

**The
Bureau of Land Management's

Information Technology
Investment Management Process**

Version 1.0

September 21, 2001

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CIO FORWARD

I am pleased to present the Bureau of Land Management's Investment Management Process as the policy and procedures for managing Information Technology (IT) investments. An IT investment management process is an integrated approach to managing IT investments that provides for continuous identification, selection, control, life-cycle management, and evaluation of existing IT investments. The process relies on incorporating practice-proven project management best management practices to better ensure repeatable successes. This structured process provides a systematic method for the Bureau to minimize risks while maximizing the return on IT investments.

Several recent management reform efforts have introduced requirements emphasizing the need for federal agencies to significantly improve their management processes, including how they select and manage IT resources. For example, a key goal of the Clinger-Cohen Act is that agencies have processes and information in place to help ensure that IT projects are: business driven; being implemented at acceptable costs, within reasonable and expected time frames; and are contributing to tangible, observable improvements in mission performance.

This document was prepared based on information we have gained evaluating other organization's processes and procedures, and direct and indirect input by the GAO.

I expect all of the Bureau of Land Management personnel to use these new processes when making any IT investment.

If you have any questions or require assistance contact the System Coordination Office Manager (WO-570) at (303) 236-8915.

Hord Tipton
Assistant Director for Information Resource Management
Chief Information Officer
Bureau of Land Management

1.0 Introduction

This section provides background information on the Information Technology Investment Management Process's (IMP) authority and purpose, scope, organizational roles and responsibilities, a process overview, and an outline of the document's structure.

1.1 Investment Management Process Authority and Purpose

In recent years, five statutes were passed requiring federal agencies to revise their operational and management practices to achieve greater mission efficiency and effectiveness. These laws are:

- The Chief Financial Officers Act of 1990 (CFO)
- The Government Performance and Results Act of 1993 (GPRA)
- The Federal Acquisition Streamlining Act of 1994 (FASA)
- The Paperwork Reduction Act of 1995 (PRA)
- The Clinger-Cohen Act of 1996

This document implements specific information technology (IT) requirements of those laws. The Bureau's IMP is authorized and maintained by the office of the Chief Information Officer (CIO) and is consistent with Office of Management and Budget (OMB) and General Accounting Office (GAO) guidance. Inquiries related to the IMP are to be directed to System Coordination Office Manager (WO-570).

The IMP is a structured, integrated approach to managing IT investments. The IMP ensures that all IT investments (or projects) align with the Bureau's mission and support its business needs while minimizing risks and maximizing returns throughout the investment's life cycle. Instead of a one-time funding justification, the IMP relies on systematic selection, control, and on-going evaluation processes to ensure that the investment's objectives are met efficiently and effectively. These continuous processes are depicted in Figure 1, Information and Process Flow.

The information flows shown in Figure 1 also represent a feedback mechanism to institutionalize lessons learned. Approved investments become part of a larger investment portfolio maintained by the CIO. This portfolio contains an inventory of investments, as well as supporting strategic, technical, and financial information related to each project's risk and return profile. This information will be reported annually to the Department of Interior and OMB through the Information Technology Investment Portfolio System (I-TIPS).

When all IT investments are consolidated into the portfolio, the CIO can ensure that all systems work in concert with each other: systems under development, systems currently in use, and systems scheduled for retirement and/or replacement.

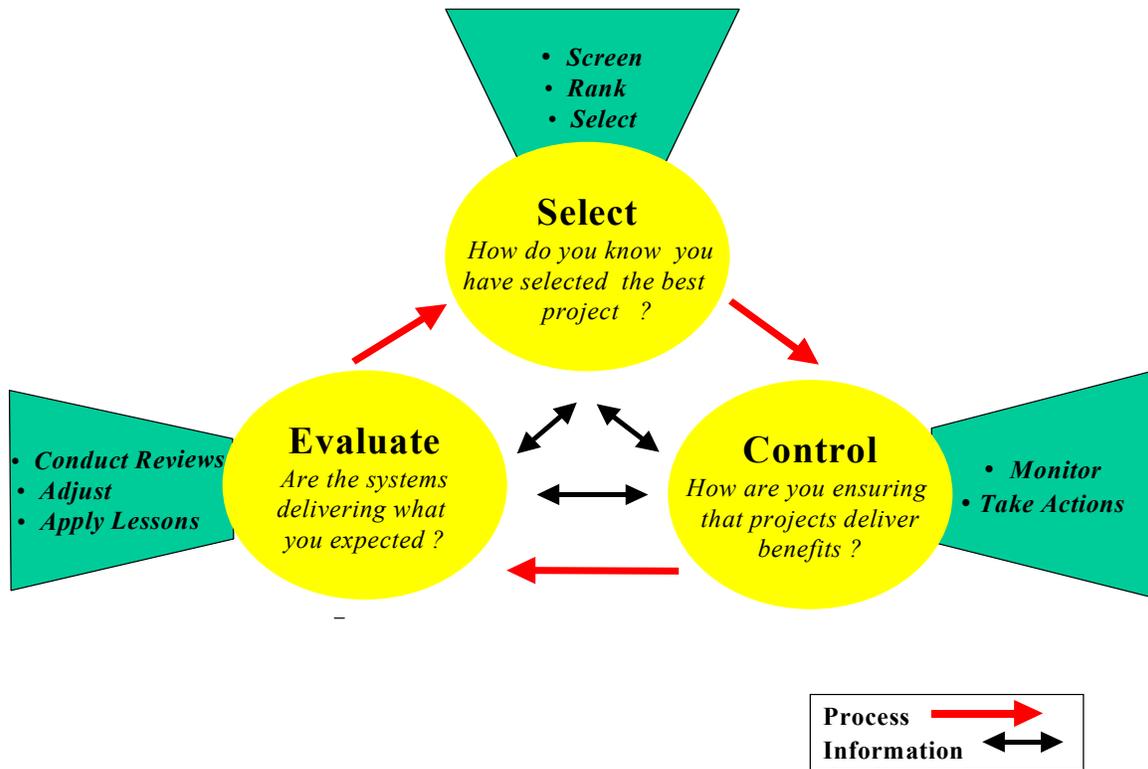


Figure 1: Information and Process Flow

1 Assessing Risks and Returns: A Guide for Evaluating Federal Agencies' IT Investment Decision-making; United States General Accounting Office; GAO/AIMD-10.31.13; February 1997.

1.2 Scope

All IT investments (projects) meeting the national level screening criteria, must follow the Bureau's IT IMP. The screening criteria for a national level investment is:

- Any proposed investment which is a Major Application or General Support System
- Any proposed investment with a life cycle value of greater than \$ 500,000
- Any proposed investment which will affect multiple states/centers
- Any proposed investment that will affect multiple business areas
- Any proposed investment between \$ 50,000 and \$ 500,000 where a State/Center does not have their own ITIB
- Any O&M investment that is not included in Program Base Funding

All IT investments (projects) meeting the minimum State/Center level screening criteria , must follow their respective IT Investment Management Process. The screening criteria for a State/Center level investment is:

- Any proposed investment with a life cycle value of less than \$ 500,000.

1.3 Roles and Responsibilities

The following decision-making bodies, supporting staff, offices and personnel are assigned the responsibilities listed below.

1.3.1 Key Decision Making Bodies

The following decision-making bodies are responsible for ensuring that proposed investments meet the Bureau's strategic, business, and technical objectives:

- **National Information Technology Investment Board (ITIB)** – Is responsible for selecting, controlling, and evaluating all Information Technology investments at the national level. The most recent version of the Bureau's National ITIB Charter can be found at the following website: <http://web.blm.gov/internal/wo-500/itib/itib.htm>
- **State/Centers Information Technology Investment Board (ITIB)** – Is responsible selecting, controlling, and evaluating all Information Technology investments at the State/Center level.

1.3.2 Supporting Staff, Offices and Personnel

The following supporting staff, offices and personnel are responsible for successfully implementing the IMP:

- **Project Proponent (PP)** – Is responsible for leading the development of the Investment Proposal, coordinating and championing the development of the business case, and working with the Project Manager throughout the life cycle of the project.
- **Assistant Director's IRM Advisor** – Is responsible for serving as the Assistant Director's primary point of contact for issues concerning the project.
- **Assistant Director's Portfolio Manager** - Is responsible for:
 - a) ensuring all IT Investment Proposals, national systems, and externally directed systems are planned, developed, maintained and distributed according to the Bureau's IT Investment Management Process, and Configuration Management (CM), and are in conformance with established Bureau hardware/software standards, as well as the Bureau's Architecture and Technical Reference Model;
 - b) summarizing all operations and maintenance costs associated with existing and proposed systems;
 - c) ensuring all new project proposals address the discontinuance of existing systems as a cost saving measure; and
 - d) working directly with each state/center that proposes moving a state/center or local application to a national level system.

The Assistant Director's Portfolio Manager and the Assistant Director's IRM Advisor may or may not be the same person.

- **Business Process Owner (BPO)** – Is responsible for ensuring that the business processes under development or enhancement are re-engineered prior to being automated.
- **Project Manager (PM)** – Is responsible for the development of the Business Case, Project Plan, and leadership and management of the project. The Project Manager reports directly to the Project Sponsor and may be called upon by the ITIB to occasionally provide an update of the project. Ultimately, they are responsible for the successful management and completion of one or more projects approved by the ITIB.
- **System Coordination Office (SCO)** - Is responsible for screening all IT investments and projects to ensure they are in line with the Bureau's selection, control, and evaluation criteria. Ensures that projects are consistent with the Bureau Architecture and facilitates the maintenance of the Bureau Architecture. Monitors project performance (scope, schedule, and budget) during the Control phase, and maintains the Bureau's IT Clearinghouse and Metadata Repository. The SCO is also responsible for coordinating the development of a Project Management curriculum, and mentoring and developing a cadre of trained and experienced Project Managers.
- **Investment Management Group (IMG)** - Is responsible for coordinating the development and maintenance of the Bureau's IT investment portfolio. Ensures all investments are linked to the Capital Asset Plan, and provides investment updates and forecasting as needed.
- **Project Sponsor** - A Field, Center, or Washington Office manager who authorizes the development of a business case. The Project Sponsor shifts roles to become the System Owner when the project moves into Operations and Maintenance. The Project Sponsor is responsible for selecting a Project Manager, approving all project documentation, and participating in a management oversight role throughout the planning, design, development, testing, acceptance and deployment of the project.
- **System Owner** - Is responsible for identifying a system User Representative, and ensuring that the system is evaluated on an annual basis, and receives an appropriate level of funding for the operations and maintenance of the system.
- **System Manager/User Representative** - Is responsible for program oversight of a deployed system that is in operations and maintenance.

1.4 Process Overview

The Investment Management Process (IMP) is a fluid, dynamic process in which proposed and ongoing Information Technology investments, projects and systems are continually

monitored throughout their life cycle. Successful investments and those that are terminated or delayed are evaluated to assess both the impact on future proposals and to benefit from any lessons learned.

The IMP contains three phases: Select, Control, and Evaluate. Each phase is comprised of multiple stages as shown in **Figure 2, Investment Management Process**.

