Investment Management Process System Description

Version 2.1

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United States Customs Service

Table of Contents

FOREWORD FROM CIO ..... **iii**

1 INTRODUCTION **1-1**

1.1 INVESTMENT MANAGEMENT PROCESS AUTHORITY AND PURPOSE 1-1
1.2 SCOPE 1-2
1.3 ROLES AND RESPONSIBILITIES 1-2
1.4 PROCESS OVERVIEW 1-3
1.5 SOFTWARE PROCESS IMPROVEMENT PROGRAM 1-5
1.6 DOCUMENT STRUCTURE 1-6

2 SELECT PHASE **2-1**

2.1 CONCEPT DEVELOPMENT AND ARCHITECTURE VERIFICATION PROCESS DESCRIPTION STAGE 2-1
2.2 BUSINESS CASE DEVELOPMENT STAGE 2-5
2.3 ACQUISITION PLAN DEVELOPMENT STAGE 2-10
2.4 PROJECT INITIATION STAGE 2-12

3 CONTROL PHASE **3-1**

3.1 PROJECT REVIEWS 3-1
3.2 PROJECT DEFINITION STAGE 3-3
3.3 SYSTEM / SERVICES ACQUISITION STAGE 3-7
3.4 SYSTEM DESIGN STAGE 3-9
3.5 PROGRAMMING / CONSTRUCTION STAGE 3-13
3.6 ACCEPTANCE TESTING STAGE 3-17
3.7 IMPLEMENTATION / TRANSITION STAGE 3-21

4 EVALUATE PHASE **4-1**

4.1 OPERATIONS/PRODUCTION STAGE 4-1
4.2 POST IMPLEMENTATION REVIEW (PIR) STAGE 4-5

APPENDIX A: ACRONYMS AND BIBLIOGRAPHY **A-1**

APPENDIX B: FORMS AND INSTRUCTIONS **B-1**

APPENDIX C: INVESTMENT MANAGEMENT PROCESS PROCEDURES **C-1**

1 Earned Value Overview C-1
2 Work Breakdown Structure (WBS) Procedures C-7
3 Organizational Breakdown Structure (OBS) Procedures C-11
4 Project Schedule Procedures C-13
5 Cost Estimating Procedures C-15
6 Project Budgeting Procedures C-17
7 Performance Measurement Procedures C-21
8 Variance Analysis Procedures C-23
9 Estimates at Completion Procedures C-27
10 Baseline Maintenance Procedures C-29
11 Management Reserve Procedures C-31
12 Internal Replanning Procedures C-33
13 Acquisition Planning Procedures – Select Phase C-35
14 System Services Acquisition Procedures – Control Phase C-37
15 Glossary of Earned Value Management Terms C-39

APPENDIX D: CONTROL PHASE REVIEWS **D-1**

APPENDIX E: TECHNOLOGY REVIEW COMMITTEE (TRC) CHARTER E-1

APPENDIX F: INFORMATION TECHNOLOGY COMMITTEE (ITC) CHARTER.....F-1

APPENDIX G: INVESTMENT REVIEW BOARD (IRB) CHARTER G-1

Index of Tables

TABLE 1: SELECT PHASE SUMMARY 2-1
TABLE 2: CONTROL PHASE SUMMARY 3-1
TABLE 3: EVALUATE PHASE SUMMARY 4-1

Index of Figures

FIGUIRE 1: INFORMATION AND PROCESS FLOWS 1-1
FIGURE 2: INVESTMENT MANAGEMENT PROCESS..... 1-3

Foreword from CIO

Forward Department of Treasury—United States Customs Service

I am pleased to present Customs Investment Management Process as the policy and procedure 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 IT investments. This structured process provides a systematic method for Customs to minimize risks while maximizing the return on IT investments.

Several recent management reforms have introduced requirements emphasizing the need for federal agencies to significantly improve their management processes, including how they select and manage IT resources. For instance, a key goal of the Clinger-Cohen Act is that agencies have processes and information in place to help ensure that IT projects are 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 upon information we have gained evaluating other organizations and the input provided by the GAO. We expect all of USCS personnel to use it when making IT investments.

If you have any questions or require assistance contact Rob Thomas at (202) 927-4021.

S.W. Hall, Jr.
Assistant Commissioner
Office of Information and Technology

1 Introduction

This section provides background information on the IMP's 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 Investment Management Process (IMP) document implements specific information technology (IT) requirements of those laws. The 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 the office of the CIO.

The IMP is a structured, integrated approach to managing IT investments. The IMP ensures that all IT investments (or projects) align with Customs 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 a 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[1].

The information flows shown in Figure 1 also represent a feedback mechanism to institutionalize lessons learned. Approved investments become part of a

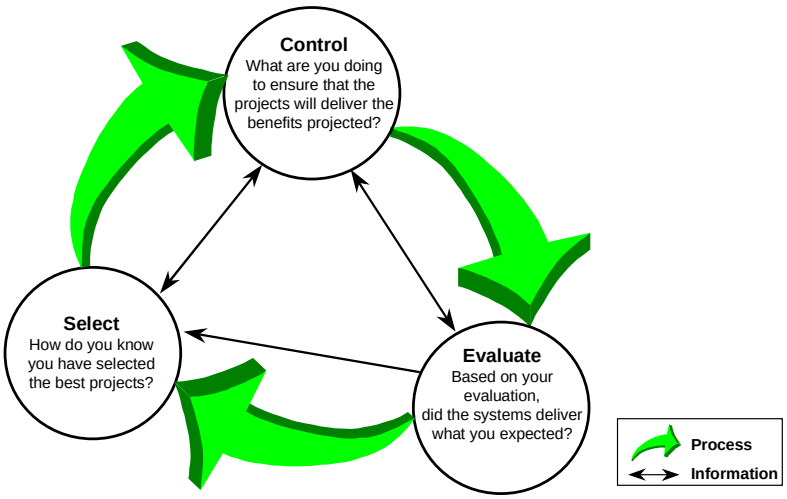


Figure 1: Information and Process Flows

[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.

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 is reported annually to Treasury departmental offices 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 and a system's retirement and replacement is well-planned.

1.2 Scope

All IT projects within Customs, except for Operations and Maintenance (O&M) efforts included in the Base Funding budget, must comply with IMP procedures. A project not meeting specific IMP procedure thresholds must still comply with the Customs System Development Life Cycle (SDLC)[2] requirements. Exemptions and waivers are granted only in exceptional circumstances.

1.3 Roles and Responsibilities

The following decision-making bodies and personnel have been assigned the responsibilities listed below.

1.3.1 Key Decision Making Bodies

These entities are the governing and approval bodies responsible for ensuring that proposed investments meet Customs strategic, business, and technical objectives.

- **Technology Review Committee (TRC)** –Responsible for ensuring that proposed projects comply with Customs IT architecture. The TRC Charter is contained in Appendix E.
- **Information Technology Committee (ITC)** – Responsible for ensuring that Customs strategic goals are met. The ITC Charter is contained in Appendix F.
- **Investment Review Board (IRB)** – Responsible for reviewing and approving strategic investment decisions. The IRB Charter is contained in Appendix G.

1.3.2 Key Personnel

The following key personnel are responsible for successfully completing the IMP:

- **Business Information Technology Representative (BITR)** –Responsible for serving as the primary OIT interface to a project's users and serves as the point of contact for issues concerning the project.
- **Business Interface Representative (BIR)** – Responsible for serving as the primary user interface to OIT and serves as the point of contact for issues concerning the project.
- **Process Owner –** Responsible for the strategic business processes under development or enhancement and ensuring their integrity. The SDLC refers to the Process Owner as the *Business Sponsor*.

[2] See SDLC Compliance Policy Memorandum issued September 3, 1999.

- **Project Manager** – Is responsible for successful management and completion of one or more OIT projects.
- **Business Project Manager** – Is responsible for managing specific projects in support of the BITR. The Process Owner may designate a Business Project Manager in instances where the BITR's span of control requires additional project management support.
- **Acquisition Support Team Representative** – Is responsible for serving as the primary acquisition support interface between the project users and the Office of Finance, Procurement Division (OFDD).

1.4 Process Overview

The IMP is a fluid, dynamic process in which proposed and ongoing projects are continually monitored throughout their life cycle. Successful investments and those that are terminated or delayed are evaluated to both assess the impact on future proposals and to benefit from any lessons learned. The IMP contains three phases (Select, Control, and Evaluate) each comprised of multiple stages as shown in Figure 2:

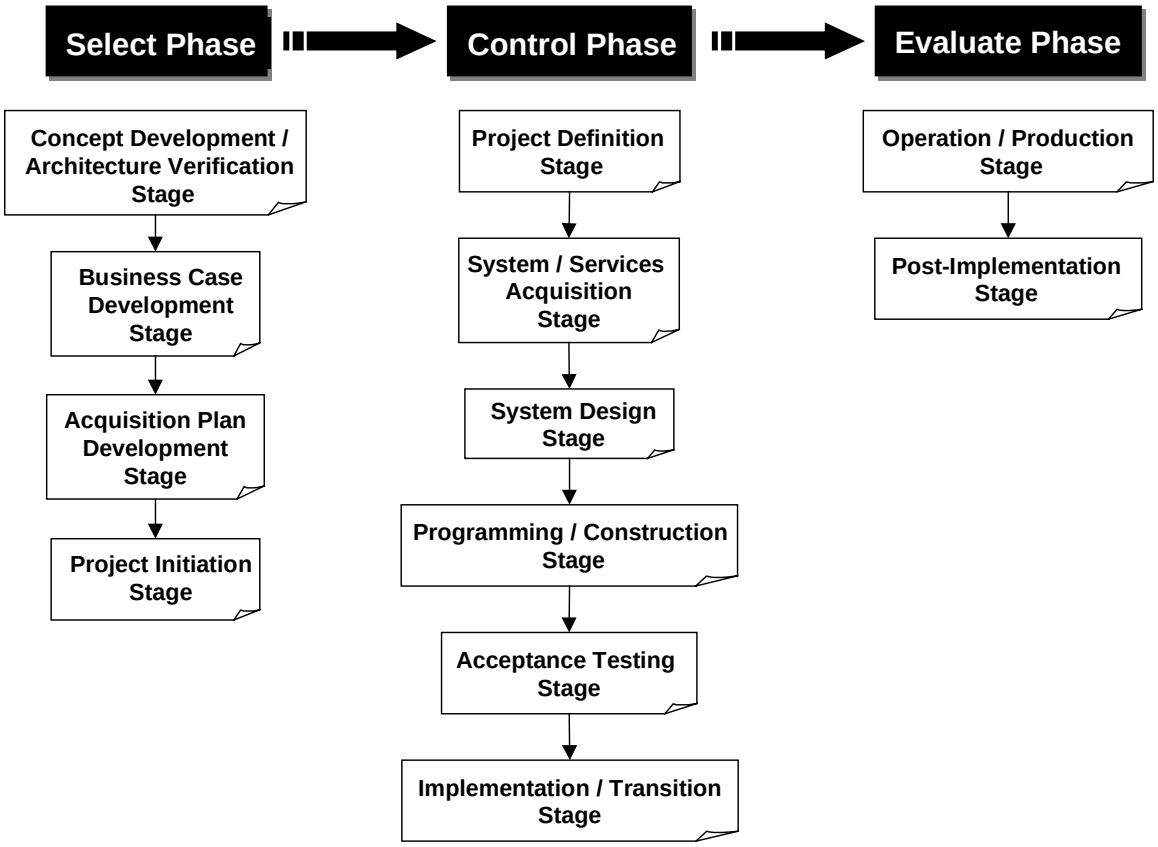


Figure 2: Investment Management Process

Within all phases, each stage contains the following common elements:

- Purpose – Describes the stage's objective
- Entry 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 action necessary for proceeding 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 overseen by a decision making body that ultimately approves or rejects a project's advancement to the next stage. This ensures that each project receives the appropriate level of managerial review and that coordination and accountability exist. Exceptions to IMP and SDLC[3] requirements must be identified in a project plan via tailoring as described in SDLC Volume I, Section C, Page1-27.

1.4.1 Select Phase

The Select Phase ensures that Customs chooses IT projects that best support its mission and comply with its IT architecture. Individual projects are evaluated in the broader context of technical alignment with other IT systems as well as the investment's impact to Customs IT portfolio performance as measured by cost, benefit, and risk. This phase requires that milestones and review schedules be established for each project.

As part of the process, Customs 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 then systematically evaluated and ranked among other projects in the IT portfolio. Finally, a decision-making body of senior executives (the IRB) decides which projects will be included in the portfolio, and which will be submitted to Treasury departmental offices for funding.

The Select Phase consists of four discrete stages:

- Concept Development and Architecture Verification
- Business Case Development
- Acquisition Plan Development
- Project Initiation and Review

[3] *Systems Development Life Cycle Handbook*; CIS HB 5500-07; October 1998 USTD, USCS OIT, TAG Group

1.4.2 Control Phase

Once selected for inclusion in the Customs IT portfolio, each project is consistently managed and monitored throughout its life cycle. At key milestone dates, progress reviews are conducted in which the project's status is compared to planned benefit, cost, schedule, and technical efficiency and effectiveness measures. The project's risk, complexity, and cost determine the review's scope and frequency. If a project does not meet its budget, schedule, or performance plan, the IRB decides upon an appropriate course of action.

The Control Phase contains six discrete stages:

- Project Definition
- System / Services Acquisition
- System Design
- Programming/Construction
- Acceptance
- Implementation

1.4.3 Evaluate Phase

Once a project is fully implemented, 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
- Revise the investment management processes based on lessons learned
- Assess technical compliance with the Customs Enterprise Architecture

The Evaluate Phase has two discrete stages:

- Operation/Production
- Post-Implementation

1.5 Software Process Improvement Program

As part of the IMP, Customs has instituted an IT software process improvement (SPI) program. These processes are based upon the Software Engineering Institute's (SEI) Capability Maturity Model (CMM) and represent industry and government best practices. The SDLC is the primary means by which CMM-compliant processes are promulgated. Specific SDLC project requirements are reflected in the IMP. As a result, project managers and project sponsors will be

guided by one all-encompassing process with well-defined sub-processes. These sub-processes are further described in the *SDLC Handbook*.

1.6 Document Structure

The IMP is divided into four chapters and seven appendices as described below:

- **Chapter 1: Introduction** – Describes the IMP's purpose and authority, scope, overview, and document structure.
- **Chapter 2: Select Phase** – Describes the purpose, entry criteria, process, results, exit criteria, and next steps for each stage in the Select phase.
- **Chapter 3: Control Phase** – Describes the purpose, entry criteria, process, results, exit criteria, and next steps for each stage in the Control phase.
- **Chapter 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: Forms and Instructions**– Contains instructions and forms used in the IMP.
- **Appendix C: Investment Management Procedures**– Describes procedures necessary to successfully complete the IMP.
- **Appendix D: Project Reviews** – Describes the reviews necessary to ensure that quality systems are efficiently and effectively created or enhanced.
- **Appendix E: Technology Review Committee (TRC) Charter**– Describes the TRC's responsibilities and authority.
- **Appendix F: Information Technology Committee (ITC) Charter**– Describes the ITC's responsibilities and authority.
- **Appendix G: Investment Review Board (IRB) Charter** – Describes the IRB's responsibilities and authority.

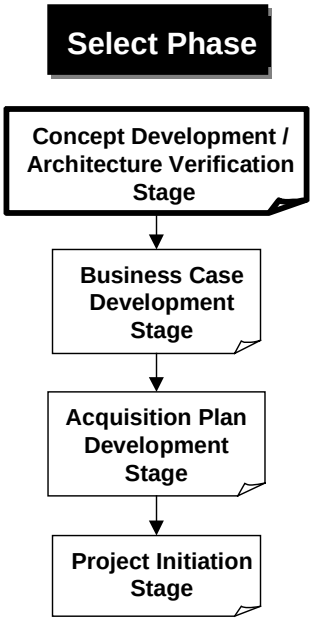
2 Select Phase

The Select Phase begins with a project concept 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 Initiation Stage, during which a *Work Authorization Memo* is created that authorizes work to begin. The Select Phase consists of four stages as summarized in Table 1:

Table 1: Select Phase Summary

Stage	Purpose	Results
Concept Development and Architecture Verification	Ensure proposed investment aligns with Customs mission, technical architecture, and existing and proposed systems.	*ITCD Decision Memo*
***Business Case* Development**	▪ Develop a *Business Case* assessing investments strategic, technical, and financial merit. ▪ Provide information for ITC and IRB to evaluate and rank proposal in Customs project portfolio.	*Project Initiation Memo*
Acquisition Plan Development	▪ Develop an Acquisition Plan ▪ Ensures objectives are met in the most effective, economical, and timely manner	OFPD *Acquisition Plan*
Project Initiation	Ensure project fundamentals are well developed so effort can be managed to achieve technical, cost, schedule, and risk management objectives.	*Work Authorization Memo*

2.1 Concept Development and Architecture Verification Process Description Stage



2.1.1 Purpose

This section describes the steps necessary to present a project for architecture review, verification, and validation. The TRC reviews each hardware and software project to ensure:

- A mature and stable project development environment
- Compliance with Customs IT architecture
- No duplicate development efforts
- Performance and management risks resulting in cost overruns and schedule delays are minimized

It is mandatory that each IT project, regardless of cost or size (other than routine maintenance projects), be reviewed for architectural

compliance and obtain either a TRC approval or waiver.

This stage involves the following entities:

- TRC
- Technical Architecture Group (TAG)
- BITR
- BIR
- Process Owner
- Business Project Manager

2.1.2 Entry Criteria

To qualify for IMP review and funding, prospective investments must comply with the following IMP requirements:

- Any proposed investment that is not an O&M effort included in Base Funding amounts must participate in the IMP process. An O&M investment not part of the Base Funding initiative is required to participate in the IMP process regardless of whether the project is a change or enhancement. Further, enhancements funded through Base Funding must also participate in the IMP process.
- Any proposed investment with a life cycle value greater than $25,000 (proposed investments with life cycle value less than $25,000 must go through the IMP process but no *Business Case* is required).

2.1.3 Process

Three processes occur in this stage:

- An Information Technology Concept Document (ITCD) is developed
- The project is registered
- The TRC reviews the ITCD

2.1.3.1 Information Technology Concept Document Development (ITCD)

The *ITCD* identifies the originating organization, key points of contact, and defines the investments objectives, technical alignment, and resource requirements. Instructions for creating an *ITCD* are located in Appendix B. The Business Project Manager must route the *ITCD* through the BITR for review and approval before IMP submission.

2.1.3.2 Project Registration

Upon successful *ITCD* review, the project is registered with the TAG. The TAG assigns a unique project tracking number so that investments may be identified and tracked within Customs. The project tracking number also serves as the Management Control Plan (MCP) number for Treasury departmental offices. More information concerning MCP requirements is contained in *OMB Circular A-123*.

2.1.3.3 TAG and TRC Preliminary Project Review

The TAG also performs a preliminary project review. This review includes, but is not limited to, the quality of information (defendable concept), the quantity of information (sufficient detail) and architecture compliance. The TAG's findings and recommendations are forwarded to the TRC. The TRC then determines if the project aligns with Customs strategic information technology objectives.

2.1.4 Results

Based upon TRC review, an *ITCD Decision Memo* is issued by the TAG stating the project is either:

- Approved
- Approved and granted a waiver. If the project requires a waiver, it must be granted by the ITC and noted in the *ITCD Decision Memo*. An example of a project requiring a waiver would be a software application that is not compliant with Customs enterprise architecture but is required by Treasury departmental offices.
- Disapproved
- Returned for additional analysis or information

The *ITCD Decision Memo* will be attached to the *ITCD* and notice sent to the BITR and the Business Project Manager. The BITR must request consideration for a waiver. The *USCS Enterprise Architecture Blueprint*[4] Section 2 contains additional Enterprise Architecture information and guidance.

Projects successfully exiting this stage are those with business and technical architectures that are feasible and do not duplicate existing projects.

2.1.5 Exit Criteria

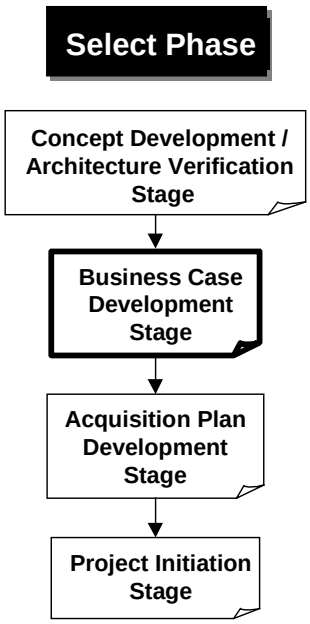
The BITR must receive a TRC issued *ITCD Decision Memo* approving the project concept or a waiver memo granted by the ITC.

[4] US Customs Service Enterprise Architecture Blueprint, August 1999.

2.1.6 Next Step

Once the project has been approved by the TRC or granted a waiver by the ITC, the project proceeds to the Business Case Development Stage.

2.2 Business Case Development Stage



2.2.1 Purpose

The *Business Case* organizes information necessary to make a funding decision in a consistent, structured format. In this stage, the project's strategic, technical and financial merit is documented. The *Business Case* must provide sufficient information for the ITC and IRB to determine if a solid alignment with Customs mission, business needs, and technical architecture exists. In doing so, the IRB will also evaluate and rank the proposal against other proposed investments according to the project's benefits, costs, and risks. Upon review, the ITC and IRB will approve or disapprove the project for a funding request. At this stage, the *Business Case* is a summary level document. As more financial information becomes available, the *Business Case* will be expanded and updated in the Project Initiation Stage.

The entities involved in this stage are:

- Project Manager
- BIR
- BITR
- TAG
- Planning Group
- Acquisition Support Team
- Program Monitoring Group (PMG)
- ITC
- IRB

2.2.2 Entry Criteria

Before entering this stage, the BITR must receive an *ITCD Decision Memo* from the TRC. The following conditions also apply:

- Projects with life cycle cost greater than $25,000 but less than $100,000 must develop a *Business Case* and a Preliminary Budget Estimate. No preliminary Cost-Benefit Analysis (CBA) is required.
- Projects with a life cycle cost greater than $100,000 must develop a *Business Case* including a Preliminary Budget Estimate and a CBA.

In very rare instances, a project may be exempted from developing a *Business Case* and undergoing ITC and IRB review and approval. An instance may include a catastrophic mission-critical system repair, upgrade, or replacement resulting from a natural disaster.

If a waiver is granted, the project must be reviewed for architectural compliance by the TRC. The CIO grants permission for the project to be funded and allows initiation without formal ITC and IRB review. The CIO and the PMG will provide special oversight to any project having received a *Business Case* waiver.

The following project types meet the IRB review criteria and require IRB approval:

- All unfunded projects
- All projects considered high risk (defined by the TRC and ITC)
- All projects with a life cycle value greater than $1,000,000

2.2.3 Process

The first step in developing the *Business Case* is for the Business Project Manager and/or the BITR to contact OIT and identify a Point of Contact for technical issues and estimates. The OIT Point of Contact plays an active role in supporting the business case development. The Project Team consists of:

- Business Project Manager
- OIT Point of Contact
- BIR*
- BITR*
- Support staff

* The BIR and BITR serve as liaison between the Project Manager and the Process Owner.

The Business Project Manager is responsible for successfully and accurately completing all aspects of the Business Case Worksheet. The Business Project Manager is responsible for coordinating with OIT to ensure that technical issues are identified/resolved and that the development/deployment cost estimate has OIT's concurrence.

