3.4.2.3 Functional BaseLine (FBL) Audit

By establishing the Functional BaseLine (FBL), the functional and other requirements described in the Requirements Document (RD) become an explicit item against which the changes can be proposed, evaluated, implemented, and controlled. This baseline consists of an RD approved by the CCB.

The function of the FBL audit is to document the traceability between system concepts and high-level requirements to the lower level system specifications. The FBL audit is performed at the completion of SRR.

3.4.2.4 Allocated BaseLine (ABL) Audit

The Allocated BaseLine (ABL) contains the initial approved specifications that form the basis for the software development and testing. The ABL represents the logical progression from the FBL and represents the link between the design process and the development process.

The function of the ABL audit is to document that the system design is sufficiently detailed and traceable to the baseline system requirements to enable correct coding and development. Additionally, the ABL audit verifies that all requirements have been validated prior to the establishment of the design baseline. The ABL audit is performed at the completion of Product Acceptance Test (PAT).

3.4.2.5 Product BaseLine (PBL) Audit

The Product BaseLine (PBL) represents the technical and support documentation established after successful completion of the FCA and PCA. The PBL is the initial approved technical documentation (including source code, object code, and other deliverables) which defines CIs for the production, operation, and maintenance support during its lifecycle. The PBL audit is performed at the completion of PCA.

3.4.3 Audit Reports

The primary objective of configuration audits is to determine if selected system products meet functional and physical requirements. They are used to assess the products readiness to be baselined or released, and whether the products are complete as delivered. Audits of CM activities are also performed to assess effectiveness and to identify areas for improvement. Configuration audit reports capture audit findings and document discrepancies with corrective actions and estimated completion dates. Configuration audit reports identified for the ERA program include the following.

- FCA Report
- PCA Report

Configuration audit reports for the ERA program are discussed in the following paragraphs.

3.4.3.1 Functional Configuration Audit (FCA) Reports

The purpose of the FCA Report is to verify that the contractor development effort has successfully achieved the requirements specified in the configuration documentation, i.e., the design matches the requirements. In other words, an FCA is used to verify that each CI has adequately achieved the performance and the functional characteristics as specified in the system documentation. The FCA will be performed in accordance with the integrated schedule.

| Name: | Functional Configuration Audit (FCA) Report |
|--------------------------|--|
| Methods | Validation of system functionality can be performed by review of approved test plans, test specifications, and test reports; review of traceability matrix of test cases and test results to system requirements; and verification of test results by test team. |
| Inputs | ERA RD, SyRS, test plans, test specifications, test reports, Verification Cross Reference Matrix (VCRM) |
| Outputs | FCA findings, traceability verification matrix, discrepancies, proposed corrective actions, estimated completion dates |
| Intended Audience | ERA PD, COR, Division Managers, CM Manager, QM Manager, Testing Officer, Respective Contract Developer CM Manager |

Table 3-4: Functional Configuration Audit (FCA) Report

3.4.3.2 Physical Configuration Audit (PCA) Reports

The purpose of the PCA report is to verify the As-Built System matches the design documents, i.e., the hardware/software is fully and accurately documented. The PCA, along with the FCA, will generally be performed in accordance with the integrated schedule.

| | |
|---------------------------|--|
| Name: | Physical Configuration Audit (PCA) Report |
| Methods: | Validation of physical configuration can be performed by an inspection of the system documentation against the items physically listed and present in the product release. |
| Inputs: | System deliverables, source code, executables, build reports, release notes, version description documents |
| Outputs: | Physical configuration audit findings, discrepancies, proposed corrective actions, estimated completion dates |
| Intended Audience: | ERA PD, COR, Division Managers, CM Manager, QM Manager, Testing Officer, Respective Contract Developer CM Manager |

Table 3-5: Physical Configuration Audit (PCA) Report

3.4.4 Configuration Management (CM) Metrics Reports

The purpose of CM metrics is to measure performance. CM metrics also can be used to review and revise existing CM processes and procedures throughout the project lifecycle. The data derived from metrics is used to understand problems and inefficiencies in products and processes, to address the extent of those problems and inefficiencies, and to provide insight for making necessary corrections and improvements. This section includes the following:

- Configuration Status Accounting Reporting Frequency and Collection

3.4.4.1 Configuration Status Accounting Reporting Frequency

Timeliness is an important quality for configuration status accounting reporting. To ensure that configuration status accounting reports are received at the proper frequency required to provide meaningful information for informed decision making, a schedule for reporting frequency has been established. The reporting frequency as defined for the configuration status accounting reports for the ERA program are provided in **Table 3-8, Configuration Status Accounting Reporting Frequency**.

| Table Name | Reporting Frequency | | | | |
|------------|---------------------|-----------|------------|--------------|----------|
| | Monthly | Quarterly | By Release | By Increment | By Phase |
| CR opened | | √ | | | |
| CR Closed | | √ | | | |

| Table Name | Reporting Frequency | | | | |
|-------------------|---------------------|-----------|------------|--------------|--|
| | Monthly | Quarterly | By Release | By Increment | By Phase |
| CR Deferred | | √ | | | |
| Waivers Opened | | | √ | | |
| Waivers Closed | | | √ | | |
| Deviations Opened | | | √ | | |
| Deviations Closed | | | √ | | |
| FCA Reports | | | | | In accordance with the integrated schedule |
| PCA Reports | | | | | In accordance with the integrated schedule |

Table 3-6: Configuration Status Accounting Reporting Frequency

PVCS Version Manager is the repository that maintains the CML where all the documents related to ERA PMO are baselined. In addition, ClearQuest is used for managing change requests and action items. (See **Section 5.2** for a discussion of the CM tools.)

3.5 Configuration Audits and Reviews

Configuration audits are performed to determine if the configuration item accurately reflects the physical and functional characteristics as defined. Reviews are performed to ensure that CIs have been correctly identified and produced. A discussion of configuration audits and reviews proposed for the ERA program is provided in the following paragraphs.

3.5.1 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.

Items to be reviewed include but are not limited to the following test plans, test specifications, and test results to ensure that each CI performs as required:

- Acceptance Test Results;

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- Verification Cross Reference Matrix such that requirements from the ERA SyRS (which includes the entire requirement set from the *ERA RD*) will be traceable from design documents to test cases; and
- Technical manuals (e.g., system operating manuals, support documents) are verified for accuracy, completeness, and effectiveness of use.

3.5.2 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.

Items to be reviewed include but are not limited to the following:

- COTS Inventory Report;
- Master Configuration Document (MCD);
- Applicable drawings; and
- Final draft versions of technical documents, such as system operating and support documents.

3.5.3 Configuration Management (CM) Internal Audits

In addition to audits performed by QM, the CM Team performs internal audits to confirm documented procedures are followed.

- Configuration Control – The CM Team audits activities and outputs to determine if they are in compliance with the *Configuration Control Procedures*.
- Data Collection – The CM Team audits files and folders in Version Manager to verify compliance with the *Version Control and Naming Standard*.
- CM Audits – The CM Team conducts audits as needed to verify compliance with the other *CM Processes and Procedures*.
- CR Documentation – The CM Team monitors the audit trail of CR documentation packages from initiation through closure via the Clear Quest.
- Clear Quest Records – The CM Team examines ClearQuest records to verify that appropriate process related fields are properly populated.

3.5.4 Reviews

System design will evolve through a series of stages for the ERA program; from concept exploration, through concept development and initial production. As the design evolves, an evaluation of the completeness and adequacy of the design must be performed at critical milestones throughout the lifecycle of the system to ensure that system design is sufficient for subsequent design and development to proceed.

Final

The CM team participates in the following design reviews to ensure that system products have been correctly identified and that all issues have been resolved. Reference the *ERA Technical Review Process (TEP)* document for additional information on the review process. The following types of design reviews will be used in the ERA program.

- System Requirements Review (SRR)
- Preliminary Design Review (PDR)
- Critical Design Review (CDR)

A discussion of these design reviews identified for the ERA program is provided in the following paragraphs.

3.5.4.1 System Requirements Review (SRR)

The purpose of SRR is to verify the adequacy of system requirements to completely describe the desired system. The SRR is a technical review to ensure that the system under review can proceed into the system development. It also ensures that all system and performance requirements derived from the Initial Operational Capabilities Document are defined and are consistent with cost (program budget), schedule (program schedule), risk, and other system constraints. The SRR is performed towards the start of the concept development phase for each increment. The CM team participates in the SRR.