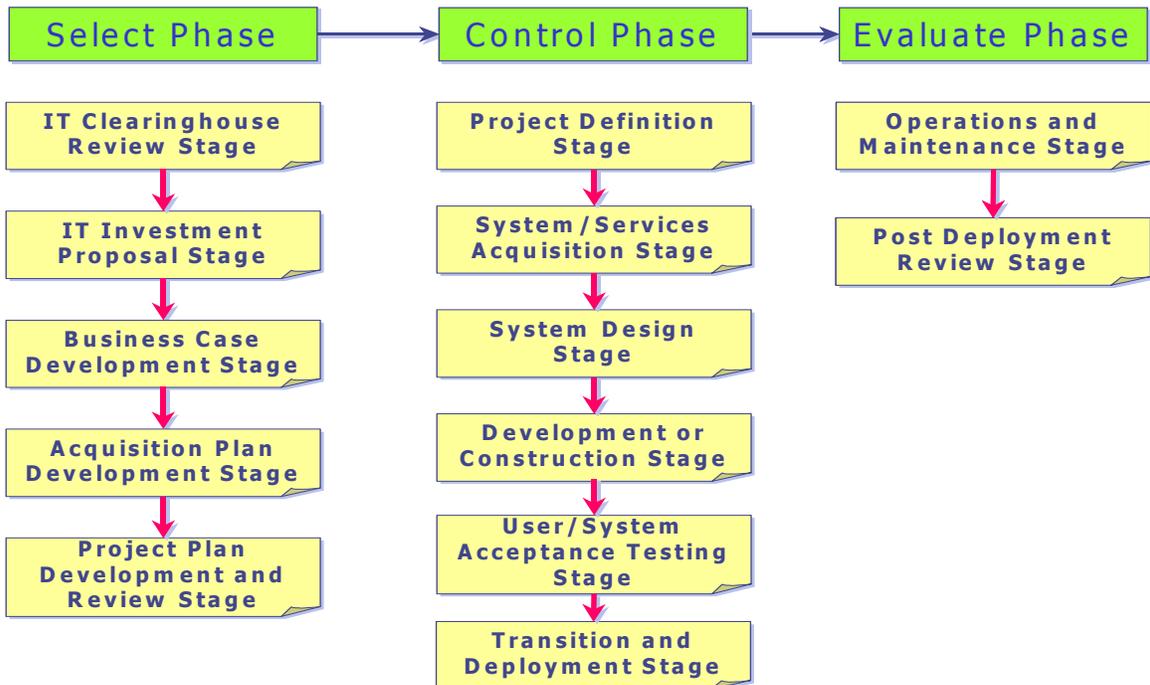


Figure 2. Investment Management Process

Within each phase, each stage contains the following common elements:

Purpose – Describes the stage’s objective

Entrance Criteria – Describes the stage’s prerequisite requirements and thresholds

Process – Describes the type of justification, planning and review that will occur

Results – Describes the actions occurring from the process

Exit Criteria – Describes the actions required to proceed to the next stage or phase

Next Steps - Describes the subsequent activities

Completing one phase is necessary before beginning a subsequent phase. Each phase is coordinated and reviewed by the SCO or IMG and is based on the ITIB’s decisions that either approve or reject an investment proposal/project request to advance to the next phase

or stage. This ensures that each project receives the appropriate level of managerial and technical review and that coordination and accountability exist. Requests for exceptions to IMP requirements must be identified and documented in a business case and be approved by the ITIB.

1.4.1 Select Phase

The Select Phase ensures that the Bureau chooses IT projects that best support its mission and comply with its architecture. Individual projects are evaluated in the broader context of technical alignment with other IT systems as well as the investment's impact to the Bureau's IT portfolio performance as measured by cost, benefit, and risk.

This phase requires that milestones for architecture, technical and project management reviews be included within the project plan/schedule.

As part of the process, the ITIB prioritizes each investment and decides which projects will be funded in subsequent fiscal years.

Screening is the first step during which a project submitted for funding is assessed against a uniform set of evaluation criteria and thresholds. If the project meets minimum requirements, then the appropriate level of organizational review is determined. The project's benefits, costs, and risks are systematically evaluated and ranked among other projects in the IT portfolio. Finally, a decision-making body of senior executives (the ITIB) decides which projects will be included in the portfolio.

The Select Phase consists of five stages:

- IT Clearinghouse Review Stage
- Investment Proposal Stage
- Business Case Development Stage
- Acquisition Plan Development Stage
- Project Plan Development and Review Stage

The Acquisition Plan Development Stage and the Project Plan Development Stage may be done concurrently.

1.4.2 Control Phase

Once selected for inclusion in the Bureau's IT portfolio, each project is managed by a trained or experienced IT project manager and monitored by the ITIB throughout its life cycle.

This phase also requires that milestones for architecture, technical and project management reviews be included within the project plan/schedule.

The project's risk, complexity, and cost determine the scope and frequency of each

milestone review. If a project does not meet its budget, schedule, or does not stay within the scope of the Project Plan, the ITIB decides upon an appropriate course of action. They will determine to continue the project, re-baseline either the scope, schedule or budget, or decide to terminate the project. The ITIB may at anytime decide to conduct a technical review or arrange for an Independent Verification and Validation (IV&V) of the project.

The Control Phase contains six stages:

- Project Definition Stage
- System/Services Acquisition Stage
- System Design Stage
- Development or Construction Stage
- User/System Acceptance Testing Stage
- Transition and Deployment Stage

Many of the Stages within the Control Phase may be somewhat current or cyclic depending on the software development methodology or overall project strategy.

1.4.3 Evaluate Phase

Once a project has been fully implemented and accepted by the users and system owner, actual results are evaluated against expected results to:

- Compare realized to estimated benefits
- Assess the project's impact on mission performance
- Identify any changes or modifications to the project that may be needed
- Assess technical compliance with the Bureau Architecture
- Revise the investment management processes based on lessons learned

The Evaluate Phase has two stages:

- Operations and Maintenance Stage
- Post Deployment Review Stage

1.5 IT Investment Management Process Improvement Effort

As part of the IT Investment Management Process, the Bureau has instituted an IT investment management improvement effort. The management improvement effort incorporates the GAO's guidelines for IT Investment Management (ITIM) maturity framework. The Bureau's IT IMP, and the SCO's Best Management Practices will be the primary means by which ITIM processes are promulgated. Specific project requirements are reflected in the three above mentioned documents. As a result, project managers, project sponsors and system managers will be guided by one all-encompassing process with well-defined sub-processes.

1.6 Document Structure

The IMP is divided into four sections and two appendices as described below:

- **Section 1: Introduction** – Describes the IMP’s purpose and authority, scope, overview, and document structure.
- **Section 2: Select Phase** – Describes the purpose, entry criteria, process, results, exit criteria, and next steps for each stage in the Select phase.
- **Section 3: Control Phase** - Describes the purpose, entry criteria, process, results, exit criteria, and next steps for each stage in the Control phase.
- **Section 4: Evaluate Phase** - Describes the purpose, entry criteria, process, results, exit criteria, and next steps for each stage in the Evaluate phase.
- **Appendix A: Acronym List** - Describes acronyms used in the document.
- **Appendix B: Bibliography** - Describes the manuals, and documents cited or used in the development of the Bureau’s IT Investment Management Process.

2.0 Select Phase

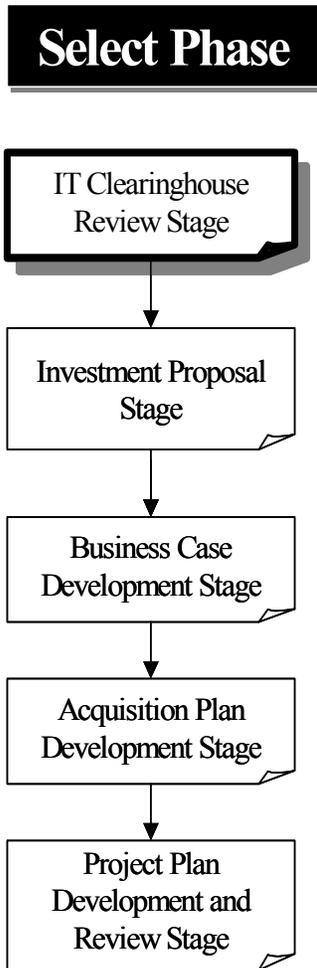
The Select Phase begins with a IT Clearinghouse Review and moves through the development of the business case, acquisition plan, and a project plan. These plans lay a solid foundation for success in the subsequent Control and Evaluate phases. This phase culminates in the Project Plan Development and Review. It is at this time that a ***Project Authorization Memorandum*** is created that authorizes work to begin. The Select Phase consists of five stages as summarized below.

Stage	Purpose	Results
IT Clearinghouse Review	<ul style="list-style-type: none"> •Ensure that the proposed investment does not duplicate existing systems, ongoing projects or a proposed project 	<i>Clearinghouse Registration Memorandum</i>
IT Investment Proposal	<ul style="list-style-type: none"> •Allows for an early review and confirmation that the business process re-engineering effort has a sponsor and ITIB approval to proceed 	<i>Investment Proposal Registration Memorandum</i>
Business Case Development	<ul style="list-style-type: none"> •Addresses the business need •Analyzes business processes (documents re-engineering) • Provides the technical and financial merits, identifies risks • Ensure proposed investment aligns with the Bureau’s Mission, Strategic Plans and Architecture • Provides information for SCO, IMG and ITIB to evaluate and rank proposal within the Bureau’s IT portfolio 	<i>ITIB Record of Decision</i> <i>Business Case Decision Memorandum</i>
Acquisition Plan Development	<ul style="list-style-type: none"> •Ensures objectives are met in the most effective, economical, and timely manner • Promotes the Contracting Officer’s involvement early in the investment management process 	<i>Acquisition Plan Approval Memorandum</i>
Project Plan Development and Review	<ul style="list-style-type: none"> • Ensure project management fundamentals are incorporated into the project from the very start • Promotes attainment of technical, cost, schedule, and risk management objectives • Initial User Requirements are developed, placed under change control, and reviewed and approved • Establishes the baseline for project scope, schedule and budget 	<i>Project Authorization Memorandum</i>

Table 1: Select Phase Summary

2.1 IT Clearinghouse Review Stage

2.1.1 Purpose



This section describes the steps necessary to conduct a IT Clearinghouse review. It is the responsibility of the Project Proponent to conduct a Clearinghouse Review and register their proposed project, with the Project Sponsor's concurrence, into the Bureau's IT Clearinghouse.

After successfully entering the proposed investment / project into the Bureau's IT Clearinghouse, the Project Proponent notifies the SCO. The SCO is also available to assist the Project Proponent with the Clearinghouse Review. The SCO will review or coordinate the review of each investment to ensure it is:

- In compliance with the Bureau Architecture
- Does not duplicate any existing system or system currently under development

This stage involves the following entities:

- Project Proponent (PP)
- Project Sponsor (an Assistant Director, or Deputy Director, or State/Center Director)
- System Coordination Office (SCO)

2.1.2 Entrance Criteria

Every IT investment / project, regardless of cost or size, must be entered into the Bureau's IT Clearinghouse and reviewed for architectural compliance.

2.1.3 Process

Two processes occur in this stage:

- A review of the Bureau's IT Clearinghouse, other Federal/State or non-profit agencies, and a review for commercial off-the-shelf products, and
- Project Registration

2.1.3.1 IT Clearinghouse Review

Review of the Bureau's IT Clearinghouse, as well as all other available sources of

information, is mandatory to determine that there is not: 1) an existing system or application, either in production/use or currently under development, that would meet the business needs of the proposed project, or 2) an existing Commercial-off-the Shelf (COTS) product or an Application Service Provider (ASP) that would meet the business needs of the proposed project.

