

U.S. Environmental Protection Agency

EA Program Configuration Management Plan

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1. INTRODUCTION

This Configuration Management Plan (CMP) provides the basis for identifying artifacts of the Environmental Protection Agency (EPA) Enterprise Architecture (EA) Program, managing change to these items in a controlled and coordinated manner and maintaining accurate records of change and copies of those artifacts that are subject to change management.

1.1 Scope

This plan is applicable to all EA program team members and all contractors and subcontractors throughout the entire EPA EA program life cycle. This plan complies with the framework for Configuration Management (CM) implementation established by the Software Engineering Institute's (SEI) Capability Maturity Model® Integration (CMMI®), but has been tailored to meet the CM requirements for "services" type projects and projects that primarily produce and manage documentation. As mentioned above, the scope also includes CM processes to be used for managing changes in configuration items for the EPA EA program.

This plan does not describe every detailed step for managing any single type of configuration item, rather it focuses primarily on establishing a configuration item naming convention, identifying the types of Configuration Items (CI) and providing the general process of tracking and managing the evolution of CIs from their initial development states to a final or published state.

1.2 Goals

The EA team shall ensure that the CM Plan is implemented to manage EA Program artifacts so that the following CM goals are achieved:

- Identify and track the status of CIs as they relate to the EA program at given points in time
- Systematically control changes to these configuration items
- Make available to the EA team and other stakeholders status reports on current configuration item identification and change data and make this information available for review or audits, if required

1.3 Purpose

The purpose of this plan is to:

- Establish and maintain the integrity of the CM process on the EPA Enterprise Architecture Program
- Identify work products and the ART toolset and environment on the EA Program that will be managed according to this plan
- Identify a naming and numbering scheme for these work products
- Provide the process steps necessary to carry out the CM activities
- Identify related CM documentation and supporting materials to effectively perform the CM activities

Consistent implementation and adherence to all aspects of this CM plan are essential to maintain the EA program artifacts in a manner that most effectively supports the identification, versioning, maintenance, publication, security, and accessibility of these artifacts. This CMP shall be updated as required to reflect current and improved CM processes.

1.4 Document Overview

This CMP is divided into four main sections as described in Table 1-1 below.

Table 1-1. CMP Organization

Section	Section Name	Description
1	Introduction	Defines the scope, goals and purpose, applicable standards and references for the CMP and provides a brief overview of the major sections of the plan
2	Organization and Responsibilities	Defines the organizational structure, roles, and responsibilities required to implement the EPA EA CM Plan
3	Configuration Management Tasks	Defines the general activities involved in CM
4	Change Control	Describes the change control processes and CM for the ART repository, server environment and all other EA program documentation and work products within the scope of the CM plan

1.5 Standards

The following standards were used in the preparation of this document.

- ANSI/IEEE 1042–1987, Guide to Software Configuration Management.
- ANSI/IEEE 828–1990, IEEE Standard for Software Configuration Management Plans.
- EIA 649, National Consensus Standard for Configuration Management, July 1998.
- IEEE/EIA Joint Standards, 12207.1 – 1997.
- Software Engineering Institute (SEI) Carnegie Mellon University, Key Practices of the Capability Maturity Model Version 1.1, CMU/SEI-93-TR-25, February 1993.

1.6 References

The following documents are referenced in this document and are included in the project's reference library.

- Essential SET, Software Productivity Centre, Inc.
- EPA EA Support Work Plan (project number 12881.007) and Project Schedule.
- ART Change Request Form template
- Physical Configuration Audit Checklist template
- Configuration Item Tracking Sheet
- EPA EA Governance Procedure





2. ORGANIZATION AND RESPONSIBILITIES

This section defines the project CM organization structure and CM roles and responsibilities for the EPA EA Program and related CM documentation required to perform configuration management on the program.

2.1 CM Organization Structure

Figure 2-1 below depicts the CM organizational structure for EPA EA as it relates to configuration management.

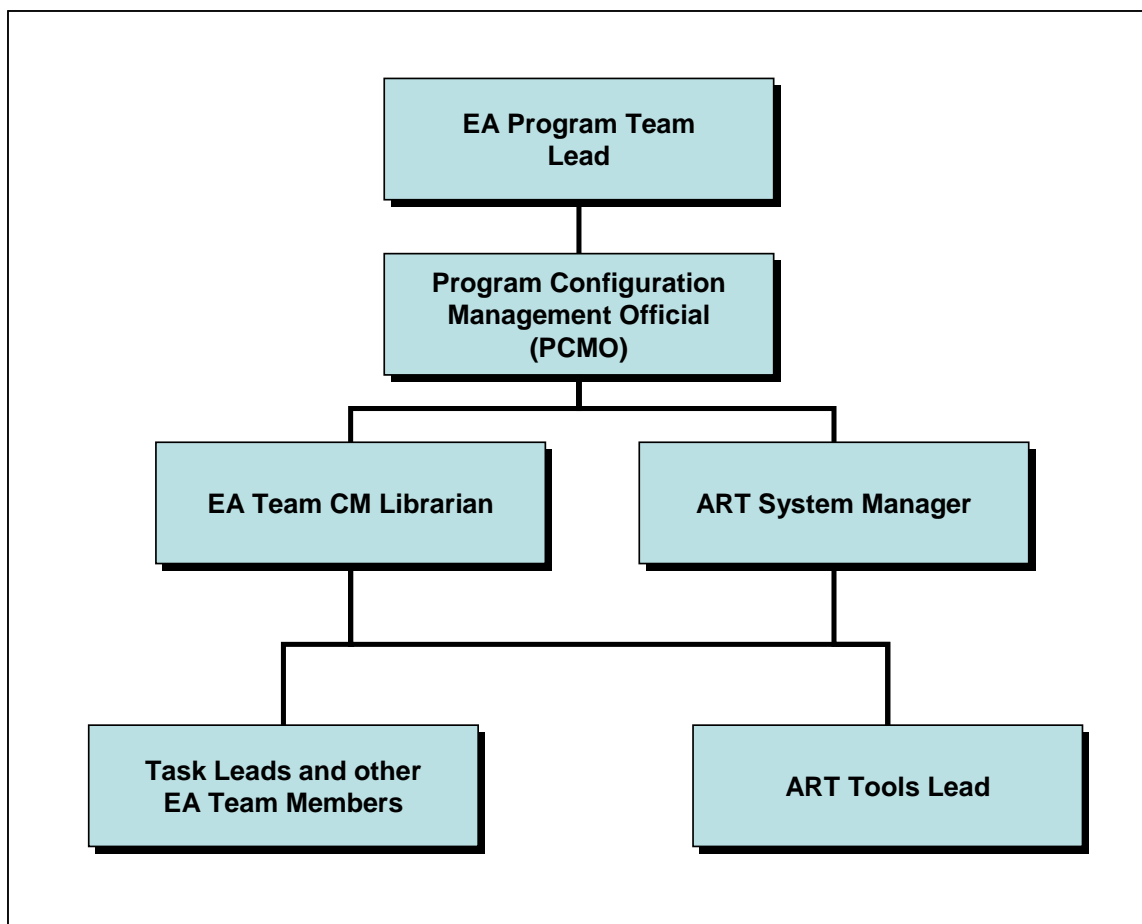


Figure 2-1. Configuration Management and Organization Chart

2.2 Roles and Responsibilities

Table 2-1 below defines the CM roles and responsibilities required to define, implement, perform, and evaluate CM on the EA Program. The various roles defined below will be carried out by a combination of EPA personnel and contractor personnel.