During Inc 1, ERA established the foundation of the BASE system. System Requirement were elicited and defined through a formal process of analysis, interviews, documentation and formal review. This sequence of activities was a 2-day formal SRR with participation from all stakeholders and PMO System engineering.

During Inc 2 and Inc 3, ERA continued building upon that foundation, and made modifications to the process based on Lessons Learned to make it more agile and responsive. This is necessary as ERA is addressing lower level business and behavior types of requirements, which are by nature more prone to changes and interpretation errors. Requirements now continue to be expressed at the A Level (SyRS) and the B Level (SwRS) as "shall" statements. The SwRS requirements are expanded to provide the necessary detail to ensure translation of intent from end user to test.

The formal 2 day "waterfall" like model of the Inc 1 SRR has evolved into a more "incremental" model. The initial draft of the SyRS and SwRS produced at the beginning of the development cycle is further decomposed and refined through a series of analysis and reviews with key stakeholders through the System IPT, the EOP IPT, the OPA IPT, the Preservation IPT, etc. Inputs from these meetings are documented through meeting minutes, tracked through IPT action item lists and any requirement modification handled through the SIG process. Feedback from disposition of the SIG process will in turn update the SyRS and SwRS for final delivery. All the closure artifacts are under CM control.

Requirements are also further refined based on feedback received from LM and NARA community, through user interface tests, and served as iterative feedback to the next cycle of development.

This process is needed as we are at the stage of the project where prototyping and implementation mock up are necessary to elicit the full desired system behavior.

3.5.4.2 Preliminary Design Review (PDR)

The purpose of PDR is to ensure that the system can proceed into detailed design and meet the stated performance requirements within cost, schedule, risk, and other system constraints. Generally, this review assesses the preliminary system design as captured in specifications for each CI in the system and ensures that each function in the FBL has been allocated to one (1) or more system level CIs. Overall project status, proposed technical solutions, evolving software products, and associated documentation are reviewed at a high level to determine completeness and consistency, raise and resolve any technical issues, and identify and mitigate project, technical, and/or business risks affecting continued detailed design. A successful PDR determines whether the hardware and software preliminary designs are complete, and whether the Integrated Product Team (LMC and PMO) is prepared to start detailed design and test procedure development. The CM team participates in the PDR.

3.5.4.3 Critical Design Review (CDR)

The purpose of CDR is to ensure that the system under review can proceed into system fabrication, demonstration, and test; and can meet the stated performance requirements within cost (program budget), schedule (program schedule), risk, and other system constraints. The CDR is conducted when the “build-to” system has been achieved, allowing production and coding of software deliverables to proceed. The CM team participates in the CDR.

3.6 Operations

The purpose of the Operations Configuration Control Process is to systematically analyze, coordinate, and provide disposition of proposed changes and track the implementation of approved changes to baselined items and associated documentation and data.

The process applies to the following areas in the operations environment:

- Software changes in the Production environment (Software components include all operating systems, security patches, application and infrastructure software, and any associated database and/or configuration files that are executed in the Production environment);
- Hardware and operating system environment maintenance (Hardware components include all computers, disk drives, controllers, and any other hardware required for the operation of ERA in the Production environment); and

- System Administration Guide lists, relevant processes and procedures that are needed for day to day activities.

Any additional processes or procedures are kept on the Shared drive. Location on the S drive is: [S:\ERAPMO\ERA Standard Operating Procedures \(SOPs\)\Operations](S:\ERAPMO\ERA Standard Operating Procedures (SOPs)\Operations)

3.7 Interface Control

The Interface Control Document (ICD) identifies critical interfaces to the ERA system, the owners of these systems, and specifies the interface requirements for the ERA system. To coordinate changes to configuration items for ERA with changes to interfacing systems, an Interface Control Working Group (ICWG) will be established as required for each interfacing system. Currently, ERA does not interface to any outside systems so there is no need for an ICWG. The only internal interface would be the hardware sharing between Base and EOP. Congressional Records Instance is a standalone system. The ERA CCB and Ops CCB are decision making authorities for reviewing and approving proposed changes to the system.