The Project Proponent must have management support in the form of sponsorship of the Deputy Director, Assistant Director, or Center or State Director. It is also the Project Proponents responsibility to notify the Business Process Owner and the ADS IRM Advisor for review and approval before entering the project into the IT Clearinghouse. SCO will confirm sponsorship, and contact the Business Process Owner and the ADS IRM Advisor.

2.1.3.2 Project Registration

The SCO will formally notify the Project Proponent and the Project Sponsor that the project has been successfully entered into the IT Clearinghouse.

2.1.4 Exit Criteria

The SCO, on behalf of the ITIB, will issue a *Clearinghouse Registration Memorandum* that will be sent to the Project Proponent with courtesy copies sent to the Project Sponsor, AD's IRM Advisor and the Business Process Owner.

2.1.5 Next Step

Once the Project Proponent and Project Sponsor have received the *Clearinghouse Registration Memorandum*, the project may proceed to either the Investment Proposal Stage or the Business Case Development Stage. The SCO is available to advise and guide the Project Proponent in the development of the Investment Proposal.

2.2 Investment Proposal Stage

2.2.1 Purpose

Select Phase

The primary purpose of the Investment Proposal is to obtain concurrence from the Project Sponsor and the ITIB that the re-engineering effort is worth investigating further and to obtain the necessary funding to develop a Business Case.

IT Clearinghouse
Review Stage

This section describes the steps necessary to develop an IT Investment Proposal. The SCO reviews each IT Investment Proposal to ensure:

Investment Proposal
Stage

- Consistency with OMB Circular A-130 guidance
- Compliance with the Bureau Architecture
- No duplicate development efforts are initiated

Business Case
Development Stage

It is mandatory that each IT project, regardless of cost or size be reviewed for architectural compliance.

This stage involves the following entities:

Acquisition Plan
Development Stage

- A Project Proponent
- System Coordination Office
- Bureau Architecture Group
- Assistant Director's IRM Advisor (ADAs)
- Business Process Owner/ Project Sponsor

Project Plan
Development and
Review Stage

2.2.2 Entrance Criteria

To enter this stage, the Project Proponent must have a *Clearinghouse Registration Memorandum*.

2.2.3 Process

Five major processes occur in this stage:

1. An Investment Proposal is developed
2. The Project Proponent transmits the Investment Proposal to the Sponsor
3. The Project Proponent transmits the Investment Proposal to the SCO
4. The SCO conducts a review of the Investment Proposal
5. The ITIB approves, approves with stipulations, returns for further analysis or rejects the Investment Proposal

2.2.3.1 Investment Proposal (IP)

The Investment Proposal identifies the Project Proponent originating the proposal, other

key points of contact (Business Users and Management Groups), and identifies the business process re-engineering effort, the Bureau Architecture alignment and the resources and funding needed to develop a Business Case. Instructions for creating an Investment Proposal can be found at the SCO website at:
<http://web.blm.gov/internal/wo-500/sco/sco.htm>.

The Project Proponent must have both program and management support, route the IP through the Assistant Director's IRM Advisor for Project Sponsor approval before submitting it to the SCO for review.

The Project Proponent is responsible for successfully and accurately completing all components of the Investment Proposal and the estimated cost estimates for developing a Business Case as well as the preliminary estimate for the total life-cycle costs are as accurate as possible. The SCO will work with the Project Proponent to ensure that the Investment Proposal is properly completed. The SCO is then responsible for ensuring that technical and program issues are identified/resolved.

2.2.3.2 Preliminary Project Review and ITIB Decision

The SCO performs a preliminary project review. This review includes, but is not limited to, the alignment with the Bureau strategic plan and mission goals, the quality of information (defendable concept), the quantity of information (sufficient detail), confirmation of management and user support, and an initial architecture review. The SCO's findings and recommendations are forwarded through the CIO to the ITIB. The ITIB will either approve the Investment Proposal, approve it with stipulations, return it for further analysis or reject it in principle.

2.2.3.3 Project Management

After the Investment Proposal is approved by the ITIB, the Project Sponsor begins the process of identifying or selecting a trained or experienced Project Manager. The complexity of Information Technology (IT) investment management and its dependency for improved project management supports the need to use only trained or experienced project managers to develop a business case, as well as subsequent project planning documents, and manage the project should the business case be approved by the ITIB. Since Bureauwide IT investments at this level are viewed as major capital investment commitments, it is imperative that each project be led by a trained or experienced project manager.

Before any work begins on the development of the Business Case, the project manager needs to obtain a unique project number to track the cost of development of their respective Business Case. Project Manager contacts the SCO to obtain a unique project number. The SCO will notify the Project Manager when a project number has been assigned to the project.

2.2.4 Results

Based on SCO's findings and recommendations and the ITIB's decision, an ***Investment Proposal Decision Memorandum*** is issued by the SCO on behalf of the ITIB, stating that

the project is either:

- **Approved** - giving permission to proceed to the Business Case Development Stage,
- **Approved (with stipulations)** - conditional approval; actions items must be completed prior to proceeding to the Business Case Development Stage,
- **Returned** - directing additional analysis and requesting re-submission, or
- **Rejected** - ending the business process re-engineering effort

The SCO will prepare an *Investment Proposal Decision Memorandum* that will document the ITIB decision and provide additional guidance to the Project Sponsor on how best to proceed.

Projects proposals that successfully exit this stage are those that conform with the Bureau Architecture, do not duplicate existing projects or systems, have Project Sponsor concurrence, ITIB commitment for the business process re-engineering effort and minimize the risks associated with the investment.

2.2.5 Exit Criteria

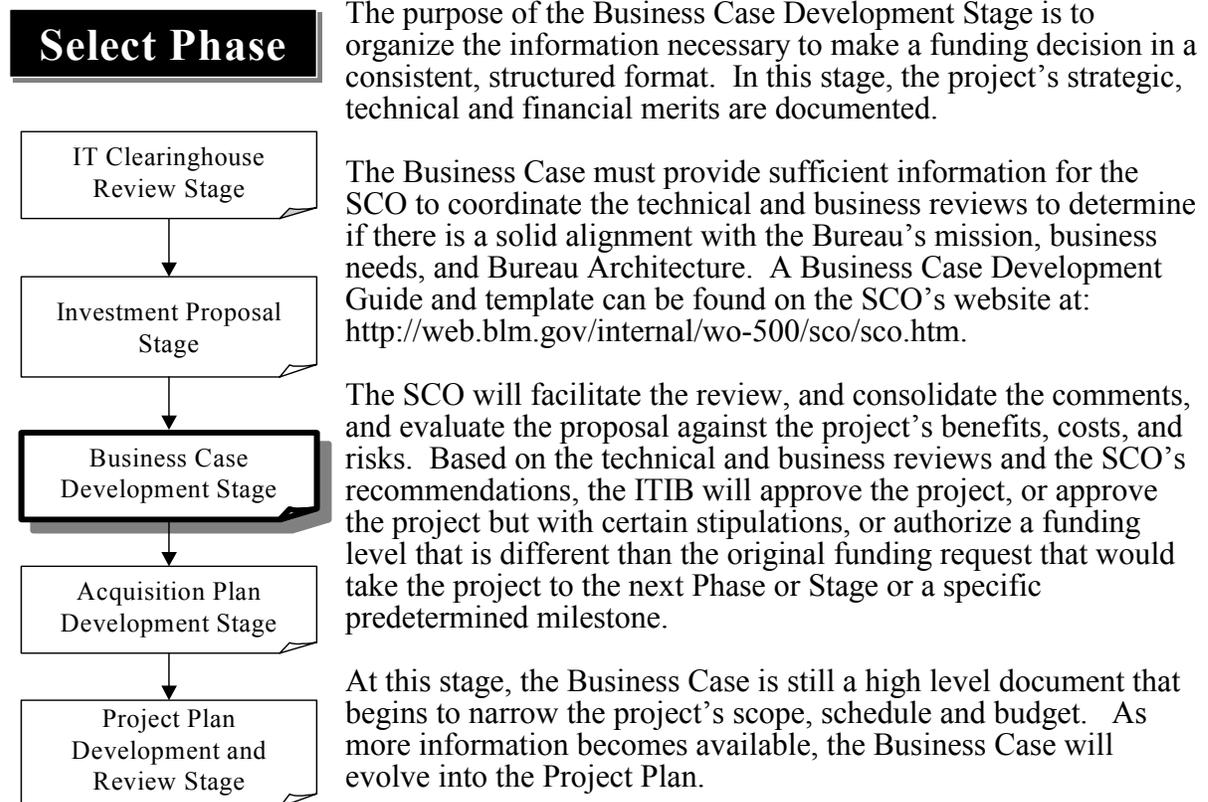
The Project Proponent, ADS IRM Advisor and the Project Sponsor must all receive the *Investment Proposal Decision Memorandum* issued by the SCO on behalf of the ITIB before proceeding to the next Stage.

2.2.6 Next Step

Once the Project Sponsor has received the *Investment Proposal Decision Memorandum*, the project may proceed to the Business Case Development Stage.

2.3 Business Case Development Stage

2.3.1 Purpose



The entities involved in this stage are:

- Project Proponent (PP)
- Project Sponsor (a State/Center Director, Assistant Director, or Deputy Director)
- Assistant Director's IRM Advisor and/or Portfolio Manager
- Business Process Owner (BPO)
- System Coordination Office (SCO)
- Investment Management Group (IMG)
- Washington Office Policy Group (Records, Security)
- National IRM Center (System Engineering)
- National Business Center (Contracting)
- Bureau Architecture Group (BAG)
- CIO and ITIB

2.3.2 Entrance Criteria

Before entering this stage, the Project Proponent, ADS IRM Advisor and the Business Process Owner must receive an *Investment Proposal Registration Memorandum* from the SCO.

In very rare instances, a project may be exempted from developing a Business Case, SCO review and ITIB approval. This may include a catastrophic mission-critical system repair, upgrade, or replacement resulting from a natural disaster. If a waiver is granted, the project still must be reviewed for architectural compliance. The CIO grants permission for the project to be funded and allows initiation without formal ITIB review. The CIO and the System Owner will provide special oversight to any project with a Business Case waiver.

2.3.3 Process

The first step in developing the Business Case is for the Project Manager to contact the SCO. The SCO will appoint a Point of Contact (POC) for the project. The SCO Point of Contact plays an active role in advising, guiding and facilitating development of the business case.

The Business Case Development Team consists of:

- Project Proponent
- Project Manager
- System Coordination Office's POC
- Business Process Owner
- ADS IRM Advisor
- Integrated Project Team
- Support staff (as needed)

The Project Manager is responsible for successfully and accurately completing all components of the Business Case. The Project Manager is responsible for coordinating with the SCO to ensure that technical issues are identified/resolved and that the total estimated life-cycle costs have SCO's concurrence.

The SCO Point of Contact is responsible for coordinating the program, technical and project management review. One of the key areas in which the SCO Point of Contact must participate is the development of the technical cost estimate. The Business Case requires a level of detail for cost estimates that the SCO can help provide.

The Integrated Project Team is responsible for ensuring that the cost estimates for all aspects of the project, both technical and programmatic, are as accurate as possible.

The ADS IRM Advisor serves as the liaison between the Project Manager, the Business Process Owner, and the Sponsor.