Table 2-1. CM Roles and Responsibilities

Role	Responsibilities
EPA EA Team Lead	<p>Ensure overall success of EPA EA CM plan</p> <p>Approve CM planning and associated procedures to be implemented</p> <p>Review and approve personnel, budget, and equipment required to implement CM activities</p> <p>Direct the program team's efforts to implement CM actions based on the CMP. This may include assigning responsibility for CM to a designated team member or contractor to carry out the PCMO role</p>
Program Configuration Management Official (PCMO)	<p>Develop, coordinate, and update the CMP</p> <p>Develop, coordinate, and enforce the methodology and standard procedures for identifying and documenting program-related Configuration Items (CIs)</p> <p>Maintain a current record of all CIs for the program and conduct periodic audits and inventories of all CIs</p> <p>Conduct CM training as required</p>
EA Team CM Librarian	<p>Conduct Physical Configuration Audits (PCA) for every configuration item</p> <p>Maintain the secured CM Repository, including program configuration records and documentation</p> <p>Establish and maintain the product baseline for internal and deliverable work products including program documentation, architectural models, status reports, reports to external stakeholders such as OMB and GAO.</p> <p>Assign Document Control Numbers or Model Control Numbers to CIs</p> <p>Maintain and control access to CIs</p> <p>Prepare reports and support change activity</p> <p>Provide notification of changes and maintain CI currency</p>
ART System Manager	<p>Receive and review ART Change Requests and determine appropriate routing and levels of approval</p> <p>Coordinate with ART Tools Lead on changes to ART models and environment</p> <p>Ensure that changes to ART models and environment are implemented and that the CM Librarian receives all applicable artifacts and evidence pertaining to ART change requests necessary to maintain the CM Library</p>
ART Tools Lead	<p>Implement assigned Document Control Numbers or Model Control Numbers for CIs</p> <p>Setup access and control of access to CIs</p> <p>Perform updates to ART toolset, environment, reference models, metamodel or other architecture models</p> <p>Support change activity</p> <p>Provide notification of changes to ART toolset, environment, reference models, metamodel or other architecture models</p>
Task Leads and Project Team Member(s)	<p>Review, understand, and support this CMP</p> <p>Implement approved action items according to the program schedule</p> <p>Assist management in assessing cost, technical, and schedule impact of changes proposed in action items</p> <p>Support established version management procedures</p> <p>Support established baseline identification procedures</p>

2.3 Configuration Management Documentation

Figure 2-2 below identifies the documentation that is used to perform configuration management activities on the EA Program.

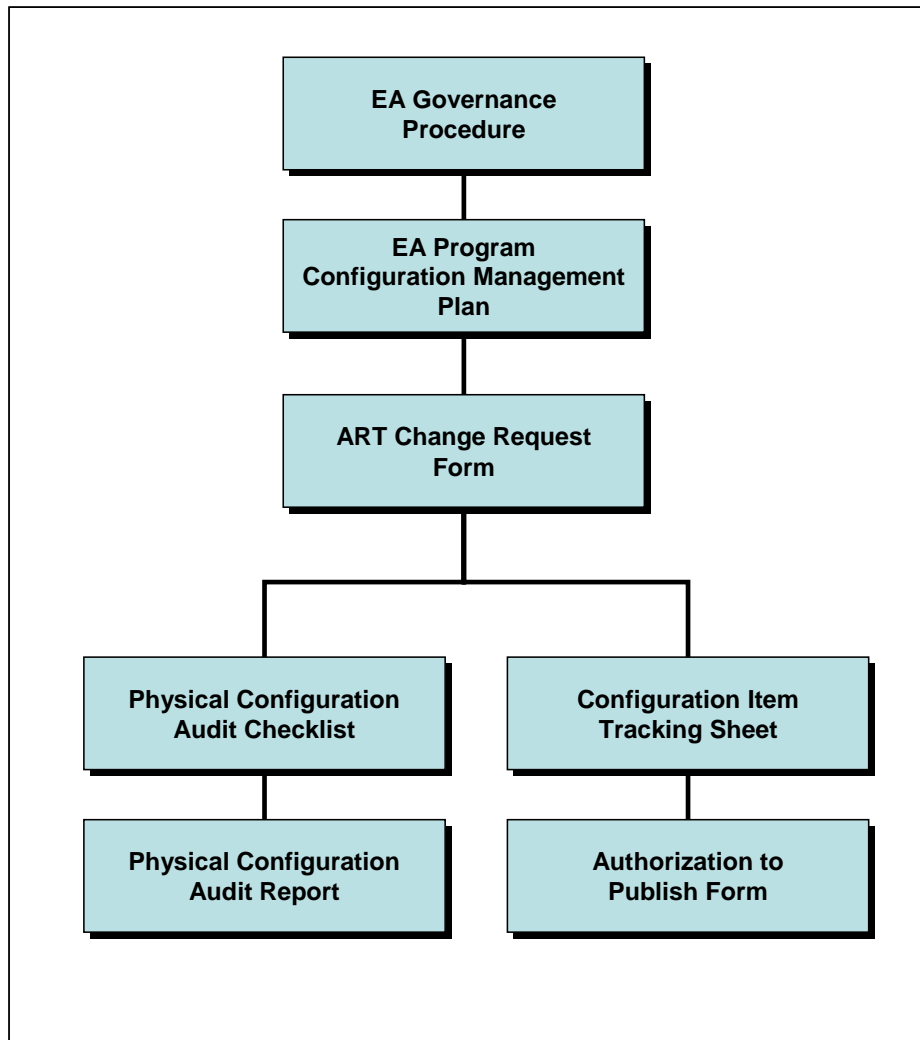


Figure 2-2. Configuration Management Documentation

2.3.1 EA Governance Procedure

The *EA Governance Procedure* describes the processes for review and approving changes to architecture documents and models at the enterprise, segment, and solution level. It describes architecture checkpoints, control gates, and points of coordination with other Agency life cycles as depicted in Figure 3-1. Agency Life Cycle Phases, Checkpoints and Control Gates (p. 3-6).



2.3.2 EA Program Configuration Management Plan

This document describes the version identification scheme and types of configuration items and their related baselines, the roles, responsibilities and general process for managing and coordinating change in a controlled manner for artifacts of the EA program.

2.3.3 ART Change Request Form

This form provides the mechanism to request changes to the ART metamodel, enterprise tier model, segment and solution models, ART toolset, and server environment. The review and approval of these changes is described in the *EA Governance Procedure*.

2.3.4 Physical Configuration Audit Checklist

This checklist is used and filled out for each CI submitted and updated any time a CI is promoted from one baseline to another. It provides the mechanism by which the CM Librarian verifies that all appropriate accompanying artifacts are obtained and filed in the CM library repository in the folder for the CI in question, thus helping to ensure that a complete record of all changes and accompanying documentation for an EA artifact is carefully maintained and updated.

2.3.5 Physical Configuration Audit Report

This report summarizes all CIs in the CM Library and indicates their current status. The CI status allows members of the EA team to assess which CIs may be missing key accompanying documentation or approvals and what the baseline state of any CI is at the time of the report. The PCA Report provides the necessary documentation to support Inspector General Audits and other inquiries as to the status and latest version and location of any CI under configuration management within the EA program.

2.3.6 Configuration Item Tracking Sheet

The *Configuration Item Tracking Sheet* is a Microsoft Excel workbook with a list of all configuration items. There is a tab for each category of CI:

- ART Toolset and Environment CIs
- EA Program Documentation CIs
- ART Metamodel CIs
- ART Reference Model CIs
- ART Enterprise Tier Architecture CIs
- ART Segment Architecture CIs
- ART Solution Architecture CIs

The Configuration Item Tracking Sheet is the formal inventory, maintained by the CM Librarian, of all CIs and their location and status, and is the basis for generating the *Physical Configuration Audit Report*.

