

# **ELECTRONIC RECORDS ARCHIVES**

## **ERA LIFE CYCLE (ELC)**

**(TOMP VERSION 2.0, TASK 4.3.1)**

for the

**NATIONAL ARCHIVES AND  
RECORDS ADMINISTRATION**

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

Final  
October 9, 2003

Prepared by:

***Integrated Computer Engineering (ICE)***  
***A Subsidiary of***  
***American Systems Corporation (ASC)***

Contract Number: GS-35F-0673K  
Delivery Order Number: NAMA-01-F-0031/03-056

FINAL

## **ERA LIFE CYCLE (ELC)**

### **Signature Page**

Program Director,

I recommend approval of the ERA Life Cycle (ELC).

\_\_\_\_\_  
Carmen Colon,  
ERA Program

\_\_\_\_\_  
Date

Approved,

\_\_\_\_\_  
Ken Thibodeau,  
ERA Program Director

\_\_\_\_\_  
Date

### Document Change Control Sheet

Document Title: ERA Life Cycle (ELC)

Date	Filename/version #	Author	Revision Description
02/15/02	ERA.DC.ELC.1.0.DOC	Jon Valett Bob Nagle	Baseline ELC.
09/24/03	ERA.DC.ELC.2.0.DOC	Sharon Burke	See Government Review Comment Form for ELC.
10/09/03	ERA.DC.ELC.2.1.DOC	Sharon Burke	Refer to Change Request: CR-ERA-PMO-DCMT-61

FINAL
Table of Contents

SIGNATURE PAGE .....i
DOCUMENT CHANGE CONTROL SHEET..... ii
1.0 INTRODUCTION.....1
1.1 PURPOSE.....1
1.2 ERA PROGRAM OVERVIEW.....1
1.3 SCOPE OF DOCUMENT .....1
1.4 DEFINITIONS AND ACRONYMS.....2
1.5 REFERENCE DOCUMENTS .....3
1.5.1 ERA PMO References.....3
1.5.2 Industry Standards and References .....4
2.0 ERA LIFE CYCLE PROCESSES .....4
2.1 OVERVIEW OF THE PRIMARY PROCESSES .....4
2.1.1 Acquisition.....9
2.1.2 Supply .....9
2.1.3 Development .....10
2.1.4 Operations and Support.....11
2.1.5 Maintenance .....11
2.2 SUPPORTING LIFE CYCLE PROCESSES .....11
2.2.1 Documentation.....11
2.2.2 Configuration Management (CM) .....11
2.2.3 Quality Management (QM).....12
2.2.4 Verification .....12
2.2.5 Validation .....12
2.2.6 Joint Review.....13
2.2.7 Audit Process .....13
2.2.8 Problem Resolution .....13
2.3 ORGANIZATIONAL PROCESSES .....13
2.3.1 Program Management .....13
2.3.2 Infrastructure.....14
2.3.3 Improvement .....14
2.3.4 Training .....14
3.0 LIFE CYCLE DOCUMENT MAINTENANCE.....14

LIST OF FIGURES

Figure 2-1: ERA Life Cycle..... 5
Figure 2-2: ERA Development Life Cycle ..... 7
Figure 2-3: ERA Development Life Cycle Release Detail..... 8

LIST OF TABLES

Table 1-1: Acronyms List ..... 3

FINAL  
**ERA LIFE CYCLE (ELC)**

## **1.0 Introduction**

This Electronic Records Archive (ERA) Life Cycle (ELC) document presents the ERA system's life cycle from inception through retirement. It defines, at a high-level, the processes for acquiring, supplying, developing, operating, and maintaining ERA products and services.

The ELC, through careful planning, follows the approach for Information Technology (IT) acquisition, development, and management established by the Paperwork Reduction Act (PRA), Clinger-Cohen Act (CCA), and Office of Management and Budget (OMB) Circular A-11. The National Archives and Records Administration (NARA) will utilize Commercial Off-The-Shelf (COTS) and Non-Developmental Item (NDI) products, where possible, to develop an ERA system. All life cycle activities will be subject to continuous risk management as defined in the *ERA Risk Management Plan (RKM)*, and continuous quality assurance and quality control activities as defined in the *ERA Quality Management Plan (QMP)*.

### **1.1 Purpose**

The purpose of the ELC is to define the ERA system's development life cycle processes, the activities and products of each process, and show how they relate to one another. Execution of the processes is managed according to the plans and procedures described in the *ERA Program Management Plan (PMP)*.

### **1.2 ERA Program Overview**

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

The ERA system will encompass all of the associated equipment, facilities, material, software, hardware, policy, technical documentation, services, and personnel required to fulfill ERA program objectives.