The Business Case Development Team is responsible for:

- Completing the Business Case
- Establishing the baseline for the scope of the project
- Establishing a high level project schedule and identifying major risks
- Developing preliminary budget estimates
- Developing a Benefit-Cost Analysis (BCA) or Return-on-Investment (ROI)

2.3.4 Results

Based upon SCO's findings and recommendations and the ITIB's decision, a ***Business Case Decision Memorandum*** is issued by the SCO on behalf of the ITIB, stating that the project is either:

- **Approved** - to proceed to the Acquisition Plan and Project Plan Development and Review Stage
- **Approved (with stipulations)** - The ITIB may authorize a different funding level or require additional reviews by the SCO at critical review points/milestones, or required that specific tasks be performed before moving on to the next stage
- **Returned** - Returned for additional analysis or information.

If the requested amount is approved, the project is forwarded to the Bureau's Budget Strategy Team (BST) for funding. The decision to include the project in the Bureau's IT Investment Portfolio is documented in the official minutes of ITIB meetings. A copy of the meeting minutes is sent to the Project Manager, Project Proponent, Project Sponsor, the ADS IRM Advisor and the IMG. Upon authorization of funding from the Budget Strategy Team, a ***Business Case Decision Memorandum*** is issued by SCO on behalf of the ITIB.

All ITIB approved projects will be entered into the Information Technology Investment Portfolio System I-TIPS to support Bureau's and the Department's OMB annual reporting requirements.

2.3.5 Exit Criteria

The SCO, on behalf of the ITIB, issues a ***Business Case Decision Memorandum*** granting approval to the Project Manager to proceed to the next Stage.

2.3.6 Next Step

Once the project receives funding approval, it may proceed to the Acquisition Plan Development and Project Development and Review Stage. If a Project Manager has not been identified and assigned to the project, work on the project may not proceed.

2.4 Acquisition Plan Development Stage

Select Phase

IT Clearinghouse
Review Stage

Investment Proposal
Stage

Business Case
Development Stage

Acquisition Plan
Development Stage

Project Plan
Development and
Review Stage

2.4.1 Purpose

The purpose of this stage is to develop an Acquisition Plan (AP). The AP ensures that the Project Manager meets the project objectives in the most cost efficient and effective manner. The acquisition plan addresses all technical, business, management, and other significant considerations that will control the acquisitions' outcome.

This stage involves the following entities:

- Project Manger
- Contracting Officer (CO) at the State Office or National Center
- Acquisition Support Team (AST)
- Integrated Project Team
- SCO

2.4.2 Entrance Criteria

To enter this stage, the Project Manager, ADS IRM Advisor, Business Process Owner and the Sponsor must have received a ***Business Case Decision Memorandum***.

2.4.3 Process

The following three activities occur in this Stage:

- A Contracting Officer (CO) is assigned to assist the project based on requirements included in the Business Case.
- The Acquisition Support Team (AST), and the Integrated Project Team assist the Project Manager in the development of Acquisition Plan.
- Project Manager completes the Acquisition Plan, in accordance with Federal Acquisition Rules (FAR), and submits it to the CO for approval.

2.4.4 Results

Upon receipt of a completed Acquisition Plan, the Contracting Officer reviews the Acquisition Plan and either approves or rejects the submission.

2.4.5 Exit Criteria

The exit criteria is for the Project Manager to receive an approved *Acquisition Plan Approval Memorandum* that is issued by the SCO on behalf of the Contracting Officer. Although the Acquisition Plan is approved, it is continually updated during the Project Plan Development and Review Stage, and the Project Definition Stage.

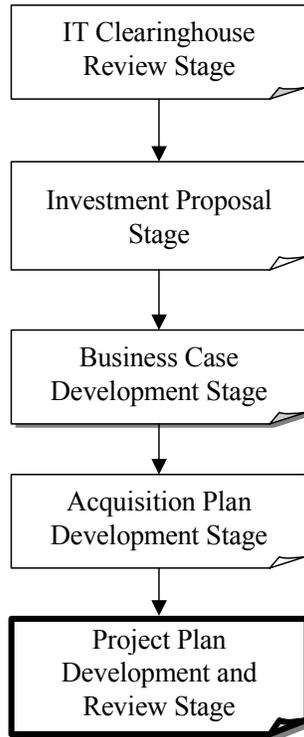
2.4.6 Next Step

The next step is the Project Plan Development and Review Stage, where the steps necessary to receive project authorization are defined. The Project Plan Development and Review Stage can be performed concurrently with the Acquisition Plan Development Stage.

2.5 Project Plan Development and Review Stage

2.5.1 Purpose

Select Phase



This stage ensures that project management controls are well developed so the investment can be managed to achieve its technical, cost, schedule, and risk management objectives. As part of these activities, the Project Plan Development and Review Stage details the steps necessary to receive project authorization. This stage involves the following entities:

- Project Manager
- ADS IRM Advisor
- Business Process Owner
- System Coordination Office
- Project Sponsor

2.5.2 Entrance Criteria

To enter this stage, the Project Manager must have received a **Business Case Decision Memorandum** issued from the SCO, on behalf of the ITIB. The memorandum documents the funding amount and any stipulations based on the official ITIB record of decision. The Project Manager must also have received an approved **Acquisition Plan Approval Memorandum** from the SCO on behalf of the State or Center Contracting Office.

For a project with a significant risk profile, the SCO may recommend to the ITIB that the project be funded in increments that correspond to the IMP Phases or Stages.

2.5.3 Process

The following three activities must be accomplished:

- Identify and document initial user requirements.
- Develop a project plan (as described in the SCO's Best Management Practices for Developing and Maintaining a Project Plan).
- Conduct a Project Plan Review (PPR).

2.5.3.1 Develop User Requirements

The user requirements development step shall identify and document the following elements:

- Identify and document the existing and proposed re-engineered work processes

- Information needs
- Application description
- Acceptance requirements

Initial user requirements are necessary to develop a detailed Project Plan and schedule, and to perform a benefit-cost analysis.

2.5.3.3 Develop a Project Plan

Project Plan Development and Review Stage is complete when Initial User Requirements and the Project Plan are submitted to the SCO and the SCO conducts a review of the Project Plan. The SCO will then conduct a close-out with the Project Manager and /or Sponsor. The Project Plan identifies the:

- Business Process Owner
- ADS IRM Advisor
- End-users or Customers
- Project Manager
- Project Sponsor

2.5.3.4 Conduct a Project Plan Review (PPR)

After the User and Functional Requirements have been documented and the Project Plan finalized, the Project Manager and the SCO Point of Contact share the responsibility for conducting a Project Plan Review. The Project Manager, SCO Point of Contact, ADS IRM Advisor, and the Business Process Owner constitute the core Project Plan Review Team that evaluates the Project Plan, User and Functional Requirements and the detailed benefit-cost analysis.

The review encompasses architecture validation, budget allocation, schedule and performance metrics. If the Project Manager disagrees with the review team's findings, the SCO Manager will intervene and decide if the issues are material and must be addressed immediately, or non-material and allow the project to proceed.

The PPR at a minimum must address the following:

Conformance to the Bureau Architecture: This review identifies any changes in the project's conformance to the Bureau's Architecture since the ITIB's approval of the Business Case.

Detailed Budget Estimate: The Preliminary Budget Estimate must be enhanced and expanded so resources can be accurately planned, scheduled and obtained. The detailed budget estimate must both reflect the timing of activities shown in the Work Breakdown Structure (WBS) and be consistent with the detailed benefit-cost analysis.

Detailed Benefit-Cost analysis: The benefit-cost analysis must be enhanced and expanded to reflect current cost, benefit, and risk elements and values. The elements and values shall be consistent with those shown in the detailed 5-year Budget Estimate. See the *SCO's Best Management Practices for Developing a Financial Analysis for a BLM IT Proposal*.

The PPR also ensures that the:

- Project's budget and schedule align
- Performance and Risk Management metrics are clearly defined
- Project is within the scope, schedule and budget of the approved Business Case

The AD's IRM Advisor, on behalf of the Project Sponsor, participates in the Project Plan In-Progress Review.

2.5.4 Results

The PPR Team forwards the findings and recommendations to the SCO. The SCO acknowledges its receipt and reviews the Team's findings and recommendation. The SCO, on behalf of the Sponsor, will develop a draft ***Project Authorization Memorandum*** for the Project Sponsor. The Sponsor will finalize the draft ***Project Authorization Memorandum*** sign and forward it to the Project Manager, with a courtesy copy sent to the SCO.

If the findings from the PPR document that the project plan is within the scope, schedule and budget as approved by the ITIB based on the Business Case, the SCO will issue a ***Project Authorization Memorandum*** and notify the ITIB that the project has entered the Control Phase. If the project is outside the approved scope, schedule or budget, the SCO and IMG will develop their findings and recommendations and forward them to the ITIB. The ITIB will analyze the impact to the Bureau's IT portfolio and either re-baseline the project's scope, schedule or budget, or request a Project Plan revision.

2.5.5 Exit Criteria

The exit criteria for this stage is for the Project Manager to receive a ***Project Authorization Memorandum*** from the Sponsor.

2.5.6 Next Step

The next step is the Control Phase where the first stage - Project Definition - reviews, refines, and formalizes many of the plans and strategies developed in Project Plan Development and Review Stage.

3.0 Control Phase

During the Control Phase, a project moves from requirements definition to implementation. The Control Phase is divided into six stages, with each stage divided into several steps. Each step produces one or more work products (deliverables) or results. The final step in each stage is a review, where the work products are assessed and the budget and project schedule evaluated and updated as necessary. A list of the stages is provided in Table 2, Control Phase Summary along with a summary of the stage's purpose and results:

Table 2: Control Phase Summary

Stage	Purpose	Results
Project Definition	<ul style="list-style-type: none"> • Final User Requirements • Functional Requirements • Requirements Certification • Additional Plans & System Security Plans and other deliverables • Conduct Project Definition Completion Review 	<p><i>Requirements Certification Memorandum</i></p> <p><i>Project Definition Completion Review Memorandum</i></p>
System and/or Services Acquisition	<ul style="list-style-type: none"> • Procure System/Services • Contracting Officer's Review 	<p><i>Signed Contract(s)</i></p>
System Design	<ul style="list-style-type: none"> • Design System • Update Test Plans • Conduct Critical Design Review 	<p><i>Critical Design Review Memorandum</i></p>
Development or Construction	<ul style="list-style-type: none"> • Establish Development Environment • Create or Modify Programs • Conduct Unit and Integration Testing • Prepare Computer Systems Operator's Manual • Conduct Test Readiness Review 	<p><i>Test Readiness Review Memorandum</i></p>
User/System Acceptance Testing	<ul style="list-style-type: none"> • Submit Developed Software for Testing • System Acceptance Testing • Security Testing • Security Certification Package • User Documentation and Training Materials • Conduct User Acceptance Testing • Conduct Transition/Deployment Readiness Review 	<p><i>Transition/Deployment Readiness Review Memorandum</i></p>
Transition and Deployment	<ul style="list-style-type: none"> • Determine Acceptable Level of Operational Risk • Train Users • Implement Developed Software • Document Lessons Learned • Conduct Operational Readiness Review 	<p><i>Operational Readiness Review Memorandum</i></p> <p><i>Record of Deployment Memorandum</i></p>

Before each stage's milestone review, the project plan must be updated.

3.1 Project Reviews

Each stage culminates in a major milestone review to ensure that the stage's objectives have been achieved. Every project is subject to the following reviews.