3.8 Subcontractor/Vendor Control

LMC is required to submit a CM plan that documents the details for their respective CM program. LMC's CMP will be consistent with the *ERA CMP* as appropriate. Additionally, the LMC's CMP and CM activities will be compliant with all contractual documents for the ERA program. The LMC's CMP must specify control for subcontractor activities; including subcontractor monitoring, audits and reviews to be performed, subcontractor change control process, and verification of all subcontractor deliverables. The LMC's CMP is a deliverable to the ERA PMO and is subject to review and acceptance by the ERA PMO.

The ERA Independent Verification and Validation (IV&V), QM, and CM teams will monitor LMC's CM activities to assess compliance with their procedures as defined in their CMP through performance, product and process reviews, and the conduct of informal CM audits.

3.8.1 Subcontractor Products

LMC has adopted a teaming approach with their sub-contractors, which integrates them into the LMC business processes.

3.8.2 Vendor Products

Vendor products selected for implementation in the ERA project must show evidence through test results that they meet functional and physical requirements. COTS products are verified for "suitability" to meet functional and physical requirements during LMC's system testing and then verified by the PMO during PAT testing. LMC performs preliminary analysis of products with the System IPT and trade studies to support their selection and eventual inclusion into the architecture.

3.8.3 Release Management and Delivery

The build, release, and delivery of software products for each increment are controlled by the LMC CM team, ERA CM Team, and Release Management. The process responsible for planning, scheduling and controlling the movement of Releases to test and Production environments is called Release Management. The primary objective of Release Management is to ensure that the integrity of the Production environment is protected and that the correct components are released. The Release Management SOP is located on the S drive at: [S:\ERAPMO\ERA Standard Operating Procedures \(SOPs\)\Release Management\Release Management_Vizio.doc](S:\ERAPMO\ERA Standard Operating Procedures (SOPs)\Release Management\Release Management_Vizio.doc)

4.0 Configuration Management (CM) Schedules

This section discusses schedule information for the sequence and coordination of CM and CM-related activities.

ERA CM maintains documentation that contains safety or security critical functions in accordance with the policies and procedures outlined in **Section 3.0** of the ERA CM Plan

4.1 General Configuration Management (CM) Activities Schedule

A list of planned CM activities and activity frequency for the entire lifecycle of the ERA Program is provided in **Table 4-1, Frequency of CM Activities**. This list will continue to change as details of the ERA Program are expanded.

Final

| CM Activity | Frequency |
|--|--|
| CM Planning and Management | |
| Plan CM activities and resources | Ongoing |
| Provide Status Report (Program Review) | Quarterly |
| Report CM activities to management | Weekly |
| Update <i>CMP</i> | At each Increment |
| Develop CM Procedures | On going |
| Develop CM Checklists | On going |
| Develop CM Forms | On going |
| Develop CM Templates | On going |
| Setup and maintain CM Environment | On going |
| Establish and maintain CM Library | On going |
| Archive CM records | At selected milestones and at close of ERA Program |
| Conduct CM Training | As defined in Table 5-4: Configuration Management (CM) Training Needs/As needed |
| Configuration Identification | |
| Configuration Item Identification | Ongoing |
| Develop and Maintain Configuration Item List | Ongoing |
| Establish ERA Baselines | At defined milestones (Section 3.1.1.1) |
| Change Control | |
| Manage Changes, Change Requests, and Change Proposals | Ongoing |
| Conduct ERA CCB Pre-Screening Meeting | Monthly (or as needed) |
| Conduct ERA CCB Meetings | Monthly (or as needed) |
| Conduct Ops CCB Meetings | Weekly (or as needed) |
| Configuration Status Accounting | |
| Collect Configuration Status Accounting information | Ongoing |
| Prepare Configuration Status Accounting reports | Ongoing, at specified schedules (see section Configuration Status Accounting) |
| Configuration Audits and Reviews | |
| Conduct FCAs | At defined milestones (see Sections 3.5.1) |
| Conduct PCAs | At defined milestones (see Sections 3.5.2) |
| Provide support to PMO in support of oversight audit | As required |
| Provide Support to QM of CM Audit of processes and practices | Regularly, as scheduled by QM |
| Provide Support to QM for SRR as needed | At defined milestones (see Section 3.5.4.1) |
| Provide Support to QM for PDR as needed | At defined milestones (see Section 3.5.4.2) |
| Provide Support to QM for CDR as needed | At defined milestones (see Section 3.5.4.3) |

Table 4-1: Frequency of Configuration Management (CM) Activities

Additionally, the ERA Integrated Schedule provides details for CM activities, schedule, sequence, task dependencies, and planned resources. Details for this schedule will continue to be developed to include the entire ERA lifecycle.