### **1.3 Scope of Document**

The ELC document offers a telescopic view of the entire life cycle of the ERA system along with a more robust treatment of the system development process. The scope and magnitude of the ERA program and envisioned system supports the use of *IEEE 12207 Standard for Information Technology, Software Life Cycle Processes* (hereafter referred to as 12207), as a guide for establishing required tasks and deliverable products. 12207 was chosen because it includes the tasks and products specified in NARA's Systems Development Lifecycle (SDLC) and additional ones necessary to the ELC. Unless otherwise noted, the ELC follows all of the primary, supporting, and organization processes identified by 12207, and engages in the relevant activities and tasks. The ELC cites NARA's expected products and reviews at each major development milestone. However, this declaration does not exclude engagement with other activities and products cited in 12207.

**FINAL**

Details of the acquisition process, including operations and maintenance, and its life cycle are identified in the *ERA Acquisition Strategy (AS)*. The ERA Program Management Office (PMO) and the supplier will agree jointly on the details of the supply process at contract award.

#### 1.4 Definitions and Acronyms

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

ACRONYM	DEFINITION
AS	Acquisition Strategy
AT	Acceptance Test
CCA	Clinger-Cohen Act
CCB	Configuration Control Board
CDR	Critical Design Review
CM	Configuration Management
CMG	Configuration Management Guide
CMP	Configuration Management Plan
COTS	Commercial Off-The-Shelf
CPP	Configuration Management PVCS Procedures
DAP	Document Development and Approval Process
ELC	ERA Life Cycle
ERA	Electronic Records Archives
FOC	Full Operational Capability
ICD	Interface Control Document
IOC	Initial Operating Capability
IRD	Interface Requirement Documents
IEEE	Institute of Electrical and Electronics Engineers
IT	Information Technology
IV&V	Independent Verification and Validation
IVVP	Independent Verification and Validation Plan
MED	Managed Evolutionary Development
MNS	Mission Needs Statement
MP	Metrics Plan
NARA	National Archives and Records Administration
NDI	Non-Developmental Item
OMB	Office of Management and Budget
ORR	Operational Readiness Review
PDR	Preliminary Design Review
PMO	Program Management Office
PMP	Program Management Plan
PRP	Peer Review Process
PWS	Performance Work Statement
QA	Quality Assurance
QC	Quality Control

ACRONYM	DEFINITION
QM	Quality Management
QMP	Quality Management Plan
QPP	Quality Management Processes & Procedures
RFP	Request for Proposal
RKM	Risk Management Plan
SDD	System Design Document
SDLC	Systems Development Lifecycle
SDR	System Design Review
SyRS	System Requirements Specifications
SRR	System Requirements Review
TEP	Technical Review Process
TMG	Testing Management Guide
TRA	Training Needs Assessment
TRP	PMO Training Plan
TRR	Test Readiness Review
TSP	Testing Management Plan

**Table 1-1: Acronyms List**

## 1.5 Reference Documents

The documents, industry standards, and references used to develop the ELC are described in the sections that follow.

### 1.5.1 ERA PMO Documents

The following ERA PMO documents were used in developing this document.

- Acquisition Strategy (AS), Version 3.0
- Configuration Management Guide (CMG), Version 1.0
- Configuration Management Plan (CMP), Version 2.0
- Configuration Management PVCS Procedures (CPP), Version 1.0
- Document Development and Approval Process (DAP), Version 1.3
- Independent Verification and Validation (IVVP), Version 0.01
- Metrics Plan (MP), Version 2.0
- Mission Needs Statement (MNS), Version 1.2
- PMO Training Plan (TRP), Version 1.0
- Program Management Plan (PMP), Version 1.2
- Quality Management Plan (QMP), Version 2.1
- Quality Management Processes and Procedures (QPP), Version 1.0
- Risk Management Plan (RKM), Version 2.1
- Technical Review Process (TEP), Version 1.0
- Testing Management Plan (TSP), Version 2.1
- Peer Review Process (PRP), Version 1.1
- Training Needs Assessment (TRA), Version 2.0

## 1.5.2 Industry Standards and References

The following standards and references were used in the development of this document.

- Industry Implementation of International Standard ISO/IEC 12207: 1995 (ISO/IEC 12207) Standard for Information Technology, 12207.0, *Software Life Cycle Processes*
- Industry Implementation of International Standard ISO/IEC 12207: 1995 (ISO/IEC 12207) Standard for Information Technology, 12207.1 Standard for Information Technology, *Software Life Cycle Data*
- Industry Implementation of International Standard ISO/IEC 12207: 1995 (ISO/IEC 12207) Standard for Information Technology, 12207.2 Standard for Information Technology, *Software Life Cycle Implementation Considerations*
- IEEE Std 610.12-1990, *IEEE Standard Glossary of Software Engineering Terminology*

## 2.0 ERA Life Cycle Processes

ERA's Life Cycle Processes are described in the following sections.