2.3.7 Authorization to Publish Form

The *Authorization to Publish Form* is used to indicate to the CM Librarian and the ART Toolset Lead that a given CI has been authorized by the appropriate approving official for publication, promotion to its published baseline and placement in the ART production environment and repository. This form is filed by the CM Librarian in the CM Library folder for the given CI and checked off on the PCA checklist.



Architecture models and EA program documentation will not be published (placed in the ART production environment) until an accompanying *Authorization to Publish Form* has been obtained and reviewed by the CM Librarian and the ART Toolset Lead.



3. CONFIGURATION MANAGEMENT TASKS

All Configuration Items placed under CM control are uniquely identified, scheduled, and included in the appropriate baseline for the project. The following section details the identification and tracking of CIs within a controlled environment.

3.1 Identifying Configuration Items

Configuration Item identification defines and documents CIs throughout the history of the EA program. A CI is defined as any internal or external documentation or architectural model or data set used or produced during the program's life. A typical, but not exhaustive, list of CIs includes:

- EA Training Plan
- EA Communication Plan
- Architecture Standard and Guidance
- EA Methodology
- EA Metamodel
- EA Baseline Architecture
- EA Target Architecture
- EA Transition Architecture
- Segment Architecture
- Solution Architecture
- Architecture Waivers
- White Papers
- Product Evaluations
- Configuration Management Plan
- EA Procedure
- EA Policy
- Annual OMB EA Self-Assessment
- Quarterly OMB EA Status Reports
- EA Documents submitted by Agency Program Offices or Regions as part of architecture development
- EPA Reference Models (BRM, TRM, IT Roadmap, DRM, Strategic Plan/Objectives)
- ART Security Plan
- Program Reviews
- Executive Presentations and Briefings





- ART Toolset and environment

CIIs also include items identified with or required to create or manage these items (CMP, Project Management Plan (PMP)). All identified CIIs must undergo the CM review process.

The EA Program may have work products that are not considered CIIs, such as work products that are repetitive in nature. While initial products will undergo substantial review, future iterations will not be subject to as much rigor in terms of the peer review process. For example, the project's first Monthly Status Report (MSR) may go through the CM process to ensure all formatting and required information are present and correct. However, subsequent MSRs may not be subjected to a rigorous peer review process.

3.2 List of Configuration Items

A list of CIIs is maintained by PCMO. Once a CI has been identified, its descriptive information is placed on the CI Tracking Sheet and used to prepare reports and queries that show the status, location, and file name associated with each CI. A comprehensive but not exhaustive list of configuration items is provided in Appendix A: Configuration Item List.

A CM Library will be established using the Documentum document management tool. Documentum is the Agency standard Enterprise Tool identified for use in document management activities. The specific physical location of the library repository has yet to be determined, but the expectation is that both EA Program documents and copies of architecture model files will be stored within the repository and accessible via the EPA EA intranet Web site. The Metis Team Server tool environment located at the National Computer Center (NCC) in Research Triangle Park (RTP), North Carolina hosts the ART development and production environment and associated model files and data for architecture model development in Metis.

The CM library will be used to track and control all CIIs and records of changes to them. The CM library holds all baselines and changes, both proposed and approved. It may house "working versions" of certain CIIs. The CM Library will contain the CM Plan and relevant templates such as the Physical Configuration Audit (PCA) Checklist. Within the CM Library, a folder will be created for each CI. Each CI folder will include:

- The final or most current version of the CI
- An archive sub-folder with all previous versions or drafts of the CI
- All completed EPA comment tracking sheets for the CI
- The CI's completed PCA form
- Deliverable cover letter for delivery of the CI for those CIIs produced by contractors that are being formally delivered
- Distribution cover letter or e-mail from the EPA office distributing the CI for review and comment or for delivery of a final CI
- Authorization to Publish form for models or EA documents



3.3 Configuration Item Baselines

This section identifies groups of related configuration items covered by this CM plan. The groups are broken down into specific CI types and specific baselines are identified and described for each CI type. Chapter 4 describes change management of these baselines for each CI.

3.3.1 ART Toolset Baselines

The ART toolset and its supporting server environment is the environment in which Metis architecture models are developed and reviewed. Currently the ART environment, hosted at the National Computer Center (NCC), consists of two servers whose configuration is managed by NCC personnel and coordinated with the EPA EA team at EPA Headquarters. The following elements constitute the ART toolset and environment and are configuration items that will be tracked in the CI Tracking Sheet.

- Metis Team Server
- Metis Client Tools (Designer, Developer, Editor)
- Oracle DBMS
- Microsoft Internet Information Server (MS/IIS)
- Windows Server 2000
- Metis Business Process Modeling Notation (BPMN) Template
- Metis Data Interface (DIF) Tool

3.3.2 ART Metamodel Baselines

The EPA EA is currently built using Metis from Troux Technologies. The architecture models built in Metis are built using the elements of a metamodel defined in the Metis environment. EPA has developed the ART 4.0 metamodel as the foundation for all architecture model development. Versions of the metamodel are maintained in the ART Team Server development environment. Files for the latest version of the metamodel are distributed to Metis modelers across the Agency as versions become available. Once a working version of the metamodel is approved, it is made available within the Team Server environment for other Metis modelers to use.

The metamodel evolves from its working copy or development baseline, to an approval baseline of the model that is reviewed and approved, to the published baseline that is used by modelers to develop their architecture models.

Changes to the ART metamodel and new versions are submitted and approved via the EA Governance Procedure and tracked using the *ART Change Request Form*.

3.3.3 ART Reference Model Baselines

The EPA EA contains a number of reference models that are used by architecture teams across the Agency. These reference models are part of the ART architecture content and each is an individual CI. Each model evolves through a simple evolution from its working copy or development baseline, to an approval version of the model that is reviewed and approved, to the published baseline. These reference models are under configuration management and include:

- EPA Strategic Plan (SP) – (Development Baseline, Approval Baseline, Published Baseline)



- EPA Business Reference Model (EPA BRM) – (Development Baseline, Approval Baseline, Published Baseline)
- EPA Data Class Model (EPA DCM) – (Development Baseline, Approval Baseline, Published Baseline)
- EPA Technical Reference Model (EPA TRM) – (Development Baseline, Approval Baseline, Published Baseline)
- EPA IT Roadmap (IT/Roadmap) – (Development Baseline, Approval Baseline, Published Baseline)
- FEA Performance Reference Model (FEA PRM) – (Development Baseline, Approval Baseline, Published Baseline)
- FEA Business Reference Model (FEA BRM) – (Development Baseline, Approval Baseline, Published Baseline)
- FEA Service Component Reference Model (FEA SRM) – (Development Baseline, Approval Baseline, Published Baseline)
- FEA Technical Reference Model (FEA TRM) – (Development Baseline, Approval Baseline, Published Baseline)
- FEA Federal Transition Framework (FTF) Metamodel – (Development Baseline, Approval Baseline, Published Baseline)

3.3.4 Enterprise Architecture Baselines

The Agency Enterprise Architecture is the enterprise tier architecture for the Agency. All segment and solution architectures are ultimately integrated with this architecture model to link to elements in the FEA, EPA reference models and other more “global” enterprise model content. As segment architectures and solution architectures are integrated vertically with the enterprise tier, the combined set of architectures will be published periodically and represent the most complete snapshot of the entire Agency architecture at any point in time.

The list of CIs for the enterprise tier baselines of the EA include:

- EA Strategic Architecture – (Development Baseline, Approval Baseline, Published Baseline)
- EA Baseline Architecture (includes Federal and Non-Federal Partner Architecture and FEA elements) – (Development Baseline, Approval Baseline, Published Baseline)
- EA Target Architecture (includes Federal and Non-Federal Partner Architecture and FEA elements) – (Development Baseline, Approval Baseline, Published Baseline)
- EA Transition Architecture – (Development Baseline, Approval Baseline, Published Baseline)

3.3.5 Segment Architecture Baselines

The architecture baselines for segment architectures parallel the EPA Architecture Development Methodology. Each designated segment will produce the following set of architectures, each treated as a separate CI. These architectures will be managed as separate sub-models in ART where they will be approved and further integrated with the ART enterprise tier.