The OIT Point of Contact is responsible for providing IT technical expertise. One of the key areas in which the OIT Point of Contact must participate is the development of the technical cost estimate. The Business Case requires a level of detail for its cost estimates that only OIT can provide.

The BIR coordinates/assists the OIT Point of Contact in supporting the needs of the Business Project Manager. The BIR is responsible for ensuring that information flowing out of OIT is accurate and defendable.

The BITR coordinates/assists the Business Project Manager in supporting the development of the Business Case. The BITR is responsible for ensuring that information contained within the Business Case is accurate and defendable. The BITR is the Point of Contact for all issues and questions resulting from ITC/IRB reviews.

The Project Team is responsible for:

- Establishing the Project Timeline
- Developing Preliminary Budget Estimates (including and excluding government full time equivalents [FTEs])
- Developing a Preliminary CBA (if the project life cycle cost is greater than $100,000)
- Completing the *Business Case Worksheet*[5]

The three elements (preliminary project timeline, preliminary budget estimate and preliminary CBA) must be included as attachments to the *Business Case Worksheet*. Each element is described below.

2.2.3.1 Develop Preliminary Project Timeline

The timeline must include the project's start date, major milestones, control points, and the completion date. The timeline should be realistic, reflect any contract development, award and subcontract review activities. An acquisition strategy summary describing the project's procurement plan is also required.

2.2.3.2 Conduct Preliminary Budget Estimate

The preliminary budget estimate must identify principal cost elements such as government FTEs, contractor support, software procurement, software development, and infrastructure procurement. This estimate establishes cost categories and values for each summary level Work Breakdown Structure (WBS) element. The preliminary budget estimate must separately show budget requirements both with and without government FTEs. Supporting detail where appropriate must accompany the estimate. If the project spans fewer than 5 years, the entire life cycle budget must be reflected. Otherwise a 5-year budget estimate is required.

2.2.3.3 Conduct Preliminary Cost-Benefit Analysis (CBA)

A preliminary CBA containing the costs and benefits throughout the project's life cycle is required. This is a preliminary CBA in which the minimum requirements are to:

[5] The *Business Case Worksheet* is located in Appendix B.

- Identify high-level system/user requirements (sufficient detail must be provided to support the summary description of the costs and benefits)
- Identify summary cost elements
- Identify summary internal benefit elements (quantitative and/or qualitative)
- Identify summary external benefit elements (quantitative and/or qualitative)
- Assign values for each cost and benefit element for each year in the project's life cycle
- Identify at least one technical alternative

Preliminary budget estimates and CBA cost elements should be the same and must be consistent with the *Business Case Worksheet.*

The preliminary CBA must be updated and populated with detailed financial data during subsequent IMP stages.

For projects containing significant risk, life cycle funding amounts, or which span a large number of years, the ITC or IRB may require an incremental CBA to gain insight into the projects timing, performance, risk profile, costs, and benefits.

The *Customs Cost Benefit Analysis Handbook*[6] provides step-by-step guidance for conducting a CBA. *OMB Circular A-94* supplements the Handbook and also provides guidance on accessing benefits that accrue to the public.

2.2.3.4 Develop Business Case Worksheet

The *Business Case Worksheet* provides a summary project overview. The worksheet identifies key points-of-contact, the project's objectives, costs, strategic Customs activities the project will support, and a checklist of documentation that must accompany the worksheet.

The *Business Case Worksheet* must be organized and submitted to the Project Manager. The Project Manager will review and prepare the project for presentation to the ITC and IRB for review and approval, or rejection. The Business Case Worksheet and instructions are located in Appendix B.

2.2.4 Results

This stage results in the ITC and IRB issuing *IRB Meeting Minutes* to the BITR which:

- Approve the amount requested
- Approve an amount different from that requested
- Reject funding

If the requested amount is approved, the project is included in Customs budget submission to Treasury departmental offices for funding. Including the project in the portfolio is documented

[6] *Customs Cost Benefit Analysis Handbook*; United States Customs Service; November 15, 1999.

in the *IRB Meeting Minutes* and issued to the BITR and Business Project Manager. Upon receipt of funding from the Department, a *Project Initiation Memo* is issued by the Planning Group to the BITR.

The approved IT Initiatives will be entered into the Information Technology Investment Portfolio System I-TIPS to support Treasury departmental offices and OMB annual reporting requirements.

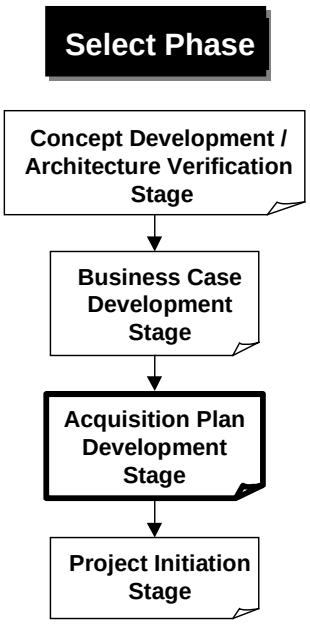
2.2.5 Exit Criterion

The Planning Group issues a *Project Initiation Memo* granting approval to the BITR. The *Project Initiation Memo* is issued upon funding approval.

2.2.6 Next Step

If the project is approved by the ITC and meets IRB review criteria, it is then sent to the IRB for review and approval, or rejection. Once the project receives funding approval, it progresses to the Acquisition Plan Development Stage.

2.3 Acquisition Plan Development Stage



2.3.1 Purpose

The purpose of this stage is to develop an Acquisition Plan (AP). The AP ensures that the Project Manager meets their objectives in the most efficient and effective manner. The 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), Office of Finance, Procurement Division (OFPD)
- Acquisition Support Team (AST)

2.3.2 Entry Criteria

To enter this stage, the Project Business Case Worksheet must be completed; specifically item Number 27 of the "Required Document Checklist" located in Appendix B.

2.3.3 Process

The following three activities occur in this Stage:

- OFPD assigns a CO based on requirements included in the Project Business Case Worksheet
- CO coordinates with the Project Manager and AST to develop an AP
- Project Manager completes the AP in accordance with Federal Acquisition Rules (FAR), Part 7, Acquisition Planning

2.3.4 Results

Upon receipt of a completed AP, OFPD reviews the plan and either approves or rejects the submission.

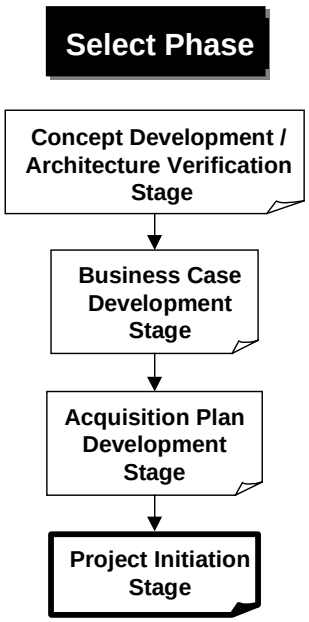
2.3.5 Exit Criterion

The exit criterion is for the Project Manager and the AST to receive an approved AP from OFPD. Although the AP is approved, it is continually updated during the Project Initiation Stage as user requirements are refined.

2.3.6 Next Step

The next step is the Project Initiation Stage, where the steps necessary to receive project authorization are defined.

2.4 Project Initiation Stage



2.4.1 Purpose

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 Initiation Stage details the steps necessary to receive project authorization. This stage involves the following entities:

- Planning Group
- Project Manager
- BITR
- BIR
- AST
- Support Staff

2.4.2 Entry Criteria

To enter this stage, the BITR must have received a *Project Initiation Memo* from the Planning Group. The memo contains the funding amount and any special restrictions or requirements. The BITR must also have received an approved AP from the OFPD.

If the funded amount is different from the amount requested in the *Business Case*, the *Business Case* must be updated and re-submitted to the IMP Project Manager for ITC review before the Project Initiation Stage concludes.

For a project with a significant risk profile, the ITC or IRB may agree to fund only the User Requirements Development step of this stage. The remaining effort will not be approved to start until the requirements development step is complete. The *Business Case* must be updated with the new revised requirements. Once updated, the *Business Case* must be reviewed and approved by the ITC.

A multi-year project that has been funded and worked on in previous periods must contain the approved plans and requirements. The project must also present project-to-date schedule, cost and technical performance results.

2.4.3 Process

The following four activities must be accomplished:

- Prepare initial user requirements
- Develop a project plan

- Complete a Project Initiation Worksheet
- Conduct Project Initiation Review and management review of user requirements, the project plan, and the Project Initiation Worksheet

2.4.3.1 Develop User Requirements

The user requirements development step shall identify and document the following elements (SDLC Volume I Page 6-14):

- Differences between existing and proposed methodology
- Information needs
- Application description
- Acceptance requirements

User requirements are necessary to develop a detailed CBA. All user requirement elements must be included within the *Project Initiation Worksheet* submission.

2.4.3.2 Project Plan

The next step is to develop the Project Plan as described in Volume II, Chapter 13 Section B of the *SDLC Handbook*. The Project Plan includes the following 15 elements:

1. Project definition and description *
2. Project schedule and budget
3. Project development strategy and life cycle
4. Project organization structure and responsibilities
5. Project summary WBS
6. Project critical objectives and performance measures
7. Project risk areas and mitigation strategies *
8. Project quality assurance activities and milestones
9. Project configuration management strategy
10. Project security issues and activities
11. SDLC deliverables list
12. SDLC tailoring
13. Project facilities and resources required
14. Project resource Acquisition Plan
15. Project staffing impact strategy

* included in the *Business Case* presented to the ITC

The actions required for each Project Plan element are described below. The *SDLC Handbook* reference appears in parenthesis.

1. Project definition and description
Describe the project, its strategic and technical alignment, the business need it addresses, the technical complexity, organizations and systems that will be impacted, and the management and performance risks associated with the project. Describe assumptions, dependencies and constraints associated with the project. Provide a project bibliography of key project references. Provide a glossary of terms and abbreviations. (SDLC Volume II, Chapter 13, Section B 1.1- 1.5)

2. Project Schedule and Budget
Provide the target completion date for each life cycle phase and major milestones for each life cycle phase. Specify project/task interdependencies for each life cycle phase as well. Ensure the project schedule and related WBS reconcile with one another. Provide the estimated staff months of effort for each life cycle phase. The staffing requirements shall be estimated both including and excluding government FTEs. Add detail to the Preliminary Budget developed in the Business Case Development stage. (SDLC Volume II, Chapter 13, Section B-4.1)

3. Project development strategy and life cycle
Provide an overview of the project's life cycle and development strategy. (SDLC Volume II, Chapter 13, Section B-1.2)

4. Project organization structure and responsibilities
Describe the organizational units, structure, and roles and responsibilities. Include all agency/OIT organization and staff titles, roles, and project-related responsibilities. Develop a line organization chart. Describe the project team structure, reporting channels, responsibilities, relationships, authority, expertise. (SDLC Volume II, Chapter 13, Section B-2.1, 2.2)

5. Project Work Breakdown Structure (PWBS)
Develop the detailed PWBS. Appendix C contains PWBS guidance. (SDLC Volume II, Chapter 13, Section B-3.1)

6. Project critical objectives and performance measures
Define the project's performance measures to be used to determine how efficiently and effectively the project is achieving its schedule, budget, functional, technical, and quality objectives. (SDLC Volume II, Chapter 13, Section B-2.3, Volume II Chapter 4)

7. Project risk and mitigation plan
Describe the project's control procedures to manage performance and management risks. The plan should identify the project's threats and vulnerabilities, the consequence of those threats or vulnerabilities, and the control measures used to manage those threats and vulnerabilities. The risk management plan should clearly identify the project risk

manager and delineate the individual's responsibilities. (SDLC Volume II, Chapter 13, Section B-2.4, 4.4, 5.0)

8. Project quality assurance activities and milestones
Describe the quality assurance plan and the individual responsible for implementing and managing the plan. The plan should identify key quality metrics and milestone events. (SDLC Volume II, Chapter 13, Section B-2.5, 4.7.4)

9. Project configuration management plan
Describe the methodology for ensuring project configuration control and identify the individuals responsible for those activities. (SDLC Volume II, Chapter 13, Section B-2.6)

10. Project and information security plan
Describe the plan for identifying and safeguarding sensitive information and the individuals responsible for doing so. (SDLC Volume II, Chapter 13, Section B-4.7.5, 4.7.6)

11. Project SDLC deliverables list
Identify the work products to be developed during each phase of the project life cycle. (SDLC Volume II, Chapter 13, Section B-4.7.3)

12. Project SDLC tailoring
Explain how each item is tailored to the type of development activity anticipated during the project. (SDLC Volume II, Chapter 13, Section B-4.7.2, 4.7.3)

13. Project facilities and resources required
Identify the required facility and resources needed to complete the project throughout its life cycle. (SDLC Volume II, Chapter 13, Bection B-4.2)

14. Project resource Acquisition Plan
Describe the acquisition plan for acquiring specific hardware, software, or contracting support. (SDLC Volume II, Chapter 13, Section B-4.5; FAR, Part 7)

15. Project staffing impact strategy
Identify the staffing plan and any positions that cannot be filled with available staff and the strategy to acquire the necessary talent. (SDLC Volume II, Chapter 13, Section B-4.6)

2.4.3.3 Project Initiation Worksheet

Project initiation is complete when *Initial User Requirements*, the *Project Plan*, and the *Project Initiation Worksheet* are submitted to the Planning Group. The *Project Initiation Worksheet* identifies the:

- Process Owner

- Business Information Technology Representative
- Business Project Manager
- Business Interface Representative

In addition the *Project Initiation Worksheet* addresses:

- **Conformance to Technical Architecture:** This identifies any technical changes and any changes in the project's conformance to Customs Technical Architecture since TRC Review.
- **Detailed Budget Estimate:** The Preliminary Budget Estimate must be enhanced and expanded so resources can be accurately planned and scheduled. The detailed budget estimate must both reflect the timing of activities shown in the WBS and be consistent with the detailed CBA. The detailed budget estimate must be fully integrated with the WBS.
- The summary level 5-year budget requirement must be incorporated into the *Project Initiation Worksheet*. This shall include estimated infrastructure cost that must be approved by an ISD representative's signature on the *Project Initiation Worksheet*.
- **Detailed CBA:** The preliminary CBA 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 *Customs CBA Handbook*[7] for guidance.

The Project Authorization Coordinator (member of the Planning Group staff) manages the Project Initiation Stage review. The Program Monitoring Group, Technical Architecture Group (TAG), and the Planning Group constitute the core Project Initiation Review Team. This team is responsible for reviewing the *Project Initiation Worksheet* and supplemental information. The review encompasses SDLC compliance, architecture review, budget allocation, and schedule and performance metrics. Comments and concerns must be addressed with the Project Team. If the Project Manager disagrees with the review team's findings, the ITC will intervene and decide if the issues are material and must be addressed immediately, or non-material and allow the project to proceed.

The Project Manager must also refine the project's list of deliverables. The Project Initiation Review Team, as part of the overall Project Initiation Review, reviews and approves the tailored deliverables list.

2.4.3.4 Project Initiation Review

The project initiation review ensures that the project is organized in a manner that allows Customs to effectively manage and control the project's progress. The review also ensures that the:

[7] *Customs Cost Benefit Analysis Handbook*; United States Customs Service; November 15, 1999

- Project's budget and schedule align
- Performance metrics are clearly defined
- Project is consistent with the approved *Business Case*

The appropriate level of senior management conducts the project initiation review. Upon review for conformance with Customs guidance and requirements, the project is authorized to begin.

2.4.4 Results

Upon the Director of Planning's approval, the Planning Group issues a *Project Authorization Memo* to the BITR.

2.4.5 Exit Criterion

The exit criterion is for the BITR to receive a *Project Authorization Memo* from the Planning Group.

2.4.6 Next Step

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

3 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 schedule evaluated and updated as necessary. A list of the stages is provided in Table 2, along with a summary of the stage's purpose and results:

Table 2: Control Phase Summary

Stage	Purpose	Results
Project Definition	▪ Functional Requirements ▪ Requirements Certification ▪ Additional Plans & Security Deliverables ▪ Definition Completion Review	*Definition Completion Review Memo*
System / Services Acquisition	▪ Procure System/Services	*Signed Contract(s)*
System Design	▪ Design System ▪ Update Test Plans	*Critical Design Review Memo*
Programming/ Construction	▪ Establish Development Environment ▪ Create or Modify Programs ▪ Conduct Unit and Integration Testing ▪ Prepare Operator's Manual	*Migration Turnover/Test Readiness Review Memo*
Acceptance	▪ Submit Developed Software for Testing ▪ System Acceptance Testing ▪ Security Testing ▪ Security Certification Package ▪ User Documentation and Training Materials ▪ Conduct User Acceptance Testing	*Deployment/Production Readiness Review Memo*
Implementation	▪ Determine Acceptable Level of Operational Risk ▪ Train Users ▪ Implement Developed Software ▪ Document Lessons Learned	*Operational Readiness Review Memo*

Before each stage's control gate review, the investment project plan must be updated.

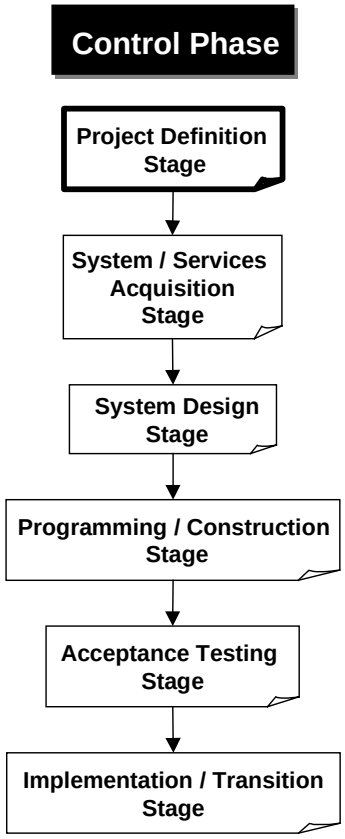
3.1 Project Reviews

Each stage culminates in a project review to ensure that the stage's objectives have been achieved. A project is subject to any of four types of reviews. Additional review details are provided in Appendix D.

- **Periodic Management Status Review**- These reviews assess the project's status on a regular basis. During the review, project managers present technical performance, cost, and schedule information to senior management and PMG.

- **Milestone & Deliverable Reviews** – This control gate review determines if a project has achieved current stages objectives stage. Significant deviations, management concerns, or other events may prompt a Triggered Review.
- **Triggered Reviews** – These reviews, initiated by senior management, address specific issues or problems.
- **SDLC Compliance Reviews** – These reviews compare project deliverables to SDLC policies and standards. These reviews, performed in conjunction with the Milestone and Deliverable reviews, ensure that the appropriate components are included in deliverables, and that the SDLC-required processes were followed.

3.2 Project Definition Stage



3.2.1 Purpose

The Project Definition Stage develops functional requirements, certifies user and functional requirements, develops additional plans and security deliverables, and reviews the project before it enters system design. The SDD Management Team is responsible for reviewing and accessing the project's planned and actual costs, schedule, and technical performance.

3.2.2 Entry Criterion

The entry criterion is receipt by the BITR of the *Project Authorization Memo*, issued by the Planning Group. In some cases, this memo may prescribe limitations on project funding, e.g., project funding only through requirements analysis.

3.2.3 Process

3.2.3.1 Functional Requirements

Based on the User Requirements, the System Development 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., 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). (SDLC II 7-13)

3.2.3.2 Requirements Certification/Baseline

After completing the Functional Requirements, a Functional Requirements Walkthrough is conducted. This provides an opportunity for all System Development Team members, users, and the Business Sponsor to make sure that there is a complete and clear understanding of the Functional Requirements. Upon this walkthrough's successful completion, the Business Sponsor and the Project Manager document their mutual understanding by completing and signing the *Requirements Certification Memo*. (SDLC II 7-16)

3.2.3.3 Additional Plans and Security Deliverables

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

- Data Management Plan (SDLC II 7-17)
- Security Deliverables (SDLC II 7-18):

  - Security Plan
  - Security Risk Assessment
  - Security Test Plan
  - Trusted Facilities Manual
  - Disaster Recovery/Contingency Plan
- Training Plan (SDLC II 7-22)
- System Test Plan (SDLC II 7-24)
- Quality Assurance Plan (SDLC II 7-26)
- Configuration Management Plan (SDLC II 7-29)

3.2.3.4 Update Project Plan

The project plan contains organizational responsibilities, Project Work Break Down Structures (PWBS), task descriptions, schedule and resource requirements and risk mitigation strategies. (SDLC II 13-4) These must be updated as necessary.

3.2.3.5 Definition Completion Review

The final step in Project Definition is the Definition Completion Review. This review is used as a control gate to ensure that the project is clearly defined and scoped before system design begins. (SDLC II 7-31)

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

- Project Analysts/Designers/Developers
- 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
- Representatives of other project consumers or customers

During this review, the System Development Team presents evidence that:

- All required work products are available and up-to-date
- The project's plans are realistic
- The User Requirements and Functional Requirements are certified

- 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 System Development Team uses:

- Project Documentation and Plans
- Requirements Certification
- Life Cycle Process and methods intended to be used
- Draft Implementation Plan
- Cost and Schedule status
- Proof of Project Approval
- Proof of Project Feasibility
- Proof of Cost and Schedule realism and affordability
- Proof of Functional Requirements walkthroughs and Work Product Reviews (e.g., meeting minutes and completed action items)
- Risk Analysis and Mitigation Plans

In the event that conflict resolution is required based on the presentation and findings, the Director of Planning shall evaluate the merits of each position and render a decision.

Action items generated from the review are assigned to a responsible party and tracked by the OIT Project Manager. The PMG will monitor these action items as they are completed.

3.2.4 Results

Upon the reviews, the Business Sponsor decides one of the following:

- Definition completion is satisfactory with approval to continue the project
- Limited approval to proceed – Action items require closure before the project can proceed
- Definition results are unacceptable and must be redone
- The requirements baseline/project scope is deficient, and the project must be re-approved after negotiation with the Business Sponsor, senior management, and/or the IRB, as appropriate.

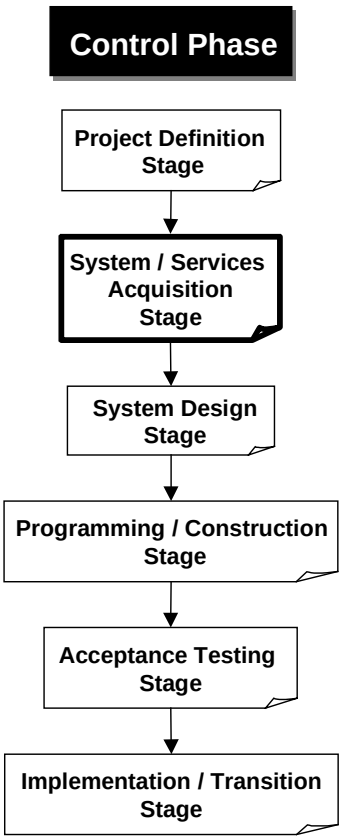
3.2.5 Exit Criterion

The exit criterion is a complete and signed *Definition Completion Review Memo* with all action items resolved. The Memo is signed by the business sponsor and delivered to the BITR and Project Manager.

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 previous stages. This stage involves the following personnel and entities:

- PM
- AST
- RMG
- Procurement Group, OFPD
- CO, OFPD

3.3.2 Entry Criteria

To enter this stage, an *Acquisition Plan* and a *Project Plan* must be completed. Both plans were developed during the Select Phase.