### 2.1 Overview of the Primary Processes

The ELC is comprised of the following primary processes:

- Acquisition,
- Supply,
- Development,
- Operations and Support, and
- Maintenance.

The ELC model, depicted in **Figure 2-1, ERA Life Cycle**, is an overview of the expected major activities, products, and controlling elements/reviews of each of the primary processes. In addition to the primary ELC processes are those phases that uniquely describe Acquisition. Acquisition is viewed somewhat differently here because it is a contractual activity and the standard used for acquisition differs from the 12207 standard applied to the ELC. The acquisition phase includes:

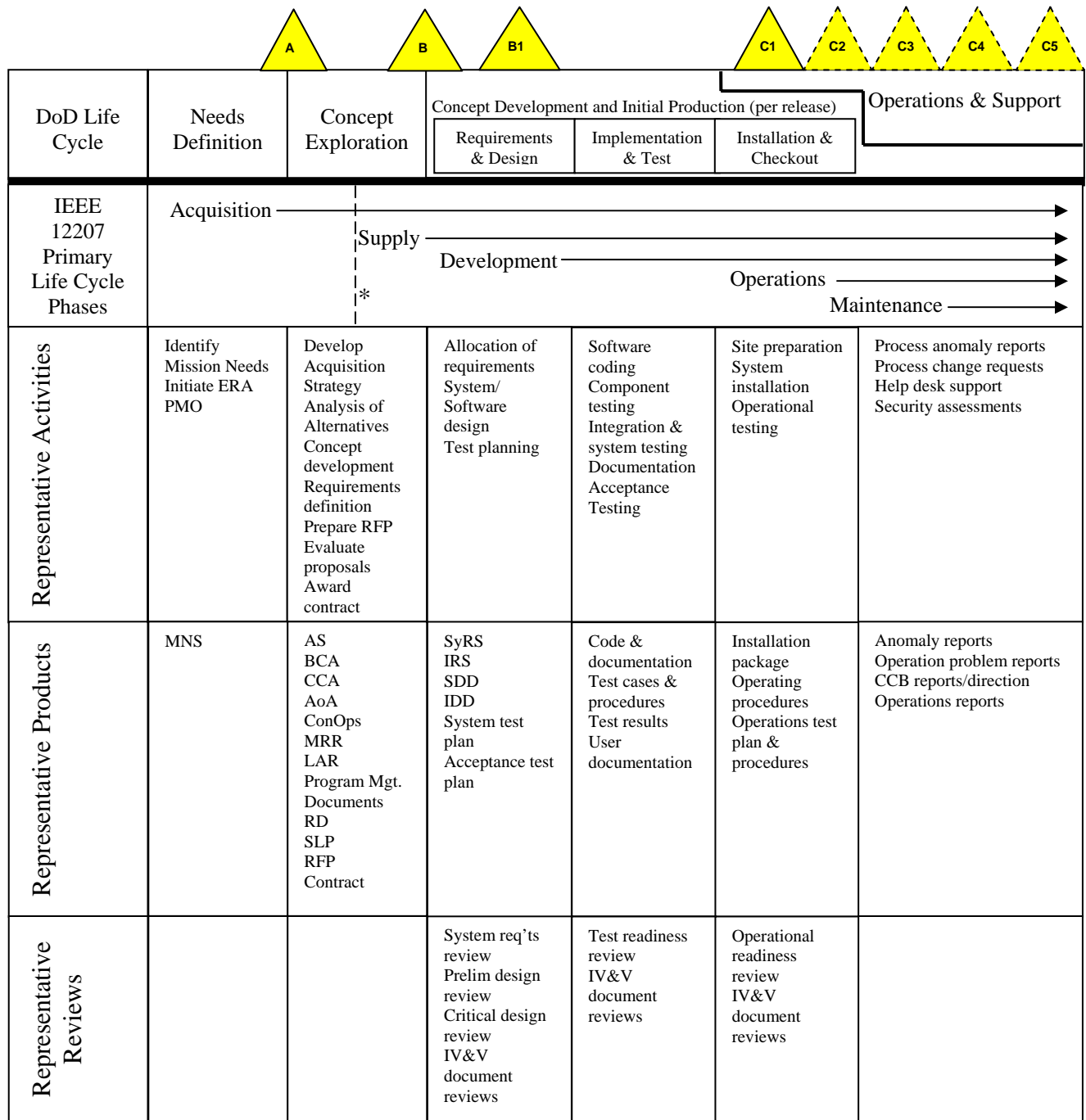
- Needs Definition,
- Concept Exploration,
- Concept Development,
- Initial Production, and
- Operations and Support.