The list of CIs for these architecture baselines include:

- Segment Strategic Architecture - (Development Baseline, Approval Baseline, Published Baseline) – the strategic layer of the segment
- Segment Baseline Architecture - (Development Baseline, Approval Baseline, Published Baseline) – the business, data, application, technology, partner, and security elements of the segment baseline architecture
- Segment Target Architecture - (Development Baseline, Approval Baseline, Published Baseline) - the business, data, application, technology, partner, and security elements of the segment target architecture
- Segment Transition Architecture - (Development Baseline, Approval Baseline, Published Baseline) – the transition elements of the segment architecture

3.3.6 Solution Architecture Baselines

Versions of solution architectures will be based on the phase of the System Life Cycle Management (SLCM) the solution is in, and correspond to the phases of solution architecture development identified in the *EPA Enterprise Architecture Methodology*. Upon completion of a phase of the SLCM and arrival at a checkpoint/control, a version will be submitted for review and approvals for that phase according to the EA Procedure. The architecture will be promoted from a development baseline for a given phase to a review baseline for required reviews and approvals. Once a given version of the architecture in some SLCM phase has been approved, it can then be published in the ART production environment, thus representing the most up-to-date and approved version of the architecture for the current SLCM phase of that solution.

The updated ART model containing the new version of the solution architecture will be promoted to a published state and published in the ART production environment within Microsoft Internet Information Server (MS/IIS).

Figure 3-1 below shows the phases of the parallel life-cycles for EPA. During each phase one or more artifacts such as solution architectures are completed and then reviewed upon reaching a particular control gate before proceeding further into the life-cycle. The phases of Solution Architecture development and corresponding baseline CIs are:

- Concept Exploration Phase - (Development Baseline, Approval Baseline, Published Baseline)
- System Planning Phase - (Development Baseline, Approval Baseline, Published Baseline)
- Requirements Phase - (Development Baseline, Approval Baseline, Published Baseline)
- Design Phase - (Development Baseline, Approval Baseline, Published Baseline)

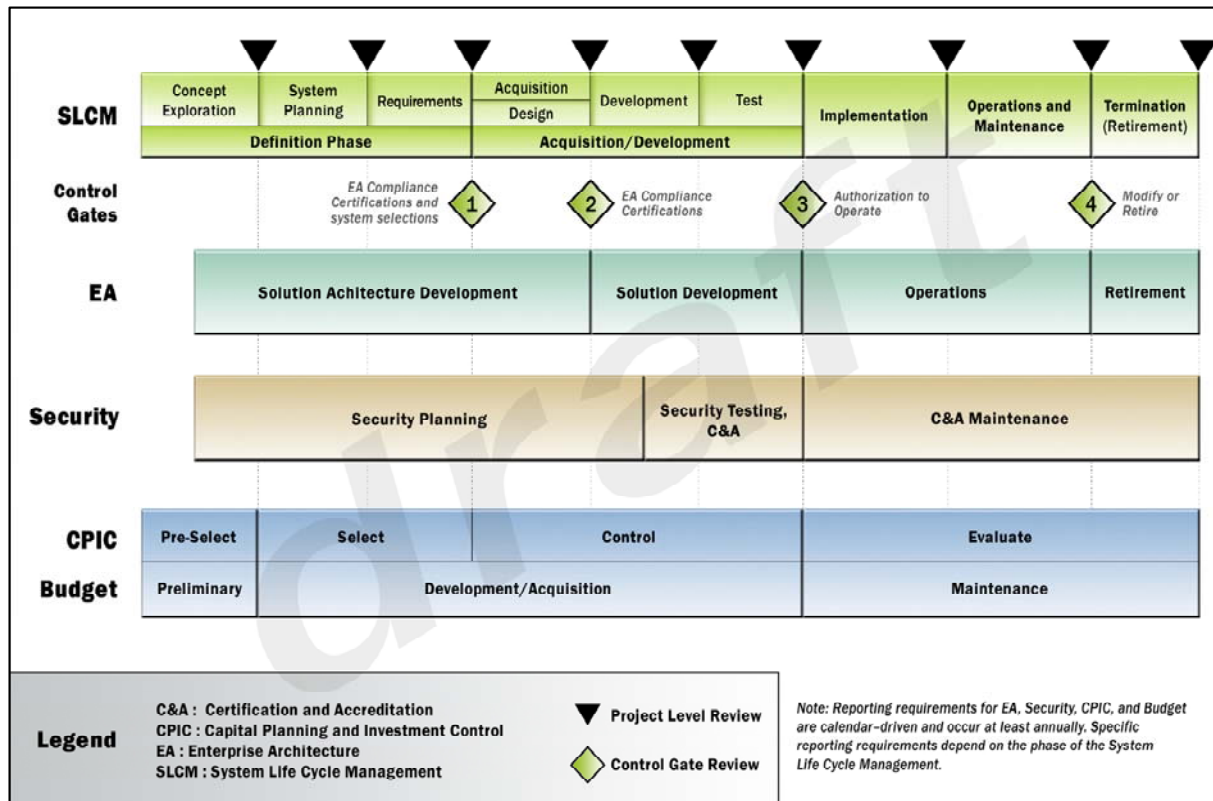


Figure 3-1. Agency Life Cycle Phases, Checkpoints and Control Gates

3.3.7 EA Program Document and Procedure Baselines

EA Program Document baselines are based on the evolution of documents through Outline, Draft, and Final status, and on to Published state: Outline Baseline, Draft Baseline, Final Baseline, Published Baseline.

3.4 Version Control

Version Control is established to track the evolution and identification of all configuration items. Version Control shall be applied to all configuration items created after implementation of this CMP, and those created beforehand as able. Version Control is implemented by use of a configuration item control numbering system. All CM-controlled document items must also contain a Change History Table like the one on page i of this document.

All work-in-process CIs will use a standard naming structure that must include a descriptive document or CI name, latest version number, most current date changes were applied. Any configuration items identified or added to the list in Appendix A: Configuration Item List, will use the Document Control Number naming convention or the Model Control Number naming convention that are described in the next two sections for formal identification and tracking.



3.5 Document Control Number

All documents will be numbered according to the numbering convention defined in Table 3-1 below.

Table 3-1. Document Control Number

Format: A-PTS-D-m.n		
Explanation:	A	represents the acronym for the document
	PTS	represents the Project Code
	D	represents the Deliverable Number typically corresponding to the Statement of Work for any relevant contractor.
	m.n	"m" represents the version number of the document "n" denotes a minor revision
Example: CMP-12881.007-0-1.0 refers to the initial version of the CM Plan for EPA EA Support		

The Document Control Number (DCN) is placed on all configuration items.

3.6 Model Control Number

All architecture models will be numbered according to the numbering convention defined in Table 3-2 below.

Table 3-2. Model Control Number

Format: S-N-D-m.n		
Explanation:	S	represents the acronym for the scope of the architecture model (F – Federal, E – EPA Enterprise, S – Segment, SL – Solution)
	N	represents the name of the model (EPA-EA, Water Quality Management, Business Reference Model)
	D	represents the disposition or state of the model (D – Development, A – Approval, P – Published)
	m.n	"m" represents the version number of the architecture "n" denotes a minor revision
Example: F-Business Reference Model-P-3.1 - refers to the published configuration item of version 3.1 Federal BRM		

The Model Control Number (MCN) is placed on all configuration items and in the case of models is the basis for the file names for the various models.