A proposed timeline for planned ERA configuration management activities is provided in **Figure 3-1, ERA Program Milestones and Baselines**. The ERA system will be developed and released in multiple increments and releases. Many of the activities identified in **Figure 3-1** will occur iteratively throughout the ERA lifecycle for each system increment.

5.0 Configuration Management (CM) Resources

This section discusses the products, software tools, hardware, personnel, and training required to implement CM activities for the ERA Program.

5.1 Configuration Management (CM) Organizational Products

A list of CM organizational products that is developed by the ERA PMO to support the daily operation of CM activities for the ERA program as shown in **Table 5-1, Configuration Management (CM) Organizational Products**. An organizational product is any work product developed for ERA that enables performance of PMO administration, technical, or management activities, such as SOPs, checklists, forms, templates, and ERA websites. Organizational products promote the consistency of activities performed across the PMO by specifying the procedures, tools, and techniques to be used for each task or process. Many of these organizational products have been identified for the PMO, but are currently in development. **Table 5-1** references the CM organizational products and indicates the status of each product, e.g., available, completed, in development, or retired.

| Title | Type | Description | Status | Location |
|---|-----------|---|-----------|---|
| CCB Decision Making Procedure | Procedure | Provides CCB roles and responsibilities and the specific steps for reviewing Change Requests. | Completed | S:\ERAPMO\ERA Standard Operating Procedures (SOPs)\Configuration Management |
| Configuration Control Procedure | Procedure | Provides the procedures to submit, evaluate, approve, and implement a change request. | Completed | S:\ERAPMO\ERA Standard Operating Procedures (SOPs)\Configuration Management\Configuration Control Process.pdf |
| Creating and maintaining the CM Library | Procedure | Provides the procedures for creating and maintaining the Managed Library and the items under managed CM control | | TBD |
| Conducting Configuration Audits | Plan | Provides the plans for conducting audits | Completed | S:\ERAPMO\ERA Configuration Management\Deliverables\Audit Plan\CM Audit Plan.doc |
| CM Audit Checklist: FCA and PCA | Checklist | Checklist for conducting the Functional and Physical Configuration Audits | Completed | PVCS |
| ERA CCB Agenda Template | Template | Provides the CCB Agenda Template | Completed | PVCS |
| ERA CCB Minutes Template | Template | Provides the ERA CCB Minutes Template | Completed | PVCS |
| ERA CR Form | Form | Standard ERA CR form | Completed | PVCS |

Table 5-1: Configuration Management (CM) Organizational Products

5.2 Configuration Management (CM) Tools

A list of tools identified to support CM activities is provided below.

- Rational ClearQuest
- PVCS Version Manager

Details of each tool, its functionality, and the CM activities that it is intended to support are provided in the paragraphs below.

5.2.1 Rational ClearQuest

Rational ClearQuest manages change requests and change proposals and tracks their status for the ERA Program. ClearQuest provides defect tracking, process automation, reporting and lifecycle traceability for better visibility and control of the system development lifecycle.

ClearQuest is managed as a CI and its configuration is documented and version controlled. Changes to ClearQuest's configuration are initiated through the configuration control process. A description of Rational ClearQuest and the intended change request management functionality that it supports is provided in **Table 5-2, Rational ClearQuest**, below.

| Software | Version | Functionality | Status of Implementation | Vendor |
|---|------------|--|--------------------------|--------|
| Rational ClearQuest | 2003.06.14 | <ul style="list-style-type: none"> • Change Request Management • Defect Reporting and Tracking • Enhancement Requests • Status Reporting | Implemented | IBM |
| CM Activities | | | | |
| Configuration Control: <ul style="list-style-type: none"> • Manage changes, Change Requests, and Change Proposals, Action Item tracking, change request tracking, defect reporting Configuration Status Accounting: <ul style="list-style-type: none"> • Collect CSA information, Prepare CSA reports, Prepare CR reports | | | | |

Table 5-2: Rational ClearQuest

5.2.2 PVCS Version Manager

PVCS is currently implemented within the ERA environment as the CM library repository for all CIs and work products that are placed under CM control. PVCS provides access for all authorized users to check-in and check-out items for use. PVCS also provides version control capability to manage the versioning of changed files. PVCS provides basic reporting capability

providing information about archives and revisions made to an item stored within PVCS. The following options are available when generating a report in PVCS.