- **Project Plan Reviews (PPRs)** - These reviews assess the project's status on a regular basis. During the review, the project manager presents technical performance, scope, schedule or budget information to the Project Sponsor/System Owner, SCO and the ITIB.
- **Milestone Reviews** - These reviews determine if a project has achieved the current stages objectives. These reviews include the Project Plan Review; the project Definition Review; the Critical Design Review; the Test Readiness Review, the Transition/Deployment Review; the Operational Readiness Review; and the Post Deployment Review. Significant deviations, management concerns, or other events may prompt a Technical Review Board review or IV&V review.
- **Triggered Reviews** - These reviews, initiated by senior management, address specific issues or problems.
- **Quality Assurance Reviews** - These reviews compare project deliverables to policies, standards and best management practices. These reviews, performed in conjunction with the Milestone Reviews, ensure that the appropriate components are included in the deliverables, and that the required and recommended processes were followed.

3.2 Project Definition Stage

3.2.1 Purpose

Control Phase

Project Definition Stage

System/Services Acquisition Stage

System Design Stage

Development/Construction Stage

Acceptance Testing Stage

Transition/Deployment Stage

The Project Definition Stage develops and certifies user and functional requirements; requires the development of additional life-cycle documents, plans and security deliverables; and reviews and establishes the project's baseline before the project enters the System Design Stage.

3.2.2 Entrance Criteria

The Entrance criteria is receipt by the Project Manager of the **Project Authorization Memorandum**. In some cases, this memorandum may prescribe limitations on project funding, e.g., project funding through a particular Phase or Stage.

3.2.3 Process

3.2.3.1 User and Functional Requirements

Based on the user and functional requirements, the Integrated Project Team analyzes and develops current and possible future functional requirements that the new system will meet to satisfy end-user needs.

Functional requirements must be clear, complete and consistent; they must be free of design decisions; and they must be testable. Functional requirements must include a detailed description of system functions, technical requirements (e.g., risk management, performance, interfaces, data, screens, failure contingencies, security), support function requirements (e.g., quality assurance, configuration management, documentation, training), and constraints (e.g., laws and regulations, audit requirements, budget/time/technology).

3.2.3.2 Requirements Certification/Baseline

After identifying and documenting the User and Functional Requirements, a Quality Assurance Review is conducted. This provides an opportunity for the Integrated Project Team members, users, and the Project Sponsor to ensure that there is a complete and clear understanding of the user and functional requirements. Upon the successful completion of this review, the Project Sponsor and the Project Manager document their mutual understanding by completing and signing the **Requirements Certification Memorandum**, with a courtesy copy being sent to the SCO.

3.2.3.3 Additional Plans and Security Deliverables

The next step within this Stage requires the development of detailed project documentation and security deliverables. This includes the following:

- Data Management Plan
- Security Deliverables
 - System Security Plan
 - Security Risk Assessment
 - Security Test Plan
 - Trusted Facilities Manual
 - Disaster Recovery/Contingency Plan
- Training Plan [Draft]
- System Test Plan [Draft]
- Quality Assurance Plan
- Configuration Management Plan
- Transition / Deployment Plan [Draft]
- Acquisition Plan [Updated]
- Project Plan [Updated]

Templates for each of the above documents have been or are currently being developed. They can be found at the SCO's website at: <http://web.blm.gov/internal/wo-500/sco/sco.htm>

3.2.3.4 Update Project Plan

The project plan contains organizational responsibilities, activities or tasks identified in a Work Break Down Structure (WBS) format, activity or task descriptions; a detailed project schedule; resource requirements; and risk mitigation/response strategies. See *SCO's Best Management Practices for Project Managers on Developing and Maintaining a Project Schedule*.

3.2.3.5 Definition Completion Review

The final step in Project Definition Stage is the Project Definition Completion Review. This review is used as a major go/no-go decision point to ensure that the project is clearly defined and fully scoped before system design begins.

The Project Definition Completion Review is co-chaired by the Project Manager and the Project Sponsor. Participants may include:

- Project Analysts/Designers/Developers
- User Representatives
- Project Quality Assurance (QA) Team members

- User Acceptance (UAT) Team members
- Configuration Management (CM) Team representatives
- Data Administration Team (DAT) representatives
- AIS Security Team representatives
- SCO Representative
- NIRMC System Engineering
- IMG Representative
- Technical Review Board (TRB) Representative(s)

During this review, the Project Manager and the Integrated Project Team presents evidence that:

- All required work products are available and up-to-date
- The project plan and schedule have been updated and are still within the project's baseline
- The User Requirements and Functional Requirements are certified
- All affected support organizations are aware of, and in agreement with, the commitment of resources and schedules as defined in the project plan/schedule
- Quality assurance reviews have been planned for the next phase

To present this evidence, the Project Manager/Integrated Project Team uses:

- Project Documentation and Plans
- Requirements Certification
- Life Cycle Process and methods intended to be used
- Draft Implementation Plan
- Quarterly Project Status
- Functional and User Requirements walkthroughs and Work Product Reviews (e.g., meeting minutes and completed action items)
- Risk Analysis and Mitigation Plans

Action items generated from the review are assigned to a responsible party and tracked by the Project Manager. The Project Manager will monitor and report to the SCO when each action item has been completed.

3.2.4 Results

Based on the Project Definition Completion Review, the Project Sponsor decides that the project is:

- **Approved to proceed** - The project definition is clearly understood and documented,
- **Approved to proceed (with stipulations)** - Conditional approval. Actions items

- must be completed prior to proceeding to the System Design Stage, or
• **Returned for further analysis and documentation** - Definition results are unacceptable and must be redone **or** the requirements baseline/project scope is deficient, and the project must be re-approved after negotiation with the Users, Project Sponsor/System Owner and/or the ITIB, as appropriate.

3.2.5 Exit Criteria

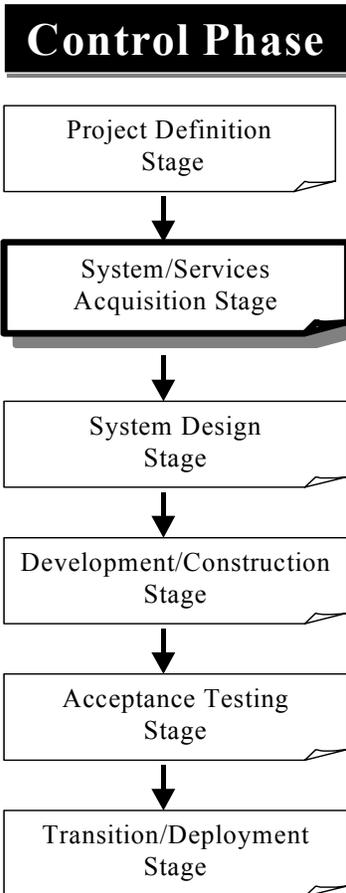
The exit criteria is a complete and signed ***Project Definition Completion Review Memorandum*** with all action items resolved. The Project Manager, on behalf of the Sponsor, will develop a draft ***Project Definition Completion Review Memorandum*** for the Project Sponsor. The Sponsor will finalize, sign and send the ***Project Definition Completion Review Memorandum*** to the Project Manager, with a courtesy copy sent to the ADS IRM Advisor and the SCO.

3.2.6 Next Step

The next step is to proceed to the System/Services Acquisition Stage.

3.3 System/Services Acquisition Stage

3.3.1 Purpose



This stage identifies the steps necessary to procure the system and/or services described in Acquisition Plan Development Stage. This stage involves the following personnel and entities and may occur numerous times throughout the course of the project:

- Project Manager
- Contracting Officer (State or National Business Center)
- Acquisition Support Team (AST)
- System Coordination Office (POC)

3.3.2 Entrance Criteria

The entrance criteria for this stage is a complete and signed ***Project Definition Completion Review Memorandum*** with all action items resolved.

3.3.3 Process

The following activities occur during the System/Services Acquisition Stage:

- PM provides AST a copy of the completed Project Plan
- PM finalizes requirements and forwards to AST for Statement of Work (SOW) preparation
- AST finalizes SOW and other appropriate sections of the Request for Proposal (RFP)
- CO develops a Request for Proposals (RFP), in accordance with the Federal Acquisition Regulations (FAR), Part 15.203,
- CO reviews RFPs and awards the contract

3.3.4 Results

Timely and adequate planning during this stage and the Select Phase's Acquisition Planning Stage ensures that a contract is awarded to the most qualified vendor/contractor within the cost and time constraints set forth in the RFP.

3.3.5 Exit Criteria

A contract is awarded based on the requirements identified in the Project Definition Stage, and the terms and conditions included in the RFP. As a result, copies of the signed document are forwarded to all entities listed Section 3.3.1..

3.3.6 Next Step

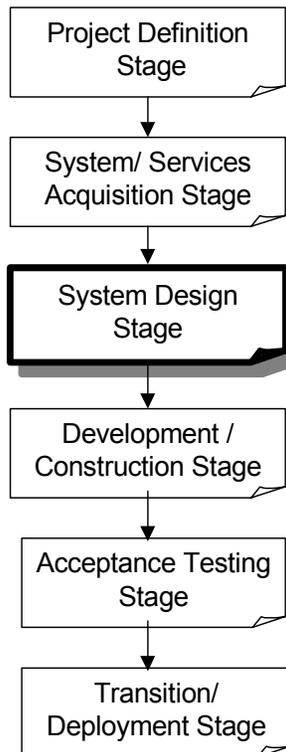
The next step is the System Design Stage.

3.4 System Design Stage

3.4.1 Purpose

Control Phase

The purpose of the System Design stage is to develop a System Design document, update the system and security test plans, and conduct the Critical Design Review.



3.4.2 Entrance Criteria

The entrance criteria for the System Design stage is receipt by the Project Manager from the Project Sponsor of a signed **Project Definition Completion Review Memorandum**. The Project Manager must also receive a signed copy of any system/service contract from the Contracting Officer.

3.4.3 Process

3.4.3.1 Design System

The first step is to develop the System Design document. The System Design (build-to and code-to) Document (SDD) contains the system architecture, functional and user requirements, program specifications, security design, database specifications, and other specifications as needed.

The System Design Document defines:

- All system inputs and outputs (files, reports, screens, etc.), specifying format, use, content, purpose, use, volume, frequency, and distribution control,
- The internal structure of each program in sufficient detail to enable coding,
- Where the system will reside (mainframe, PC, client/server, etc.), off-line process, data input and output requirements, and
- Application security features, if required.

3.4.3.2 Update Test Plans

After the System Design Document is completed, the System Test Plan and the Security Test Plan can be updated.

3.4.3.3 Update Project Plan

The project plan must be updated to reflect current organizational responsibilities, specific activities or tasks in the form of an updated WBS, activity or task descriptions, a schedule

and

resources, risk and mitigation strategies. See *SCO guidance to Project Managers on Developing and Maintaining a Project Schedule*.

3.4.3.4 Critical Design Review

The final System Design step is the Critical Design Review (CDR). This review is used as a major go/no-go decision point before any coding begins.

The CDR is co-chaired by the Project Manager and the Project Sponsor. Participants include:

- Project Analysts/Designers/Developers
- User Representatives
- Project Quality Assurance Team (QAT) members
- User Acceptance Team (UAT) member(s)
- Configuration Management (CM) Team representatives
- Data Administration Team (DAT) representatives
- Bureau Architecture Group and/or Technical Review Board Representative
- NIRMCM System Engineering Representative
- AIS Security Team representatives
- SCO and IMG Representatives

During the Critical Design Review, the Integrated Project Team presents evidence that:

- All required work products have been completed, are available and up-to-date
- The System Design (build-to and code-to) Document is complete and has acceptable risk
- All support organizations are in agreement with the identified design, resources and schedule
- User Requirements have been met and incorporated into the design
- Quality assurance reviews have been planned for the next phase

To present this evidence, the Project Manager and the System Development Team uses:

- System Design (build-to and code-to) Document
- Development and internal Quality Assurance processes intended to be used
- Draft Verification and Test plans
- Quarterly Project Status Reports
- Requirements traceability matrices
- Findings and Recommendations from Design Walkthroughs and Reviews
- Risk analysis and mitigation plans
- Draft Users Guide
- Draft Transition or Deployment Plan

In the event that a serious technical conflict is identified, the Technical Review Board will intervene and develop their findings and recommendations, and forward them to the ITIB through the SCO.