3.3.3 Process

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

- PM provides AST with 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). Forwards to RMG for CF-148 preparation
- RMG commits funds in AIMS and forwards to OFPD for processing
- OFPD, Procurement Group, processes procurement package
- OFPD, CO, develops a draft RFP, in accordance with the FAR, Part 15.203, Request for Proposals, based on the completed Project Plan and information forwarded by AST
- OFPD, CO 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.

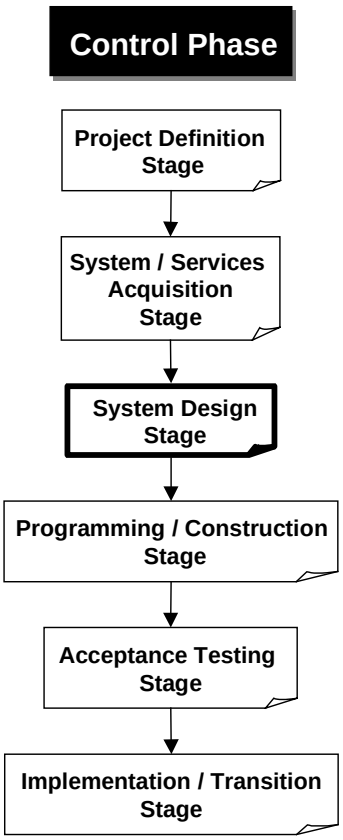
3.3.5 Exit Criteria

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

3.3.6 Next Step

The next step is the System Design Stage.

3.4 System Design Stage



3.4.1 Purpose

The purpose of the System Design stage is to develop a complete System Design document, update the system and security test plans, and conduct the Critical Design Review. The SDD Management Team is responsible for providing oversight review and analysis of planned and actual costs, schedule, and technical performance.

3.4.2 Entry Criterion

The entry criterion for the System Design stage is receipt by the Project Manager from the Business Sponsor of a signed *Definition Completion Review Memo.* The Project Manager must also receive a signed copy of the project's contract from OFPD.

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) contains the system architecture, program specifications, security design, database specifications, and other specifications as needed (SDLC II 7-34). The System Design 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 to take place
- Determine where the system will reside (mainframe, PC, client/server, etc.)
- Off-line process and data input and output requirements
- Application security features, if required

3.4.3.2 Update Test Plans

After the System Design is completed, the System Test Plan and the Security Test Plan developed during the Project Definition stage must be revised to add references to System Design elements. (SDLC II 7-36)

3.4.3.3 Update Project Plan

The project plan contains organizational responsibilities, PWBS, task description schedule and resources, risk and mitigation strategies. (SDLC II 13-4) These must be updated as necessary.

3.4.3.4 Critical Design Review

The final System Design step is the Critical Design Review (CDR). This review is used as a control gate before coding begins. (SDLC II 7-37)
The CDR is co-chaired by the Project Manager and the Business Sponsor. Participants include:

- Project Analysts/Designers/Developers
- User Representatives
- Project Quality Assurance Team (QAT) members
- 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 Critical Design Review, the System Development Team presents evidence that:

- All required work products are available and up-to-date
- The System Design (build-to and code-to) Baseline is complete and has acceptable risk
- All affected support organizations are aware of, and in agreement with, the design and the schedules defined
- Quality assurance reviews have been planned for the next phase

To present this evidence, the System Development Team uses:

- System Design (build-to and code-to) documentation
- Development and internal Quality Assurance processes intended to be used
- Draft Verification and Test plans
- Cost and schedule status
- Proof of requirements traceability
- Proof of producibility
- Proof of Cost and Schedule realism and affordability
- Proof of Design Walkthroughs and Work Product Reviews
- Risk analysis and mitigation plans
- Draft Integration Plans and/or Deployment Plan

In the event that conflict resolution is required based on the presentation and findings, the Director of Planning shall evaluate the merits of each position and render a decision.

Action items generated from the review will be assigned to a responsible party and tracked by the OIT Project Manager. The PMG will monitor the these action items as they are completed.

3.4.4 Results

Upon completing the review, the Business Sponsor decides one of the following:

- Completion of the stage is satisfactory with approval to continue the project
- Limited approval to proceed – Action items require closure before the project can proceed
- The stage results are unacceptable and must be redone
- The System Design Baseline is deficient, and the project must be re-approved after negotiation with the Business Sponsor, senior management, and/or the IRB, as appropriate.

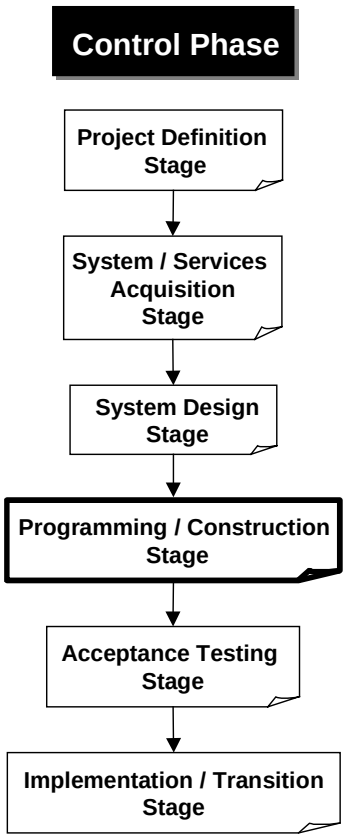
3.4.5 Exit Criterion

The exit criterion for the System Design stage is issuance by the Business Sponsor to the BITR and Project Manager of a completed and signed *Critical Design Review Memo* with all action items resolved.

3.4.6 Next Step

The next step is the Programming/Construction Stage.

3.5 Programming / Construction Stage



3.5.1 Purpose

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

The PMG is responsible for performing oversight review and analysis of planned and actual costs, schedule, and technical performance.

3.5.2 Entry Criterion

The entry criterion for the Programming/Construction Stage is for the BITR and Project Manager to receive from the Business Sponsor a signed *Critical Design Review Memo*.

3.5.3 Process

3.5.3.1 Establish Development Environment

This activity establishes the system environments and facilities necessary for software development and testing. This includes hardware, libraries, development tools, software migration facilities, etc. (SDLC II 7-41) This is required before developers begin creating or modifying programs.

3.5.3.2 Create or Modify Programs

Next, 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. (SDLC II 7-42)

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 application development team typically performs these tests. (SDLC II 7-43)

3.5.3.4 Prepare Operator's Manual

The System Development Team prepares an operator's manual and submits it to Operations. 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. (SDLC II 7-44)

3.5.3.5 Update Project Plan

Before entering the Migration Turnover/Test Readiness Review, the project plan must be evaluated and revised where appropriate.

3.5.3.6 Migration Turnover/Test Readiness Review

The Migration Turnover/Test Readiness Review control gate ensures that the System Development 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, compiles, and functions correctly. (SDLC II 7-45)

The Migration Turnover/Test Readiness Review is chaired by the Quality Assurance Team (QAT) lead or Independent Testing Team lead. 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 Migration Turnover/Test Readiness Review, the System Development Team presents evidence that:

- All required work products are available and up-to-date
- The Development Baseline is complete and correct
- The Turnover Package is complete and itemized, including a Request for Service and Package Cover Sheet 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 System Development Team uses:

- Turnover Package
- Testing Process and Procedures intended to be used
- Draft Test Plans and Test Cases
- Cost and schedule status
- Proof of requirements traceability
- Proof of successful unit/integration tests
- Proof of Cost and Schedule realism and affordability
- Proof of Code Walkthroughs and Work Product Reviews
- Risk analysis and mitigation plans
- Draft Implementation, Integration, and/or Deployment Plans

In the event that conflict resolution is required based on the presentation and findings, the Director of Planning shall evaluate the merits of each position and render a decision.

Action items generated from the review will be assigned to a responsible party and tracked by the OIT project manager. The PMG will monitor these action items as they are completed.

3.5.4 Results

The review's closure depends on decisions made by both the QA Team Lead and the Business Sponsor. The QA Team Lead decides one of the following:

- The contents of the Turnover Package are satisfactory and the project is approved for continuation into next stage
- Materials provided for turnover are insufficient or unacceptable and must be redone
- Limited approval is granted; action items are assigned and require closure before the stage is completed

The Business Sponsor grants either:

- Approval- The Turnover Package is satisfactory and the project may proceed
- Limited approval to proceed – Action items are assigned that require closure before the project proceeds

- Rejection- The Development Baseline is deficient, and the project must be re-approved after negotiation with the Business Sponsor, senior management, and/or the IRB, as appropriate

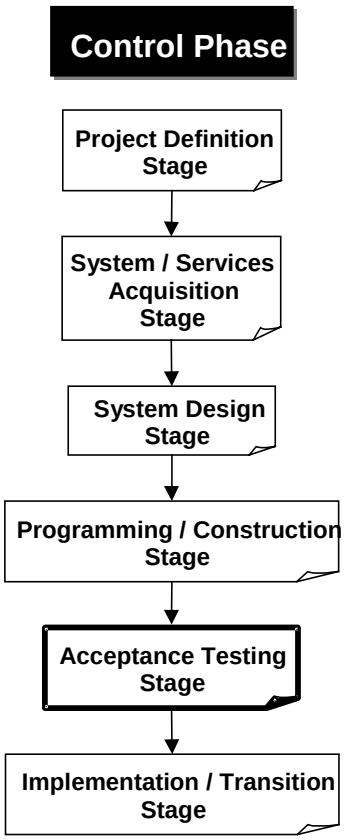
3.5.5 Exit Criterion

The exit criterion for the Programming/Construction stage is a completed and signed *Migration Turnover/Test Readiness Review Memo* signature page, with all action items resolved from the Business Sponsor to the BITR and Project Manager.

3.5.6 Next Step

The next step is the Acceptance Testing Stage.

3.6 Acceptance Testing Stage



3.6.1 Purpose

The purpose of the 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 that they are accepted by the user
- Conduct a deployment readiness review to ensure that the system and all supporting documentation are ready for a successful move into production

The PMG is responsible for performing oversight review and analysis of planned and actual costs, schedule, and technical performance.

3.6.2 Entry Criterion

The Acceptance Stage entry criterion is a signed *Migration Turnover/Test Readiness Review Memo* received from the Business 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. A *Request for Service* form is used to initiate this transfer. (SDLC II 7-50)

To complete this step, a Turnover Package is 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 System Acceptance Testing

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 objectives 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. (SDLC II 7-52)

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 Team. The Security Test results are recorded in the Security Test Report. (SDLC II 7-54)

3.6.3.4 Security Certification Package

The Security Certification Package includes analysis and documentation of the systems 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. (SDLC II 7-55)

For a list of items contained in the Security Certification Package, see the *SDLC Handbook*, Volume II Chapter 7-56.

3.6.3.5 User Documentation and Training Materials

The next step is to develop user documentation and training materials that provide clear and concise instructions to guide the user through interactions with the system. (SDLC II 7-57)

3.6.3.6 User Acceptance Testing

User Acceptance Testing allows the Business 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. (SDLC II 7-58)

3.6.3.7 Update Project Plan

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

3.6.3.8 Deployment/Production Readiness Review

The final step in the Acceptance stage is the Deployment/Production Readiness Review. This control gate is used to verify that the system meets all certified user and functional requirements and is ready for implementation into production. (SDLC II 7-59)

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

- Project Analysts/Designers/Developers
- Business Sponsor/User Representatives
- Project QAT members
- 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 Deployment/Production Readiness Review, the System Development 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 System Development 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 Director of Planning shall evaluate the merits of all positions and render a decision.

Action items generated from the review will be assigned to a responsible party and tracked by the OIT project manager. The PMG will monitor these action items as they are completed.

3.6.4 Results

Upon completion of the review, the Business Sponsor decides one of the following:

- Approval- Acceptance is satisfactory with approval to continue the project
- Limited approval to proceed – Action items require closure before the project can proceed
- Return- Acceptance results are unacceptable and must be redone
- Submit for Re-approval- The Test/Build Baseline or functionality is deficient, and the project must be re-approved after negotiation with the Business Sponsor, senior management, and/or the IRB, as appropriate

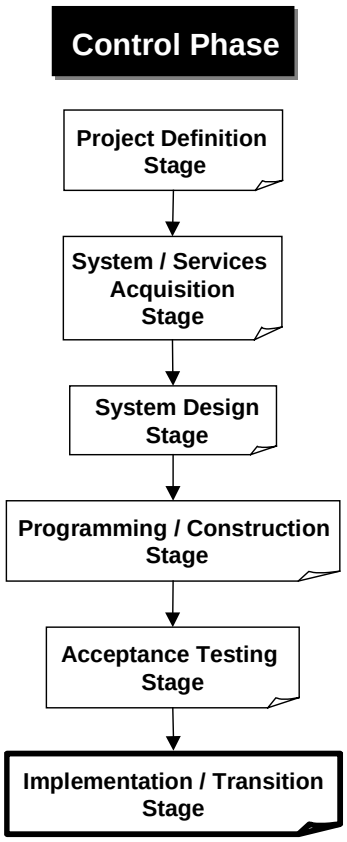
3.6.5 Exit Criterion

The exit criterion for the Acceptance Stage is a completed and signed *Deployment/Production Readiness Review Memo* with all action items resolved.

3.6.6 Next Step

The next stage is Implementation/Transition Stage.

3.7 Implementation / Transition Stage



3.7.1 Purpose

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

The PMG is responsible for performing oversight review and analysis of planned and actual costs, schedule, and technical performance.

3.7.2 Entry Criterion

The entry criterion for the Implementation/Transition Stage is a completed and signed *Deployment/Production Readiness Review Memo* from the Business 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 enters operation. The Security Accreditation documents the system's operational risk assessment. The Designated Approval Authorities (i.e., the Information Systems Security Officer and the Business Sponsor) establish the acceptable level of risk based on identified risks and operational needs. (SDLC II 7-63, 15-52)

3.7.3.2 Train Users

The Training Plan developed earlier is now executed. Training activities are recorded in the Customs Training and Enrollment System, TRAEN. (SDLC II 7-64)

3.7.3.3 Implement Developed Software

The next step is to implement the developed software in accordance with the current Project Plan and the Implementation Plan. (SDLC II 7-65)

This step includes issuing an Implementation Notice, which is sent to all affected organizations using e-mail. 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 implementation and related activities
- A summary of the effects of the new system and how it differs from the old
- 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 implementation of the system

This step also may includes any of the following (if needed):

- Data transfer or conversion from paper records or another system (SDLC II 7-66)
- Parallel operations (SDLC II 7-66) to operate the old system until the new system is performing as designed
- User acceptance (SDLC II 7-67) to verify that the implemented system meets pre-determined performance criteria over a given period

3.7.3.4 Document Lessons Learned

The Project Team (i.e., the Project Management Team, the Project Initiation Team, and the System Development Team) conducts a post-implementation project evaluation. This evaluation reviews and critiques the project's execution as it proceeded through the system development life cycle. The 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. (SDLC II 7-68)

This report is distributed to the:

- Business Sponsor
- Project Management Team
- Project CM File
- Process Improvement Team
- SDLC Team

3.7.3.5 Update Project Plan

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

3.7.3.6 Perform Operational Readiness Review

The Operational Readiness Review is a control gate to ensure completion of all activities required for full production mode of the system. (SDLC II 7-70) These activities ensure:

- Security Accreditation is complete
- All training is complete
- 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 Business 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 representatives
- Representatives of other consumers/customer relating to the work products

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 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
- Post-Implementation Reviews have been planned as required

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
- Cost and Schedule status
- Proof of successful implementation (including data conversions)
- Proof of requirements traceability and Performance Measures
- Proof of Cost and Schedule realism and affordability
- Risk analysis and mitigation plans

In the event that conflict resolution is required based on the presentation and findings, the Director of Planning shall evaluate the merit of each position and render a decision.

Action items generated from the review are assigned to a responsible party and tracked by the OIT project manager. PMG will monitor the closure of these action items. Appendix D describes the exit criteria requirements for PMG to perform the Milestone Review.

3.7.4 Results

Upon completing review, the Business Sponsor decides one of the following:

- Approval- Implementation is satisfactory and the project may continue
- Limited approval to proceed – Action items require closure before the project can proceed
- Rejection- Implementation results are unacceptable and must be redone
- Submit for Re-approval- 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 IRB, as appropriate.

3.7.5 Exit Criterion

The Implementation/Transition stage exit criterion is for the Business Sponsor to provide a completed and signed *Operational Readiness Review Memo*, with all action items resolved.

3.7.6 Next Stage

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

4 Evaluate Phase

The Evaluate Phase begins once system implementation has been completed and the system becomes operational or goes into production. Any project cancelled prior to going into operation must also be evaluated. This phase includes the collection of actual verse projected performance measurements, and a post-implementation review to determine the system's efficiency and effectiveness in meeting its performance and financial objectives. In doing so, a methodical 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.

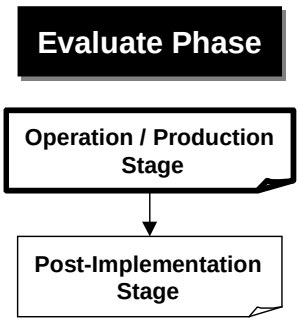
Table 3: Evaluate Phase Summary

Stage	Purpose	Results
Operations/Production	Collect actual versus projected performance measurements.	▪ Assess the project's impact on mission performance and evaluate the project's ▪ Document performance statistics
Post Implementation Review	Conduct PIR using a standard methodology.	Feed lessons learned back into the Select and Control Phases.

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

- Operations/Production Stage
- Post Implementation Review Stage

4.1 Operations/Production Stage



A project is in the Operations/Production Stage once users are able to access the system hardware and software as an application and the system is incorporated into the enterprise architecture. The architecture, in this context, may be the mainframe or local area network (LAN) environments. The OIT System Operations Group is responsible for operating the system. Their responsibilities include:

- Collecting the statistical data on the project's hardware and software performance
- Monitoring systems costs and functions
- Feeding back information to management (reporting)

- Detecting defects
- Managing systems problems
- Recovering from systems problems
- Implementing changes

4.1.1 Purpose

The Operations/Production 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.

The group responsible for producing system statistics and analyzing the results is the Systems Engineering Branch Performance and Capacity Planning Team. The Operations/Production Stage involves the following entities as required by the *SDLC Handbook*:

- Business Sponsor
- Systems Operation Division Performance Monitoring Group
- TAG System Capacity Planning Team
- Security Team

4.1.2 Entry Criteria

The Operations/Production Stage entry criterion is receipt by the BITR of a signed *Operational Readiness Report* from the Process Owner. The Process Owner's signature must be included.

The following four processes occur in the Operational/Production 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 Systems Engineering Branch's Performance and Capacity Planning Team, 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. (SDLC II 7-73)

Performance measurement and strategic capacity planning reports are generated daily and 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. The Systems Engineering Performance Monitoring Group is responsible for monitoring system performance according to OIT guidelines. For additional information on Monitor Performance activities refer to the *SDLC Handbook* (SDLC II 7-74).

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

See the *SDLC Handbook* (SDLC Volume II, Chapter 7, Page 75) for more information. Specific recovery procedures are detailed in the *Continuity of Operations Plan Handbook*[8] that each data center maintains and updates.

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 Team is responsible for implementing this plan in accordance with the *SDLC Handbook* (SDLC Volume II, Chapter 15, Page 44).

4.1.2.4 Perform Recurring Accreditation

An operational 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/Sponsor and OIT Assistant Commissioner. The Computer Security Officer is responsible for performing Certification and Accreditation in accordance with the procedures provided in the *Department of Treasury TD P 85-03, Risk Assessment Guideline, Volumes 1 and 2*. Additional information and guidance is provided in the *SDLC Handbook* (SDLC II 15-30, 15-52) and *CIS HB 1400-06*, Annex D[9].

[8] *Continuity of Operations Handbook* (Data Center); United States Customs Service
[9] *U.S. Customs Service IS Security Policy and Procedures*, CIS HB 1400-06, Accreditation Procedures, Annex D.

4.1.3 Results

All findings generated from the Operations/Production Stage are analyzed and reported to operations management during weekly and monthly status meetings or on an ad-hoc basis. The findings and responses to the findings are shared with stakeholders and retained by the Systems Operations Branch.

4.1.4 Exit Criterion

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

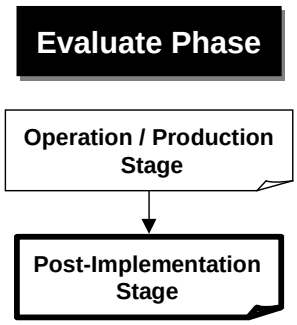
4.1.5 Next Step

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

- Weekly "Systems Availability Meetings" during which mainframe and client/server performance issues is discussed (SDLC Volume II, Chapter 7, Section G, Page 74, Monitor Performance).
- Performance reports from the Performance Monitoring Group, Systems Operations Division. These reports contain graphical performance summaries for review by OIT management.
- System utilization and resource requirement reports from the Systems Capacity Planning Team, TAG.

The *SDLC Handbook, Volume II, Assure Continuity of Operations* describes the reporting mechanisms applicable to the Assure Continuity of Operations Stage activities. The mechanisms described are Help Desk tickets, Operational Problem Reports, Change and Defect Requests.

4.2 Post Implementation Review (PIR) Stage



The Evaluate Phase includes a Post Implementation Review (PIR) stage where the system's documentation and performance is fully assessed. The PIR assesses the system's efficiency and effectiveness to determine if the investment was cost beneficial and achieved the planned functionality. The review also determines how well the system meets mission needs and supports its user base. Refer to the *Office of Management and Budget (OMB) and General Accounting Office (GAO) Requirements in Appendix A of the PIR Handbook*[10].

4.2.1 Purpose

A PIR must be conducted within six to nine months after the system goes into production and on all cancelled projects. The PIR:

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

The entities involved in this stage are the:

- Evaluation Team
- Business Process Owner/Sponsor
- Project Manager
- IRB
- OIT Staff
- Trade Community Users
- User Support Division

Refer to the *SDLC Handbook* (SDLC II 7-78) and the *Office of Information and Technology Customs IT Investment Management Process, Post Implementation Review, Reviewer's Handbook.*

4.2.2 Entry Criterion

The Evaluation Team initiates the PIR approximately six months after the system becomes operational. In instances where the project was cancelled, the Evaluation Team initiates the PIR immediately. The *PIR Handbook* describes these initiation steps. The Evaluation Team will request from the Project Manager and Process Owner, certain documentation to be provided

[10] *Post Implementation Review, Reviewer's Handbook*; Office Of Information and Technology Customs IT Investment Management Process*;* July 1, 1998.

within two weeks of the PIR Initiation notification letter or memorandum. The documents requested are listed in the *PIR Handbook Initiation* section.

4.2.3 Process

This stage requires the following seven sub-processes:

- Initiate PIR
- Analyze Documentation
- Interview Key OIT-Business Process Players
- Measure Performance
- Perform User Surveys
- Final Analysis
- Reporting

4.2.3.1 Initiate PIR

The Evaluation Team is responsible for initiating the PIR approximately six months after the system becomes operational. A review schedule is included in the OIT Annual Plan maintained by the IRB. Instructions for conducting the PIR Initiation are contained in the *PIR Handbook*. The PIR Evaluation Team prepares and sends a memorandum to the Business Process Owner/Sponsor and the Project Manager stating that the review has begun. The *PIR Initiation Memo* includes a schedule for the planned review and areas that may receive special review emphasis.

4.2.3.2 Analyze Documentation

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

4.2.3.3 Interview Key OIT and Business Process Players

The Evaluation Team is responsible for interviewing all key OIT and Business Process Players. The interview objective is to develop an understanding of the system's goals, objectives, benefits, and costs as described in *Business Case* developed in the Select Phase. These interviews determine how efficient and effective the systems objectives, goals, performance measures, and benefits are being achieved. The interview also serves to identify system deficiencies and enhancement needs. See the *Briefing* section of the *PIR Handbook* for interview briefing details.