Acquisition begins in the needs definition phase with creation of the Mission Need Statement (MNS). It then moves into concept exploration where an acquisition strategy is established and a Request For Proposal (RFP) is prepared. As shown, Acquisition spans the entire life cycle until full operation, evolving toward those events that are specific to Supply, Development, and the



**FINAL**

parallel responsibilities underlying Operations, Support, and Maintenance. More detailed information about acquisition is located in the *ERA AS*.



\* There is overlap between the Acquisition and Supply phases during Concept Exploration.

**Figure 2-1: ERA Life Cycle**

The activities of the Supply Process prepare the way for the Development Process. The first phase of the Development Process, Systems Analysis and Design, concentrates on acquiring two (2) independent design teams to perform an ERA system analysis and an architectural design for

**FINAL**

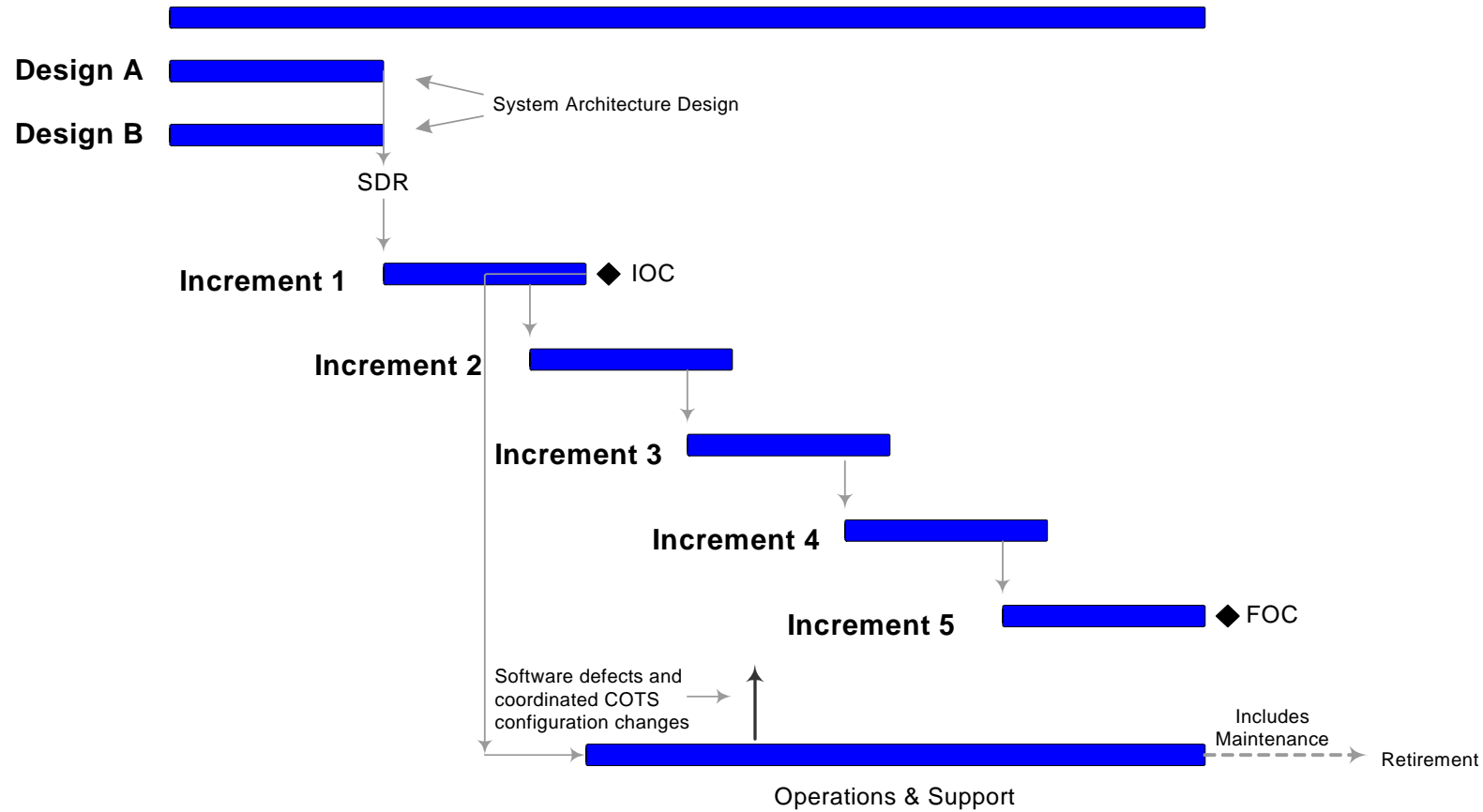
the system. The design activity inaugurates the ERA system and culminates with a System Design Review (SDR). Each of the teams develops its own set of design requirements based upon those provided by the ERA PMO, devises a system architecture design, documents it in a System Design Document (SDD) and presents it at an SDR. Acceptance of the best single design marks the starting point for the Systems Development phase. At this juncture, and until full operation, development utilizes an incremental life cycle approach with allocated releases within each of several operational increments. By applying this strategy, ERA development occurs simultaneously on three different levels that include system, increment, and release. The activities, products, and reviews noted in **Figure 2-1** apply to all development levels and are iterative within the levels. The triangles at the top of **Figure 2-1** represent milestones in each of the acquisition phases. Transition to the next phase requires a milestone decision that the exit criteria for the current phase have been met. The ERA program is currently in the Concept Exploration Phase, approaching Milestone B. A complete description of each milestone's exit criteria can be found in the *ERA AS*.

As shown in **Figure 2-2, ERA Development Life Cycle**, the system is developed in multiple overlapping increments. Each increment is overlapped by the one immediately preceding it; that is, each new increment begins before the previous one terminates. Overlapping also applies to the releases within each increment (three releases in the first increment and just two in later ones), resulting in the completion of an earlier release in parallel with the first part of development of the next release.

**Figure 2-3, ERA Development Life Cycle Release Detail**, illustrates this approach with more precision at the increment and release levels, and includes the specific tasks undertaken within a representative release cycle (i.e., Increment 1-Release 1). Overall system planning and requirements analysis occurs only one time during development - at the beginning. Increment requirements analysis occurs at the start of each increment, and release requirements analysis is repeated for each release of the system in addition to iterative design, development, and testing. The first release of the system incorporates a subset of the planned capabilities. The next release then adds another subset. Initial Operating Capability (IOC) occurs after more capabilities have been added to generate the third release. Note that releases overlap as development within the increment progresses. This sequence continues through four additional increments, each containing two releases, until the outputs form a complete operational system.

FINAL

### Development



Note: This diagram is not to scale for development and increments.

Figure 2-2: ERA Development Life Cycle

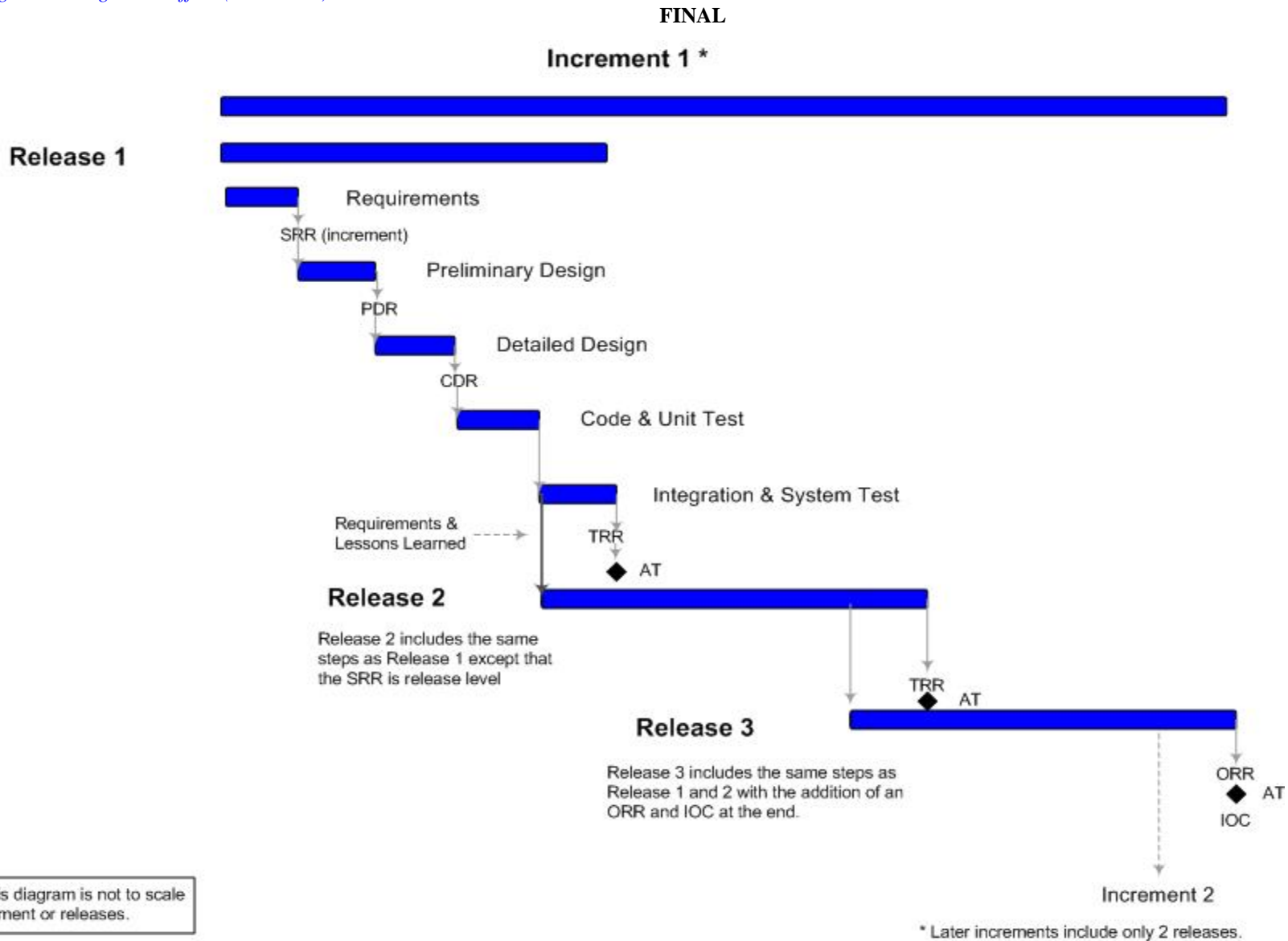


Figure 2-3: ERA Development Life Cycle Release Detail

**FINAL**

An iterative and incremental development approach with possible use of prototyping, like that specified by NARA's Managed Evolutionary Development (MED) methodology, is appropriate for ERA development because:

- ERA is a new system where user needs are determined and basic system requirements are defined early;
- Risk management is enhanced because risks are addressed regularly and much earlier in the project life cycle. See the *RKM* for further information;
- Functionality is seen in some intermediate version at each release of the product;
- Testing is done at the end of every release to ensure a safe and complete product as well as a refinement of the testing documentation and processes to be used in testing operational increments;
- User and stakeholder feedback is obtained at each release and immediately factored into the planning for the next release; and
- The quality of ERA is enhanced because quality issues can be identified and addressed early in the program life cycle.

Both the Maintenance and Operations and Support Processes begin while the Development Process evolves. As shown in **Figure 2-2**, IOC commences at the end of the first increment of the Development Process. Maintenance also begins at IOC and continues to function in step with Operations throughout the ELC. Because Supply, Operations and Support, and Maintenance are in the domain of the contractor, more exact specifications of those processes will become formalized at contract award. 12207 lists the activities and tasks that may be expected during discharge of these contractor processes.

### 2.1.1 Acquisition

The Acquisition Process contains the activities and tasks for NARA to acquire ERA. This process begins with the definition of the need to acquire ERA. From this process initiation, it continues with the preparation and issuance of a Request for Proposal (RFP), contract preparation, selection of a supplier, monitoring of the supplier, and management of the acquisition process through acceptance and completion. Responsibilities related to acquisition are depicted in **Figure 2-1** and documented in the *ERA AS*.

### 2.1.2 Supply

The Supply Process contains the activities and tasks of the developers. The supplier analyzes the requirements in the RFP bounded by organizational policies and other regulations, makes a decision to bid, and proposes a plan of procedures and resources needed to manage and assure the ERA program, including development of project plans and execution of the plans through delivery of the ERA system. The supplier executes the plan after formal acceptance by NARA, monitors and controls the progress and the quality of products and services through acceptance and completion, with oversight of the ERA PMO Quality Management Team. Details of the Supply process will be incorporated in the supplier's plans and in the Performance Work Statement (PWS) and reflect the expectations of NARA, the acquirer. Supplier activities and deliverables are cited in ISO/IEC 12207: 1995, Section 5.2.

### 2.1.3 Development

Conceptually, there will be two separate development phases – one for the design and the other for implementation of the design. The first development phase will focus on the creation of a system design for ERA and the alignment of that design with the NARA target architecture. In the event that deliverable submissions from the contractor(s) are acceptable, NARA will down-select to the contractor providing the best overall value to NARA.

The Development Process contains the activities and tasks of the developer that are related to development of ERA and its resulting products. Included in the process are activities for both system and software requirements analysis, system and software architecture design, software coding and testing, system and software integration, qualification testing, installation, and acceptance. The developer iteratively performs or supports the activities in this process in accordance with the contract, and is subject to reviews and product delivery at development milestones. Detailed descriptions of the different types of reviews, and guidelines for their use, can be found in the *Technical Review Process (TEP)*, *QMP*, and ISO/IEC 12207: 1995 Section 5.3.

#### 2.1.3.1 Systems Analysis and Design

Two independent developers will focus on the creation of an architectural design for ERA prior to starting the actual development of the system. System design will begin with a comprehensive system requirements analysis, and will incorporate strategies to ensure that the risks inherent to Open Standards COTS-based software development and integration are addressed. Activities may include creating design documents, holding reviews, demonstrating architectural approaches, and implementing prototypes that are specific to systems interface development. NARA will conduct an evaluation to assess contractor deliverables at the conclusion of systems analysis and design to determine which submission is superior, and then down select to a contractor for development. The best design components from either design effort will be considered for development; that is, specific items, identified as desirable, from the losing design will be provided to the winning contractor at Increment 1 startup for incorporation into the chosen design. Process activities and deliverables that may apply during design are cited in **Figure 2-1**.

#### 2.1.3.2 Systems Development

Increment one (1) of five (5) increments envisioned for ERA's development life cycle begins after a single contractor has been selected to develop the system. The first increment consists of three (3) sequential releases with the third release representing an IOC (Refer to **Figure 2-3**). The four (4) later increments will have two (2) releases within the increments. Completion of the fifth increment (Refer to **Figure 2-2**) represents Full Operational Capability (FOC). Activities within each increment will be iterative for all releases within that increment and each release will be subject to the same sequence and types of tests and reviews. As explained earlier, the final step (Integration & System Test) of the preceding release, both within and across an increment, will overlap the beginning of the next release's development period. The objectives of this overlapping methodology are to leverage resources, provide new requirements and lessons learned to the next effort, and ensure smooth transition into the next development release timeframe.

Activities and deliverables necessary to satisfy the development process are iterative during some or all release episodes and follow 12207 guidelines.

## 2.1.4 Operations and Support

The Operations and Support Process contains the activities and tasks of the operator(s) of ERA, and includes both operation of the ERA system and operational support to ERA users. Operations begin at the end of Increment 1 (IOC) and continue until the ERA system is retired. Some of the possible operation and support activities defined in 12207 are Process implementation, Operational testing, System operation, and User support. Specifics of the Operations Process activities and tasks, patterned after those found in 12207, will be determined at contract award.

## 2.1.5 Maintenance

The Maintenance Process contains the activities and tasks of the developer to maintain the ERA system during the Development Process. Maintenance is instituted at the end of Increment 1 (IOC) when operations begin. The process is activated when the ERA system undergoes modifications to code and associated documentation due to a problem or the need for improvement or adaptation. Applying configuration management when modifying the existing operating ERA system ensures system integrity. Maintenance is carried out in parallel with Operations by the developer until FOC, then by the operator or other designated maintenance entity after FOC. Maintenance may consist of some or all of the following activities:

- Process implementation,
- Problem and modification analysis,
- Modification implementation,
- Maintenance review and acceptance,
- Migration, and
- Software retirement.

## 2.2 Supporting Life Cycle Processes

The ELC takes into account the eight supporting processes covered by 12207. They are described briefly in the following subsections.

### 2.2.1 Documentation

A document development and approval process has been established for the ERA PMO. The *ERA Quality Management Document Development and Approval Process (DAP)* document contains the relevant activities and tasks.

### 2.2.2 Configuration Management (CM)

The Configuration Management (CM) Process was established very early in the life cycle and is rigorously enforced to support product integrity and manage change. The *ERA Configuration Management Plan (CMP)*, along with the *ERA Configuration Management Guide (CMG)*, defines the CM process while the *ERA Configuration Management PVCS Procedures (CPP)* explains use of the CM tool.

### 2.2.3 Quality Management (QM)

Quality planning, quality assurance, and quality control are integral parts of ERA's Quality Management (QM) program. They are applied to ensure that a consistently high level of quality is maintained in all elements of the program.

Quality planning, performed in parallel with other program planning processes, identifies which quality standards are relevant to ERA and determines how to satisfy them. Quality Assurance (QA) is used to regularly evaluate program performance and products to ensure program satisfaction of quality standards. QA may be internal or external and make use of other supporting processes such as Verification, Validation, Joint Reviews, Audits, and Problem Resolution. ERA uses Quality Control (QC) to monitor both products (e.g., deliverables) and performance (e.g., cost and schedule) for compliance with quality standards, and to identify ways to eliminate problem causes.

The *QMP* documents how the ERA PMO plans, implements, and assesses the effectiveness of its quality planning, quality assurance, and quality control activities.

### 2.2.4 Verification

The purpose of verification is to ensure that selected work products meet their specified requirements. The ERA verification process confirms that a product satisfies selected requirements. Verification is incremental and it occurs throughout the ELC for all work products. Verification substantially increases the likelihood that the ERA product will meet the customer, product, and product-component requirements.

Peer reviews are an important verification method, applied for effective defect removal. ERA peer reviews involve a methodical examination of work products by the producers' peers to identify defects and other changes that are needed. The peer review process is described in the *Peer Review Process (PRP)*. Other types of reviews are defined in the *ERA TEP*. Additionally, the *Independent Verification and Validation Plan (IVVP)* document describes how the verification process provides objective evidence that all life cycle processes have been properly and adequately performed.

### 2.2.5 Validation

Validation demonstrates that the product will fulfill its intended use. Validation activities are applied to all ELC work products throughout the life cycle including planning, development, maintenance, and operations. Products are selected for validation along with the validation environment, procedures, and criteria. The validation environment used is driven by the product or product components selected, by the type of the work products (e.g., design, prototype, final version), and by the methods of validation.

A product must perform as expected in its intended operational environment to be acceptable to users. Various levels of testing, described in the *ERA Testing Management Plan (TSP)* and the *ERA Testing Management Guide (TMG)* are used in the ERA validation process. The data resulting from validation tests, inspections, demonstrations, or evaluations are analyzed against the defined validation criteria. Analysis reports indicate whether the needs were met. In addition, the *ERA IVVP* describes how the validation process examines and provides objective evidence of product compliance with the system's functional requirements and the users' needs.



### 2.2.6 Joint Review

The Joint Review process defines the activities for evaluating the status and products of the ERA ELC. Joint reviews are held at both the program management and technical levels throughout the life cycle. The reviews are conducted in a joint forum by the reviewing and reviewed parties to evaluate status and compliance of products and activities on a pre-agreed to schedule. ERA's use of the Joint Review process also ensures that action items are recorded and assigned.

Different types of joint reviews including the System Requirements Review (SRR), SDR, Test Readiness Review (TRR), and Operational Readiness Review (ORR) are described in the *ERA TEP*.

### 2.2.7 Audit Process

The ERA PMO uses audits to identify deviations in process performance, identify noncompliance items that cannot be resolved at the technical support or program management level, validate process improvement/correction action achievements, and provide relevant reports to all management levels. Both products and processes are audited according to the guidelines specified in the *ERA QMP*. The product audit assesses compliance with specifications, standards, customer requirements, or other criteria. The process audit determines whether quality activities and related results comply with planned standards, policies and procedures, and whether these are implemented effectively and are suitable to achieve ERA's objectives.

### 2.2.8 Problem Resolution

The developer will provide a problem report to the ERA PMO when problems or non-conformances are detected in the ERA system. The developer will be responsible for establishing a problem resolution process for handling detected problems and activities. With ERA PMO guidance, the developer may include the following in the process:

- A scheme for categorizing and prioritizing the problems,
- Analysis to detect trends in the problems reported, and/or
- Evaluation of problem resolutions and dispositions to determine whether adverse trends have been reversed, if changes have been correctly implemented and whether additional problems have been introduced.

## 2.3 Organizational Processes

NARA established the ERA PMO to support the acquisition of a system to enable it to accomplish its mission for life cycle management of electronic records. The PMO has direct responsibility for all of those organizational life cycle processes needed to undertake and accomplish the PMO mission.

### 2.3.1 Program Management

The *ERA PMP* identifies the scope, cost, and schedule baselines required to manage the ERA program and its related processes.

### 2.3.2 Infrastructure

The ERA PMO serves as the foundation and infrastructure for the ELC and supports the establishment and maintenance of all other ELC processes. The PMO has been organized and staffed with structure, processes, knowledge, and skill optimized for the sole purpose of managing acquisition of the ERA system through the entire ELC to FOC. The developer, with PMO direction, will establish the development infrastructure.

### 2.3.3 Improvement

Lessons learned from the application of many of ERA's support processes contribute to its Improvement Process. For more detailed information about lessons learned, see the **Lessons Learned Program** section of the *Quality Management Processes and Procedures (QPP)* document. A yearly overall program assessment also contributes to the improvement process. Activities of the support processes are described in their respective documentation including:

- Configuration Management Plan,
- Technical Review Process,
- Change Management Plan,
- Metrics Plan (MP),
- Quality Management Plan, and
- Risk Management Plan.

### 2.3.4 Training

The ERA PMO regularly assesses training needs as prescribed in the *ERA Training Needs Assessment (TRA)* document. The *ERA PMO Training Plan (TRP)* and training program have been established and actively engaged.

## 3.0 Life Cycle Document Maintenance

The ERA Program Management Division is responsible for this document. As a part of process improvement (e.g., IV&V assessments, lessons learned, QM assessments), the ELC and the overall life cycle management approach will continue to evolve. The document will be updated as needed to maintain current and sufficient life cycle management activities. The document will be placed under CM control following its initial approval by the ERA PMO. Updates to the ELC will be controlled by the Configuration Control Board (CCB).