In the event that conflict resolution is required based on the presentation and findings, the SCO shall evaluate the merits of each position. The SCO manager will make a recommendation to the Project Sponsor.

Action items generated from the review will be assigned to a responsible party and tracked by the Project Manager. The Project Manager will monitor and report to the SCO when each action item has been completed.

3.4.4 Results

Based on the Critical Design Review, the Project Sponsor decides that the project is:

- **Approved to proceed** - With the development/construction stage,
- **Approved to proceed (with stipulations)** - Conditional approval. Actions items must be completed prior to proceeding, or
- **Returned for further analysis and documentation** - Design results are unacceptable **or** the System Design Baseline is deficient, and the project must be re-approved after negotiation with the Project Sponsor, senior management, and/or the ITIB, as appropriate.

3.4.5 Exit Criteria

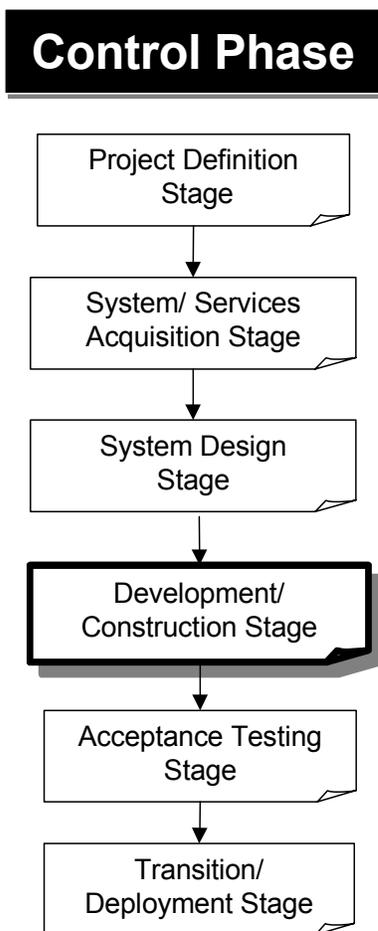
The exit criteria for the System Design stage is issuance by the Project Sponsor to the Project Manager of a completed and signed *Critical Design Review Memorandum* with a stipulation that all action items resolved. Courtesy copies of the *Critical Design Review Memorandum* are provided to the ADs IRM Advisor and the SCO.

3.4.6 Next Step

The next step is the Development/Construction Stage.

3.5 Development/Construction Stage

3.5.1 Purpose



Control Phase

During the Development/Construction Stage, the Project Manager and Project Development Team establishes an environment necessary to code and test; create or modify programs defined by program specifications, conduct unit and integration testing, and perform a Test Readiness Review.

3.5.2 Entrance Criteria

The entrance criteria for the Development/Construction Stage is for the Project Manager to receive from the Project Sponsor a signed *Critical Design Review Memorandum*.

3.5.3 Process

3.5.3.1 Establish Development Environment

This activity establishes the system environment, and identifies and commits the facilities necessary for software development and testing. This includes hardware, libraries, development tools, software migration facilities, etc. This is required before developers begin creating or modifying programs. It is extremely important that the identification and establishment of the development environment is included within the project plan.

3.5.3.2 Create or Modify Programs

The application developers create or modify the programs specified in the System Design Baseline, develop program documentation, and compile programs to obtain machine-executable modules.

3.5.3.3 Conduct Unit and Integration Testing

After the programs have been created and compiled, the programs undergo unit testing and integration testing. The Project Development Team typically performs these tests.

3.5.3.4 Prepare Computer Systems Operator's Manual

The Project Manager and the Project Development Team prepare a Computer Systems Operator's Manual (CSOM) and submits it to the site responsible for Operations and Maintenance. This manual provides the information needed to execute batch applications; job dependencies; restart/rerun instructions, report distribution information; and special handling instructions, required scripts, input parameters, and error handling procedures.

3.5.3.5 Update Project Plan

Before entering the Test Readiness Review, the project plan must be evaluated, and if necessary, revised where appropriate.

3.5.3.6 Test Readiness Review

The Test Readiness Review is another major milestone where a go/no-go decision point will ensure that the Integrated Project Team, users, and the Independent Testing staff jointly approve the turnover of the system code, documentation, and associated verification plans for acceptance testing and production. This is done after the developers have demonstrated that the baseline system is complete and functions correctly.

The Test Readiness Review is chaired by the Project Manager. Participants include:

- Project Analysts/Designers/Developers
- Business Sponsor/User Representatives
- Project Quality Assurance (QA) Team members
- System Acceptance Test (SAT) Team members
- Configuration Management (CM) Team representatives
- Data Administration Team (DAT) representatives
- AIS Security Team representatives
- Customer representatives

During the Test Readiness Review, the Project Team presents evidence that:

- All required work products have been completed are available and up-to-date
- The Development Baseline is complete and correct
- The Turnover Package is complete, including a draft Version Description Document (VDD) that lists all items to be moved to the Test and Production environments. These items include, but are not limited to:
 - Affected programs
 - Databases
 - Definitions
 - Conversion programs
 - Scripts
 - Maps
 - Procedures
- All affected support organizations are aware of, and in agreement with, the defined implementation plans and the schedules
- Quality assurance reviews have been planned for the next stage

To present this evidence, the Project Manager and Integrated Project Team uses:

- Turnover Package
- Testing Process and Procedures intended to be used
- Draft Test Plans and Test Cases
- Cost and schedule status
- Requirements traceability matrices
- Unit and System Integration test results
- Quarterly Project Status Reports
- Walkthroughs and Work Product Reviews
- Risk analysis and mitigation plans
- Draft Transition/Deployment Plans

In the event that conflict resolution is required based on the presentation and findings, the SCO shall evaluate the merits of each position. The SCO Manager will make a recommendation to the Project Sponsor.

Action items generated from the review will be assigned to a responsible party and tracked by the Project Manager. The Project Manager will monitor and report to the SCO when each action item has been completed.

3.5.4 Results

Based on the Test Readiness Review, the Project Sponsor decides that the project is;

- **Approved to proceed** - To the User/System Acceptance Testing Stage,
- **Approved to proceed (with stipulations)** - Conditional approval. Action items must be completed prior to proceeding, or
- **Returned for further analysis and documentation** - Test Readiness Review results are unacceptable or deficient, and the project must be re-approved after negotiation with the Project Sponsor, senior management, and/or the ITIB, as appropriate.

3.5.5 Exit Criteria

The exit criteria for the Development/Construction stage is a completed and signed ***Test Readiness Review Memorandum*** from the Project Sponsor to Project Manager. Copies will be sent to the ADs IRM Advisor and the SCO. The SCO, on behalf of the Sponsor, will develop a draft ***Test Readiness Review Memorandum*** for the Project Sponsor. The Sponsor will finalize and sign the ***Test Readiness Review Memorandum*** and forward it to the Project Manager, with a courtesy copy to the ADs IRM Advisor and the SCO.

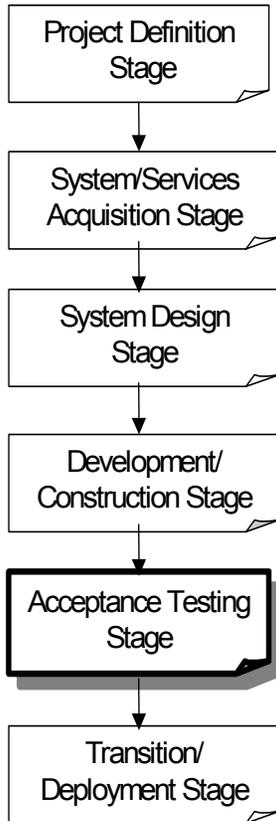
3.5.6 Next Step

The next step is the User/System Acceptance Testing Stage.

3.6 User/System Acceptance Testing Stage

3.6.1 Purpose

Control Phase



The purpose of the User/System Acceptance Testing Stage is to:

- Verify that the system meets the certified user and functional requirements
- Certify that the system meets security requirements
- Prepare user documentation and training materials, and verify they are accepted by the user
- Conduct a Transition/Deployment Readiness Review to ensure the system and all supporting documentation are ready for a successful move into operations and maintenance
- Confirm that the ITIB agrees with the Project Sponsor's recommendation that the system is ready for deployment and subsequent transition to Operations and Maintenance

3.6.2 Entrance Criteria

The User/System Acceptance Testing Stage entrance criteria is a signed *Test Readiness Review Memorandum* received from the Project Sponsor with no unresolved action items.

3.6.3 Process

3.6.3.1 Submit Developed Software for Testing

When the application developers finish creating the programs, the software is turned over to testers for an independent evaluation before it is released into the production environment.

To complete this step, a Turnover Package is prepared and sent to the independent testers. The Turnover Package includes:

- User Requirements and Functional Requirements
- Program specifications
- Unit and Integration tested software components, compiled and error-free (the Test/Build Baseline)

3.6.3.2 User/System Acceptance Testing

User/System Acceptance Testing ensures that:

- The system meets user and functional requirements
- All hardware works as an integrated system
- All software executes as intended, including checkpoint and restart logic
- All communication links work properly
- Service level agreement can be met, if applicable
- Documentation agrees with and supports the use of the system

System Acceptance Testing may include Regression Tests, Unit Tests, Integration Tests, End-to-End System Testing, and Disaster Recovery Testing. Any problems detected must be documented in a Test Problem Report (TPR). If software modifications are required, the application developers will make the corrections and resubmit the corrected components for testing.

3.6.3.3 Security Testing

Security testing is performed according to the Security Test Plan, in order to ensure that the application meets its security requirements. Security Testing is used to identify design and implementation flaws that would allow a user to violate security requirements or accountability policies. Security testing is conducted by the SAT group or QAT in consultation with the AIS Security Lead. The Security Test results are recorded in the Security Test Report.

3.6.3.4 Security Certification Package

The Security Certification Package includes analysis and documentation of the system's technical and non-technical security features and safeguards. In addition, the package contains an analysis of the extent to which the system meets the security requirements for its mission and operational environment. It is the Information Systems Security Officer's responsibility to certify that the application has been tested and found to meet all applicable federal policies, regulations, and standards for securing information systems and the data that will be processed by them.

3.6.3.5 User Documentation and Training Materials

The next step is to finalize user documentation and training materials that provide clear and concise instructions to guide the user through interactions with the system.

3.6.3.6 User Acceptance Testing

User Acceptance Testing allows the Project Sponsor and/or representatives to approve the results of the software implementation, as well as user documentation and training materials. Problems detected in either the software, documentation, or training materials are documented on an Acceptance Problem Report (APR) and returned to testing and development for diagnosis and correction.

3.6.3.7 Update Project Plan

Before conducting the Transition/Deployment Readiness Review, the project plan must be evaluated and revised where appropriate.

3.6.3.8 Transition/Deployment Readiness Review

The final step in the User/System Acceptance Stage is the Transition/Deployment Readiness Review. This major go/no-go decision point is used to verify that the system meets all certified user and functional requirements and is ready for deployment.

The Transition/Deployment Readiness Review is chaired by the Project Manager. Participants include:

- Project Analysts/Designers/Developers
- Business Sponsor/User Representatives
- Bureau Architecture Group or Technical Review Board Representative
- System Acceptance Test (SAT) Team members
- Configuration Management (CM) Team representatives
- Data Administration Team (DAT) representatives
- AIS Security Team representatives
- Representatives of other consumers/customer relating to the work products

During the Transition/Deployment Readiness Review, the Integrated Project Team presents evidence that:

- All required work products are available and up-to-date
- The project's implementation plans are realistic
- The Test/Build Baseline is complete, correct, and verified
- The TPRs and APRs have been completed, accepted by the user, or a plan put in place to correct the problem
- All affected support organizations are aware of, and in agreement with, the schedules defined
- Quality Assurance reviews have been planned for the next phase

To present this evidence, the Project Manager and the Integrated Project Team uses:

- Security Test Results
- User Documentation and Training materials and plans
- Security Certification
- Implementation and Evaluation Process intended to be used
- Implementation and Conversion Plans

- Cost and Schedule status

In the event that conflict resolution is required based on the presentation and findings, the Project Manager shall evaluate the merits of all positions and will make a recommendation to the Project Sponsor.

Action items generated from the review will be assigned to a responsible party and tracked by the Project Manager. The Project Manager will monitor and report to the SCO when each action item has been completed.

3.6.4 Results

Upon completion of the review, the Project Sponsor will recommend to the ITIB that the system should be:

- **Approved** - User/System acceptance testing is satisfactory and the Sponsor recommends deployment
- **Limited Approval** - Action items require closure before the project can proceed
- **Returned** - Acceptance results are unacceptable and must be redone and/or the Test/Build Baseline or functionality is deficient, and the project must be re-approved after negotiation with the Project Sponsor, senior management, and/or the ITIB, as appropriate

Based on the Project Sponsor's recommendation and the SCO findings and recommendations, the ITIB will either:

- **Concur with the Sponsor's recommendation** - That the system is ready for deployment and subsequently to move to Operations and Maintenance,
- **Give limited Approval** - Action items require closure before the project can proceed to deployment, or
- **Disagree with the Sponsor's recommendation** - That the system is ready for deployment .

3.6.5 Exit Criteria

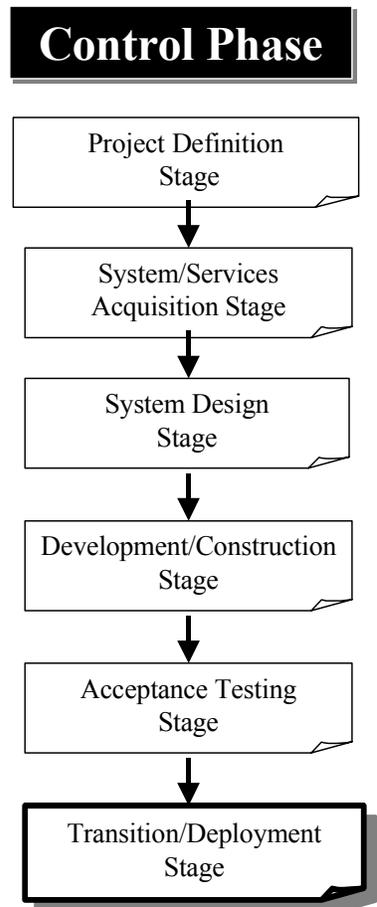
The exit criteria for the Acceptance Stage is a completed and signed *Transition/ Deployment Readiness Review Memorandum* with all action items resolved. The Project Manager, on behalf of the Sponsor, will develop a draft *Transition/ Deployment Readiness Review Memorandum* for the Project Sponsor. The Sponsor will finalize and sign the *Transition/ Deployment Readiness Review Memorandum*, and forward it to the Project Manager, with a courtesy copy to the ADs IRM Advisor and the SCO.

3.6.6 Next Step

The next stage is Transition/Deployment Stage.

3.7 Transition/Deployment Stage

3.7.1 Purpose



The Transition/Deployment Stage completes the Security Accreditation Package, user training, deploys and implements software/hardware, and documents lessons learned. The stage concludes with the Operational Readiness Review.

3.7.2 Entrance Criteria

The Entrance criteria for the Transition/Deployment Stage is a completed and signed *Transition/Deployment Readiness Review Memorandum* from the Project Sponsor.

3.7.3 Process

3.7.3.1 Determine Acceptable Level of Operational Risk

The individual assigned system security responsibility must complete the Security Accreditation before the system becomes operational. The Security Accreditation documents the system's operational risk assessment. The Designated Approval Authorities (i.e., the Information Systems Security Officer and the Project Sponsor) establish the acceptable level of risk based on identified risks and operational needs.

3.7.3.2 Train Users

The Training Plan developed earlier is now reviewed, updated if necessary, and executed. Training activities are coordinated and recorded in the National Training Center's Training and Enrollment System.

3.7.3.3 Deploy Developed Software/Hardware

The next step is to deploy the developed software/hardware in accordance with the current Project Plan and the Transition/Deployment Plan. This step includes issuing an Version Description Document (VDD), which is sent to all affected organizations. This notice contains:

- How the system will affect the users and field sites and what they need to do to prepare
- The date and time of deployment and related activities
- How to handle the existing system(s) that the new system is replacing
- Activities to be performed by the users or fields sites as part of implementation
- The names and telephone numbers of support personnel who can answer questions and resolve problems related to deployment of the system

This step also may include any of the following:

- Data transfer or conversion from paper records or another system
- Parallel operations to operate the old system until the new system is performing as designed
- User acceptance to verify that the deployed system meets pre-determined performance criteria

3.7.3.4 Update Project Plan

Before conducting the Operational Readiness Review, the Project Plan and Project Schedule must be evaluated and revised where appropriate. Detailed project close-out activities should be included at this time.

3.7.3.5 Perform Operational Readiness Review

The Operational Readiness Review is the final major milestone review where the go/no-go decision point ensures completion of all activities required for full production mode of the system.

These activities ensure:

- Security Accreditation is complete
- All training is complete or is in progress based on phased transition/deployment
- All conversions are complete
- Field sites are prepared to receive the system
- Any outstanding problems are acceptable to the user

The Operational Readiness Review is chaired by the Project Sponsor and/or User representative. The presenters include:

- The System Development Team technical and management personnel
- Operations group staff
- Security group staff
- Training group staff

Attendees include:

- Project Manager
- Project Analysts/Designers/Developers
- Business Sponsor/User Representatives
- Project Quality Assurance (QA) Team members
- Configuration Management (CM) Team representatives

- Data Administration Team (DAT) representatives
- AIS Security Team representatives
- Training/Documentation Team representative
- Operations and Maintenance representatives
- SCO and IMG representatives

The presenters provide evidence that:

- All required work products are available and up-to-date
- The project's implementation, deployment, and operations plans are realistic
- The Production Baseline is complete, correct, and verified
- Lessons learned have been documented
- All Test Problem Reports (TPRs) and Acceptance Problem Reports (APRs) have been completed, accepted by the user, or a plan put in place to correct the problem
- All affected support organizations are aware of, and in agreement with, the schedules defined
- Post-Deployment Reviews have been planned as required
- Detailed Project Close-out activities have been planned and included within the updated Project Plan

To present this evidence, the presenters provide:

- Parallel operations results
- Training materials and status
- Security Accreditation
- Evaluation Process intended to be used
- Implementation, Conversion, and Deployment status
- Quarterly Project Status Reports
- Requirements traceability matrices and Performance Measures
- Risk analysis and mitigation plans

In the event conflict resolution is required based on the presentation and findings, the SCO shall evaluate the merit of each position. The SCO Manager will make a recommendation to the Project Sponsor.

Action items generated from the review are assigned to a responsible party and tracked by the Project Manager. The Project Manager will monitor and report to the SCO when each of the action items have been completed.

Following the successful deployment, the Project Sponsor shall notify the ITIB that the system has been deployed and is operational, and identify any problems encountered during the deployment and any unresolved issues. All unresolved issues shall be presented with a

resolution plan which will include a schedule and a responsible individual for each issue. The Project Sponsor will document the deployment with a ***Record of Deployment Memorandum***.

3.7.3.6 Document Lessons Learned

The Integrated Project Team is responsible for conducting a post-deployment project evaluation. This evaluation reviews and critiques the project's execution as it proceeded through the system development life cycle. The Integrated Project Team recommends process and project improvements. This evaluation is used to guide future projects, review the system's quality, and recommend any system enhancements for future releases.

This report is distributed to the:

- Project Sponsor
- Project Management Team
- Project CM File
- System Coordination Office

3.7.3.7 Initiate Project Close-out Activities

Now is the time to begin implementation of the activities associated with the closing out of the project. This will require updating the project plan. See *SCO's Best Management Practices for Managing a Project Closeout*.

3.7.4 Results

Upon completing the Operational Readiness Review, the Project Sponsor decides that the system is:

- **Approved** - Planning and coordination is satisfactory and the system may move into Operations and Maintenance
- **Conditionally approved** – Action items require closure before the project can proceed
- **Returned** - Operational Readiness Review results are unacceptable and must be redone and/or the Production Baseline or functionality is deficient, and the project must be re-approved after negotiation with the Business Sponsor, senior management, and/or the ITIB, as appropriate

3.7.5 Exit Criteria

The Transition/Deployment stage exit criteria is for the Project Sponsor to provide a completed and signed ***Operational Readiness Review Memorandum***, with all action items resolved. This will be followed by a ***Record of Deployment Memorandum*** which confirms deployment of the new system, identifies problems encountered, and describes any unresolved issues.

Transition/Deployment is the final stage in the Control Phase. The next stage, in the Evaluate Phase, is the Operations/Maintenance Stage.

4.0 Evaluate Phase

The Evaluate Phase begins once the system transition/deployment stage has been completed and the system moves into operations and maintenance. Any project terminated prior to going into operation must also be evaluated. This phase includes the collection of actual versus projected performance measurements, and a post-deployment review to determine the system's efficiency and effectiveness in meeting its performance and financial objectives. In doing so, an assessment of the project's costs, performance, benefits, documentation, mission, and level of customer satisfaction is undertaken.

Results from the Evaluate Phase are fed back to the Select and Control phases as lessons learned and provide for continuous process improvement.

Table 3: Evaluate Phase Summary

Stage	Purpose	Results
Operations and Maintenance	<ul style="list-style-type: none"> Collect actual versus projected performance measurements. 	Assess the project's impact on mission performance and evaluate the project's Document performance statistics
Post Deployment Review	<ul style="list-style-type: none"> Conduct a Post Deployment Review using a standard methodology 	Feed lessons learned back into the Select and Control Phases Post Deployment Review Report

Several evaluations occur throughout a project's operational life. These are conducted within the following two stages:

- Operations and Maintenance Stage
- Post Deployment Review Stage

4.1 Operations/Maintenance Stage

A project is in the Operations and Maintenance Stage once users are able to access the system hardware and software as an application and the system is incorporated into the Bureau architecture. The identified site for Operations and Maintenance has the responsible for:

- Collecting the statistical data on the project's hardware and software performance
- Monitoring systems costs and functions
- Reporting information to management
- Detecting defects
- Managing system problems
- Recovering from system problems
- Implementing changes

4.1.1 Purpose

Evaluate Phase

The Operations and Maintenance Stage's purpose is to collect system statistics so that IT resources and performance can be well managed and evaluated. In this stage, the system is continually monitored for performance, outages, maintenance activities, costs, resource allocation, defects, problems, and system changes. System stability is also periodically evaluated.

Operation/Maintenance Stage

There must be an identified group responsible for producing system statistics and analyzing the results. The Operations and Maintenance Stage involves the following:

Post Deployment Review Stage

- System Owner and System User Representative
- O&M site representative(s)
- Security Team
- IMG and ITIB

4.1.2 Entrance Criteria

The Operations/Maintenance Stage Entrance criteria is receipt by the System's User Representative of a signed **Operational Readiness Review Memorandum** from the System Owner (Project Sponsor).

The following four processes occur in the Operations/Maintenance Stage:

- Monitor Performance
- Assure Continuity of Operations
- Evaluate Disaster Recovery/Contingency Plan
- Perform Recurring Accreditation

4.1.2.1 Monitor Performance

Performance and capacity management activities, performed by the O&M Site representative are continually conducted while the project is in production. These activities include hardware and software performance monitoring and capacity planning. Statistics are generated to track system performance, utilization, and resource allocations. Actual performance is compared to performance projections made during the Select Phase.

Performance measurement and strategic capacity planning reports are generated on demand. Business Process Owners may request an ad-hoc report on a specific application. System capacity is monitored to support strategic planning, and to monitor current and future performance and utilization needs.

4.1.2.2 Assure Continuity of Operations

Assuring continuity of operations is a collection of four activities designed to manage and maintain an effective IT environment. These activities are:

- Detecting Defects
- Managing (and Preventing) System Problems
- Recovering from System Problems
- Implementing System Changes

4.1.2.3 Conduct Disaster Recovery/Contingency Plan

A Disaster Recovery/Contingency Plan activity must be tested and reviewed at a frequency commensurate with the risk level and expected magnitude of loss resulting from a service disruption. The AIS Security Lead is responsible for implementing this plan.

4.1.2.4 Perform Recurring Security Certification/Accreditation

Major applications/system must be re-accredited whenever significant system changes occur, and at least every three years.

Security Certification must precede Security Accreditation. Security Certification is a formal statement, from the Designated Security Officer for the system, that the system meets its defined security requirements; is in compliance with all applicable policies and directives; and has reasonable security controls. Security Accreditation is the responsibility of the Business Process Owner and System Owner. The IT Security Officer is responsible for performing Certification and Accreditation.

4.1.3 Results

All findings generated from the Operations/Maintenance Stage are analyzed and reported to operations management during status meetings with the System User Representative. The findings and responses to the findings are shared with stakeholders and retained by the O&M site representative.

4.1.4 Exit Criteria

While the system is in Operations and Maintenance, it remains in the Evaluate Phase during which all stages are repeated periodically or on demand.

4.1.5 Next Step

The next step is to provide information, including lessons learned, to the Select and Control Phases; Post Deployment Review; ongoing projects, and retired or canceled projects. This information is made available to management on a regular basis. Two mechanisms which provide feedback to management during the Monitor Performance activity are:

- “Systems Availability Meetings” during which mainframe and client/server performance issues are discussed.

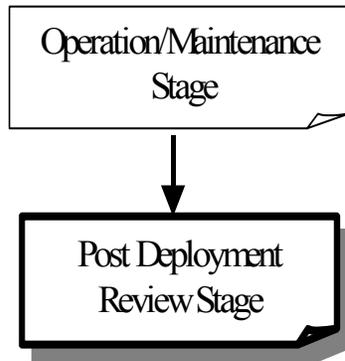
4.2 Post Deployment Review (PDR) Stage

The Evaluate Phase includes a Post Deployment Review (PDR) stage where the system's documentation and performance is fully assessed. The PDR assesses the system's efficiency and effectiveness to determine if the investment was cost beneficial and achieved the planned functionality. The PDR also determines how well the system meets mission needs and supports the re-engineering efforts as originally identified. The PDR is part of the overall project costs and should be included in the initial estimated project cost developed in the Business Case Development Stage.

4.2.1 Purpose

Evaluate Phase

A PDR must be conducted within six to nine months after the system goes into Operations and Maintenance and on all canceled projects. The PDR:



- Provides a project assessment including an evaluation of the development process
- Indicates the extent to which the Bureau's investment decision making process is sustaining or improving the success rate of other IT projects

The PDR Team members involved in this stage are :

- Business Process Owner/ ADS IRM Advisor
- User Representative
- NIRMC System Engineering
- System Users
- SCO and IMG Representatives

4.2.2 Entrance Criteria

The PDR Team initiates, at the Sponsor's request, the PDR approximately six months after the system becomes operational. In instances where the project was canceled, the PDR Team initiates the PDR immediately, based on the Sponsor's request. The PDR Team will request, from the Business Process Owner, certain documentation to be provided within two weeks of the PDR initiation notification letter or memorandum.

4.2.3 Process

This stage requires the following seven sub-processes:

- Initiate PDR
- Analyze Documentation
- Interview Key Stakeholders
- Measure Performance
- Perform User Surveys
- Final Analysis

- Reporting

4.2.3.1 Initiate PDR

The Sponsor is responsible for identifying a PDR Team that is responsible for initiating the review approximately six months after the system becomes operational. A review schedule is included in the CIOs Annual Performance Plan maintained by the IMG. The PDR Team prepares and sends a memorandum to the Sponsor, ADS IRM Advisor, Business Process Owner and the System User Representative stating that the review has begun. The ***PDR Initiation Memorandum*** includes a schedule for the planned review, and areas that may receive special review emphasis, and the original project number for tracking all cost associated with the PDR.

4.2.3.2 Analyze Documentation

The PDR Team requests project documentation from the project files to the extent possible. All required documentation must be provided within two weeks from the receipt of the ***PDR Initiation Memorandum***. The PDR Team must analyze this information to understand project scope, generate interview and survey questions, prepare for system overview briefings, and plan the PDR schedule. The PDR Team must also review reports and memorandums from the Select and Control Phases to collect any findings or outstanding issues.

4.2.3.3 Interview Key Stakeholders

The PDR Team is responsible for interviewing all key stakeholders. The interview objective is to develop an understanding of the system's goals, objectives, benefits, and costs as described in Business Case and Project Plan developed in the Select Phase. These interviews determine how efficient and effective the systems objectives, goals, performance measures, and benefits have been achieved. The interview also serves to identify system deficiencies and enhancement needs.

4.2.3.4 Measure Performance

The PDR Team is responsible for reviewing all performance measurement documentation. Project Performance Measures established in the Select Phase are compared to data generated during the Operations and Maintenance stage. In the absence of certain statistics, the PDR team may perform on-site observations to measure specific criteria.

4.2.3.5 Perform User Surveys

The PDR Team will conduct qualitative surveys with users to determine user satisfaction with the system. Executing the survey includes designing questionnaires, distributing the survey questionnaires to remote users' locations, receiving responses, analyzing results, and generating memorandum. The survey measures the system's efficiency and effectiveness in achieving its stated goals, benefits, and satisfying end users needs.

4.2.3.6 Perform Analysis

The PDR Team will perform an analysis of all documentation, survey results, and

performance measurements to determine if the system efficiently and effectively achieved its objectives.

4.2.3.7 Issue Report

After comments are received from the ADS IRM Advisor, Business Process Owner, User Representative, and Users on the draft report, the PDR Team prepares the Final Report and submits it to the System Owner, CIO and the ITIB.

4.2.4 PDR Results

The Business Process Owner reviews the PDR Report. The PDR Reports findings and recommendations are also conveyed to the CIO and ITIB. The PDR Report's findings and recommendation are also incorporated, as needed, into the Bureau's IT Investment Management Process Document.

4.2.5 Exit Criteria

The exit criteria is for the PDR Team to provide ***PDR Report*** to the System Owner, CIO and the ITIB. The ***PDR Report*** is also distributed electronically to the System User Representative, Business Process Owner, and System Owner.

Appendix A

Acronyms

AD	Assistant Director
AP	Acquisition Plan
APR	Acceptance Problem Report
AST	Acquisition Support Team
BAG	Bureau Architecture Group
BCA	Benefit-Cost Analysis
BPO	Business Process Owner
CDR	Critical Design Review
CFO	Chief Financial Officer
CIO	Chief Information Officer
CM	Configuration Management
CO	Contracting Officer
CSOM	Computer System Operations Manual
DAT	Data Administration Team
FAR	Federal Acquisition Rules
FASA	The Federal Acquisition Streamlining Act of 1994
GAO	General Accounting Office
GPRA	The Government Performance and Results Act of 1993
IMP	Investment Management Process
IMG	Investment Management Group (WO-550)
IRM	Information Resource Management
ITIB	Information Technology Investment Board
IT	Information Technology
I-TIPS	Information Technology Investment Portfolio System
NIRMC	National IRM Center
OMB	Office of Management and Budget
O&M	Operations and Maintenance
ORR	Operational Readiness Review
PDR	Post Deployment Review
PM	Project Manager
POC	Point of Contact
PP	Project Proponent
PPR	Project Plan Review
PRA	The Paperwork Reduction Act of 1995
QAT	Quality Assurance Team
RFP	Request For Proposal
SCO	System Coordination Office (WO-570)
SOW	Statement of Work
TBD	To be Determined
TRB	Technical Reference Board
TRR	Test Readiness Review
UAT	User/System Acceptance Test
VDD	Version Description Document
WBS	Work Breakdown Structure

Appendix B

Bibliography

The following manuals, documents, and studies are cited as used in developing the IMP:

Department of Defense, *Department of Defense Handbook Work Breakdown Structure, MIL-HDBK- 881*, January 2, 1998. Source: www.acq.osd.mil/pm/newpolicy/wbs/wbs.htm.

Department of Defense, *Earned Value Management Implementation Guide*, October 3, 1997. Source: www.acq.osd.mil/pm/currentpolicy/jig/evmig1.htm.

Fleming, Quentin W., Koppelman, Joel M., *Earned Value Project Management, A Powerful Tool for Software Projects*, Primavera Systems, Inc, July 1998. Source: www.stsc.hill.af.mil/crosstalk/1998/jul/value.htm.

Management Systems Subcommittee of the National Security Industrial Association, *Industry Standard Guidelines for Earned Value Management Systems*, January 15, 1997.

Project Management Institute, *Earned Value Management Systems (EVMS), Basic Concepts*. Source: www.acq.osd.mil/pm/paperpres/sean_alex/sld009.htm.

United States Customs Service, *Customs Cost Benefit Analysis Handbook*, November 15, 1999.

United States Customs Service, *Office of Information and Technology Customs IT Investment Management Process, Post Implementation Review, Reviewer's Handbook*, July 1, 1998.

United States Customs Service, *US Customs Service Enterprise Architecture Blueprint*, August 1999.

United States Customs Service, USCS Office of Information Technology, Technical Architecture Group, *Systems Development Life Cycle Handbook, CIS HB 5500-07*, October 1998.

United States General Accounting Office, *Assessing Risks and Returns: A Guide for Evaluating Federal Agencies' IT Investment Decision-making*, GAO/AIMD-10.31.13, February 1997.

United States General Accounting Office, *Information Technology Investment Management (ITIM): A Framework for Assessing and Improving Process Maturity*, GAO/AIMD-10.1.23 May 2000, Version 1.

Wilkins, Tammo T., *Earned Value, Clean and Simple*, Los Angeles County Metropolitan Transportation Authority. Source: www.acq.osd.mil/pm/paperpres/wilkins_art.pdf