4.2.3.4 Measure Performance

The Evaluation 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/Production stage. In the absence of certain statistics, the Evaluation Team may perform onsite observations to measure specific criteria.

4.2.3.5 Perform User Surveys

The PIR Evaluation 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. See the *PIR Handbook* for instructions on conducting the survey.

4.2.3.6 Perform Analysis

The Evaluation Team will perform an analysis of all documentation, survey results, and performance measurements to determine if the system efficiently and effectively achieved its objectives. See the *Analysis Checklist* found in the *PIR Handbook* for additional details.

4.2.3.7 Issue Report

After comments are received from the Project Manager and Process Owner/Sponsor, the Evaluation Team prepares the *Final Report* and submits it to the IRB. The report findings and recommendations must be clear and concise to avoid misunderstanding. Refer to the *PIR Handbook, Finalize Report* section for additional information.

4.2.4 PIR Results

The Project Manager and Business Process Owner review the *Final Report.* The *Final Reports* findings and recommendations are conveyed Senior Management. The *Final Report's* results are also incorporated, as needed, into the Select or Control Phases.

4.2.5 Exit Criterion

The exit criterion is for the PIR Evaluation Team to distribute the *PIR Report* to the IRB. The *PIR Report* is also distributed electronically to the Project Manager, Business Process Owner/Sponsor and IRB.

Appendix A: Acronyms and Bibliography

Acronym	Definition
ACE	Automated Commercial Environment
ACS	Automated Commercial System
ACWP	Actual Cost of Work Performed
ADP	Automated Data Processing
AES	Automated Export System
AP	Acquisition Plan
APR	Acceptance Problem Report
AST	Acquisition Support Team
ATD	Applied Technology Division
ATS	Automated Targeting System
BAC	Budget at Completion
BCWP	Budgeted Cost for Work Performed
BCWS	Budgeted Cost for Work Scheduled
BIR	Business Interface Representative
BITR	Business Information Technology Representative
CBA	Cost-Benefit Analysis
CBB	Contract Budget Base
CDR	Critical Design Review
CFO	Chief Financial Officer
CIO	Chief Information Officer
CM	Configuration Management
CMM	Capability Maturity Model
CPI	Cost Performance Index

Acronym	Definition
CV	Cost Variance
DAT	Data Administration Team
EAC	Estimate at Completion
EDW	Electronic Data Warehouse
ETC	Estimate to Complete
FAR	Federal Acquisition Rules
FASA	The Federal Acquisition Streamlining Act of 1994
FTE	Full Time Equivalent
FY	Fiscal Year
GAGAS	Generally Accepted Government Auditing Standards
GAO	General Accounting Office
GPRA	The Government Performance and Results Act of 1993
HQ	Headquarters
IBIS	Interagency Border Inspection System
IMP	Investment Management Process
IRB	Investment Review Board
ISD	Infrastructure Services Division
IT	Information Technology
ITC	Information Technology Committee
ITCD	Information Technology Concept Document
I-TIPS	Information Technology Investment Portfolio System
IV&V	Independent Verification and Validation

Acronym	Definition
LAN	Local Area Network
LOE	Level Of Effort
M&S	Material and Subcontracts
MCP	Management Control Plan
MR	Management Reserve
NPV	Net Present Value
NTE	Not-to-Exceed
O&M	Operations and Maintenance
OBS	Organizational Breakdown Structure
ODC	Other Direct Cost
OFPD	Office of Finance, Procurement Division
OIT	Office of Information and Technology
OMB	Office of Management and Budget
ORR	Operations Readiness Review
PDR	Preliminary Design Review
PG	Planning Group
PIR	Post Implementation Review
PIT	Project Initiation Team
PMB	Performance Measurement Baseline
PMG	Program Monitoring Group
PRA	The Paperwork Reduction Act of 1995
PT&O	Program Tracking & Oversight

Acronym	Definition
PV	Present Value
PWBS	Project Summary Work Breakdown Structure
QA	Quality Assurance
QAT	Quality Assurance Teams
RFP	Request For Proposal
R&D	Research & Development
ROI	Return on Investment
ROM	Rough Order of Magnitude
SAT	System Acceptance Test
SDD	Software Development Division
SDLC	Systems Development Lifecycle
SEACATS	Seized Currency and Asset Tracking System
SEI	Software Engineering Institute
SLC	System Life Cycle
SOW	Statement of Work
SPI	Software Process Improvement
SPI	Schedule Performance Index
SPS	Strategic Planning Staff
SQA	Software Quality Assurance
SV	Schedule Variance
TAG	Technology and Architecture Group
TAP	Trend-Analysis and Analytical-Selectivity Prototype
TBD	To be Determined

Acronym	Definition
TBR	To Be Resolved
TECS	Treasury Enforcement Communication System
TPR	Test Problem Report
TRC	Technology Review Committee
USCS	United States Customs Service
VAC	Variance at Completion
WBS	Work Breakdown Structure

Bibliography

The following manuals, documents, and studies are cited by or where 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.html.

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.html.

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, *Continuity of Operations Handbook (Data Center).*

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, *SDLC Compliance Policy Memorandum,* September 3, 1997.

United States Customs Service, *U.S. Customs Service IS Security Policy and Procedures, CIS HB 1400-06, Accreditation Procedures, Annex D.* Source: http://customsnet/iss/1400-06/annxd.htm.

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/AMD-10.31.13, February 1997.

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

Appendix B: Forms and Instructions

United States Customs Service
Office of Information and Technology
Investment Management Process

Information Technology Concept Document (ITCD)

1. Submission Date:

2. Project Name: 3. FY:

4. Process Owner: Organization:
Name: Signature:

Business Project Manager:
Name: Signature:

5. Business Information Technology Representative (BITR):
Name: Signature: Phone #:

6 Business Interface Representative:
Name: Phone #:

7. Concept/Requirement: (attach additional pages if required)

8. Justification: (attach additional pages if required)

9. Funding: Is funding available? (yes/no) If "yes", indicate source:
Initial Cost Estimate: (excluding FTE's)
Provide project cost estimate, otherwise check the appropriate box below: $

Less Than $25,000: ☐ Between $25,000 and $ 1,000,000: ☐ Greater Than $1,000,000: ☐

10. Architecture Alignment:
Does the project align with Customs business requirements and technical architecture (yes/no)?

Space below this line is for OIT Investment Management Process Staff use only

11. Project #:

12. Solution/Recommendation:

Completing the ITCD

1. Submission Date
Enter the date the *ITCD* was submitted.

2. Project Name
Enter the project name.

3. Fiscal Year (FY)
Enter the fiscal year for which the project is requesting funding.

4. Process Owner/Business Project Manager
Identify the process owner, business project manager and the sponsoring organization**.**

The process owner's signature is required and indicates the information has been reviewed and approved for accuracy, reliability and completeness.

5. Business Information Technology Representative (BITR)
Identify the BITR.

The BITR's signature is required and indicates that the project's ITCD development has been coordinated with the BIR.

6. Business Interface Representative (BIR)
Identify the BIR.

The BIR's signature is required and indicates that the project's ITCD development has been coordinated with the BITR.

7. Concept/Requirement
Describe the project's concept and summarize the functional requirements.
Describe what benefit will be realized. The *Customs Cost Benefit Analysis Handbook* contains additional guidance.

8. Justification
Justify why the project is being presented.

9. Funding
Indicate whether or not funding is available. If funding is available, specify the funding source(s). Check the box that best defines the estimated life cycle cost range. The estimated cost shall exclude government FTEs.

10. Architecture Alignment
Indicate whether or not the concept and requirement align with Customs business requirements and technical architecture. Verify with the BITR and TAG.

If the project does not conform to Customs architecture requirements, a waiver must be granted by the ITC. If the waiver is not on file, the ITCD will be disapproved.

11. Project Number

TAG will assign a unique tracking number for managing and controlling the project throughout its life cycle.

12. Solution/Recommendation

The TRC will indicate the ITCD's disposition and rational for its decision.

United States Customs Service
Office of Information and Technology
Investment Management Process

Investment Management Process
Business Case Worksheet

1. Submission Date: FY:

2. Project Name: 3. Project Number:

4. Process Owner:
Name: Office:
Signature: Division:

5. Business Information Technology Representative (BITR):
Name: Signature: Phone #:

Business Project Manager:
Name: Signature: Phone #:

6. Business Interface Representative:
Name: Signature: Phone #:

7. This is: ☐ A New Project ☐ An Enhancement ☐ Maintenance

8. If there has been a name change, provide the former name/acronym:

9. Describe the project's objectives, the business needs it meets, related projects, and a brief description of any guiding legislative, regulatory, or process improvement requirements or initiatives:

10. Summary Cost (include costs from other funding sources):

	With FTE	Without FTE	Infrastructure Costs
Initial Fiscal Year Costs:	_____	_____	_____
FY + 1 Total Costs:	_____	_____	_____
FY + 2 Total Costs:	_____	_____	_____
FY + 3 Total Costs:	_____	_____	_____
FY + 4 Total Costs:	_____	_____	_____
Total lifecycle costs (minimum of 5 years):			

11. Processes/strategies supported by this project (check all that apply):
☐ Passenger ☐ Trade Compliance ☐ Outbound ☐ Other (identify)
☐ Narcotics ☐ Mission Support ☐ Money Laundering

12. Describe the project's relationship to the processes checked:

13. If this is an infrastructure project, indicate the primary (P) and all secondary (S) applications:

____ACE	____AES	____ACS	____TAP
____EDW	____IBIS	____SEACATS	____Other (identify)
____Admin. Systems	____TECS	____ATS	

Page 1of 2

United States Customs Service
Office of Information and Technology
Investment Management Process

Investment Management Process
Business Case Worksheet

Are the following documents included? (Yes/No)

Required Document Checklist: (See Section 2.2.3.4 of the IMP System Description for further detail)

14. Conformance to the Business Architecture _____
15. Business Process Improvement: _____
16. Linkage to Strategic Plan: _____
17. Legislative Compliance: _____
18. Impact of Non-Implementation: _____
19. Change Management: _____
20. Improved Service to Stakeholders: _____
21. Defined Performance Measures: _____
22. OMB's 3 Pesky Questions: _____
23. Risk Analysis _____
24. Project Timeline _____
25. Project Cost Estimate _____
26. CBA _____
27. Acquisition Strategy _____

Note: If any of the above answers are "No", provide an explanation.

28. Data Sensitivity Category:

☐ Non-Sensitive Information ☐ Classified

☐ Sensitive but Unclassified ☐ Other

29. Miscellaneous Comments:

OMB's Three "Pesky Questions":

1. Does the investment in a capital asset support core/priority mission functions that need to be performed by the Federal Government?

2. Does the investment need to be undertaken by the requesting agency because no alternative private sector or governmental source can better support the function?

3. Does the investment support work processes that have been simplified or otherwise redesigned to reduce costs, improve effectiveness, and make maximum use of commercial off-the-shelf technology?

Page 2 of 2

Completing the Project Business Case

1. Submission Date
Enter the date the Project Business Case was submitted.

Fiscal Year Funding
Enter the fiscal year for which the business case is requesting funding.

2. Project Name
Enter the project name.

3. Project Number
Enter the Project Tracking Number (as assigned by TAG on the ITCD).

4. Process Owner
Identify the process owner**.** Identify the Office and Division of the Process Owner.

The Process Owner's signature is required and indicates the Business Case has been reviewed and approved for accuracy, reliability and completeness.

5. Business Information Technology Representative (BITR) and Business Project Manager
Identify the BITR's and Business Project Manager's name and phone number.

The BITR's signature is required and indicates that the business case has been coordinated with the BIR. The signature also indicates that ISD has reviewed the concept and estimated the infrastructure requirements.

6. Business Interface Representative (BIR)
Identify the name and phone number of the BIR.

The signature of the BIR is required and indicates that the business case has been coordinated with ISD and the BITR.

7. Project Type
Check either "New Project" or "Enhancement" or "Maintenance".

8. Project Name
Identify if the project's name as changed from the ITCD of previous business cases.

9. Project Description
Describe the project's objectives, the business needs the project is responding to, and related projects. Summarize any guiding legislation, regulations or initiatives. Describe how the project will be developed and managed.

10. Summary Cost

Provide fiscal year costs for the project's design, development, deployment and 5 years of maintenance. If the project's life cycle is greater than 5 years, forecasted costs may be included for the out years. Provide costs with and without government FTEs. **The Information Services Division (ISD) is required provide an infrastructure cost.**

11. Processes Supported

Identify all processes and strategies supported by the proposed project.

12. Process Description

Describe the support, strategy, and relationships for the processes checked in item 11.

13. Infrastructure

Identify the primary and secondary applications and hardware necessary to support this project. *Check "Yes" or "No" for each of the required decision variables and a provide detail explanation for each.*

14. Conformance to Business Architecture

Describe how this project conforms to Customs Business Architectural standards.
If the project does not conform to the business architecture, it must have an "approved waiver" granted by the ITC.

15. Business Process Improvement

Describe how the process was redesigned or improved and how the project will support the redesign or improvement. Summarize the "needs" analysis performed for this process, and attach the needs analysis findings to this form. If the process was not redesigned or a "needs" analysis was not performed, explain why.

16. Linkage to Strategic Plan

Explain how the project will support Customs mission and strategic plans.

17. Legislative Compliance

Identify the legislation, regulation, directives, policy, or audit requirements that either authorize the project or with which the project is compliant.

18. Impact of Non-implementation

Describe the organizational impact if the project is not developed (*i.e.*, the magnitude of the impact to program operations or customer services). Rate the severity of each impact as low, medium, or high.

19. Change Management (Organizational and Process)

Describe how this project will impact Customs and identify the organizations within Customs that will be affected. Describe whether or not the project will cause significant organizational changes, process redesign, or change the way employees perform their jobs. Identify the controls that will be applied to manage organizational and process changes.

20. Improved Services to Stakeholders

Identify all internal and external stakeholders (functional areas) serviced by the proposed project and state whether the stakeholders consider the project to serve a critical operational function. Identify the service being provided. Address any cross-functional issues.

21. Defined Performance Measures

Identify the project's financial measures and the frequency of evaluation.

22. OMB's 3 "Pesky Questions"

Provide answers to the OMB's 3 Pesky Questions. These questions must be answered prior to Treasury's IRB submission.

23. Summary Risk Analysis

Identify threats and vulnerabilities that may affect the project's risk profile and the project's ability to successfully achieve its objectives. Describe the controls used to manage those risks.

24. Project Timeline

Provide estimated Start and Completion dates for the project. Also, identify intermediate significant dates or deadlines (*e.g.*, "Completion of Release 1 Requirements").

25. Project Cost Estimate

Provide a cost estimate for the project. The estimate shall be at a summary WBS level and backed up with the appropriate level of detail. Dollar value, risk, and schedule will all contribute to the level of detail required to support the estimate. Supporting detail shall be easily available upon request.

26. CBA

Provide a project CBA. The Customs Cost Benefit Analysis Handbook contains additional detail and instructions.

27. Acquisition Strategy

Describe the strategy for acquiring specific hardware, software, or contracting support.

28. Data Sensitivity Category

Identify the highest level of data classification to be managed within the project.

29. Miscellaneous Comments

Include additional comments to further define and justify the project's investment.

United States Customs Service
Office of Information and Technology
Investment Management Process

Investment Management Process
Project Initiation Worksheet

1. FY: Submission Date:

2. Project Name: 3. Project Number:

4. Process Owner:
Name: Office:
Signature: Division:

5. Business Information Technology Representative (BITR):
Name: Signature: Phone #:

Business Project Manager:
Name: Signature: Phone #:

6. Business Interface Representative:
Name: Signature: Phone #:

7. If there has been a name change, provide the former name/acronym by which this project was known:

8. Conformance to Technical Architecture:

9. Prepare the project level WBS detail cost estimate: (attach detail)

10. Budget Distribution and Time Phasing (Dollars):

	With FTE	Without FTE	Infrastructure Costs
FY			
FY + 1			
FY + 2			
FY + 3			
FY + 4			

ISD Representative Validation of Infrastructure Costs:
Name: _____ Signature: _____
(Required for Submission)

11. Detail (Updated) Cost Benefit Analysis:

Net Present Value of Selected Option: _____ Internal Rate of Return: _____

Cost/Benefit Ratio of Selected Option: _____ Pay Back Period: _____

Completing the Project Initiation Form

1. FY
Enter the Fiscal Year in which the Project Initiation Worksheet is prepared.

Submission Date:
Enter the date the Project Initiation Worksheet was submitted:

2. Project Name
Enter the project name.

3. Project Number
Enter the Project Tracking Number (as assigned by TAG on the ITCD)

4. Process Owner
Identify the process owner and the process owners office and division.

The process owner's signature indicates the information has been reviewed and approved for accuracy, reliability, and completeness.

5. Business Information Technology Representative (BITR)
Business Project Manager
Identify the name and phone number of the BITR and the Business Project Manager.

The BITR's signature is required and indicates that the project's detail planning has been coordinated with the appropriate organizations and offices.

6. Business Interface Representative (BIR)
Identify the name and phone number of the BIR

The BIRs' signature is required and indicates that the project's software and infrastructure estimates are accurate, reliable and complete.

7. Name Change
If the project's name has changed, provide the new name or acronym.

8. Conformance to Technical Architecture
Describe how the project conforms to Customs Enterprise Architecture standards. Explain how the project aligns with Customs baselines and targets for work, functional and information architectures. If the architecture has been modified since TRC approval, describe how and why the change occurred. If the change affects cost, schedule, architectural conformance, risk, or other important project elements, a revised business case must be developed. If there have been no architectural changes, attach a copy of the TRC architecture approval form or waiver.

9. Prepare 5-Year Budget Estimate

Prepare a detailed 5-year budget estimate based upon the WBS elements described in the Project Plan. Any management reserve not distributed to a specific WBS element must be identified and a plan for managing the distribution will be attached.

10. Budget Distribution

Time phase each WBS element and generate a fiscal year summary. This must be prepared with and without government FTE's. Infrastructure costs necessary to support the project must be estimated and provided by ISD. An ISD representative's signature is required to ensure the project's budget has been coordinated with ISD.

If infrastructure costs are not included, an explanation must be provided as to how the infrastructure will be funded. The detailed WBS must be attached.

11. Detail (Updated) CBA

The expanded CBA must contain sufficient detail to:

- Establish the project's financial, technical and strategic merits relative to other technical alternatives
- Establish a baseline to monitor, measure and evaluate the project throughout its life cycle.

The *Customs Cost Benefit Analysis Handbook* provides guidance for achieving the the above objectives. The investment decision criteria must be reflected on the Project Initiation Worksheet.

Appendix C: Investment Management Process Procedures

Procedure Table of Contents

1 INTRODUCTION AND EARNED VALUE OVERVIEW C-1

2 WORK BREAKDOWN STRUCTURE (WBS) PROCEDURES C-7

3 ORGANIZATIONAL BREAKDOWN STRUCTURE (OBS) PROCEDURES C-11

4 PROJECT SCHEDULE PROCEDURES C-13

5 COST ESTIMATING PROCEDURES C-15

6 PROJECT BUDGETING PROCEDURES C-17

7 PERFORMANCE MEASUREMENT PROCEDURES C-21

8 VARIANCE ANALYSIS PROCEDURES C-23

9 ESTIMATES AT COMPLETION (EAC) PROCEDURES C-27

10 BASELINE MAINTENANCE PROCEDURES C-29

11 MANAGEMENT RESERVE (MR) C-31

12 INTERNAL REPLANNING C-33

13 ACQUISITION PLANNING PROCEDURES – SELECT PHASE C-35

14 SYSTEM / SERVICES ACQUISITION PROCEDURES – CONTROL PHASE C-37

15 GLOSSARY OF EARNED VALUE MANAGEMENT TERMS C-39

1 Introduction and Earned Value Overview

The following procedures provide an overview of program management tools and processes. The overview introduces general procedural activities recommended to execute various IMP stages. Each procedural description is not intended to be an exhaustive tutorial. For this, the reader should reference the footnoted documentation and the bibliography in Appendix A. Instead, the procedures represent a list of tools and processes that have been successfully implemented by the public and private sectors to ensure successful program management. Included also in this appendix is a glossary of common Earned Value terms. The relationship between the procedures described in this appendix and the IMP's phases and stages is shown in Table 1.

Table 1: Procedure-IMP Relationships

	SELECT PHASE				CONTROL PHASE						EVALUATE PHASE	
Stages → Procedures ↓	Concept Development Architecture Verification	Business Case Development	Acquisition Plan Development	Project Initiation	Project Definition	System / Services Acquisition	System Design	Programming /Construction	Acceptance Testing	Implementation Transition	Operation / Production	Post-Implementation Review
Work Breakdown Structure		●	●	●	●	●	●	●	●	●		
Organizational Breakdown Structure		●	●	●	●	●	●	●	●	●		
Project Schedule		●	●	●	●	●	●	●	●	●		
Cost Estimating	●	●	●	●	●							
Project Budgeting				●	●	●	●	●	●	●	●	
Performance Measurement						●	●	●	●	●	●	●
Variance Analysis						●	●	●	●	●	●	●
Estimates At Completion						●	●	●	●	●		
Base Line Maintenance						●	●	●	●	●		
Management Reserve				●	●	●	●	●	●	●		
Internal Replanning				●	●	●	●	●	●	●		
Acquisition Planning	●	●	●	●	●							
System / Service Acquisition						●	●	●	●	●	●	

1.1 Purpose

Earned value is a project management approach allowing the Project Manager to evaluate and gain insight into a project's actual schedule and financial progress relative the project plan. This procedure is based upon *Earned Value, Clean and Simple*[1].

The earned value methodology requires that a project be fully defined at the outset and then a bottom-up plan be created. This allows measurements to be taken throughout the entire project life cycle. This approach can provide accurate and reliable project assessments from as early as 15 percent in to the project's life. The project manager can use these performance readings to predict how much the project will cost to complete within a narrow band of values[2].

1.2 Methodology

The following steps are necessary to establish an Earned Value project system. These are:

- Develop a Work Breakdown Structure (WBS)
- Define project activities
- Allocate costs to each WBS element
- Schedule each activity
- Chart and evaluate the project's status

Once these five steps are completed, the project manager will have the basis for periodically assessing the project's performance. This includes:

- **Updating the Schedule**
  The project schedule activities are reported as started, completed or with a remaining duration, as appropriate. The percent complete of unfinished activities should also be reported. For work that results in discrete/concrete deliverable products (e.g., reports, studies, briefings), it may be easy to determine the percent complete. For efforts that are not so easily measured, special "earning rules" may be employed. A common "earning rule" is to report percent complete according to completed milestones within an activity.

- **Recording Actual Costs**
  After updating the schedule, actual costs from the project's accounting system should be recorded.