- All of the versioned files of all of the projects/subprojects within the project database or project
- Only the versioned files within the selected project, not including the projects and/or subprojects

A description of PVCS Version Manager and its functionality and CM activities that it supports is provided in **Table 5-3, PVCS Version Manager**, below.

| Software | Version | Functionality | Status of Implementation | Vendor |
|--|---|--|--------------------------|--------|
| Polytron Version Control System (PVCS) – Version Manager | 7.5.1.5 (Client) | <ul style="list-style-type: none"> • CML Repository • Workspace Management and Version Control | Implemented | PVCS |
| | CM Activities | | | |
| | Configuration Identification: <ul style="list-style-type: none"> • CI identification, Maintain CI list, Establish ERA baselines, CI check-in/check-out, CI version control | | | |

Table 5-3: PVCS Version Manager

5.3 Configuration Management (CM) Support Environment

Currently, the CM support environment is maintained within the NARA network as illustrated in **Figure 5-1, ERA Configuration Management (CM) Support**, below. The NARA server has a partitioned area on the S Drive that is reserved for the ERA program. Currently security, maintenance (including backup and recovery of data), and access control for CM databases is maintained by the ERA staff. Access control is applied to each of the CM databases and managed by the ERA staff. CM is applied to the database to ensure that the configuration of the tool is documented and controlled.

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ERA CM Support Environment

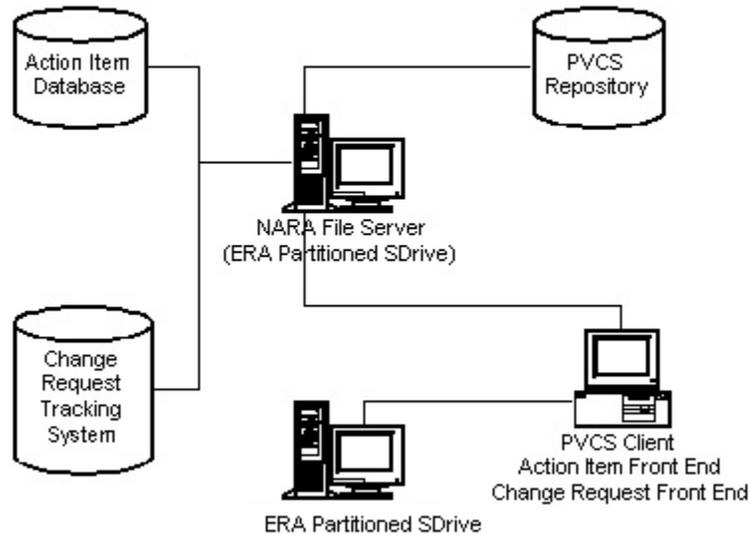


Figure 5-1: ERA Configuration Management (CM) Support Environment

Configuration Management (CM) Personnel

The CM team is divided into two (2) roles in support of CM operations: The CM Manager and the CM team, which is inclusive of a CM Analyst and a Software Tools Specialist. The CM Team is responsible for supporting the CM Manager in the day-to-day operation and planning of CM activities. Descriptions and functions for ERA CM Roles are identified in **Table 2-1, Configuration Management (CM) Organization Roles and Responsibilities**.

5.4 Configuration Management (CM) Training

Proper training is essential for ERA PMO to efficiently accomplish their tasks. Training needs are determined by matching skill requirements for a specific task against the skills of the assigned personnel.