3.7 Configuration Management Schedule

The content of the EA and related documents comes from a variety of sources and has numerous managerial, technical, and architectural drivers. Below is a summary of when changes to CIs are made and how approvals occur.

- Changes to EPA Reference models are made as needed and approved according to the EPA EA Governance Procedure.

- Changes to the EPA Metamodel are made as needed and approved by the EPA EA team lead.
- Changes to segment models are made as needed and approved according to the EPA EA Governance Procedure.
- Changes to EPA EA Program Documents are made as needed and approved according to the EPA EA Governance Procedure.
- Changes to the solution architecture models are made according to the EPA SLCM and related life cycles depicted in Figure 3-1 and approved according to the EPA EA Governance Procedure.

3.8 Configuration Management Environment and Library

This section identifies the CM repositories for the EA program. Table 3-3 below identifies the locations of the controlled libraries for this program.

Table 3-3. CM Repository Location

CM Repository/Library	Machine/Network Location	Status	Access Control
Architecture Development Repository (DR)	Metis Team Server repository in the ART development environment	Active	All EA Modelers have read access to the entire model space and write access to their individual model spaces
Architecture Archive Repository (AR)	Documentum EA Repository (location TBD)	Active	Only the PCMO has read/write access. All project team members have read only access to this area

3.8.1 Architecture Development Repository

The EPA Architecture Development Repository is all documentation defining and describing ART, e.g., source code, user guides, training material, metamodel, enterprise tier models, segment and solution architecture models, etc.

The EPA Architecture Development Environment is the computer system used for the development and testing of ART. The EPA EA Repository Production Environment is the computer system where EA staff maintains EA information and where enterprise decision makers may find information to support their decision making. The EA Repository is maintained in a Development Environment and deployed in a Production Environment. Each environment is implemented as a separate Web-enabled server.

The core of each environment is a Metis Team Server repository. The repository storage is provided by a common database server, but each environment has a separate database. Each environment also provides a few virtual directories accessible through the https protocol. The Development Environment is intended for the developers of ART and for training of EPA EA Repository users.

The Production Environment is for enterprise architects and managers. It allows them to create enterprise models and perform analysis based on these models. The production environment is further divided into an 'Entry' area and a 'Publishing' area, each supported with a separate version of the EPA EA Repository Framework.



Access to the EPA EA Repository and its artifacts is granted by EPA EA Repository Administrators. Users are grouped according to the roles they play in the EA Repository. An administrator can delegate management authority, for a segment of the repository, to a specific user or group.

3.8.2 Architecture Archive Repository

The EPA Architecture Archive Repository is currently located on the EPA intranet EA site and will be updated with links to the Documentum Archive Repository, which will house all archived EA Documents and architecture model files.

3.9 Submitting CIs

This section describes how CIs are submitted and logged into the CM library. When a CI is created and begins its life, a copy of the CI is submitted to the CM Librarian who then follows the general steps identified below. CIs are identified by the types listed in Appendix A: Configuration Item List (p. A-1) and designated as such by the EA Team and architects upon determination that an artifact being created requires configuration management and version control.

CONFIGURATION ITEM SUBMISSION AND LOGGING PROCESS

Step	Role	Task
1	CM Librarian	Assign a MCN or DCN to the CI depending upon the type of CI.
2	CM Librarian	Create CM library folder structure for the CI.
3	CM Librarian	Place a copy of the CI in the folder. Place CI package items above in the CI folder. For architecture models, their folder and work space will exist in the Metis Team Server environment for all phases of their evolution. However, a parallel folder will be created in the Documentum repository to house other relevant items in the CI package that pertain to the architecture models as well as a copy of any published model files themselves.
4	CM Librarian	Update CI Tracking Sheet with CI information.
5	CM Librarian	Identify applicable items in the CI package for the particular CI (applicability of the items below depends on type of CI and whether it is draft or final): <ul style="list-style-type: none"> • All completed EPA comment tracking sheets for the CI • The CI's completed PCA form • Deliverable cover letter for delivery of the CI for those CIs produced by contractors that are being formally delivered • Distribution cover letter or e-mail from the EPA office distributing the CI for review and comment or for delivery of a final CI • Authorization to Publish form for models or EA documents
6	CM Librarian	Perform a Physical Configuration Audit (using the PCA Checklist). Fill in the checklist and place it in the CM folder in the Documentum repository.
7	CM Librarian	Notify the submitter of the CI of any missing CI package items and obtain them for inclusion in the CM folder for that CI.
8	CM Librarian	Update the PCA checklist and place in the CI folder.





3.10 Archiving and Purging CIs

Table 3-4 below outlines the retention period for the contents of each CM repository.

Table 3-4. Retention Periods

CM Repository/Library	Retention Period	Reason
Development Repository (DR)	Indefinite	Mandatory retention of government records
Archive Repository (AR)	Indefinite	Mandatory retention of government records

4. CHANGE CONTROL

This section describes the configuration management baselines and processes for managing changes to them.

4.1 Change Control of ART Baselines

This section describes the processes related to the configuration management of the EPA Architecture Repository and Tool (ART). ART is the information system supporting EPA staff and contractors participating in EA activities and contains the architecture models for the EA. EPA currently follows an approved EA Governance Procedure to track, manage, and control all changes proposed to the ART model itself and environment. This configuration management plan provides the administrative and technical support to manage and implement changes described in the EA Governance Procedure while also providing the naming conventions and process required to manage various versions of the repository and toolset.

All change requests to the EA Repository are logged and tracked to closure through the ART Access and EA Change Request Process in Figure 4-1. This process is triggered by the submission of a completed ART Access and EA Change Request Form. Implementation of the actual changes is accomplished by following the generalized process steps in sections 4.1.1 through 4.1.7. The processes described in these sections expand upon and provide necessary details for the task in the flowchart in Figure 4-1 labeled “Implement Change.”

Each form is archived and depending on the potential impact of the change, the request follows a workflow path assuring appropriate review by governing bodies.

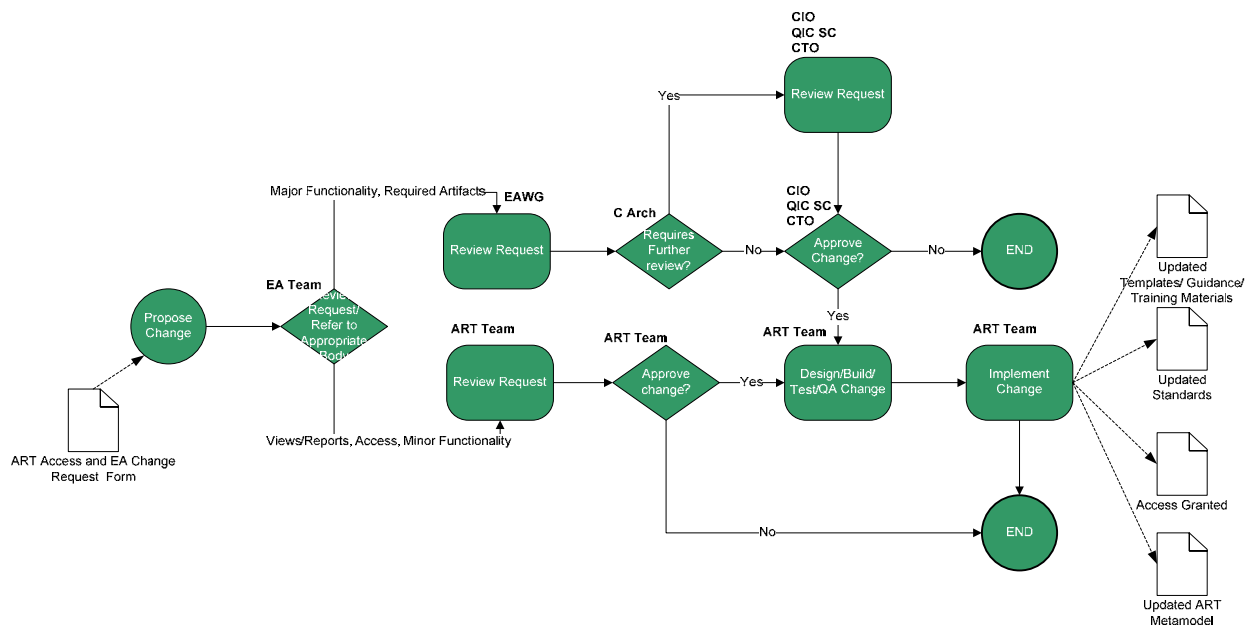


Figure 4-1. Architecture Repository and Tool (ART) Access and EA Change Request Process