- **Calculating Earned Value Measures**
  After recording actual project costs for the reporting period, Earned Value measures are calculated, and reports generated. This can be done, in part, by creating an Earned Value

[1] *Earned Value, Clean and Simple;* Wilkens, Tammo T., Los Angeles County Metropolitan Transportation Authority. Source: www.acq.osd.mil/pm/paperpres/wilkins_art.pdf.
[2] *Earned Value Project Management, A Powerful Tool for Software Project;* Fleming, Quentin W., Koppelman, Joel M., Primavera Systems, Inc, July 1998. Source: www.stsc.hill.af.mil/crosstalk/1998/jul/value.html.

chart[3] as shown in Figure 1. The sample chart includes the following Earned Value measures:

- **Actual Cost of Work Performed (ACWP)** - The costs actually incurred and recorded in accomplishing the work performed within a given time period.
- **Budget at Completion (BAC)** - The sum of all budgets established for the contract.
- **Budgeted Cost for Work Performed (BCWP) -** The sum of the budgets for completed work packages and completed portions of open work packages, plus the applicable portion of the budgets for level of effort and apportioned effort.
- **Budgeted Cost of Work Scheduled (BCWS)** - The sum of all WBS element budgets that are planned or scheduled for completion.
- **Contract Budget Base (CBB)** – The total cost of all budgeted activities necessary to complete a task.
- **Cost Performance Index (CPI)** - Earned Value divided by the actual cost (BCWP/ACWP).
- **Cost Variance (CV)** - Earned Value minus the actual cost (BCWP-ACWP).
- **Estimate at Completion (EAC)** – The actual costs incurred, plus the estimated costs for completing the remaining work.
- **Estimate to Complete (ETC)** - The cost necessary to complete all tasks from the ACWP end date through the project's conclusion.
- **Management Reserve (MR)** - Is an amount of the total allocated budget withheld for management control purposes rather than designated for the accomplishment of a specific task or set of tasks. It is not a part of the Performance Measurement.
- **Performance Measurement Baseline (PMB)** – The time-phased budget plan against which project performance is measured
- **Schedule Variance (SV**) - Earned Value minus the planned budget for the completed work (BCWP-BCWS).
- **Variance at Completion (VAC) -** The difference between the total budget assigned to a contract, WBS element, Organizational entity or cost account and the estimate at completion. It represents the amount of expected overrun or underrun.

- **Analyze and Report**
  The final step in the Earned Value process is to analyze the data and report the results.

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

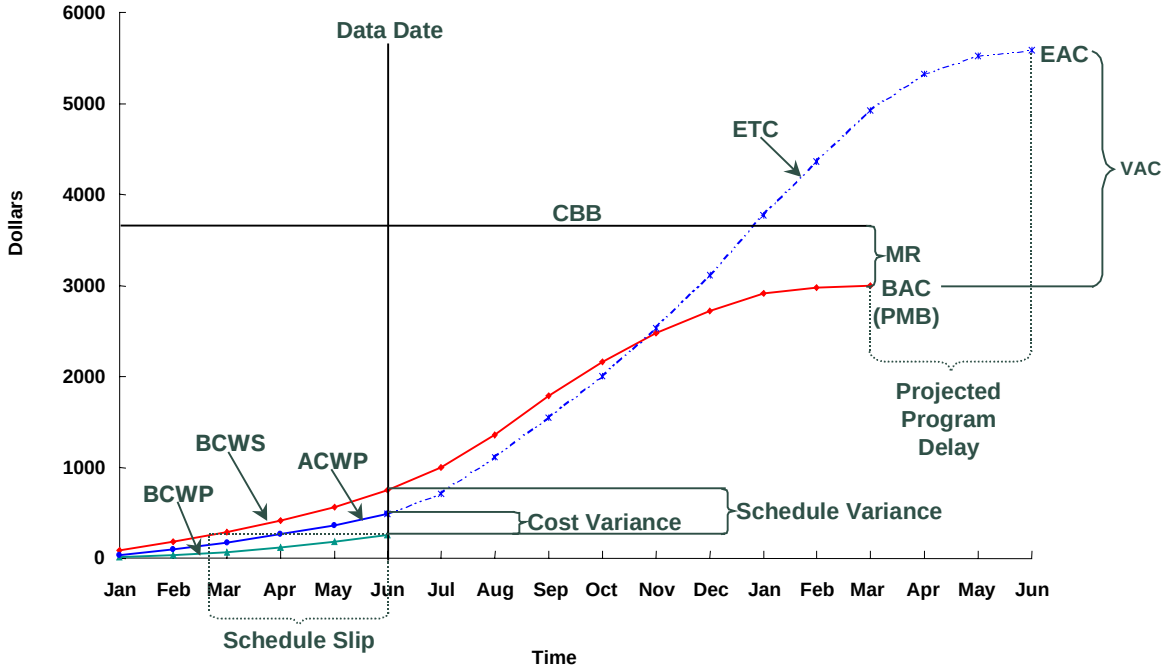


Figure 1: Sample Earned Value Chart

2 Work Breakdown Structure (WBS) Procedures

2.1 Purpose

This procedure describes the activities necessary to develop and use a Work Breakdown Structure (WBS) to estimate and manage project cost and schedule. Two WBS levels are addressed. The first - the *program* level - identifies summary-level cost and schedule activities. The second – the *project* level - identifies task-level costs and schedule activities. The program level WBS is required for *Business Case* submission while a project level WBS is necessary for project initiation. The WBS assists project management by:

- Separating the project into component-like parts or elements, making the definition of each element and its relationship to other elements clear
- Systematically planning and assigning management and technical responsibilities for each work element
- Relating technical and cost performance measures to each work element

The procedure is based upon processes initiated at the Department of Defense that have since gained wide acceptance in government and industry[4].

2.2 Definition

A WBS is a product-oriented tree hierarchy composed of hardware, software, services, deliverables, data, and facilities. A WBS identifies and defines the products to be developed or performed throughout a project's life cycle. It relates work elements to one another and to the final product. A WBS is initially developed to support the funding review and later expanded so Earned Value performance measurement can occur.

A WBS contains multiple levels of detail. Each additional WBS level expands the number of sub-activities. In doing so, corresponding budget, schedule, and sub-task responsibility planning must also occur. With a more detailed WBS, project performance can be measured with greater precision. Five WBS levels are defined, shown in Table 2:

Table 2: WBS Levels

Level	Description
Level 1:	Customs
Level 2:	Project Specific
Level 3:	Summary level cost/schedule centers.
Level 4:	First level of detail expanding Level 3.
Level 5:	Second level of detail expanding Level 4.

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

A sample WBS with expanded levels is shown in Table 3:

Table 3: Sample WBS

Level	WBS Code	Description
1	1 00 000	Customs
2	1 01 000	Project "X"
3	1 01 100	Software development (in house)
4	1 01 110	Requirements Development
4	1 01 120	Design
4	1 01 130	Construction/Coding
5	1 01 131	Coding
5	1 01 132	GUI
5	1 01 133	External System Interface

The key to successfully developing and maintaining a WBS is to identify each logical work product or processes and expand those to the level of detail necessary to effectively manage the project.

2.3 Program-Level WBS

Identifying WBS elements requires that preliminary and detail cost estimates map to a WBS element. The cost estimate must be encapsulated entirely within the WBS framework. The cost estimate summary should be planned to the third level for ITC and IRB review. Table 4 depicts a sample Level 3 software development effort:

Table 4: Sample Level 3 WBS Elements

WBS Code	Description
1 01 100	Software Development (in-house)
1 01 200	Software Procurement
1 01 300	Hardware Procurement & Installation
1 01 400	Training & Documentation
1 01 500	Quality Assurance
1 01 600	Maintenance
1 01 700	Miscellaneous
1 01 800	Miscellaneous
1 01 900	Program Management

For every project, a WBS dictionary is developed containing all WBS elements. The WBS dictionary contains the WBS code, element description, and identifies the organization and individual responsible for the element.

Identifying WBS cost data allows for an integrated and uniform process of data collection, presentation, analysis and decision making.

2.4 Project-Level WBS

Once the project is funded but before the Select Phase's Project Initiation Stage, the WBS elements must be expanded so the project can be effectively managed. The appropriate level of detail is a function of the project's size, complexity, and schedule. In doing so, the WBS dictionary is updated with additional WBS element codes, detail descriptions for each new WBS element, the organization and individual responsible for completing the element, and each deliverable, budget value, and start and completion date. The detailed WBS described in the Project Initiation Stage must conform to the *Business Case's* WBS. If the WBS has been modified, a justification and explanation must be provided. The following figures identify the WBS through Level 5. Level 5 elements represent the level at which work is broken into tasks. A Level 5 element may either be a specific task or the summation of several tasks. The basic WBS format is identified in the Figure 2 below and a sample WBS is portrayed in Figure 3.

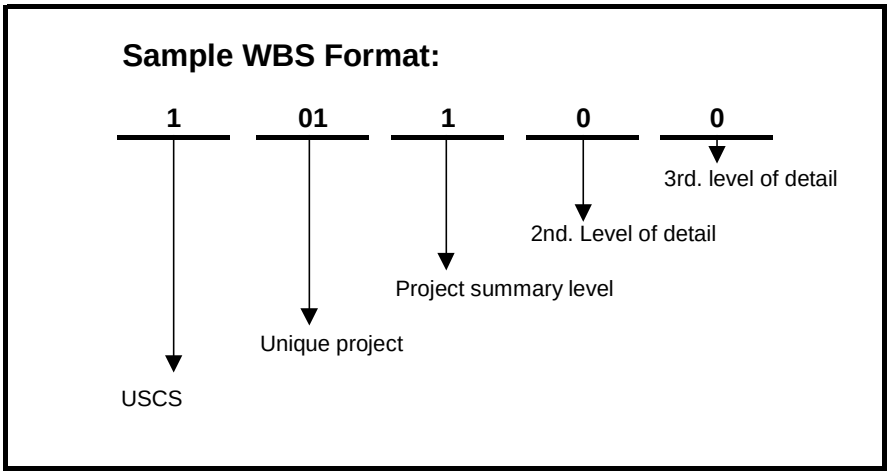


Figure 2: Sample WBS Format

Level: 1	2	3	4	5	Description:
1	00	0	0	0	All USCS Projects
1	01	0	0	0	Specific Project
1	01	1	0	0	Software Development
1	01	1	1	0	Requirements Development
1	01	1	2	0	Design
1	01	1	3	0	Coding
1	01	1	4	0	Testing
1	01	1	5	0	Implementation
1	01	1	6	0	Other
1	01	2	0	0	Software Procurement
1	01	2	1	0	COTS
1	01	2	1	1	Requirements Definition
1	01	2	1	2	Procurement
1	01	2	1	3	Installation
1	01	2	1	4	Testing
1	01	2	2	0	Software Development
1	01	2	2	1	Requirements Development
1	01	2	2	2	Design
1	01	2	2	3	Coding
1	01	2	2	4	Testing
1	01	2	2	5	Implementation
1	01	2	0	6	Other
1	01	3	0	0	Hardware Procurement
1	01	3	1	0	PC's
1	01	3	1	1	Requirements Definition
1	01	3	1	2	Procurement
1	01	3	1	3	Installation
1	01	3	1	4	Testing
1	01	3	2	0	Servers
1	01	3	2	1	Requirements Definition
1	01	3	2	2	Procurement
1	01	3	2	3	Installation
1	01	3	2	4	Testing
1	01	3	3	0	Routers
1	01	3	3	1	Requirements Definition
1	01	3	3	2	Procurement
1	01	3	3	3	Installation
1	01	3	3	4	Testing
1	01	3	4	0	Circuits
1	01	3	4	1	Requirements Definition
1	01	3	4	2	Procurement
1	01	3	4	3	Testing
1	01	3	5	0	Components
1	01	3	5	1	Requirements Definition
1	01	3	5	2	Procurement
1	01	3	5	3	Installation
1	01	3	5	4	Testing
1	01	4	0	0	Training & Documentation
1	01	4	1	0	User Training
1	01	4	2	0	User Documentation
1	01	4	3	0	System Documentation
1	01	4	4	0	Other
1	01	5	0	0	Quality Assurance
1	01	5	1	0	Project QA
1	01	5	2	0	IV & V
1	01	5	3	0	Testing
1	01	5	4	0	Other
1	01	6	0	0	Maintenance
1	01	6	1	0	Software
1	01	6	2	0	Hardware
1	01	7	0	0	Misc.
1	01	8	0	0	Misc.
1	01	9	0	0	Program Management
1	01	9	1	0	Program Office
1	01	9	1	1	Planning/Scheduling
1	01	9	1	2	Budget/Cost Control
1	01	9	1	3	Contract Management
1	01	9	1	4	Project Admin
1	01	9	1	5	Other
1	01	9	2	0	Configuration Management
1	01	9	3	0	Data Management
1	01	9	4	0	Other

Figure 3: Sample WBS

3 Organizational Breakdown Structure (OBS) Procedures

3.1 Purpose

An OBS is used to ensure that organizational and individual roles and responsibilities are clear and easy to understand. This procedure identifies the activities necessary to develop and manage the Organizational Breakdown Structure (OBS) and its relationship to the WBS. When linked, the OBS assigns task responsibility to each WBS element.

The procedure contains two components. The *program* level defines the summary necessary for the ITC and IRB review. The *project* level defines the level of work definition necessary for effective project management.

3.2 Definition

The OBS assigns task responsibility to the organization and to the individual. The OBS and WBS are linked by the budget, performance measurement, and cost collection activities as shown in the Figure 4 below:

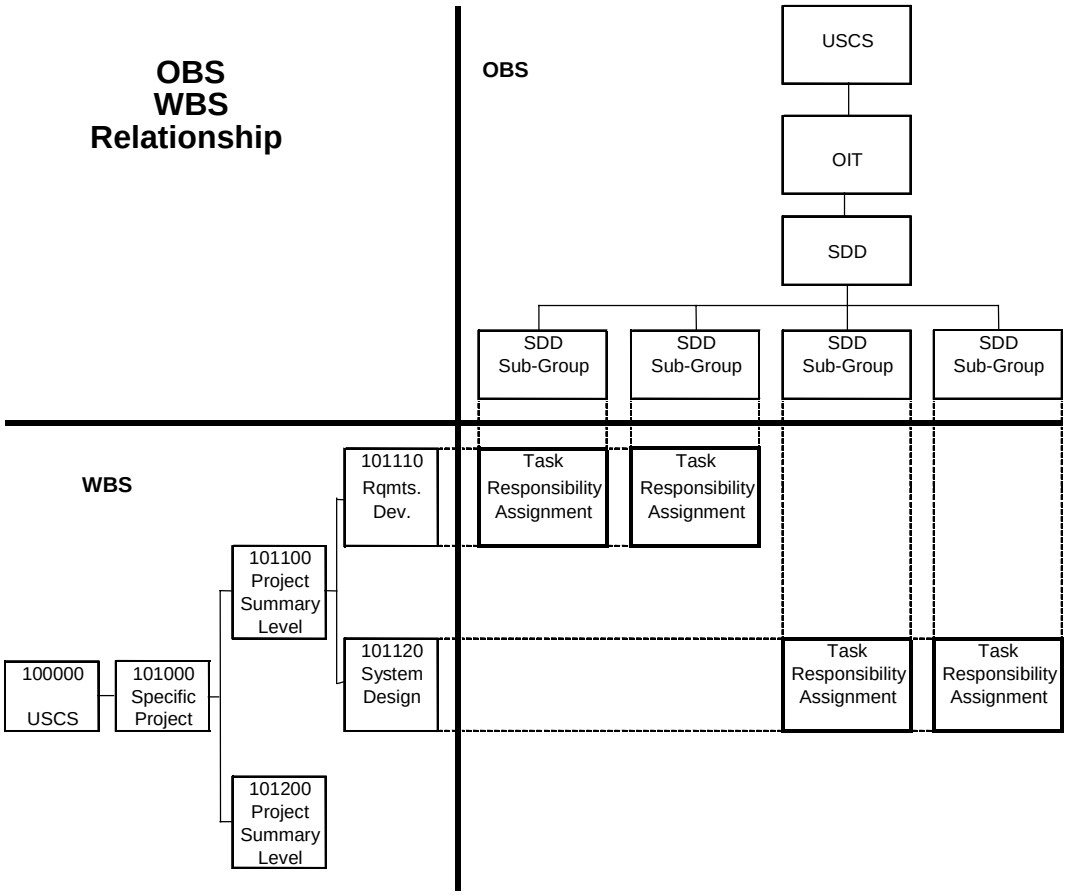


Figure 4: OBS-WBS Relationship

3.3 Program Level – OBS Development (ITC and IRB)

During the Select Phase's Business Case Development Select Stage, OBS development ensures that each work element is assigned to an organizational unit. It is important not only to identify those work elements that depend on cross-organizational support, but to achieve "buy-in" and acceptance. During Program Level OBS Development, the ITC and IRB must identify key individuals to review the project at predetermined points or intervals in the project's life cycle.

3.4 Project Level – OBS Expansion (Project Initiation Stage)

For each organization identified in the OBS, individual responsibility must also be assigned for each project level work element. Creating a project-level organization chart that identifies the organization and individual responsible for each WBS element best does this. This includes identifying cross-organizational support and contractual relationships. Figure 5 depicts a sample linked WBS and OBS.

WBS						OBS		
Level:	1	2	3	4	5	Department	Position	Name
100000	All USCS Projects					USCS	Commisioner	Joe Smith
101000		Specific Project				SDD	Program Manager	John Smith
101100			Project Summary Level (Software Development)			SDD	Manager	Mary Smith
101110				Rqmts. Development		SDD Sub-Group	Supervisor	Albert Smith
101111					Rqmts. Dev. Sub-Group 1	SDD Sub-Group	Task Supervisor	Brad Smith
101112					Rqmts. Dev. Sub-Group 2	SDD Sub-Group	Task Supervisor	Charlie Smith
101120				Design		SDD Sub-Group	Supervisor	David Smith
101130				Production/Construction		SDD Sub-Group	Supervisor	Edward Smith
101140				Testing		SDD Sub-Group	Supervisor	Fred Smith
101150				Implementation		SDD Sub-Group	Supervisor	George Smith

Figure 5: Sample Linked WBS and OBS

4 Project Schedule Procedures

4.1 Purpose

This procedure outlines key scheduling concepts necessary to assist the decision making process for ITC and IRB Project Initiation reviews. It is recognized that many variables – project size, risk profile, time, and investment value - drive scheduling requirements. These variables must be considered when developing the project schedule. The project schedule, WBS, CBA, and budget must be integrated with one another.

4.2 Program Level (ITC and IRB)

To develop a program-level schedule, use the previously developed program level WBS. A summary-level timeline must be created containing each WBS element as well as each element's major milestones and start and finish dates. The schedule can be presented as a tabular listing or in a Gantt chart format. Each scheduled activity item must be traceable to the WBS, OBS, and CBA. Based on the schedule and budget relationships, a time-phased budget baseline can be derived.

4.3 Project Level (Project Initiation)

The schedule required for the Project Initiation Stage must be a project-level schedule. To develop the project-level schedule, use the project-level WBS developed earlier. For each WBS element, the schedule must identify resources (FTE's and Contractors), timeframes, and relationships between activities. This should be done in a Gantt chart format. The Budgets will also be assigned to each of the respective WBS elements. This allows for a detailed time phasing of the budget. Detailed planning is done on a "rolling wave" basis (see Project Budgeting Procedures) where near-term work (typically 3-6 months into the future) is planned in detail and long-term work is planned in a summary format. As time passes, the summary work is further detailed planned until the entire project is budgeted and scheduled.

5 Cost Estimating Procedures

5.1 Purpose

This procedure summarizes cost estimating detail necessary for each IMP phase. The procedure also defines the requirements for cost and schedule integration using the Work Breakdown Structure (WBS). This procedure defines the steps necessary to develop a preliminary cost estimate required by the *ITCD* and used in the Project Initiation through the Project Definition Stages.

5.2 Definition

The cost estimate is the basis for determining review thresholds. The estimate addresses in sufficient detail the requirements of each IMP phase and is refined as the project progresses through successive phases.

5.3 Concept Development

The cost estimate shown in the *ITCD* represents a rough-order-of-magnitude (ROM). The life cycle ROM thresholds establish the type and level of ITCD review. The life cycle dollar thresholds are:

- Less than $25,000
- Between $25,000 and $1,000,000
- Greater than $1,000,000

The ROM should be substantiated with key assumptions.

5.4 Business Case Development

The *Business Case* cost estimate builds upon the original ITCD ROM estimate. This assigns a cost to each project-level WBS element. The cost estimates must contain supporting assumption sets and detail that are systematically maintained for review and audit purposes. Two cost estimates must be generated – one including government FTEs, and one without. The cost estimate must contain inputs from ISD to identify the estimated infrastructure life cycle costs to support the project. The costs will be summarized on the project *Business Case Worksheet* and allocated over a five-year period.

Though infrastructure costs are not included in the project funding request, the project's infrastructure costs must be contained in the ISD budget.

5.5 Project Initiation

Once funding becomes available, the Project Manager develops a detailed cost estimate identifying cost values for each project-level WBS element. This budget distribution becomes the Performance Measurement Baseline (PMB) (see Performance Measurement Baseline Procedure for additional information). Each WBS element must have sufficient detail to justify the cost element's value. Timing drives the level of detail planning. Near-term activities require detail planning at the WBS work level, while activities occurring in the future may be planned to the WBS summary level. Any budget not planned in detail shall be either assigned to a summary-level WBS element or to management reserve. For more information on planning and time phasing budgets see Project Budgeting Procedures. Management reserve usage and requirements are described in Management Reserve Procedures.

5.6 Project Definition

During the Select Phase's Project Definition Stage, the budget baseline established during the Project Initiation Stage is refined based on detailed user and functional requirements. The estimates are limited to updating WBS budget distributions.

If, while finalizing requirements, a budget deficiency or surplus is identified, the project must be presented to the ITC for authorization to proceed.

6 Project Budgeting Procedures

6.1 Purpose

Project budgeting defines, plans and schedules work activities in discrete, time-phased elements. This establishes a traceable basis to measure project performance throughout the project life cycle. Budgets are assigned at the task level and summarized at the project level. Budgets are expressed as labor hours and dollar amounts. A budgeting system should contain:

- Work Breakdown Structure (WBS) elements that are assigned resource values (hours or dollars) and organizational responsibility
- A Management Reserve (MR) budget - funds allocated to finance unanticipated in-scope project plan changes

6.2 Establishing the Budget Baseline

The baseline is used as a basis for comparison to determine if each activity is completed on time, within budget, and if it meets the technical goals of the project. The budget baseline should be established prior to receipt of the project authorization memo. In order to establish a budget baseline that will be utilized for performance tracking, it is necessary to define each of the budget elements. The Project Manager and the project team should be familiar with budgeting terminology. These include:

- Contract Budget Base (CBB)
- Performance Measurement Baseline (PMB)
- Management Reserve (MR)
- Distributed budgets
- WBS element budgets

6.2.1 Contract Budget Base (CBB)

The CBB represents the total cost of all budgeted activities necessary to complete a task. The CBB is not changed unless authorized by a funding action. Responsible project control requires that an unchanging budget baseline be established so project performance can be consistently measured across time. The CBB is established immediately after the work scope is defined. The CBB:

- Presents a clear and concise description of the work to be performed and any special project provisions
- Assures work authorizations are properly sequenced to meet deliverable schedules
- Provides correlation and traceability in the hierarchy of budgets and responsibilities

The CBB is established when these four distinct elements are present:

- A clearly defined scope of work
- An integrated and traceable project schedule
- A time-phased budget
- Management Reserve
- A Project Manager approved budget structure

The CBB is the total of the Performance Measurement Baseline (PMB) budget and Management Reserve budget. The PMB is a time-phased budget plan used to measure project performance. Management Reserve is funding allocated to finance unanticipated in-scope project plan changes.

6.2.2 Performance Management Baseline (PMB)

"The PMB is a time-phased budget plan against which project performance is measured. It is formed by the budgets assigned to scheduled WBS elements. For future effort, not planned to the detail WBS, the PMB also includes budgets assigned to higher level Project Work Breakdown Structures (PWBS) elements. The PMB equals the total allocated budget less Management Reserve (MR)."[5] See Baseline Maintenance Procedures for additional information.