Specific training needs for support of CM activities for the ERA Program have been identified in **Table 5-4, Configuration Management (CM) Training Needs**, below. The list of training requirements is expected to change as development of the ERA program continues to expand.

| Training | Type of Training | Description | Level |
|---|--------------------------|---|--------------|
| Rational ClearCase User Training, Unified Change Management (UCM) | Classroom and one on one | Training on the use of Rational ClearCase in a UCM environment. | Intermediate |
| ERA PVCS Version Management for CM, User Training | one on one | User training on the ERA procedures for CM as implemented in PVCS Version Manager. | Intermediate |
| ERA Rational ClearQuest for Change Management | Classroom and one on one | User training on ERA procedures for Change Request management as implemented in ClearQuest. | Basic |
| Configuration Control Process Training | Classroom and one on one | Informational to introduce CCB members to an overview of the CCB, its intended purpose, and roles and responsibilities. | Basic |
| CM Processes and Procedures Training | Classroom and one on one | User training on CM processes and procedures to PMO | Basic |

Table 5-4: Configuration Management (CM) Training Needs

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

6.0 Configuration Management Plan Maintenance

The ERA CM Manager is responsible for the development and maintenance of this plan. The CMP will continue to be updated as needed throughout the entire ERA lifecycle to ensure the relevance and adequacy of the CMP to plan and manage CM activities. Scheduled updates to the CMP will follow the projected dates listed in WBS. The ERA CMP is under CM control.

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APPENDIX A: IEEE Std. 828-2005 Document Tailoring

This document is based on a tailored version of IEEE Std. 828-2005. **Table A-1, IEEE to CMP Mapping**, details the mapping between 828-2005 and this CMP.

| IEEE Std. 828-2005 | ERA Configuration Management Plan (CMP) | Additions to requirements of IEEE Std 828-2005 |
|--|---|---|
| 3 The software Configuration Management Plan | | |
| 3.1 Introduction | 1.0 Introduction | 1.1 Purpose |
| | | 1.2 Overview |
| | | 1.3 Scope |
| | | 1.3.1 Document Organization |
| | | 1.3.2 Configuration Item Control Levels |
| | | 1.4 CM Guidance |
| | | 1.4.1 Provisions |
| | | 1.4.2 Accountability |
| | | 1.4.3 Policy Statements |
| | | 1.4.4 Assumptions |
| | | 1.4.5 Limitations |
| | | 1.5 Definitions and Acronyms |
| | | 1.6 References |
| | | 1.6.1 ERA PMO Documents |
| | | 1.6.2 Standards and Guidelines |
| 3.2 Software Configuration Management (SCM) | 2.0 CM Management Elements | |
| 3.2.1 Organization | 2.1 Configuration Management Organization | |
| 3.2.2 SCM Responsibilities | 2.2 Configuration Mgt. Roles and responsibilities | |
| | | 2.3 Organizational Entities versus Responsibilities |
| 3.2.3 Applicable Policies, directives and procedures | 2.4 Applicable policies and procedures | |
| | | 2.4.1 ERA Policies |
| | | 2.4.2 ERA PMO Procedures |
| | | |
| | | |
| | | |
| | | |

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| IEEE Std. 828-2005 | ERA Configuration Management Plan (CMP) | Additions to requirements of IEEE Std 828-2005 |
|---|--|--|
| 3.2.4 Management of the SCM Process | 2.5 Management of the CM Process | |
| 3.3 SCM Activities | 3.0 Configuration Management Activities | |
| 3.3.1 Configuration Identification | 3.1 Configuration Identification | |
| 3.3.1.1 Identifying Configuration Items | 3.1.1 Identifying Configuration Items | |
| | | 3.1.1.1 Identifying ERA baselines |
| | | 3.1.1.2 Identifying System Configuration Items |
| | | 3.1.1.3 Identifying Configuration identification Documents |
| 3.3.1.2 Naming Configuration Items | 3.1.2 Naming Configuration Items | |
| | | 3.1.2.1 Labeling ERA CIs |
| | | 3.1.2.2 Labeling ERA Releases |
| | | 3.1.3 Labeling COTS and CMN Software Releases |
| | | 3.1.2.3 Labeling ERA COTS Software Release |
| | | 3.1.3.1 Labeling ERA HWCI |
| 3.3.1.3 Acquiring Configuration Items | 3.1.4 Acquiring Configuration Items CIs | |
| 3.3.2 Configuration Control | 3.2 Configuration Control | |
| 3.3.2.1 Requesting Changes | 3.2.1 Configuration Control Process | |
| 3.3.2.2 Evaluating Changes | 3.2.1 Configuration Control Process | |
| 3.3.2.3 Approving Disapproving Changes | 3.2.1 Configuration Control Process | |
| 3.3.2.4 Implementing Changes | 3.2.1 Configuration Control Process | |
| | | 3.2.2 Version Control Overview |

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| IEEE Std. 828-2005 | ERA Configuration Management Plan (CMP) | Additions to requirements of IEEE Std 828-2005 |
|--|---|---|
| | | 3.3. Major or Minor Document Updates |
| 3.3.3 Configuration Status Accounting | 3.4 Configuration Status Accounting | |
| | | 3.4.1 Configuration Item List |
| | | 3.4.2 Change Request Reporting |
| | | 3.4.2.1 States |
| | | 3.4.2.2 CBL Audit |
| | | 3.4.2.3 FBL Audit |
| | | 3.4.2.4 ABL Audit |
| | | 3.4.2.5 PBL Audit |
| | | 3.4.3 Audit Reports |
| | | 3.4.3.1 Functional Configuration Audit Reports |
| | | 3.4.3.2 Physical Configuration Audit |
| | | 3.4.4 Configuration Management Metrics Reports |
| | | 3.4.4.1 Configuration Status Accounting Reporting Frequency |
| 3.3.4 Configuration Evaluation and Reviews | 3.5 Configuration Audits and Reviews | |
| | 3.5.1 Functional Configuration Audits | |
| | 3.5.2 Physical Configuration Audits | |
| | | 3.5.3 CM Internal Audits |
| | 3.5.4 Reviews | |
| | | 3.5.4.1 System Requirements Review |
| | | 3.5.4.2 Preliminary Design Review |
| | | 3.5.4.3 Critical Design Review |
| | | 3.6 Operations |
| 3.3.5 Interface Control | 3.7 Interface Control | |

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| IEEE Std. 828-2005 | ERA Configuration Management Plan (CMP) | Additions to requirements of IEEE Std 828-2005 |
|---------------------------------------|--|---|
| 3.3.6 Subcontractor / Vendor Control | 3.8 Subcontractor / Vendor Control | |
| | | 3.8.1 Sub Contractors Products |
| | | 3.8.2 Vendors Products |
| 3.3.7 Release management and delivery | 3.8.3 Release Management and Delivery | |
| 3.4 SCM Schedules | 4.0 CM Schedules | |
| | | 4.1 General CM activities Schedule |
| 3.5 SCM Resources | 5.0 CM Resources | |
| | | 5.1 Configuration Management Organizational Products |
| | | 5.2 CM Tools |
| | | 5.2.1 Rational ClearQuest |
| | | 5.2.2 PVCS Version Manger |
| | | 5.3 CM Support Environment |
| | | 5.5 CM Training |
| 3.6 SCM Plan Maintenance | 6.0 CM Plan Maintenance | |

Final

APPENDIX B: ERA Configuration Items List (Sample List)

The complete ERA Configuration Item Listing (CIL) can be found online at ["S:\ERAPMO\ERA Configuration Management\Activities\Configuration Items List"](S:\ERAPMO\ERA Configuration Management\Activities\Configuration Items List).

| ECDRL No | Title | Version Number | Baseline Finish | Actual Date Delivered | Govt. POC | POST POC | Accepted versions | Accepted Versions with Comments | PVCS VM | Notes |
|----------|--|----------------|--|--------------------------|---------------|----------|-------------------|---------------------------------|---------|---|
| 1 | System Requirements Specification (SYRS) | 3.1.0 | 11/20/2009 04/30/2010 05/18/2010 | 11/13/2009 03/16/2010 | Dyung Le | | | | Y | NARA COR request redelivery on 05/18/10 |
| 3 | System Architecture & Design Document (SADD) | 3.1.0 3.2.0 | 11/20/2009 04/30/2010 05/18/2010 | 3/15/2010 | Dyung Le | | | | Y | NARA COR request redelivery on 05/18/10 |
| 7 | Operation & Support Plan (O&S) | 3.1.0 | 4/6/2010 09/14/2010 | | Erum Welling | | | | | Per IS new date is 09/14/2010 |
| 8 | Configuration Management Plan (CMP) | 3.1.0 3.1.1 | 10/23/2009 01/04/2010 | 11/13/2009 01/04/2010 | Seema Dheman | | | | Y | |
| 9 | Risk Management Plan | 3.1.0 | 10/23/2009 | 10/23/2009 | Frank Samuels | | | | Y | Rejected. Redelivery not requested |