4.1.1 Changes to ART Toolset

Changes to the ART toolset and supporting environment will be tracked in the *CI Tracking Sheet*. The following general process will be followed to manage changes to these CIs:

ART TOOLSET CM PROCESS

Step	Role	Task
1	EA Team Member	Submit completed <i>ART Change Request Form</i> to ART System Manager.
2	EA Team Member	Obtain approval for product version upgrades, patches, installation of new service packs and critical updates to ART toolset CIs via the <i>ART Change Request Form</i> and the <i>EA Governance Procedure</i> .
3	ART Tools Lead	Upon approval of changes, the updates or upgrades will be implemented via coordination between EPA EA HQ team personnel and EPA NCC ART environment personnel as needed depending upon the CI to be updated.
4	CM Librarian	After completion of the toolset change, the CM Librarian will update the CI Tracking Sheet with the applicable product, version, and date and the name of the CI that was added or changed.
5	CM Librarian	Place the applicable <i>ART Change Request Form</i> indicating approval for the change into the CI repository folder.
6	CM Librarian	Perform a Physical Configuration Audit of the CI folder ensuring that the <i>ART Change Request Form</i> is present and details the tool or product being changed, the reason, approval and current and new version of the product, tool, patch, service pack, or other update.
7	CM Librarian	Update the CM folder in the Documentum repository with the PCA checklist.

Software upgrades to the ART toolset and its supporting server environment occur as needed according to the following generalized process:

ART TOOLSET UPGRADE PROCESS

Step	Role	Task
1	ART Tools Lead	Archive development content outside of EA Repository
2	ART Tools Lead	Update development environment
3	ART Tools Lead	Run ART Test script off site
4	ART Tools Lead	Run ART Test script from EPA HQ in the development environment
5	ART Tools Lead	Update development content on the development server and test
6	ART Tools Lead	Archive production content outside of EA production environment
7	ART Tools Lead	Run ART Test script off site
8	ART Tools Lead	Run ART Test script from EPA HQ in the production environment
9	ART Tools Lead	Update production content on the development server and test

If an upgrade is expected to render the production environment unusable for an extended period of time, the production content will be copied to the development server and enterprise architects and managers will use the development environment temporarily. Once the upgrade is completed for the production

server, the content from the development server will be uploaded to production, and enterprise architects and managers will resume work in the production environment.

4.1.2 Changes to ART Metamodel

When a change to or a new version of the ART metamodel is made the following general process is followed:

ART METAMODEL CHANGE CONTROL PROCESS

Step	Role	Task
1	EA Team Member	Submit a completed <i>ART Change Request Form</i> to ART System Manager.
2	EA Team Member	Obtain approval to change the ART metamodel via the <i>ART Change Request Form</i> and the EA Governance Procedure.
3	ART Tools Lead	Upon approval of changes, implement ART metamodel change on a copy of the most current version of the metamodel.
4	ART Tools Lead	Test and review the changes.
5	ART Tools Lead	Backup the current ART metamodel to the Metis Team Server repository and to the Documentum Repository.
6	ART Tools Lead	Notify all Metis architecture model developers of the change by e-mailing them a copy of the new metamodel file and the <i>ART Change Request Form</i> explaining the change and the reason for the change so they may implement the change to their sub-models.
7	ART Tools Lead and EA Modelers	Apply metamodel changes to the ART model and all affected sub-models in the ART development environment.
8	ART Tools Lead	Archive the current version of the ART model in the Metis Team Server repository.
9	ART Tools Lead	Backup the new version of the ART metamodel in the Metis Team Server repository.
10	ART Tools Lead	Publish the newly updated ART model based on the new metamodel to the ART production environment.
11	CM Librarian	Place the applicable <i>ART Change Request Form</i> indicating approval for the change into the CI repository folder.
12	CM Librarian	Perform a Physical Configuration Audit of the CI folder ensuring that the <i>ART Change Request Form</i> is present and details the tool or product being change, the reason, approval and current and new version of the product, tool, patch, service pack, or other update.
13	CM Librarian	Update the CM folder in the Documentum repository with the PCA checklist.

4.1.3 Changes to ART Reference Models

Changes to these reference models are accomplished by following the same general process identified above for the ART metamodel in Section 4.1.2.



4.1.4 Changes to ART Architectures

Future improvements in the ART environment must support the ability for segment and solution architecture teams to maintain information in their respective models and to integrate related elements between models typically through a Web interface. Until those data maintenance and modeling capabilities exist, individual segment architectures will be developed as Metis sub-models and linked to elements of the enterprise tier of the EA, or they will be developed in segment data collection spreadsheets and imported via the Metis DIF tool into Metis sub-models for each segment architecture model.

4.1.5 Changes to Enterprise Tier Architecture Baselines

Updates to the more global content in the Enterprise tier of the EPA EA architecture are accomplished by following the same general process identified above for the ART metamodel in Section 4.1.2.

4.1.6 Changes to Segment Architecture Baselines

Updates to segment architectures will be accomplished by giving the new version of the model a name according to an updated Model Control Number (MCN). Changes to Segment models will be made according to the following general process:

SEGMENT ARCHITECTURE MODEL CHANGE CONTROL PROCESS

Step	Role	Task
1	Segment Architect	Submit architecture data collection spreadsheet to EPA EA team along with <i>ART Change Request Form</i> .
2	ART Tools Lead	Create Metis DIF mapping schema from the spreadsheet to the segment model.
3	ART Tools Lead	Import the spreadsheet data into the segment architecture Metis model space to create the development baseline.
4	ART Tools Lead, EA Modelers	Perform updates and additional modeling against the development baseline.
5	ART Tools Lead	Promote development baseline to approval baseline.
6	SIO, AA	Review and approve segment architecture.
7	ART Tools Lead, EA Modelers	If changes are required, update the development baseline, then promote again to approval baseline, begin review and approval again.
8	Segment Architect	Submit completed <i>Approval to Publish</i> letter to ART System Manager.
9	ART Tools Lead	Promote approval baseline to published baseline.
10	ART Tools Lead	Move published baseline to production environment.
11	CM Librarian	Place the applicable ART Change Request Form indicating approval for the change into the CI repository folder.
12	CM Librarian	Perform a Physical Configuration Audit of the CI folder ensuring that the <i>ART Change Request Form</i> is present and details the tool or product being changed, the reason, approval and current and new version of the product, tool, patch, service pack, or other update.
13	CM Librarian	Update the CM folder in the Documentum repository with the PCA checklist.