6.2.3 Management Reserve (MR)

Management Reserve (MR) is an amount of the total allocated budget withheld for management control purposes rather than designated for the accomplishment of a specific task or set of tasks. It is not a part of the Performance Measurement. MR represents a contingency against unanticipated project requirements. See Management Reserve Procedures for additional information.

6.2.4 Distributed Budgets

Distributed budgets are assigned to Project Managers to perform a discrete effort. Distributed budgets must be time-phased by reporting period.

6.2.5 WBS Elements

Each WBS element has a specified scope of work, detailed schedule, and time-phased budget. Management control systems rely upon well-defined WBS summary and detail elements. Summary WBS elements should:

- Consist of one or more related task activities
- Be controlled by one manager
- Be closed only when the work is completed

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

6.3 Rolling Wave Planning

Rolling Wave planning is a periodic approach to budgeting where WBS elements are planned and budgeted in greater detail as the project progresses. While near-term tasks are easily planned and budgeted, long-term tasks, tasks with delayed start dates, or tasks with chained dependencies, are more accurately planned as more information is available.

Rolling wave planning requires periodic cycles of incremental planning to ensure that detailed planning occurs for the next major project milestone. This approach minimizes premature baseline planning which can cause distorted performance measurement.

The following guidelines apply:

- All future (forward) planning is accomplished to a significant project milestone (e.g., design review, tests, and deliveries) when practicable or, at a minimum, the next three to six months should be detail planned. Certain development projects with a high degree of uncertainty may use a smaller rolling wave timeframe.
- Before initiating a WBS task element, the task must be planned in detail at least three accounting periods forward, or up to the next major milestone.
- Any WBS task-level element that begins in the rolling wave interval must be planned through completion.
- Remaining WBS elements that have not been planned in detail must be reflected in the budget.
- Efforts beyond one year may be included as a summary planning package

7 Performance Measurement Procedures

7.1 Purpose

The purpose of performance measurement is to detect cost and schedule variances by comparing actual to planned performance.

7.2 Methodology

Performance measurement can be accomplished using three methodologies: The Discrete Effort methodology, the Apportioned Effort methodology, and Level-of-Effort methodology. This procedure is based upon the *Earned Value Management Implementation Guide*[6].

7.2.1 Discrete Effort Methodology

A discrete effort has a defined scope, objectives, schedule, and the basis for performance measurement. The most common methods of performance measurement methods are:

1. **Milestone Method -** The milestone method assigns budget values to specific work objectives (schedule milestones). Value is earned as milestones are completed. It is important for the milestones to be made up of easily measured points of accomplishment.
2. **Percent Complete Method** - This uses standard hours methodology (equivalent units is a similar process), and is common in manufacturing accounts. The budget is time-phased based upon a standard hour plan.
3. **Subjective Method -** Management assessment is used to determine the percentage of work completed for a task or group of tasks. Earned value is then calculated by applying that percentage to the total budget for the work. Management assessment includes the use of metrics for work measurement.
4. **Zero-100 Percent Method** - Work packages are established that earn no value until the milestone is complete. Zero percent is earned when the activity begins, 100 percent when the activity is completed. Activities having a short duration (less than one accounting or reporting period) should not use this method.

7.2.2 Apportioned Effort Methodology

Apportioned effort is work where planning and progress are tied to other activities. The budget for the apportioned account must be time-phased. If the baseline accounts are on performing schedule, the apportioned account will be on schedule and an appropriate amount of value will be earned.

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

7.2.3 Level of Effort (LOE) Methodology

The LOE methodology is used in instances where performance is not easily measured (such as general support activities). During a specified time period, an activity's earned value is equal to that period's budget. Performance measurement is done by comparing the planned budget to actual cost.

8 Variance Analysis Procedures

8.1 Purpose

The purpose for performing variance analysis is to identify the cause of the variance and implement corrective action. Variance analysis provides managers visibility into project performance and will:

- Provide early warning of variances that could become significant if ignored
- Determine the immediate and underlying cause(s) of the variance
- Understand both the short-term and total-project impact
- Identify when out-of-scope work is being performed
- Identify corrective action alternatives and select the appropriate alternative
- Verify whether corrective action is resulting in the planned recovery

This procedure is based upon the *Earned Value Management Implementation Guide*[7].

8.2 Definition

Variance analysis is the systematic comparison of planned to actual project performance to measure and explain changes from the project plan.

8.3 Significant Variances

For large projects, analyzing every cost and schedule variance is extremely time-consuming. Instead, by estimating cost and schedule variance thresholds management time can be better used by assessing only events which exceed a predetermined threshold. Cost Variance (CV), Schedule Variance (SV), and Estimate at Completion (EAC) variance analysis thresholds are typically established prior to project development.

The following criteria are often used in determining thresholds:

- Absolute amount versus percentages
- Cumulative versus incremental
- Favorable versus unfavorable
- Work Breakdown Structure (WBS)/Organization Breakdown Structure (OBS) levels
- Technical criticality
- Top ten (no thresholds)

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

8.3.1 Schedule Variance (SV)

Schedule Variance (SV) is Earned Value minus the planned budget for the completed work (BCWP-BCWS). Comparing the value of work completed to the value of work scheduled during a specific period provides a valuable measure of schedule status. This variance, when evaluated in hours, indicates hours behind or ahead of schedule. This variance may not, however, clearly indicate whether or not scheduled milestones are being met since some work may have been performed out of sequence or ahead of schedule. Schedule variance does not indicate whether a completed activity is a critical event or if delays in an activity's completion will affect the completion date of the contract. A formal time-phased scheduling system, therefore, must provide the means of determining the status of specific activities, milestones, and critical events.

8.3.2 Cost Variance (CV)

Comparisons of the cost of completed work with the value planned for that work provides a cost variance. Analysis of this difference reveals the factors contributing to the variance. Examples include poor initial task estimate, technical difficulties that required additional resources, the cost of labor or materials different than planned, differences between planned and actual rates, and personnel efficiency different than planned.

8.3.3 Variance at Completion (VAC)

Variance at Completion (VAC) is the difference between the total budget assigned to a contract, WBS element, Organizational entity or cost account and the estimate at completion. It represents the amount of expected overrun or underrun. When the EAC exceeds the total budget, an unfavorable variance (overrun) exists. Project managers should be alert to circumstances that affect the EAC and, therefore, the VAC.

8.4 Management Evaluation

Variance analysis identifies and evaluates the reasons for the variance. Important points to consider when evaluating variances are:

- Variances should be documented in writing, dated, and signed by the responsible project manager
- Provide a complete analysis of the problem, its impact, and the corrective actions to be taken
- Address the root causes of the variances
- Variance analysis shall be timely

8.4.1 Reason(s) for Variance

Variances explanations should clearly identify:

- The nature of the problem
- The reasons or cause for the variance
- The impact on the immediate activity
- The impact on other activities, and the cost and schedule impact on the EAC

- The corrective action to rectify the variance that is planned, taken, or underway, and
- Status on previous corrective actions

8.4.2 Project Impact

Where relevant, the project impact assessment should address the following:

- In-process WBS elements
- Pending WBS elements
- Consequences to the project
- Long-term cost, schedule, and technical implications

8.4.3 Corrective Action

The project manager is responsible for deciding on appropriate corrective action. Corrective action planning involves describing specific actions to be taken to alleviate or minimize the problem's impact. The plan describes:

- The corrective action
- Assignment of responsibility for managing the plan and its components
- Schedule and milestones
- Metrics used to determine if the corrective plan was successful

In a corrective action plan, the individual or organization responsible for the required action shall be identified to ensure ownership and to include schedules for the actions. If no corrective action is possible, it is important to explain why. Results of previous corrective action plans should also be addressed.

9 Estimates at Completion (EAC) Procedures

9.1 Purpose

The purpose for calculating and monitoring a project's Estimate at Completion's (EAC's) is to estimate the project's final cost. The EAC is calculated after the project's cost, schedule, and technical analyses have been accomplished.

9.2 Definition

Estimate-at-Completion (EAC) is defined as actual direct costs, plus indirect costs allocable to the contract, plus the estimate of costs (direct and indirect) for authorized work remaining. In other words, the EAC is defined as the actual costs incurred, plus the estimated costs for completing the remaining work. Mathematically, the EAC represents:

EAC = ACWP + ETC

Where:

- ACWP (Actual Cost of Work Performed) is the cost actually incurred and recorded in accomplishing the work performed within a given time period. ACWP should be obtained from an automated accounting and purchasing system. In the absence of an automated system, a manual project cost system must be implemented. ACWP includes both actual costs that have been paid and accruals (costs that have been received but not yet paid).

- ETC (Estimate to Complete) is that portion of the EAC that addresses total expected costs for all work remaining on the contract. ETC is the cost necessary to complete all tasks from the ACWP end date through the project's conclusion. ETC costs include commitments (costs associated with goods and services ordered but not yet received), labor, Other Direct Costs (ODC's), and Material and Subcontracts (M&S). Note the ETC does not include Management Reserve.

At a project's start, the EAC is equal to the project budget. As the project continues, the EAC becomes the ACWP plus the project ETC, taking into consideration the performance to date in predicting the project's costs. Thus, the ETC represents knowledgeable projections of future performance.

9.3 EAC Calculation Methods

The following three methods are generally used when calculating EAC. Each method uses ACWP as the starting point and reflects the project's performance to date, the remaining work to be performed, and the project staff's anticipated performance against the plan. The EAC methods are the:

1. **Comprehensive Method**- The comprehensive method builds the EAC by re-estimating lower-level incomplete WBS activities. The comprehensive method can be a time-consuming and a costly process but the benefits are an all-inclusive "bottom-up" estimate.
2. **Monthly Method**– This method updates the EAC each month. This method is less rigorous and time-consuming than the comprehensive method. During each accounting period, the Project Manager assesses the EAC. If the estimates are realistic then no action is required. The monthly method results in a more current EAC than the other calculation methods.

3. **Statistical (or Independent) Method**- The statistical (or independent) method is a statistically computed forecast based on past project performance. The statistical method relies upon two independent components - the cumulative Cost Performance Index (CPI) and Schedule Performance Index (SPI).

9.4 EAC Preparation Responsibility

The Project Manager is responsible for EAC preparation. However, as the EAC is derived from the WBS, traceability and accountability must extend from the EAC to project team.

9.5 EAC Preparation Frequency

The Project Manager is responsible for establishing the EAC preparation frequency. As the EAC provides useful management information, the Project Manager should consider the project's risk profile and financial and schedule performance history when determining or modifying the preparation schedule. In addition, non-scheduled EAC's should be conducted when the project's risk profile changes significantly.

10 Baseline Maintenance Procedures

10.1 Purpose

The baseline maintenance procedure maintains the Performance Measurement Baseline's (PMB) integrity. This procedure is a controlled process, by which the project team establishes a budget, incorporates formal changes, conducts internal re-planning, and adjusts past, present and future information to accommodate budgetary changes. This procedure is based upon the *Industry Standard Guidelines for Earned Value Management System*[8].

10.2 Performance Measurement Baseline

"The PMB is a time-phased budget plan against which project performance is measured. It is formed by the budgets assigned to the scheduled WBS. For future effort, not planned to the detail WBS, the PMB also includes budgets assigned to higher level Project Work Breakdown Structures (PWBS) elements. The Performance Measurement Baseline equals the total allocated budget less Management Reserve (MR)."[9]

10.2.1 Develop Performance Measurement Baseline

Developing a budget for each WBS element forms a Performance Measurement Baseline against which future performance is measured. The PMB should be developed shortly after project authorization is granted. When practical, all WBS elements should be planned, at least at a summary level, throughout the project's life cycle. Any WBS that cannot be established, initially, should identify the critical event(s) necessary to develop the PMB.

10.2.2 Summary Level Planning Packages

When clearly impractical to plan authorized work at a detailed WBS element level, budget and work should be aggregated at a higher WBS or OBS for later subdivision into detail WBS elements. This budget must map to specific elements, be time-phased, periodically assessed, assigned organizational and individual responsibility, and limited to activities within the project scope. Eventually, all work must be planned by specific OBS element to the detail WBS level. Summary level planning is not a substitute for early and definitive detail planning.

10.2.3 Authorized, Unbudgeted Effort

For authorized but unbudgeted work, the project manager should plan and budget near-term effort in detail WBS elements, with the remaining effort and budget assigned to a summary level WBS.

[8] *Industry Standard Guidelines for Earned Value Management Systems;* Management Systems Subcommittee of the National Security Industrial Association, January 15, 1997.
[9] Ibid.

10.3 Incorporate Changes

Changes in major projects are inevitable. The PMB should reflect any authorized budget and schedule changes. Incorporating the change into the PMB must be documented and traceable to the original baseline.

10.3.1 Provide Traceability to Previous Budgets

The PMB should constitute a traceable basis against which project growth can be measured. The starting point or base on which the original budget is built is the initial project budget. This value increases or decreases only as a result of authorized changes. Adequate records for all changes for reconciliation back to the baseline budget established during the Project Budgeting (baselining) process.

10.3.2 Control Internal PMB Changes

Future plans may significantly vary from the original baseline, and the project manager may choose to realign the project's scope, schedule, or budget. Some examples of when it may be appropriate to do Internal Replanning (e.g., within the project target cost or approved Total Allocated Budget) include:

- Changes resulting from preliminary Design Review (PDR) or a Critical Design Review (CDR) that modify future requirements
- A major shift in the resources needed to complete the project
- Funding restrictions or modifications that effect future resource availability
- Rate (labor, overhead, direct costs, etc.) changes that are significant enough to warrant re-planning

11 Management Reserve (MR)

11.1 Purpose

Management Reserve (MR) is an amount of the total allocated budget withheld for management control purposes rather than designated for the accomplishment of a specific task or set of tasks. It is not a part of the Performance Measurement. MR represents a contingency against unanticipated project requirements. **MR is not a contingency that can be eliminated from project cost during subsequent reviews or used to absorb existing variances.**

MR is an integral piece of the Select Phase initial cost estimate and risk analysis. The greater the risk, the greater MR budget.

The following are acceptable reasons for increasing or decreasing MR:

- Changes to the budget due to in-scope growth/reduction
- Completing a WBS element and having budget remaining that is not allocated
- Correction of minor accounting errors
- Major internal replanning to improve cost or schedule efficiency
- Formal Reprogramming

11.2 Documentation Process

The Management Reserve Log (Figure 6) is prepared and maintained by the Project Manager. The Log accounts for MR balances used to fund specific WBS elements. The Log must be prepared and maintained in such a way that it can be reconciled to the Project Budget Baseline.

11.3 Roles and Responsibilities

The Project Manager is responsible for managing, allocating, and documenting MR.

Figure 6: Management Reserve Log

MANAGEMENT RESERVE LOG				
MANAGEMENT RESERVE NUMBER	DATE	DESCRIPTION / WBS #	CHANGE	BALANCE

12 Internal Replanning

12.1 Purpose

Internal replanning redistributes resources to reflect revised budgets or schedules as well as efficiency gains. Internal replanning is done only within the project's budget and scope.

If replanning requires that work and associated budget be transferred between tasks, this transfer should be formal and documented. Except correcting errors or normal accounting adjustments, no retroactive changes must be made to budgets or schedules for completed work. This procedure is based on the *Earned Value Management Implementation Guide*[10].

12.2 Provide Traceability to Previous Budgets

The original project budget constitutes a traceable basis against which project progress can be measured. The project's budget increases or decreases only because of authorized changes. Adequate records of all changes must be maintained so the replanned and original budgets can be reconciled. To maintain the budget baseline validity, traceability within the organization is also necessary.

12.3 Changes to the Performance Measurement Baseline (PMB)

Performance Measurement Baseline (PMB) is the time-phased budget plan against which project performance is measured. Future plans may significantly vary from the original budget baseline and the project may choose to realign scope, schedule (replanning should not result in a schedule variance), or budget. Some examples of when it is appropriate to replan include:

- Changes resulting from a Preliminary Design Review (PDR) or a Critical Design Review (CDR) that modifies future in-scope requirements
- A major shift in the resource profile to accomplish the remaining effort
- Funding restrictions or modifications that affect resource availability

12.4 Replanning WBS Elements

WBS element replanning may be necessary to compensate for internal conditions, which affect the planning and scheduling of remaining work. Such replanning should be accomplished within the constraints of the previously established WBS element schedule and budget. When more extensive replanning is necessary and the total WBS element budget must be changed, MR may be necessary to increase or decrease the WBS element budgets. If replanning requires that work and associated budget be transferred between WBS elements, this transfer must also be controlled and documented.

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

To maintain a budget's validity, the following practices should be observed:

- Each WBS element must contain a budget
- Transferred work responsibility must include the associated work budget
- Budgets assigned to a future WBS tasks elements must not be used to perform other tasking
- MR records must clearly document the purpose and period over which those funds were used.

12.5 Authorization

Re-planning requires Division Manager approval.

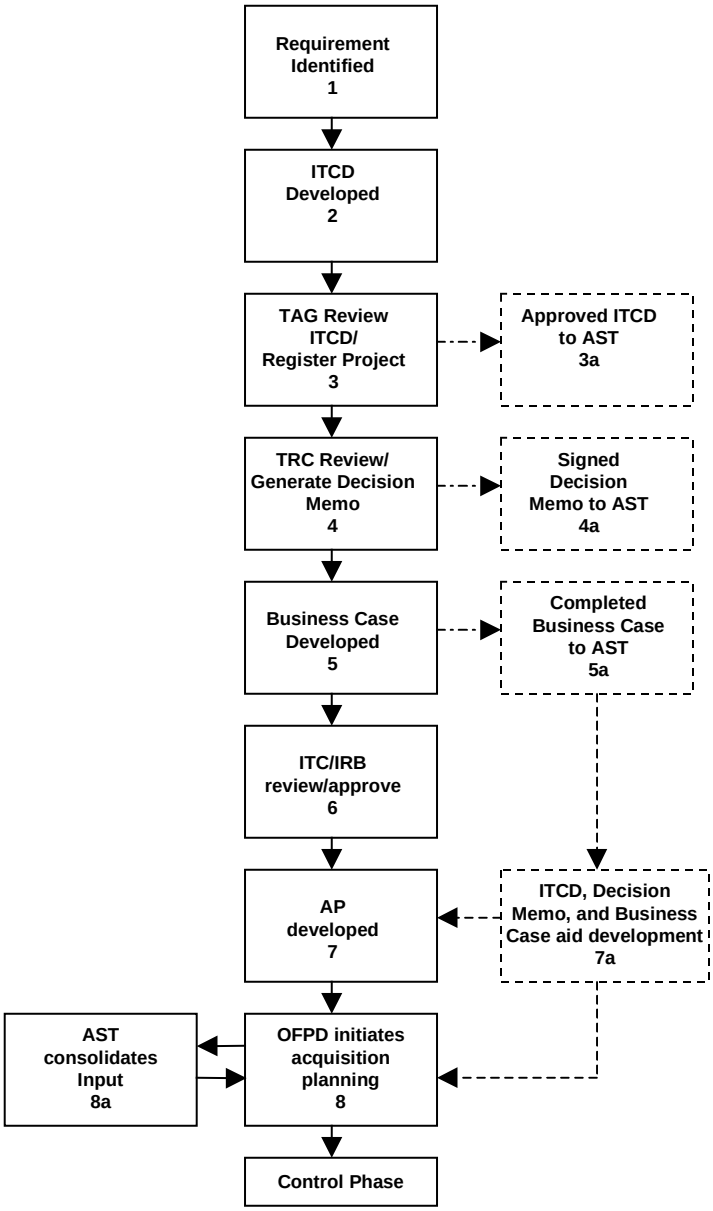
13 Acquisition Planning Procedures – Select Phase

13.1 Purpose

This diagram illustrates the acquisition planning procedures necessary during the Select Phase to ensure that the User meets his/her project objectives in the most effective, economical, and timely manner.

13.2 Process

The Acquisition Planning steps are depicted in Figure 7 below with numeric references.



1. Requirement is identified by a User within the OIT Division: Software Development Division (SDD), Infra- structure Services Division (ISD), Applied Technology Division (ATD), Customs Modernization Office (CMO) Program Management Group (PMG), Technical Architecture Group (TAG), Planning Group (PG), or Resource Management Group (RMG).

2. The IT Concept Document (ITCD) is developed by the User and submitted to TAG for review.

3. TAG performs preliminary review and registers project. Findings/recommendations are forwarded to the TRC.

3a). Copy of approved ITCD is forwarded to AST for use in the AP Development Stage.

4. TRC reviews ITCD. Upon completion of review, TAG issues ITCD Decision Memo stating project disposition: approved; approved with waiver, or disapproved.

Figure 7: Acquisition Planning Procedures

4a. Copy of signed ITCD Decision Memo is forwarded to AST for use in the AP Development Stage.

5. Business Case Worksheet is developed. The completed worksheet includes information vital to the development of the Acquisition Plan (AP).

5a. Copy of completed Business Case Worksheet is forwarded to AST for use in the AP Development Stage.

6. Information Technology Committee (ITC) reviews/approves projects less than $1M, funded, and low risk. Any projects over $1M, unfunded, or high risk are forwarded by the ITC to the Investment Review Board (IRB) for approval. After approval, the project funds are committed.

7. AP is developed through a coordinated effort between the User, Contracting Officer, and AST.

7a. The information obtained by AST during steps 3a-5a is used to develop the initial AP. The AP is continuously updated throughout the Project Initiation Stage as User requirements are refined.

8. OFPD releases Advanced Acquisition Planning memo requesting new OIT requirements valued at over $100,000.
Acquisition planning begins upon receipt of OIT inputs.

8a. AST consolidates all OIT inputs and submits to OFPD for review; contacts the User to assist in Acquisition planning for each new requirement; and coordinates with the User and OFPD to discuss acquisition strategy and establish milestones.

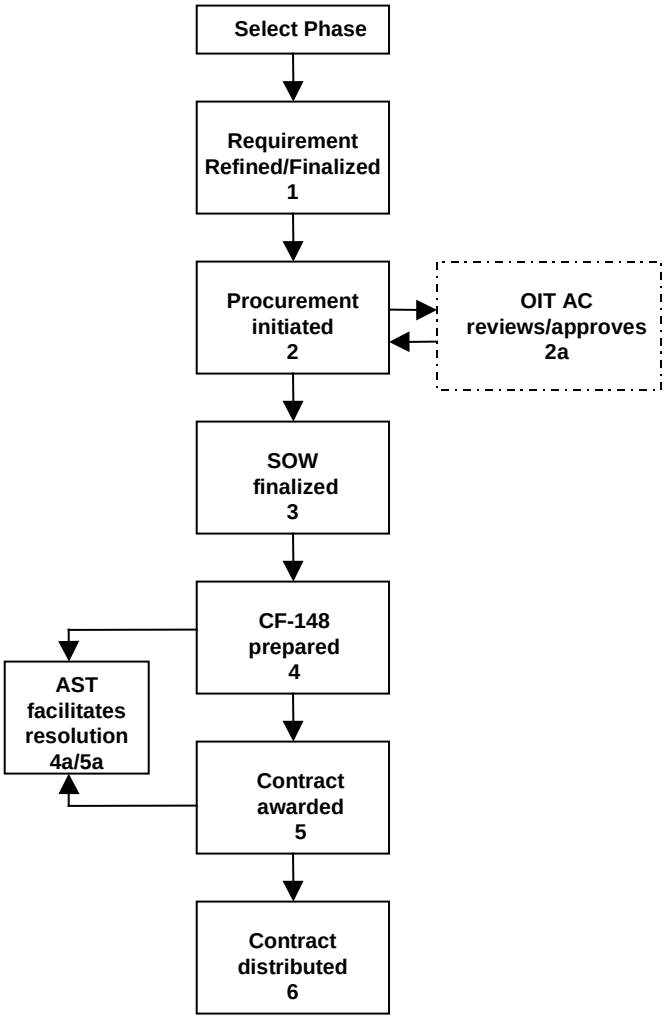
14 System / Services Acquisition Procedures – Control Phase

14.1 Purpose

The purpose of this procedure is to illustrate the acquisition processes to be used by all divisions within the OIT when purchasing supplies and/or services. It is based on the assumption that all acquisition planning procedures have been completed during the Select Phase or the requirement is part of a previously approved baseline.