4.1.7 Changes to Solution Architecture Baselines

Updates to solution architectures will be accomplished by giving the new version of the model a name according to an updated Model Control Number (MCN). Changes to Solution models will be made according to the following general process:

SOLUTION ARCHITECTURE MODEL CHANGE CONTROL PROCESS

Step	Role	Task
1	Solution Architect	Submit architecture data collection spreadsheet to EPA EA team along with <i>ART Change Request Form</i> .
2	ART Tools Lead	Create Metis DIF mapping schema from the spreadsheet to the solution model.
3	ART Tools Lead	Import the spreadsheet data into the solution architecture Metis model space to create the development baseline.
4	ART Tools Lead, EA Modelers	Perform updates and additional modeling against the development baseline.
5	ART Tools Lead	Promote development baseline to approval baseline.
6	Project Manager	Review and approve solution architecture.
7	ART Tools Lead, EA Modelers	If changes are required, update the development baseline, then promote again to approval baseline, begin review and approval again.
8	Solution Architect	Submit completed <i>Approval to Publish</i> letter to ART System Manager.
9	ART Tools Lead	Promote approval baseline to published baseline.
10	ART Tools Lead	Move published baseline to production environment.
11	CM Librarian	Place the applicable ART Change Request Form indicating approval for the change into the CI repository folder.
12	CM Librarian	Perform a Physical Configuration Audit of the CI folder ensuring that the <i>ART Change Request Form</i> is present and details the tool or product being change, the reason, approval and current and new version of the product, tool, patch, service pack, or other update.
13	CM Librarian	Update the CM folder in the Documentum repository with the PCA checklist.

4.2 Change Control of EA Documents and Procedures

The procedure for governing changes to baselined EA Program documents is described in Section 5 of the *EPA Enterprise Architecture (EA) Governance Procedure*.

Change control of documents while in development will be handled internally by SRA and quality controlled through SRA's Peer Review and QA processes.

4.3 Publication of ART Architecture Models

EPA periodically publishes complete versions of the architecture repository for access via the EPA intranet. In this way working models on the production server are not published or available for all EPA employees until fully approved and authorized for release under a new version of the architecture. EPA typically seeks to release a new version of the architecture repository on an annual basis in accordance with the OMB review cycle. These releases are sequentially numbered (i.e. Version 1.0, Version 2.0, etc.). Any interim release between OMB reviews is given a sequential decimal extension (i.e. Version 1.1,



Version 1.2, etc). The process for promoting architecture models to their published baseline is described in Sections 4.1.2 through 4.1.7.

4.4 Publication of EA Documents and Procedures

This process is TBD based on Appendix B: Recommended Implementation Steps (p. B-1).





APPENDIX A: CONFIGURATION ITEM LIST

At any point in time baselines of various configuration items exist, are under development or review, or are published. The sections below list the types of baselines that will exist for each type of CI in the EA program. These lists are not exhaustive since the most up to date list of CIs will be maintained in the configuration management library in the CI Tracking Sheet.

ART Toolset Configuration Item Baselines

- Metis Team Server
- Metis Client Tools (Designer, Developer, Editor)
- Oracle DBMS
- Microsoft Internet Information Server (MS/IIS)
- Windows Server 2000
- Metis Business Process Modeling Notation (BPMN) Template
- Metis Data Interface (DIF) Tool

Reference Model Configuration Item Baselines

- EPA Strategic Plan (SP) – (Development Baseline, Approval Baseline, Published Baseline)
- EPA Business Reference Model (EPA BRM) – (Development Baseline, Approval Baseline, Published Baseline)
- EPA Data Class Model (EPA DCM) – (Development Baseline, Approval Baseline, Published Baseline)
- EPA Technical Reference Model (EPA TRM) – (Development Baseline, Approval Baseline, Published Baseline)
- EPA IT Roadmap (IT/Roadmap) – (Development Baseline, Approval Baseline, Published Baseline)
- FEA Performance Reference Model (FEA PRM) – (Development Baseline, Approval Baseline, Published Baseline)
- FEA Business Reference Model (FEA BRM) – (Development Baseline, Approval Baseline, Published Baseline)
- FEA Service Component Reference Model (FEA SRM) – (Development Baseline, Approval Baseline, Published Baseline)
- FEA Technical Reference Model (FEA TRM) – (Development Baseline, Approval Baseline, Published Baseline)
- FEA Federal Transition Framework (FTF) Metamodel – (Development Baseline, Approval Baseline, Published Baseline)





Enterprise Architecture Configuration Item Baselines

- EA Strategic Architecture – (Development Baseline, Approval Baseline, Published Baseline)
- EA Baseline Architecture (includes Federal and Non-Federal Partner Architecture and FEA elements) – (Development Baseline, Approval Baseline, Published Baseline)
- EA Target Architecture (includes Federal and Non-Federal Partner Architecture and FEA elements) – (Development Baseline, Approval Baseline, Published Baseline)
- EA Transition Architecture – (Development Baseline, Approval Baseline, Published Baseline)

Segment Architecture Configuration Item Baselines

- Segment Strategic Architecture (Development Baseline, Approval Baseline, Published Baseline) – the strategic layer of the segment
- Segment Baseline Architecture (Development Baseline, Approval Baseline, Published Baseline) – the business, data, application, technology, partner, and security elements of the segment baseline architecture
- Segment Target Architecture (Development Baseline, Approval Baseline, Published Baseline) - the business, data, application, technology, partner, and security elements of the segment target architecture
- Segment Transition Architecture (Development Baseline, Approval Baseline, Published Baseline) – the transition elements of the segment architecture

Solution Architecture Configuration Item Baselines

- Concept Exploration Phase (Development Baseline, Approval Baseline, Published Baseline)
- System Planning Phase (Development Baseline, Approval Baseline, Published Baseline)
- Requirements Phase (Development Baseline, Approval Baseline, Published Baseline)
- Design Phase (Development Baseline, Approval Baseline, Published Baseline)

EA Program Document Configuration Item Baselines

For most of the documents below an annotated outline, draft and final version will exist:

- EA Policy
- EA Governance Procedure (outline, draft, final)
- Configuration Management Plan (outline, draft, final)
- EA Project Plan (outline, draft, final)
- FYxx EA Status Report (outline, draft, final)
- Architecture Development Methodology (outline, draft, final)
- ART System Security Plan (outline, draft, final)
- EA Framework and Metamodel (outline, draft, final)





- EA Communications Plan (outline, draft, final)
- CPIC Training Materials (outline, draft, final)
- Transition Strategy and Sequencing Plan (outline, draft, final)
- CPIC Preparers Guidance (outline, draft, final)
- Segment Baseline Architecture Data Collection Spreadsheet
- Segment Target Architecture Data Collection Spreadsheet
- Segment Transition Architecture Data Collection Spreadsheet
- Enterprise Architecture Work Plan (outline, draft, final)
- Project Managers Guide (outline, draft, final)
- 2006 Architecture Standard and Guidance (outline, draft, final)
- Configuration Item Tracking Sheet
- Physical Configuration Audit Checklist
- ART Change Request Form





APPENDIX B: RECOMMENDED IMPLEMENTATION STEPS

1. CONFIRM AND IMPLEMENT CONFIGURATION MANAGEMENT (CM) APPROACH

- Develop and approve criteria for designating artifacts as Configuration Items (CIs)
- Confirm and approve classes/categories of CIs and criteria for classification
- Confirm and approve definition of an identification system for each type of CI – Document Control Number (DCN), Model Control Number (MCN), etc.