14.2 Process

The System / Services Acquisition steps are depicted in Figure 8 below with numeric references.



1. Requirement is refined/finalized by a User within the OIT Division: Software Development Division (SDD), Infrastructure Services Division (ISD), Applied Technology Division (ATD), Customs Modernization Office, (CMO) Program Management Group (PMG), Technical Architecture Group (TAG), Planning Group (PG), or Resource Management Group (RMG).

2. User initiates procurement based on ITC/IRB approval. Prepares draft Statement of Work (SOW) with the assistance of AST, if necessary.

2a. If procurement exceeds $200K, OIT Assistant Commissioner (AC) has given approval authority for the requirement to the SDD, ISD, and ATD division heads. However, Direct Report divisions: CMO, PMG, TAG, PG, and RMG must obtain AC approval before funds are committed. All requirements exceeding $200K, regardless of approval authority, are included in a weekly report to the AC for review/approval.

Figure 8: System / Services Acquisition Procedures

3. AST finalizes SOW and submits to RMG.

4. RMG prepares CF-148 (funding document). CF-148 will not be processed for requirements exceeding $200K without prior approval. Provides copy of procurement package to AST for tracking purposes.

4a/5a. AST facilitates the resolution of all questions/issues related to a particular procurement.

5. Office of Finance, Procurement Division (OFPD) processes Request for Proposal (RFP). Contracting Officer (CO) awards contract.

6. Contract is distributed to the User, AST, and RMG.

15 Glossary of Earned Value Management Terms[11]

Actual Cost of Work Performed (ACWP) - The costs actually incurred and recorded in accomplishing the work performed within a given time period.

Allocated Budget - (See Total Allocated Budget)

Applied Direct Costs (ADC)- The actual direct costs recognized in the time period associated with the consumption of labor, material, and other direct resources, without regard to the date of commitment or the date of payment. These amounts are to be charged to work in-process when any of the following takes place:

- Labor, material, or other direct resources are actually consumed.
- Material resources are withdrawn from inventory for use.

Authorized Work - That effort which has been definitized and is on contract plus that effort for which definitized contract costs have not been agreed to but for which written authorization has been received.

Baseline - (See Performance Measurement Baseline).

Bill of Material (BOM) - A listing of material items required to complete the production of a single unit. When actual or expected prices are applied, it becomes the Priced Bill of Material (PBOM).

Budget at Completion (BAC) -The sum of all budgets established for the contract. (See Total Allocated Budget).

Budgeted Cost for Work Performed (BCWP) - The sum of the budgets for completed work packages and completed portions of open work packages, plus the applicable portion of the budgets for level of effort and apportioned effort.

Budgeted Cost for Work Scheduled (BCWS) - The sum of the budgets for all work packages, planning packages, etc., scheduled to be accomplished (including in-process work packages), plus the amount of level of effort and apportioned effort scheduled to be accomplished within a given time period.

Contract Budget Base (CBB) - The negotiated contract cost plus the estimated cost of authorized unpriced work.

Contract Data Requirements List (CDRL) -A compilation of all data requirements that the contractor is obligated to submit to the government.

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

Contractor Performance Measurement (CPM) Monitor -That person within the CAO assigned responsibility for ensuring the proper and continuing implementation of the approved integrated management system on contracts where its application is required.

Contract Work Breakdown Structure (CWBS) - The complete work breakdown structure for a contract, it includes the DoD approved work breakdown structure for reporting purposes and its discretionary extension to the lower levels by the contractor, in accordance with MIL-HNDBK 881(latest version) and the contract work statement. It includes all the elements for the hardware, software, data or services, which are the responsibility of the contractor.

Cost Account (C/A) - A management control point at which actual costs can be accumulated and compared to budgeted cost of work performed. A cost account is a natural control point for cost/schedule planning and control since it represents the work assigned to one responsible organizational element on one contract work breakdown structure (CWBS) element.

Cost Accounting Standards (CAS) - Established by the Cost Accounting Standards Board (CASB) to ensure consistent and proper accounting for direct and indirect costs applied to government contracts.

Cost Performance Report (CPR) - A contractually required report, prepared by the contractor, containing information derived from the internal system. Provides status of progress on the contract.

Cost/Schedule Status Report (C/SSR) - A performance measurement report established to capture information on smaller contracts.

Direct Cost - Any cost that may be identified specifically with a particular cost objective. This term is explained in the Federal Acquisition Regulation (FAR).

Earned Value Management System Guidelines (EVMS) - The set of 32 statements established by DoD 5000.2R, Part 11, Section B, which define the parameters within which the contractor's integrated cost/schedule management system must fit.

Estimate-at-Completion (EAC) - Actual direct costs, plus indirect costs allocable to the contract, plus the estimate of costs (direct and indirect) for authorized work remaining.

Estimate-to-Complete (ETC) - That portion of the EAC that addresses total expected costs for all work remaining on the contract.

Integrated Management System (IMS) - The contractor's system and related sub-systems implemented on major contracts to establish a relationship between cost, schedule and technical aspects of the contract, to measure progress, accumulate actual costs, analyze

deviations from plans, forecast completion of contract events and incorporate changes to the contract in a timely manner.

Level of Effort (LOE) - Effort of a general or supportive nature that does not produce definite end products.

Management Reserve (MR) - An amount of the total allocated budget withheld for management control purposes rather than designated for the accomplishment of a specific task or set of tasks. It is not a part of the Performance Measurement Baseline.

Organizational Breakdown Structure (OBS) - A functionally oriented division of the contractor's organization established to perform the work on a specific contract.

Performance Measurement Baseline (PMB) - The time-phased budget plan against which contract performance is measured. It is formed by the budgets assigned to scheduled cost accounts and the applicable indirect budgets. For future effort, not planned to the cost account level, the performance measurement baseline also includes budgets assigned to higher level CWBS elements, and undistributed budgets. It equals the total allocated budget less management reserve.

Planning Package (P/P) - A logical aggregation of work within a cost account, normally the far-term effort, that can be identified and budgeted in early baseline planning, but is not yet defined into work packages.

Project Summary Work Breakdown Structure (PWBS) - A summary work breakdown structure (WBS) tailored to a specific defense material item by selecting applicable elements from one or more summary WBSs or by adding equivalent elements unique to the project in accordance with MIL-HNDBK 881 (latest revision).

Replanning - The redistribution of budget for future work. Traceability is required to previous baselines and attention to funding requirements needs to be considered in any replanning effort.

Significant Variances - Those differences between planned and actual performance, which require further review, analysis, or action.

Summary Effort Control Package (SECP) - The summary level of the WBS and/or OBS where budgets are held for far-term efforts, not able to be identified to functional and/or WBS entities at the cost account level.

Total Allocated Budget (TAB) - The sum of all budgets allocated to the contract. Total allocated budget consists of the performance measurement baseline and all management reserve. The total allocated budget will reconcile directly to the contract budget base. Any differences will be documented as to quantity and cause.

Undistributed Budget (UB) - Budget applicable to contract effort that has not yet been identified to CWBS elements at or below the lowest level of, reporting to the Government.

Variance at Completion (VAC) - The difference between the total budget assigned to a contract, WBS element, Organizational entity or cost account and the estimate at completion. It represents the amount of expected overrun or underrun.

Work Breakdown Structure (WBS) - A product-oriented family tree division of hardware, software, services, and other work tasks which organizes, defines, and graphically displays the product to be produced as well as the work to be accomplished to achieve the specified product.

Work Package (W/P) - Detailed jobs, or material items, identified by the contractor for accomplishing work required to complete the contract. A work package has the following characteristics:

- It represents units of work at levels where the work is performed.
- It is clearly distinguished from all other work packages.
- It is assigned to a single organizational element.
- It has scheduled start and completion dates and, as applicable, interim milestones, all of which are representative of physical accomplishment.
- It has a budget or assigned value expressed in terms of dollars, man-hours, or other measurable units.
- Its duration is limited to a relatively short span of time or it is subdivided by discrete value milestones to facilitate the objective measurement of work performed.
- It is integrated with detailed engineering, manufacturing, or other schedules.

Work Package Budgets -Resources which are formally assigned by the contractor to accomplish a work package, expressed in dollars, hours, standards or other definitive units.

Appendix D: Control Phase Reviews

1 Project Reviews

1.1 Overview

The control phase of the Investment Management process includes several project reviews to ensure that quality systems are being created or enhanced, and to minimize the expense of implementing change late in the system development life cycle. There are two types of project review, calendar-based and event-based. Periodic Management Status Reviews are calendar-based. Milestone & Deliverable and Triggered Reviews are event-based. Milestone & Deliverable Reviews are control gate reviews that determine whether a program has sufficiently met the objectives of a particular phase in order to proceed to the next phase. Significant deviation from the expected status of a particular metric, management concerns, or other events may prompt Triggered Reviews. Each review is detailed further below. Associated with each review is the need to independently verify and validate the required data elements. PMG performs this task on an ongoing basis.

The Milestone & Deliverable Review and Triggered Review may take the form of an audit, IV&V, or other quality assurance review. In general, reviews are presented to the business sponsor, OIT division management, and the CIO staff groups. This is known collectively as the review committee. The review processes are similar. For example, each employs some type of interview, documentation review, and analysis. The difference is in the degree to which the review committee evaluates a project. An audit is a full evaluation of a project (GAO guidelines govern the process). An IV&V may conduct a full evaluation, but may also review a portion of the project and extrapolate the findings to the entire project. A quality assurance review examines a narrow portion of a project. The type of review selected depends on project's mission criticality, determined or projected risk, available resources, and schedule. The review committee will provide the Program Manager the type of review the team will conduct and the documentation expected before conduction the review.

Table 1: Control Phase Reviews

Review Basis	**Calendar-Based Reviews**	**Event-Based Reviews**	
Category→ Attribute↓	**Periodic Management Status Reviews**	**Milestone & Deliverable Reviews**	**Triggered Reviews**
Objective	• Ensure progress • Regularly assess the health of OIT projects	• Perform technical evaluation of the material presented • To prepare a recommendation for the CIO's attention	Highlight or clarify for executive/division management a current problem, issue, or significant change
Decision Process	• Division Director charts course of action • Decisions are made at the meeting	Review committee petitions management of technical leadership to act on committee recommendations	Executive/division management examines the findings discovered during the review process and makes decisions accordingly

Review Basis	Calendar-Based Reviews	Event-Based Reviews	
Category→ Attribute↓	**Periodic Management Status Reviews**	**Milestone & Deliverable Reviews**	**Triggered Reviews**
Attendees	Division Director, technical manager, oversight staff	Management leadership, business sponsor, technical leadership, subject matter experts, and oversight staff	Division Director, program manager, business sponsor, PMG, Planning, TAG, RMG, and subject matter experts as appropriate
Recommended Scope	Size should be limited to what can be reviewed in 60 – 90 minutes	One project	Depends on management's request (e.g., Ad hoc review, IV&V, or audit)
Presenter	Program manager or Division Director	Program manager or Division Director	Program manager or Division Director
Data submitted	As required by PT&O procedures	As required by SDLC guidance	As required by, SDLC, CMM, &/or GAO guidance (audit trail)
Materials volume	▪ Single page scorecard for overhead projection and attendees ▪ Single page metrics analysis	All required SDLC documentation to support the management decision ▪ Reports ▪ Recommendation	Event/Situation Package
Reports	Meeting minutes	• Management decision report • IV&V Report • Audit Report	• Ad Hoc Review Report • IV&V Report • Audit Report
Audit Trail	Post to Lotus Notes database: SCORECRD.NSF all supporting: ▪ spreadsheets ▪ schedules ▪ scorecards	All supporting milestone documentation is managed at the project level	All questions asked, responses given, and evidence supplied will be documented in a Lotus Notes or Access database

1.2 Milestone & Deliverable Reviews

1.2.1 Purpose

This section describes the process for conducting SDLC mandatory milestone gated reviews, and SDLC compliance reviews.

SDLC mandatory gated reviews are those conducted after each of the following SDLC-mandated phases:

Table 2: Mandatory Gates

Phase	Required Gate
Project Definition	Definition Phase Completion Review includes Requirements Certification for User and Functional Requirements
System Design	Critical Design Review
Programming/ Construction	Test Readiness Review
Acceptance	Production Readiness Review (also known as *Deployment Readiness Review*) includes: ▪ User Acceptance ▪ SAT Acceptance ▪ Security
Implementation/ Transition	Operational Readiness Review

SDLC compliance reviews compare the project deliverables against the formats and standards defined in the SDLC.

1.2 Process

1.2.1 SDLC Mandatory Gated (Milestone) Reviews

Project reviews with management are mandatory after completing each of the gated milestones. The gated review objectives are to perform an evaluation of the material presented, and to prepare a recommendation for the CIO's attention. Each review has three basic components: a presentation, a review of the documentation, and a management decision report, which includes minutes, actions to be determined (TBD), actions to be resolved (TBR), and an action resolution plan. The size of each component will vary depending on the size, complexity, and risk associated with the project. A schedule of reviews will be developed during the project plan approval process and updated as necessary at the end of each phase.

Additional, non-mandatory reviews can be negotiated and defined during the project plan development process. Non-mandatory reviews include but are not limited to a *Preliminary Design Review, Interface Design Review, and Technical Architecture*. The objectives and criteria for successfully completing these reviews will be defined during the project plan development process.

The Milestone and Deliverable Review process is shown graphically in Figure 1: Milestone and Deliverable Review Process Timeline. The process is depicted across a time continuum beginning with Requirements Development and concluding with Operational Readiness and Production. Note that each milestone could be managed as a project in itself – there is no mandate that all projects contain all milestones, but taken as a whole, all milestones will eventually be achieved. Responsibility for the process is split between the project management and project review activities. The activities above the time continuum are activities that the project management must manage, and below are activities that the project review personnel

must manage. This is not to say that other organizational entities are not involved in process execution. Each milestone is reviewed and managed in a similar fashion.

1. **Develop the deliverable -** The project manager works to develop the deliverable, as defined in the SDLC.

2. **Present the deliverable -** At the milestone, the project manager prepares a visual presentation, using standard office productivity tools, to be presented to the business sponsor, OIT division management, and the CIO staff groups which are known collectively as the review committee.

   The presentation must be supported by the relevant documentation identified in the SDLC. Advance copies of the supporting documentation must be made available to the presentation participants one week prior to the presentation.

3. **Review the deliverables -** With the advance milestone documentation, and updates distributed at the milestone presentation, the review committee will conduct a thorough review of the milestone materials.

   The review committee will conduct the reviews to evaluate the technical merits, documentation accuracy, documentation completeness, and traceability. To provide flexibility, reviews may be in the form of an IV&V, audit, or quality assurance review.

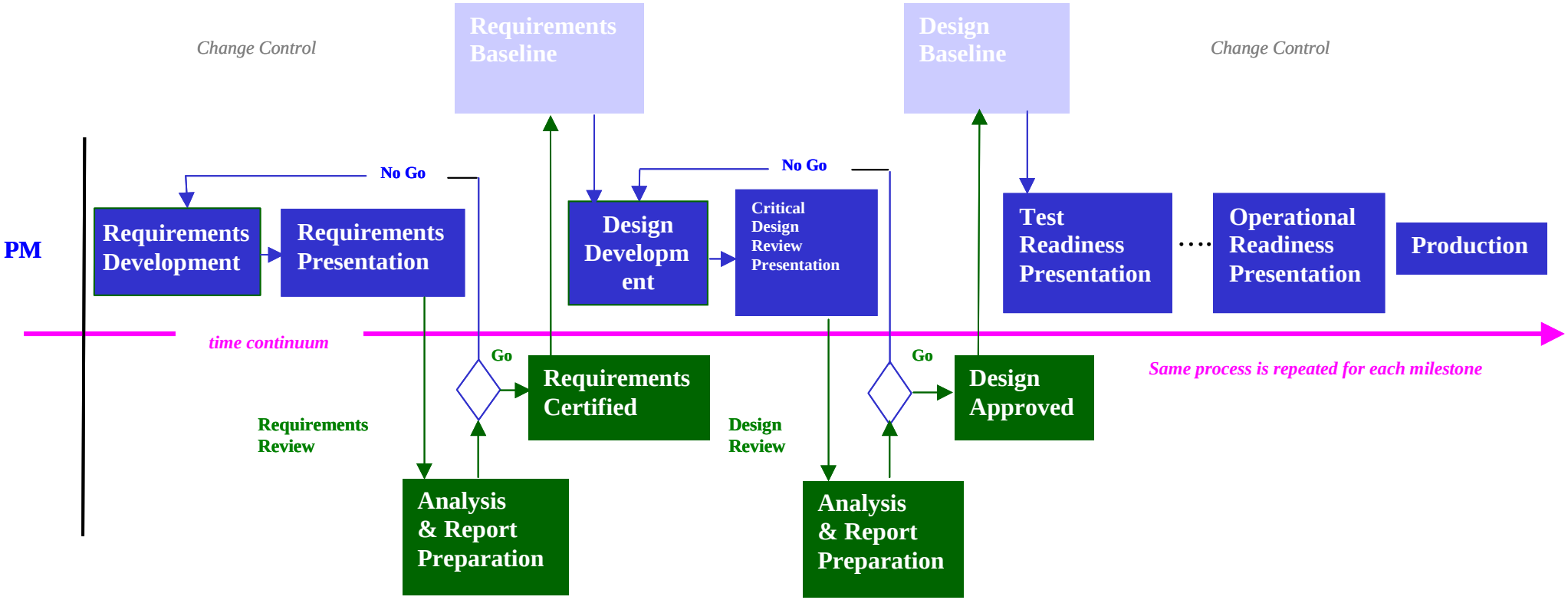
   Within 10 business days, the review committee will conclude with a management decision report to the ITC that defines a recommendation for project continuance. Recommendations can include options such as:

   - Proceed as planned
   - Proceed with plan modifications:
     - Modify Scope
     - Modify Schedule
     - Modify Funding
     - Modify Staff
   - Delay or Postpone Until Re-approved
   - Cancel

   Conflict resolution will be escalated through the approval hierarchy, until resolved. The approval hierarchy and final decision authority will vary depending upon the project's risk, size, and political visibility.

4. **Baseline the deliverable -** Once a recommendation to proceed is given, the project manager must baseline the milestone products. From the point of the baseline, all changes must be controlled by documented configuration management procedures. The baseline must be maintained for traceability.

Figure 1. Milestone and Deliverable Review Process Timeline



1.2.2.3 Review Points

- **Definition Phase Completion Review -** The objective of this review is to ensure that there is a complete and clear understanding of all user and functional project requirements. The review initiates with the delivery of:

  - User Requirements Document
  - Functional Requirements Document, and
  - Presentation of the Requirements Certification signature page.

  The Project Manager will provide the required documentation one week in advance of the presentation to the key review participants, and prepare materials for presentation to the review committee. To ensure technical qualifications, the review committee will include staff with expertise in requirements management. The review committee will prepare a management decision report with a recommendation for project disposition.

- **Critical Design Review** - The objective of this review is to ensure that both users and developers jointly approve the detailed design and associated test plans, and to demonstrate that the design presented can be produced and verified during test. The review initiates with the delivery of:

  - Detailed Design Documentation
  - Development Plan
  - Quality Assurance Plan
  - Draft Test Plans
  - Draft Test Cases
  - Cost and Schedule Status, and
  - Presentation of the Design Approval signature page.

  This documentation must be supported by evidence of requirements traceability, cost and schedule, evidence of design walkthroughs, risk analysis and risk mitigation plans, and draft integration or deployment plans. The Project Manager will provide the required documentation one week in advance of the presentation to the review participants, and prepare materials for presentation to the review committee. To ensure technical qualifications, the review committee will include staff with expertise in requirements management and the appropriate design method. The review committee will prepare a management decision report with a recommendation for project disposition.

- **Test Readiness Review -** This review ensures that the system development team, users, and the testing staff jointly approves the turnover of the system code and documentation, including test plans, to the acceptance test environment.

  The Project Manager will provide the required documentation one-week in advance of the presentation to the key review participants, and prepare a Turnover Package and materials for presentation to the review committee. To ensure technical qualifications, the review committee will include staff with expertise in requirements management, the appropriate design method, and test methods. The review committee will prepare a management decision report with a recommendation for project disposition. The review initiates with the delivery of:

  - Funding Request Worksheet, with IRB approval
  - User Requirements Document
  - Functional Requirements Document
  - STARS Request for Service (New Application Request)
  - System and Security Design and Test Plans
  - Test Cases
  - Program Specifications
  - Program Modification Log
  - Outstanding Test Discrepancies

- **Security Accreditation Review -** The security certification package provides sufficiently detailed information for making the security certification decision. The project manager will prepare the Security Certification Statement and the Security Certification Package for presentation to the Designated Security Officer, the Information Systems Security Officer, and the review committee. The review committee will prepare a management decision report with a recommendation for project disposition. The review initiates with the delivery of:

  - Security Plan
  - Security Test Plan and Report of Findings
  - Updated Security Risk Assessment
  - Security Design
  - Security Features User Guide
  - Trusted Facility Manual
  - Contingency Plan

- Security Certification Summary and Recommendation
- Formal Requests for Policy Waivers

The Security Certification Statement must be signed and retained in the Project File.

- **User Acceptance Review -** As part of the Test Readiness Review, the Business Sponsor is given the opportunity to approve the results of the acceptance test, and certify that the completed system meets all requirements and is ready for implementation into production. The Project manager will prepare:

  - User Acceptance signature page
  - Completed Test Cases
  - Document of test discrepancies outstanding
  - Operational workarounds

  The Project Manager must demonstrate that the system performs in a manner compatible with required interfaces, and that all required materials are available for a successful migration to the production environment.

  The Project Manager will provide the required documentation in advance of the presentation to the key review participants, and prepare a demonstration briefing to the review committee. To ensure technical qualifications, the review committee will include staff with expertise in requirements management, the appropriate design method, test methods and users. The review committee will prepare a management decision report with a recommendation for project disposition.

- **SDLC Compliance Review -** SDLC compliance reviews are those that compare the project deliverables against the policies and standards defined in the SDLC. These reviews, done in conjunction with the milestone reviews, ensure that the appropriate components are included in deliverables and that the SDLC-required process was followed in producing them. Management attendance is not required at these reviews.

  An assessment of the deliverables identified in the project plan will determine which ones will be selected for a compliance review; the deliverables to be considered are:
  - Configuration Management Plan
  - Cost/Benefit Analysis
  - Critical Design Review
  - Data Management Plan
  - Disaster Recovery/Contingency Plan
  - Functional Requirements

- Lessons Learned
- Move Request
- Operational Environment
- Operator's Manual
- Production Notice
- Project Plan
- Quality Assurance Plan
- Risk Management Plan
- Security Plan
- Security Risk Assessment
- Security Test Plan
- Security Test Report And Certification
- Source Code
- System Accreditation
- System Design
- System Test Plan
- Testing Problem Reports
- Training Materials (Initial and Updated)
- Training Plan--System Test Plan
- Trusted Facility Manual
- Turnover Package
- User Acceptance Problem Reports
- User Documentation
- User Requirements

Additional deliverables identified by the project manager will be considered for review as well. An SDLC compliance review may involve only some of the required deliverables and may involve reviewing parts of deliverables. The purpose is to verify that standards and policies are being followed, not to review every piece of every product.

1.2.3 Results

The review of critical milestones ensures that OIT management and the business sponsors are well informed of the project's condition. The result of the gated reviews is improved compliance with the SDLC across OIT projects.

1.2.4 Exceptions/Thresholds

All projects within OIT whose funding meets the minimum IMP criteria are candidates for milestone and deliverable reviews. Selection for such a review will be on a pre-scheduled basis, after a review of the approved project plan. All projects within OIT are subject to compliance reviews.

1.3 Periodic Management Status Reviews

1.3.1 Purpose

"The purpose of Software Project Tracking and Oversight is to provide adequate visibility into actual progress so that management can take effective actions when the software project's performance deviates significantly from the software plans". (CMM Practices; KPA for Level 2: PT&O)

The purpose of Periodic Management Status Reviews is to regularly assess the health of OIT projects. During these reviews, program managers present their major activities to senior management and the PT&O group as compared to their project plan. These presentations allow for early detection of schedule, performance or cost problems so that corrective actions can be taken when project performance deviates significantly from plan commitments. The reviews also monitor risk factors, including the likelihood and impact of risk. They differ from milestone reviews in that there is no assessment of product quality or content. Periodic management status reviews are intended to provide visibility into current project activities on a regular and frequent basis.

1.3.2 Process

Management status begins with project status reviews. The data presented at this review are collected by the team staff and presented to the program manager by the project team leader. It is mentioned here as the foundation for subsequent reviews, but it is not within the jurisdiction of the Investment Management Process. Secondly, each program manager must report project status data to their respective Division Director and to the Program Monitoring Group. Executive management reviews occur less frequently than Division management reviews, and include project data aggregated for high-level analysis.

The material supporting each level of review above the project status review is retained in an online repository for future reference to support audits, process improvement initiatives and decision support.

- **Project Status Review** - The project team leader conducts day-to-day planning and tracking meetings with the project team to collect information on accomplishments, risks, and issues as a part of his/her project management responsibilities. Status information, financial data, and metrics are collected and presented to the Program Manager, if he/she is not involved in the day-to-day meetings. The SDLC recommends that these reviews occur weekly or, at a minimum, biweekly or when specific events or problems occur.

- **Division Management Status Review -** For a particular project, division management is the functional role above that of the program manager who is responsible for the day-to-day activities and project results. This review provides senior management with information about a project's accomplishments, progress in comparison to the project's baseline plans, risks or issues and financial status than would be given at a general staff meeting. The material presented must be focused on the current reporting period, include major milestones and mandatory gated reviews, critical risks or issues, and project spending.

  Attendees at this review are the responsible Division Director, the program manager, and representation by the project tracking and oversight staff. The SDLC requires that these reviews occur at least every other month and, depending on the project's upcoming major milestones, status, risk and political visibility should occur more frequently. Reviews will be scheduled as required by the Division Director.

- **Project Tracking and Oversight (PT&O) -** The PT&O staff receives project status data from the program management staff at the same frequency as the division management. The PT&O group aggregates and summarizes the data supplied by the program manager for presentation to executive management. The summary process also includes analysis to assure consistency from reporting period to reporting period and to determine the status of the inter-project dependencies.

- **Executive Management Review -** The Division Director will present to the CIO and the executive management team the status of the projects typically at the same level of abstraction presented to division management. The Project Tracking and Oversight staff presents the summarized view (master schedule) including inter-project dependencies.

  Executive management reviews will be held at least monthly. High risk projects or projects which are not achieving their plan commitments will report monthly with other reporting at varying frequencies, monthly, bimonthly or quarterly, depending on the project status and risk.

1.3.3 Results

For the project being reviewed, management should understand the accomplishments, challenges and the degree to which the project is on schedule and within budget. Variance from the plan may require action to be taken. The tracking and reporting that the program manager performs in preparation for these reviews will ultimately lead to improved product quality.

If the status of a project is sufficiently unacceptable (typically schedule, cost or risk issues) to require further review, then this will trigger an escalation process of additional reviews, the Triggered Review Process.

1.3.4 Exceptions/Thresholds

This process applies to all projects within OIT whose funding meets the minimum IMP criteria. If a minimum or maximum threshold is encountered, this may initiate a triggered review. A triggered review may be an audit, IV&V, or other quality assurance review as detailed in the review plan scope.

1.4 Triggered Reviews

1.4.1 Purpose

The purpose of a triggered review is to highlight or clarify for senior management a current problem, issue, or significant change. These reviews are triggered by events, not by the calendar or the project phase.

- Triggered reviews are more narrowly focused than milestone reviews.
- The target audience will depend on the situation that prompted the request for review. The audience will normally be the management level who can take some action to correct the problem causing the review, or the management level that will be likely to be called on to answer for the delay or other impact of the problem.
- The reviews must receive scheduling priority since the reason for the review is likely to require quick action to limit the impact of a problem.

1.4.2 Process

These reviews are at the discretion of executive management. The material is packaged in order to give management as complete a picture as possible of the triggering event, and its potential impact.

The Program Manager will prepare an Event/Situation Package of materials for presentation to the Business Sponsor, all OIT Division Directors, the Program Monitoring Group, the Strategic Planning Group, the Technology Architecture Group, and the Resource Management Group. The Event/Situation Package includes:

- Description of the event triggering the review.
- Nature of the concern.
- What the manager needs from senior management.
- Current schedule picture, showing any potential slippage *due to this event.*
- Current budget picture, showing any potential overrun *due to this event.*

This package should not try to simultaneously present regular status information. This package should be very narrowly focused.

A triggered review could be an audit, an IV&V, quality assurance review, or some special ad-hoc request for more detail about some aspect of the project. In the case of an audit or IV&V, the review process consists of deploying a qualified review team to prepare and execute a review plan and report the results in accordance with Generally Accepted Government Auditing Standards (GAGAS), when applicable. Before the commencement of the review, the audit/IV&V/quality assurance review team will provide the project to be reviewed with written notification on the review scope.

This process includes reviews by an independent audit or review team to ensure that project information is valid, to verify that corrective actions have been taken, and/or to integrate information from this quality assurance function into the project review process.

Triggered reviews can be conducted at the end of project phases or process milestones or on an ad hoc basis (such as when significant information is discovered that may positively or negatively affect the project). Triggered reviews provide an objective and systematic examination of evidence for the purpose of providing an independent assessment of the performance of an organization, program, project, activity or function in order to improve accountability and facilitate decision making by parties with responsibility to oversee or initiate corrective action.

The review team must prepare and execute a comprehensive and detailed review plan defining the objective, scope, methodology, tests, and procedures to be employed. The review team may refer to previous reviews and audits that identify significant findings and recommendations that could affect the current review. Questionnaires will be prepared to assist in gleaning consistency among reviewers and those reviewed. Evidence gathered should meet the GAO standards of being sufficient, relevant, and competent. Established project area audit trails will be the primary source of evidence. This audit trail can be either hard copy and/or computer-processed.

In a timely manner, the review team will issue a report to senior management after performing the review. The report will identify significant findings and associated risks. Conclusions and/or recommendations, if appropriate, will be based upon the established guidelines of GAO, OMB, Treasury, other oversight agencies, industry standards, best practices, and risks. This report can be used by decision-makers to better manage the project.

A review helps to ensure internal controls are in place and functioning, providing accountability, reveal risks, and lead to the adaptation of best practices that are fed back into the life cycle to optimize project quality. Timely correction of deficiencies and improvements to control processes will help ensure operational efficiency, cost effectiveness, maximize resource usage, and regulatory legal compliance of the project.

1.5 Data IV&V

The data presented for each of the respective deliverables and reviews is subject to an independent verification and validation (IV&V). PMG is responsible for performing this task. The IV&V can include review of any of the deliverables, test verification, performance measurement, metrics, etc. The Customs *Systems Quality Assurance Plan* Sections 2.2.3, 2.3.1, 2.3.2 identify the Quality Assurance Teams (QAT) role and responsibilities.

Appendix E: Technology Review Committee (TRC) Charter

Technology Review Committee Charter

1 Purpose

In response to the Clinger-Cohen Act and the need to establish a process that ensures architectural compliance and governance, the Office of Information and Technology (OIT) has established the Technology Review Committee (TRC) to review and render decisions on new information technology concepts. The Information Technology Concept Document (ITCD) provides the basic information required to decide (approve/disapprove/pass to Information Technology Committee [ITC] for waiver) on information technology while it is still at the concept level. The review and decision ensures that Customs has alignment with the OIT Strategic Plan and linkage with the Investment Management Process (IMP). This ensures all concepts, requirements and projects comply with the Customs architecture prior to project funding and approval. See the sample *Approval Letter* on page E-5.

The Technology and Architecture Group (TAG) entry criteria for a project, enhancement, or improvement is listed below:

- Any proposed investment that is not an Operations and Maintenance (O&M) effort included in Base funding amounts. An O&M investment not part of the Base Funding initiative is required to participate in the IMP process regardless of whether the project is a change or enhancement. Further, enhancements funded from Base Funding must participate in the IMP process.
- Any proposed investment with a life cycle value greater than $25,000. **Note:** Proposed investments with a life cycle value less than $25,000 must go through the IMP process but no business case is required.

2 Membership

- Chair, Director Technology and Architecture Group
- Facilitator, TAG (non-voting member)
- Division Director of ISD
- Division Director of SDD
- Division Director of ATD (as required)
- Security Branch Chief
- Management Systems Branch Chief
- Trade Systems Branch Chief
- Enforcement Systems Branch Chief
- Inter-Process Solutions Branch Chief

3 Process

The following processes are followed by TRC members:

- The Director, TAG (Chief Architect) will chair the committee and respective committee meetings.
- The Technology and Architecture Group (TAG) will administer the committee.
- TAG presents an Information Technology (IT) concept and committee members vote. The outcome of the vote is documented within the ITCD database.
- Committee members will engage their staff to ensure the proper decisions are rendered.
- Committee members will ensure OIT resources (domain/subdomain owners and subject matter experts) are available to assist in concept development.
- The decisions will be published in the TRC minutes and memo (see attached sample) sent to the Process Owners, Business Project Managers, Business Information Technology Representatives and the Business Interface Representatives.
- Committee members will attend scheduled face to face meetings.
- Committee members will work closely with the Information Technology Committee (ITC) and the Investment Review Board (IRB) as required.
- Committee members will ensure staff participation in the project team's implementation as necessary.

4 Scope

The TRC's scope is to improve IT services and capabilities for Customs customers. Further, the Committee ensures that the overall direction is consistent with the Custom's Strategic Plan, OIT's Strategic Plan and Enterprise Architecture. The TRC performs the first Investment Management Process control gate review. The committee is responsible for:

- Approving/Disapproving the Project Concept presented by the TAG (see attached sample approval memo).
- Ensuring concepts are not duplicated or do not conflict with existing IT investments.
- Providing guidance on the direction of IT infrastructure.
- Providing cogent and sound recommendations to the ITC/IRB.
- Reviewing/Approving Architecture Compliance of hardware upgrades and purchases.
- Establishing Infrastructure IT training opportunities.
- Reviewing and approving all IT upgrades.
- Reviewing and approving all network initiatives.
- Reviewing and approving all new IT technologies.
- Reviewing and approving all Intranet and Internet initiatives.
- Reviewing and Approving all new IT services for OIT.

- Providing guidance associated with architectural waivers.
- Providing strategic guidance for Customs Business and Technical Architecture.

5 Exceptions

In the event a project is evaluated and found non-compliant with the Customs technical architecture, the TRC is responsible for making a strategic recommendation to the ITC. The ITC will decide whether to allow a waiver or reject the project.

6 Thresholds

Any project with a total life cycle cost of $25,000 or greater must be reviewed and approved by the ITC.

The ITC is responsible for reviewing and recommending to the IRB projects, which fall into any one of the following categories:

- Unfunded projects
- Projects considered high risk (defined by ITC)
- Projects with a life cycle cost greater than $1,000,000

7 Principles/Ground Rules

The following high level principles/ground rules define the TRC's responsibilities:

- Act as advocates of relevant issues decided and pursued
- Work as an integrated team
- Review materials in a timely manner
- Communicate all relevant issues to the committee, ITC, IRB, and staff
- Meaningful input and active participation is expected from all members
- Active participation from all members is expected
- Projects are approved via consensus vote of all members (consensus represents six or more "in favor" votes)
- Alternates may not vote
- Only identified members can vote
- The Chief Architect will break ties

8 Length of Service

Due to the importance and critical nature of the TRC, the length of service is indefinite.

9 Frequency of Meetings

The TRC meets weekly.

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF THE TREASURY
UNITED STATES CUSTOMS SERVICE

DATE:

FILE : MAN-1-IT:TAG DK

TO : Pete Delsandro, Office of Investigations

FROM : Director, Technology and Architecture

SUBJECT: ITCD Review-Interagency Trade Crimes Intelligence Unit

The ITCD you submitted concerning the Interagency Trade Crimes Intelligence Unit project on June 25, 1999, was reviewed by the Technology Review Committee (TRC) on June 30, 1999. Their decision was to approve the ITCD. You can proceed with developing the business case. The point of contact in OIT assigned to work with you on this project is Mr. Rick Kopel. Mr. Kopel may be reached at (703) 921-7349. Please start becoming familiar with the Investment Management Process (IMP) and Systems Development Life Cycle (SDLC) process. If you have any questions concerning the IMP, please contact Ms. Michelle Curtis at (202) 927-0244. If you have any questions concerning the SDLC, please contact Ms. Susan Coonrod at (703) 921-6685.

Appendix F: Information Technology Committee (ITC) Charter

Information Technology Committee (ITC) Charter

1 Purpose

In response to a need for improved Enterprise-wide management controls, the United States Customs Service (USCS) has implemented the Investment Management Process (IMP). The IMP also addresses legislative requirements (Clinger-Cohen) and audit findings. The IMP evaluates the following:

- Alignment of IT projects with Customs strategic business priorities and technical architecture
- Estimated costs, benefits and return on investment provided within the project plan and cost/benefit analysis
- Identification and mitigation of project risks.

To ensure project investments are aligned with these areas, USCS has established three control gates for selecting a project for funding:

- The Technology Review Committee (TRC)
- The Information Technology Committee (ITC)
- Investment Review Board (IRB)

The ITC is comprised of the Business Information Technology Representatives (BITR) and is chaired by the CIO. The mix provides a balance of business interests and ensures Customs strategic goals are best achieved. The process ensures that the projects are well defined and organized prior to receiving funding and given approval for execution. The ITC function is to review and recommend a course of action for the IRB, which permits the IRB to focus on strategic issues.

2 Membership

Membership shall consist of the following:

2.1 Voting Members

- Chair, CIO
- All BITRs and/or Alternatives

2.2 Non-Voting Members

- OIT Director, Software Development Division
- OIT Director, Infrastructure Services Division

- OIT Director, Technology and Architecture Group
- OIT Director, Planning Group
- OIT Director, Program Monitoring Group

2.3 Rules

- A quorum of 7 voting members is required.
- Passage of a motion results from approval from a simple majority.
- In the event of a tie vote, the ITC Chair shall cast the deciding vote.
- Only the ITC Chair and BITR or BITR alternates may vote.

3 Process

The following processes are to be observed:

- The CIO chairs the committee; Director of Software Development Division serves as the alternate chair.
- The IMP Project Manager facilitates meetings
- An IT project *Business Case* is submitted to the IMP Project Manager by the Business Sponsor or Project Manager. The business case is accompanied with the *Information Technology Concept Document (ITCD)* and related TRC recommendations.
- The ITC members will engage their respective staffs for review and audit of the *Business Case.*
- Each *Business Case* will be presented to the ITC with TRC member review findings.
- The ITC will vote on the project (a quorum of 7 member is required before a simple majority vote necessary for approval can be conducted).
- The ITC's voting results will be summarized and furnished to the IRB for final review and approval.

4 Schedule

The ITC will meet at least monthly. Special sessions may be called.

5 Scope

The IMP Select Phase object is, in part, to improve IT project planning and development activities. Further, the ITC ensures that the overall direction is consistent with the Customs Strategic Plan, and Enterprise Architecture Plan. To achieve those objectives, the committee's scope of responsibilities include:

- Reviewing and making recommendations on project business cases
- Making sound recommendations to the IRB
- Validating new IT investment decisions
- Validating strong IT business investments
- Defining IT business case results
- Making IT project investment initiative decisions for projects that meet **all** of the following criteria:
  - Projects less than $1,000,000
  - Low risk criteria
  - Funded projects
- Providing IT project investment recommendations to the IRB for projects if any of the following apply: Projects greater than $1,000,000; significantly risky projects; or unfunded projects.
- The committee will be the point of conflict resolution for all issues associated with the IMP that cannot be resolved at the project level.
- The committee is responsible for reviewing and issuing architectural waivers.

6 Principles/Ground Rules

The ITC shall:

- Act as advocates of ITC decisions
- Work as an integrated team
- Review materials in a timely manner
- Communicate all relevant issues to the committee, IRB and staff
- Provide meaningful input
- Participate actively

7 Length of Service

Due to the importance and critical nature of the ITC, the length of service is indefinite.

Appendix G: Investment Review Board (IRB) Charter

Investment Review Board (IRB) Charter

1 Background

In 1998, the United States Customs Service (USCS) formalized its investment review process based on best practices and legislative requirements. The Clinger-Cohen Act requires that each agency undertake capital planning and investment control by establishing a "process for maximizing the value and assessing and managing the risks of information technology acquisitions of the executive agency." Furthermore, Executive Order 13011, "Federal Information Technology," states that executive agencies shall "implement an investment review process that drives budget formulation and the execution for information systems." Consistent with best practices and legislative mandates, the Customs Deputy Commissioner commissioned the creation of the Investment Subcommittee to the Automated Data Processing (ADP) Steering Committee. This group, now known as the Customs Investment Review Board (IRB), has since superseded the ADP Steering Committee as the bureau's primary investment decision-making body.

2 Purpose

The primary purpose of the IRB is to implement an Investment Management process (IMP) that drives budget formulation and execution for investments. Specifically, the group is charged with:

- Developing and implementing policies and procedures to maximize return and minimize the risks of all investments.
- Providing senior management oversight, approval, and commitment to all significant investments.
- Approving and supporting investments that promote the Customs mission, the Strategic Plan, and meet the budget requirements.

3 Scope

All Customs investments are within the purview of the investment management process administered by the IRB. The IRB's focus is on those investments that exceed thresholds established by the IRB. For projects funded through reimbursable sources, the IRB shall consider the effect of agreements on project schedules and resources. The IRB shall determine the business value of entering into any agreement.

4 Board Membership

The IRB consists of the following principal members, each of whom have voting privileges:

- Deputy Commissioner, Chairman
- Assistant Commissioner, Field Operations
- Assistant Commissioner, Finance
- Assistant Commissioner, Information and Technology

- Assistant Commissioner, Investigations
- Assistant Commissioner, Human Resources
- Assistant Commissioner, Internal Affairs
- Assistant Commissioner, Strategic Trade

In addition, the following non-voting members shall serve in an advisory role to the IRB:

- Director, Office of Planning
- Director, Budget Division
- Treasury IRM Representative

Additional advisory members or subject matter experts may be invited to attend IRB meetings with the concurrence of the IRB Chairperson.

4.1 Board Authorities and Responsibilities

Consistent with industry best practices and the Clinger–Cohen Act, the IRB will recommend investments by initiating reviews, evaluating projects and controlling investments in order to ensure performance-based management. Specifically the IRB will:

- Make investment decisions based upon comparisons and tradeoffs among competing projects expected to have organization-wide impact. These evaluations may result in a decision to continue, modify, or cancel a project.
- Establish the investment risk assessment and financial criteria, including the net present value (NPV) and Return on Investment (ROI), and update as necessary. The IRB will use these criteria to make resource allocation decisions for investments and will document variances.
- Set project monetary thresholds and levels of review.

The IRB is responsible for:

- Ensuring that the resources necessary to execute the project are identified and available; whether those resources are funding, people, policy, etc.
- Ensuring that the process owners are involved in the management process and understand the implications of the project thresholds.
- Developing and adopting policies for the selection, control and evaluation of investments, and ensuring that all organizations within Customs follow the established IMP.
- Actively developing an organized structured and disciplined approach for the review, prioritization and approval of investments.
- Reviewing, modifying, and approving a prioritized list of investments.

- Development of an IT Portfolio.
- Ensuring that investment decisions are made consistent with strategic planning and budget planning processes.
- Directing a working group responsible for providing support to the IRB in the execution of the investment management process.
- Establishing investment review schedules of approved projects.
- Assessing approved investments against projected cost, schedule, performance and delivered benefits.
- Documenting all management decisions and supporting data.
- Incorporating lessons learned into the IMP.

5 IRB Operating Procedures

The IRB will follow the operating procedures below:

- The IRB will meet at least quarterly, or as requested by the IRB Chairman, who will schedule the date and time of the meeting. The IRB meeting shall be conducted such that ample time is allocated for thorough discussion of current issues. A minimum of four voting members, one of whom is the Chairman, must attend the meetings**. No alternates or votes by proxy are allowed.**
- The IRB will consider IMP issues and make recommendations and decisions. Recommendations and decisions will be based on consensus. Each principal IRB member has one vote. In the event of a lack of consensus the chair will make the final decision.

6 Support

The Planning Group will perform the preliminary review of investment submissions provided to the IRB by initiative sponsors, assuring all required evaluation criteria are addressed at the appropriate phase in the IMP, and providing preliminary input for IRB decision-making.

The Office of Information and Technology will provide executive support to the IRB. Responsibilities include: scheduling meetings, establishing and distributing meeting agendas, preparing and distributing meeting minutes, maintaining and updating the IRB history file (which includes documentation of all proposals submitted through the IRB) and serving as the IRB point of contact for project sponsors.

7 Definitions

- **Customs Investment Review Board (IRB)** – The executive management team at the U.S. Customs Service that makes funding decisions based upon comparisons and tradeoffs among competing project proposals, especially for those projects expected to have organization-wide impact.
- **Concept of Operations** – The guiding principles under which the IRB will function in order to administer the IMP at Customs.
- **Investment Management process (IMP)** – the framework within which investment decisions at Customs are made. This definable and repeatable process must be linked to other management and planning cycles. There are three primary phases:
  - **Select** – create a portfolio of project investments that maximizes mission performance, using a standard set of criteria for consistent comparison of projects.
  - **Control** – measure projects against their projected costs, schedule and benefits. Take action to continue, modify or cancel projects.
  - **Evaluate** – 1) determines the actual return on investment of an implemented investment against the agency's mission and 2) adapt the existing process to reflect "lessons learned."
- **Investment Ranking Criteria** – The ranking model examines a project's expected ROI, risks, improvement to mission effectiveness and strategic alignment. These criteria will be different based on the type of project under review and the current life cycle phase of the project. For the IT portfolio, each board member will rank the individual projects and an average ranking will be determined. The average ranking will be the basis for inclusion into the Customs IT portfolio presented to Treasury.
- **Responsibilities -** Review individual business cases. Solicit comments from subject matter experts, project teams and staff. Assess resource requirements. Compare and rank using defined criteria.