2. CONFIRM AND IMPLEMENT ORGANIZATION STRUCTURE

- Confirm and approve Roles and Responsibilities
- Assign individuals/groups to roles

3. CONFIRM AND IMPLEMENT LOGICAL CI MAINTENANCE

- Confirm and approve format and structure of CI List
- Confirm and approve method for tracking CIs through changes
- Confirm and approve CI lifecycle – evolution through states – and mechanisms for moving a CI through the states
- Confirm and approve mechanism for tracking and auditing status changes

4. FINALIZE PHYSICAL REPOSITORY

- Finalize discussion of use of Documentum and relationship to Metis
- Finalize definitions of repositories and identify physical locations
- Confirm version control system

5. CONFIRM AND IMPLEMENT PROCESSES

- Finalize and approve the following for each process: Tasks/Steps, Roles, Tools, Approval Other Mechanisms
 - Designating an artifact as a CI
 - Submitting a CI
 - Requesting and approving changes for each CI type
 - Controlling change of each CI type
- Define and approve process for QA'ing changes (i.e., confirming that the change is the one requested and was made accordingly)
- Further develop and finalize “Publish” and “Archive” processes, particularly in relation to use of repositories and tools





APPENDIX C: SAMPLE CM FORMS AND TEMPLATES

This appendix contains sample forms and templates for use in support of configuration management processes:

- Configuration Item Tracking Sheet
- Physical Configuration Audit Checklist
- Software Change Request Form
- Document Change Request Form
- Authorization to Publish Form (TBD based on outcome of Appendix B: Recommended Implementation Steps, p. B-1).





Configuration Item Checklist								
	Version:							
	Project Name:							
	Project Manager:							
	Control Area:							
<i>ID</i>	<i>CI Name</i>	<i>Version</i>	<i>Project Artifact</i>	<i>CM Directory</i>	<i>CM Sub-Directory</i>	<i>CI Type</i>	<i>Responsible</i>	<i>Status</i>





PCA Checklist

INSTRUCTIONS		Version 1.01	
<ul style="list-style-type: none"> Use this form as a checklist for the Physical Configuration Audits (PCA). The checklist may be modified to cover project specific issues. Mandatory reviewers are the PM, Tech Lead, PCMO, and PQAQ. For more guidance on the PCA Process, see PMH Chapter 8 (Configuration Management). This checklist is prepared for End-item Software Development contracts, as well as document only end-item contracts. Plans may be tailored in accordance with appropriate standards (e.g., IEEE Standard 828-1998, Section 5). This checklist supports Section 8.3.5, Conduct Configuration Audits, of PMH Chapter 8. 			
PROJECT IDENTIFICATION		SUBCONTRACT IDENTIFICATION	
Date		Subcontractor Name	
Project Name		Task Order ID	
Project Number		Subcontract POP	
Configuration Item Name			
PCA Number		Subcontractor Project Type	
PCA REVIEWERS		Subcontractor Role (Briefly Describe)	
PM			
Tech Lead			
CM Official			
QA Official			
AREA EVALUATED	COMPLIANT (Y/N/NA)	NOTES	
Perform PCA			
1	Is the agenda available prior to the review?		
2	Are all required configuration items physically available and do they correspond to their assigned physical specifications, formats, style, and packaging?		
3	Are the software products appropriately labeled and the correct configuration item version numbers assigned?		
4	Are the documents appropriately labeled and the correct document control numbers assigned?		
5	Do the release notes correctly reflect the labeling of the configuration items?		
6	Are all outstanding action items from previous reviews completed?		
7	Is the delivery letter on appropriate SRA letterhead and are the signature pages signed by PM or representative with a "Received by:" box for customer signature present?		





AREA EVALUATED		COMPLIANT (Y/N/NA)	NOTES
8	Have the configuration items been peer reviewed?		
9	Have the media been virus scanned?		
10	Have action items been prepared?		
11	Have minutes been prepared?		
PROJECT-SPECIFIC PCA REQUIREMENTS			



CHANGE REQUEST (CR)/PROBLEM REPORT (PR)

CR

PR

To open a CR/PR, fill out Box 1

For Testing, fill out Box 5

For Analysis/Implementation, fill out Box 2 & 3

For CM, fill out Box 6 & 7

For Affected Areas, fill out Box 4

Box 1	GENERAL PROBLEM DESCRIPTION INFORMATION
CR/PR #: _____	Name: _____
Cross Ref: _____	Organization: _____
Problem Date: _____	Location/Phone #:: _____
Brief Title: _____	
S/W System: _____	Release #: _____
H/W System: _____	
Screen Number: _____	Recommended Priority: 1 2 3 4 5 (circle one)
Problem Description: 	
Box 2	ANALYSIS
Task Lead: _____	Analysis Date: _____
Estimated Hours to Complete: _____	Analysis Time: _____ (Hrs.)
Recommended Release: _____	Error Source: _____
Analysis Description: 	
Box 3	IMPLEMENTATION
Programmer: _____	
Actual Hours to Complete: _____	Implementation Date: _____
Scheduled Release: _____	Scheduled Release Date: _____
Implementation Description: 	





Box 4	AFFECTED AREAS
System: _____	Subsystem/Functional Area: _____
Subdirectory: _____	CSI/Unit Name: _____
Copylibs: _____	Screens: _____
Reports: _____	Documentation: _____
Box 5	TESTING
Tester Name: _____	Test Date: _____
Test Results: Pass <input type="checkbox"/> Fail <input type="checkbox"/> Partial <input type="checkbox"/>	Initial: _____ Date: _____
Test Description:	
Test Comments:	
Box 6	PCCB ACTIONS
PCCB Date: _____	PCCB Priority: 1 2 3 4 5 (circle one) Class: I <input type="checkbox"/> II <input type="checkbox"/>
Analysis: Approved <input type="checkbox"/> Disapproved <input type="checkbox"/>	Date: _____
Implementation: Approved <input type="checkbox"/> Disapproved <input type="checkbox"/>	Date: _____
Actual S/W Turnover Date: _____	Software Turnover Form #: _____
Analysis/Implementation Signature: _____	Date: _____
PCCB Actions Taken:	
Box 7	PCCB CLOSURE ACTIONS
Closure: Approved <input type="checkbox"/> Disapproved <input type="checkbox"/>	Date: _____
Approval Official: _____	Closure Status: _____
Official Signature: _____	
Closure Comments:	





DOCUMENT CHANGE REQUEST		DCR No: 0	
SUBMITTER			
Name:	Date:	Project:	
REQUEST			
Request Priority: <input type="checkbox"/> 1 = Critical <input type="checkbox"/> 2 = Very Important <input type="checkbox"/> 3 = Important <input type="checkbox"/> 4 = Inconvenient <input type="checkbox"/> 5 = Interesting			
Document Type: <input type="checkbox"/> Policy <input type="checkbox"/> Procedure <input type="checkbox"/> Handbook <input type="checkbox"/> Training Materials <input type="checkbox"/> Other _____			
Document Name: QA-PRO-15	Version:	Page(s):	
Short Change Description:			
Detailed Change Description:			
Need for change recognized during: <input type="checkbox"/> Planning <input type="checkbox"/> Execution <input type="checkbox"/> Training <input type="checkbox"/> Document Review <input type="checkbox"/> Other _____			
ACTION			
CCB Priority: <input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low		Change Type: <input type="checkbox"/> Defect <input type="checkbox"/> Enhancement	
Assigned To:		Uniqueness: <input type="checkbox"/> Original request <input type="checkbox"/> Duplicate of previous request	
Evaluation:			
Other Documents Affected:			
	Implementation	Verification	Total Staff Hours
Estimated Level of Effort (Staff Hours)			
Actual Effort Expended			
Estimate Accuracy (Actual / Estimated)			
CCB Action: <input type="checkbox"/> Approved for Implementation <input type="checkbox"/> Approved with Modifications <input type="checkbox"/> Disapproved <input type="checkbox"/> Deferred until _____			
CCB Signature:	Date:	Submitter Notified? <input type="checkbox"/> Yes	
Implementation Comments:			





VERIFICATION		
CM Approval:	Date:	Promoted to QA baseline? <input type="checkbox"/> Yes
QA Approval:	Date:	Promoted to product baseline? <input type="checkbox"/> Yes
Actual Release:	Release Date:	Date Closed:

