United States General Accounting Office

GAO

April 1998

GAO Information Technology Methodology and Standards

Part 1 of 2
(Procedures)

OIMC-98-0001

GAO Information Technology Methodology and Standards

Preface

The GAO Information Technology (IT) Methodology and Standards are based on the knowledge acquired from software acquisition and development practices used in both industry and government. The acquisition/development tasks and documentation standards represent a composite of those activities, processes, and concepts that have been validated through use and documented in the Federal Information Processing Standards (FIPS) Publications, Department of Defense (DoD) manuals, Institute of Electrical and Electronics Engineers (IEEE) Standards and various software acquisition assessment models such as the Capability Maturity Model (CMM) from the Software Engineering Institute (SEI), Carnegie Mellon University.

The methodology relies on a proven, "common sense" business approach to satisfying user requirements. The methodology advocates the acquisition, installation, and implementation of commercial-off-the-shelf (COTS) software whenever possible. When COTS software packages cannot provide the required functional capability, these procedures specify the tasks/activities to be performed in order to assure both GAO management and users, that the final product will meet the need in a timely and cost-effective manner.

OIMC plans to use the SEI's capability maturity models[1] to assess and baseline its structured approach as specified by these technical standards and procedures in satisfying GAO users. As OIMC's structured approach matures over time, the model will be used to evaluate and update the software acquisition and development baseline. The model will assist OIMC's management to track and guide the evolution of the "structured approach" from its defined beginnings to a mature, well-managed software process.

Additional methods and tools -- such as prototyping or rapid application development -- can be applied to enhance this structured approach. They do not, however, negate the need for detailed documentation. Unless otherwise approved by OIMC management, a project management plan must be prepared for every project, of which a project schedule is a component. This project plan will describe, among other things, the documentation standards that will be prepared for the project based on a risk assessment.

---

[1] The SEI has developed capability maturity models for assessing and improving the software development and acquisition process within an organization.

The risk assessment is conducted and included in the project management plan to provide OIMC management with an indication of the issues and concerns associated with the project. These procedures contain a risk assessment tool[2] which is completed during the Planning Phase when the project management plan is first prepared, and then again at the end of each subsequent phase when the project management plan is updated and reviewed and approved by OIMC management. The purpose of updating the risk assessment tool at the end of each phase is to assess whether or not the risk "profile" of the project has changed, indicating a possible effect in the project's cost, schedule or functionality.

There are many ways to apply the IT methodology in the development/acquisition of systems to satisfy user needs. The GAO process uses a traditional "waterfall" approach. In this approach, the project is broken up into defined, manageable phases, and progression to the next phase is based on completion of the current phase. Project teams can employ other approaches, such as an iterative or a prototyping method. With either approach, system capabilities are defined with a minimum amount of formality and control. The requirements are determined through successive prototypes. Regardless of the approach employed, the project team is required to prepare the appropriate documentation to develop, implement, and maintain the application following the IT documentation standards.[3] The proposed documentation suite for the project must be presented to OIMC management in the Project Management Plan for review and approval.

There are a variety of terms available/used to describe the development/acquisition process. The following table shows a cross-walk between some of the terms that are used in the IT methodology and documentation standards.

IT Methodology	also known as...
decomposition	node tree
data flow diagram (DFD)	process model
entity relationship diagram (ERD)	data model

---

[2] The Risk Assessment Tool (RAT) is a table of weighted criteria which the project manager completes by scoring the various factors for the project in five categories: management, operations, technical risk, financial risk, and schedule.

[3] Standards must conform to the accepted format and cannot be combined with one another.

GAO Information Technology (IT) Methodology

Table of Contents

CHAPTER 1.0

INTRODUCTION

PURPOSE

The General Accounting Office (GAO) Information Technology (IT) methodology is a focused, disciplined, and standardized process that is used GAO wide to acquire/develop computer applications to support congressional directed studies. The emphasize is on early and continuous dialogue between the user and management with regard to the appropriateness of the requirement and the timeliness of its implementation.

This methodology provides a means for management to evaluate proposed needs with respect to GAO's mission and information strategic plans in the early stages of the project. Projects are also evaluated with respect to their impact on other systems and on GAO as a whole. It enhances management's ability to prevent stovepipe system development and envelopes the system development process within the strategic planning process.

AUTHORITY

These standards and procedures are implemented under the authority of the ACG/IM&C and apply to all GAO activities involved in the acquisition and development of software for computer systems, including hardware, and operating systems as follows:

- These procedures and standards must be used by GAO in the acquisition and development of new computer systems, the acquisition of hardware, and the redesign of existing computer systems.

- Existing computer systems that have been developed by GAO and do not have an Operations Guide and Program Maintenance Guide will develop such documentation in accordance with these standards, as resources permit and/or as directed by ACG/IM&C.

Requests for waiver from any standard or procedure contained/described in the GAO IT methodology and not explained in a Project Management Plan must be submitted in writing to the ACG/IM&C. The request must contain, at a minimum, the following information:

- Requestor's name, address, and telephone number
- Standard and/or procedure from which waiver is desired
- Project, computer system, etc. involved
- Rationale or justification for having the standard/procedure waived
- Substitute standard/procedure which will used in order to adequately cover the requirement
- Impact statement depicting resources required to comply with the standard.

The following terms are used in the procedures to indicate the degree of compliance is required.

- *Must* means that compliance is mandatory. ACG/IM&C must approve waivers to using the standard and/or procedure, and such waivers must be documented.

- *Should* means that compliance is expected unless there is a reasonable basis for departure. Such departures are to be documented. Usually, these departures are documented in the Project Management Plan.

- *May* means that this is a good practice but compliance is optional.

BACKGROUND

The GAO IT methodology is founded in the principles of information engineering which emerged as a systems development discipline in the early 1980s in an attempt to meld existing structure techniques into an "engineering-like" discipline for systems development. Information engineering evolved into an integrated set of formal techniques from an enterprise wide business perspective. These techniques were integrated through the use of a database to store the information generated using the structured techniques during each phase of the development process. This database allows changes made in one phase to flow through to the other phases. Since each phase draws its

information from the same database, the integrity and consistency of the information is ensured.

Key characteristics of information engineering include active participation of the users throughout the system life cycle and addressing user needs from an enterprise perspective. An enterprise is an organization that exists to perform a mission and to achieve goals and objectives. A goal is a high-level statement of the results to be achieved when the business strategy is implemented. A goal is an "end" which justifies the "means" or objectives. In other words, the goals set the boundaries under which the objectives are accomplished. An objective is a specific, measurable step to achieve some goal. The objective represents the "means" to the "end."

The goal of using the IT methodology is to enhance OIMC's support of GAO's evaluator and administrative staff in their mission to "serve the public interest by providing members of Congress... with accurate information, unbiased analysis, and objective recommendations on how best to utilitize public resources in support of the security and well being of the American people."[1]

Projects are defined and evaluated with respect to their relationship to the organization as a whole. Proposals are considered based on how they impact existing systems in the organization regardless of the system's ownership. The IT methodology sets up a framework for ensuring that separately designed systems will fit together.

DOCUMENTATION

Documentation is a by-product for each phase of the methodology. The documentation represents a *point-in-time status* of the project as well as a *repository of the technical knowledge* acquired in the system development/acquisition process. It provides OIMC management with information to make informed decisions about management and progress of the project.

---

[1] Quality Improvement Plan for GAO: Early Implementation (GAO/QMG-92-1, November 1991), p.4.

The documentation requirements must be tailored to the project's size, complexity, and risk. The project manager has the responsibility for determining the appropriate level of documentation and for explaining which documentation standards do not apply and why. A Project Management Plan (PMP) is always prepared. The documentation to be produced and the justification for exceptions are documented in the PMP by the project manager. Unless otherwise directed by OIMC management, the project manager prepares the agreed upon documentation suite. The PMP is continuously presented to OIMC management at the end of each phase throughout the life cycle of the project for review and revision. If certain phases are combined, the project manager explains the approach in the PMP and indicates when the OIMC management reviews will occur.

In preparing the indicated documentation, project managers must understand that the documentation standards cannot be combined and the standard format must be followed. If a traditional approach is not used, then the PMP must contain the following information: what GAO IT standard documents will be produced, when these documents will be prepared and presented for review, and finally, when and how OIMC management will be briefed on the project's progress.

The GAO IT Methodology uses a baseline approach to project documentation, meaning that designated documents are "frozen in time" and require a formal change process to be followed in order to make a change. The baselined documents are those documents that are used to manage the development/ acquisition and future maintenance of the system. Baselined documents must be kept current. The Baseline Documentation table shows the baseline documents for both development and acquisition efforts, and for maintenance projects.

Baseline Documentation			
Document Standard	Developed		Acquired (COTS)
	Build	Maintenance	
Functional Description	X	X	
System Specification	X		
Data Specification	X		
User Interface Spec	X		
System Test Plan	X	X	
Source Code	X		
Functional Test Plan	X	X	X
User's Guide	X	X	X
Implementation Plan	X		
Operations Guide	X	X	X
Program Maintenance Guide	X	X	

PROJECT

The IT methodology is based on the premise that a development/acquisition effort is treated as a project. Consequently, throughout this document, the terms "project", "project manager", and "project team" are used. The term "project" is best defined by its characteristics. A project has a defined beginning and end. It is only done once and is keyed to a defined end-product. The project involves a multi-organizational group of individuals referred to as the project team. The members of the team may change from one project to the next. The project involves the definition and organization of activities (tasks) and events (milestones) to arrive at the final goal. The leader of the team is referred to as the project manager. The project manager's role is similar to a functional manager's responsibility in an organization with regard

to planning, control, and supervision of the work being accomplished. In a project environment, however, the project manager has specific objectives which, when achieved, means the end of the manager's responsibility.

To assist the project manager in the planning, execution, and control of the activities performed in the project, an automated project management tool is provided and must be used. The project management tool is used to develop a project schedule. To facilitate its use, a standardized project schedule template has been developed. The template contains all of the activities[2] to be performed for each phase of the project following the Information Technology methodology. It also lists the lead or responsible individual for each activity. The procedures contained in this standard provide the detail descriptions for each activity documented in the project template. The goal is to assist the project manager in merging the information required to manage the project with the system life cycle acquisition/development standards. The objective is to have a structured output/baseline which can be evaluated to determine the status of the project. The schedule is created in the early part of the project and continuously updated until the system is implemented.

OVERVIEW

These Information Technology methodology procedures provide guidelines for the planning and execution of an orderly software development/acquisition project, utilizing the disciplines of information engineering and configuration management, formal OIMC management decision-making reviews, standard documentation templates, and system, quality assurance, and acceptance testing.

The approach is presented as a series of tasks. Although the tasks are presented sequentially for discussion purposes, they are not, necessarily, performed in strict sequence. Some tasks are performed concurrently and iteratively.

The procedures are divided into two sections: Procedures Section and Documentation Standards Section. The first section contains detailed

---

2 While the template contains all of the activities, it is the project manager's responsibility to tailor the template, that is, select the appropriate activities for the project's size, complexity and risk.

procedures that have be subdivided by system life cycle phase. The second section is devoted to the documentation standards presented in procedures. The documentation standards are identified by tab number so they can be easily located and referenced in the Procedures Section. The reference is made by enclosing the letters SD for 'Standard Document' followed by the tab number within brackets (i.e., [SD1] means Standard Document Tab 1). At the beginning of the Standard Documentation Section, there is a complete list of all the standard documents.

Chapter 1 - Introduction

This chapter is intended to acquaint the reader with the concepts and principles of the IT methodology, with the terminology of the discipline, and the step-by-step process a project undergoes in order to provide the required capability to the user. The step-by-step process is presented in a flowchart and included at the end of the chapter.

Chapter 2 - Planning Phase

The purpose of this chapter is to describe the activities performed in the Planning Phase of the IT process. The principal activities in the Planning Phase are: needs validation, feasibility and cost/benefit analysis, and project planning. The Planning Phase begins when a need is identified and documented in a Needs Statement. Besides documenting the need, the Needs Statement defines at a high level the requirements that must be met to fulfill the need. This statement is reviewed by Division/Unit management and forwarded to OIMC management. OIMC management evaluates the Needs Statement to ensure that the need is clearly defined, validated, sponsored, and beneficial. It also considers whether the need can be satisfied by other current or planned projects and satisfied technically. The results of this evaluation are documented in a Needs Statement Evaluation Report. Following management's review and approval of that report, needs will be prioritized, incorporated into OIMC's budget, and presented to the Information Technology Investment Committee.

As funding becomes available, a Project Leader and Team will be assigned to the project. Working with OIMC management, the team prepares a decomposition of the activities associated with the needs

statement. This decomposition is developed within the context of an existing overall agency framework. The team also prepares a Feasibility Study to evaluate the different alternatives that satisfy the needs in terms of their advantages and disadvantages. In addition, a Cost Benefit Study is prepared which documents the life cycle cost and benefits of each alternative. A Project Management Plan is begun to lay out, among other things, the project's approach and schedule.

Finally, the team prepares a Project Proposal Briefing to summarize the work performed during the Planning Phase. The Team briefs the project's sponsor, OIMC Center Directors, and OIMC management on the results of the work performed. OIMC management in turn keeps the Investment Committee and others as necessary informed on progress and problems.

Chapter 3 - Definition Phase

The purpose of this chapter is to describe the activities performed in the Definition Phase of the IT process. During the Definition Phase, the user's requirements are explicitly defined. These requirements are specified independently of *how* they will be addressed. Based on the detailed requirements, a more realistic estimate of the costs and effort to complete the project is made. The feasibility of the system is determined. A configuration management plan is completed that describes the procedures that will be used to control the changes to the user's needs during the development process.

At the end of the Definition Phase, two reviews are performed. The first review is between the GAO business area users and the analysts who assisted in preparing the requirements and other supporting documentation. This *System Requirements Review* involves the evaluation of the impact that the requirements have on the business area goals and the GAO enterprise. It is intended that this review "lock-in" the requirements and establish the *baseline* upon which the application is built or acquired.

The second review is performed by GAO management. The focus of this review is on the feasibility of completing the project. Factors considered in this review include: costs, benefits, and technical and functional feasibility. A "Go Decision" means that GAO is willing to

commit the required resources to complete the next phase of the project. A "No-go Decision" means the project is terminated. Project approval provides the project team the resources required to complete the next phase of the project, the Analysis Phase.

Chapter 4 - Analysis

The purpose of this chapter is to describe the activities performed in the Analysis Phase of the IT process. The principal activities in the Analysis Phase are: document the detailed decomposition of activities, and develop the system design specification and the database specification. As the resident business expert, the user is asked to work closely with the analyst in modeling the proposed system based on the requirements defined in the Functional Description.

Joint Application Development workshops are held. The information gathered during these workshops is used to construct two system models, namely: the process model and the data model. The process model documents the processes and the flow of the data through the system. The data model records the data requirements for the new system and is the first step in designing the system's database and related files. These system models become the key elements in the System Specification and the Database Specification. Both specification documents are formally reviewed by the user, management, and technical staff at the preliminary design review meeting. The results of the review are used to update and baseline the specifications. Once the update has been completed, a Project Decision Brief is then prepared to provide OIMC management with the information necessary to decide whether to approve/disapprove the project to proceed to the Design phase. The minutes of the meeting are used to update the Project Management Plan. If the project is approved to continue, it moves into the Design Phase. If the project is terminated, the needs sponsor and user are formally notified, a closure statement is written for inclusion in the Project Management Plan, and the plan is saved in the OIMC Technical Library for future reference.

Chapter 5 - Design Phase

The purpose of this chapter is to describe the activities performed in the Design Phase of the IT process. During the Design Phase, the system's

functional requirements are compared to the functional capabilities provided by commercial-off-the-shelf systems. The results are used to determine whether to pursue the acquisition of a commercial-off-the-shelf system to satisfy the user's needs or to proceed with the development effort. If the decision is to acquire an existing commercial-off-the-shelf system, a procurement team is established. The team prepares the required procurement documentation, seeks management's approval and performs the acquisition. If the system is to be built, one of the first activities performed by the project team is to meet with the user(s) to design the user's interfaces with the system. The user's interfaces are simulated or prototyped so that the user can better understand their need. Finally, the process and data models are updated.

The design phase is concluded by a review by the users and management. A critical design review is held with the technical staff and the users in order to baseline the technical design that will be used to satisfy the user's functional requirements recorded in the Functional Description. Management reviews the results of the critical design review so they can decide whether or not to commit the resources to complete the next phase of the project. If the project is approved to continue, it moves into the Development Phase. If the project is terminated, the needs sponsor and user are formally notified, a closure statement is written for inclusion to the Project Management Plan, and the plan is saved in the OIMC Technical Library for future reference.

Chapter 6 - Development Phase

The purpose of this chapter is to describe the activities performed in the Development Phase of the IT process. The principal activities in the Development Phase are programming and testing. Based on the specifications developed in the Design phase, the programmers create the database and generate the source code. A System Test Plan, a Functional Test Plan and a User's Guide are prepared. Both unit and system testing are performed. The implementation activities are planned and documented in the Implementation Plan. The Implementation Plan contains sub-plans that address such areas as training, installation, and data conversion. During the Development Phase, two management reviews are held. The first review, called the Product Review, involves the project staff and users. The purpose of the Product Review is to

establish a baseline of the system that will be implemented in the user's environment. It is performed to ensure that the baselined system satisfies the user requirements that were specified in the Functional Description. The second review, called the End-of-Phase Review, is performed by OIMC management. Management reviews the results of the Product Review meeting and decides whether or not to commit the resources required to complete the Implementation Phase. If the project is terminated, the needs sponsor and user are formally notified, a closure statement is written for inclusion to the Project Management Plan, and the plan is saved in the OIMC Technical Library for future reference.

Chapter 7 - Implementation Phase

The purpose of this chapter is to describe the activities performed in the Implementation Phase of the IT process. The principal activities in the Implementation Phase are: quality assurance testing, system installation, acceptance testing, and system turnover. The Implementation Phase begins when a "Go" decision is made to implement the system. One of the first tasks to occur in this phase is to begin preparation of the Operations Guide. The operations guide is a baselined document that is designed to provide the operations staff with technical information that describes how the system operates and what tasks must be performed to ensure smooth operation.

While the Operations Guide is being prepared, the system is assigned to a System Change Package and installed in the OIMC/OSC's Quality Assurance environment so that the system can be tested and certified for deployment. The Quality Assurance environment is representative of the operational environment that the System Change Package is going to be installed in. The System Change Package is tested by conducting the test scenarios documented in the Functional Tests Plan and other test plans that were prepared during the Development Phase. Problems identified during testing are documented, fixed and retested until the System Change Package passes Quality Assurance testing. *Solutions to problems which require a change to the existing network configuration must be documented in a System Change Request (SCR) and approved by OIMC Management.*

When Quality Assurance testing is successfully completed, the Program Maintenance Guide is prepared and the Project Management Plan is

updated. The Program Maintenance Guide is designed to provide the maintenance programmer with the information necessary to understand the system's structural logic. When these technical documents have been updated and prepared, a Deployment Review is held to baseline and schedule the delivery of the System Change Package. A Project Decision Brief is then prepared to provide management with the information necessary to approve the System Change Package for deployment.

After approval, notifications are sent to users and Network Administrators informing them of the upcoming change. In preparation for the deployment, OIMC/OSC personnel verify that the users' sites are properly configured to receive the System Change Package. The System Change Package is installed at the site and tested both technically and functionally to ensure that it functions as designed. Local management at the site then certifies acceptance of the System Change Package.

After all operational sites have received the System Change Package, any remaining changes are made to system documents and any lessons learned are documented. The Project Management Plan is updated again and the End-of-Project Brief/Paper is prepared for OIMC management, the needs sponsor, and the GAO Executive Committee.

Chapter 8 - Maintenance Phase

The purpose of this chapter is to describe the activities performed in the Maintenance Phase of the IT process. The OIMC/IM&C is responsible for maintaining GAO's system of local area networks and the applications that run on them. No individual may make configuration changes without approval from the OIMC/IM&C. The only exception to this rule is for an emergency changes which is discussed in this chapter.

An application enters the Maintenance Phase of the life cycle when it becomes operational. Once an application is placed into production, it

is continually evaluated[3] to identify problems or enhancements to improve upon the efficiency and/or effectiveness of the application. The procedures outlined here describe why and how an application changes - i.e., they describe the difference between a problem and an enhancement and they detail what can happen to a proposed change, depending on the type of change it is.

A system enhancement is a proposed improvement to the operational system. This can range from an upgrade to an existing commercial software component to adding new, custom functionality. An enhancement can be proposed by a user or OIMC may solicit enhancement suggestions. In either case, enhancement proposals are reviewed to determine whether they can be handled through the system change request process (described further on) or whether they are significant enough that they warrant becoming a project.

An application problem can be of two types: emergency and non-emergency. An emergency means a problem exists which threatens the integrity of the system or which threatens to halt the system inappropriately. A non-emergency problem means a "bug" exists in the existing system and a scheduled fix must be implemented.

In either case, system enhancement or system problem, the system modification is handled through a System Change Request process. System Change Requests are reviewed by OIMC management and can either be approved or disapproved.

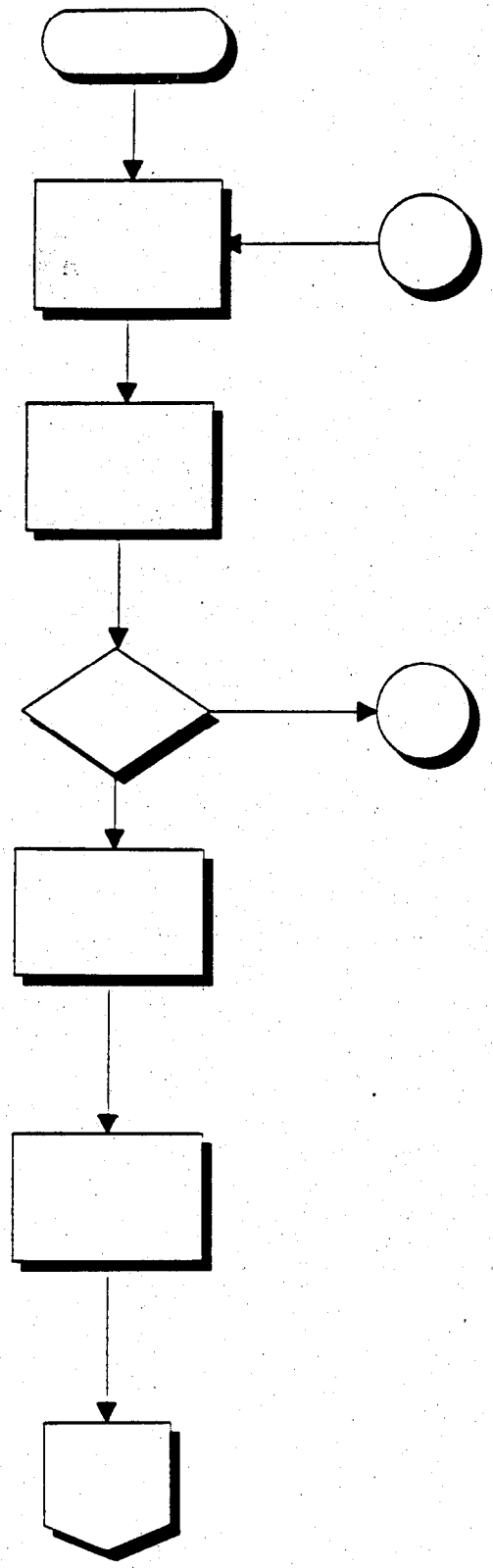
When changes are made to existing systems, it is paramount that components of the IT process detailed in the preceding chapters are met. Existing system documentation must be updated, training issues need to be considered, testing needs to be addressed, etc. Depending on the nature of the change, all baseline documentation should be considered to determine whether or not it is affected by the change.

---

[3] This may be a formal process initiated by OIMC with surveys, etc., or it can be an informal process initiated by an individual.

DOCUMENTATION CHANGES

OIMC management is responsible for the maintenance of this document. Recommended changes should be addressed to Susan Bean, OIMC/ATG for consideration. The changes are presented to ACG/IM&C for approval. Comments and suggestions are welcomed.



Information Technology

Process Flow

Version 3
November 11, 1997

INFORMATION TECHNOLOGY PROCESS FLOWS

INTRODUCTION

The purpose of the process flows is to document the process and information that is used by OIMC to ensure that information technology (IT) projects are being implemented at acceptable costs, within reasonable and expected time frames, and are contributing to tangible, observable improvements in GAO mission performance. The process flows institutionize the activities that must be performed in order to select the best technology solutions to satisfy the user within a specified time frame and within the projected costs. The process provides a means whereby the costs, risks, and benefits can be analyzed early on so that senior management decisions can be driven by accurate, up-to-date information.

The process flows are divided into the seven phases of the IT life cycle, namely: Planning, Definition, Analysis, Design, Development, Implementation, and Maintenance. In the procedures, a chapter is devoted to each phase in which a detailed description of the major activities is provided. The process flows provide an overall picture of the IT life cycle process. Below is a table of contents that can be used to find the various activities performed in the IT process.

Page

PLANNING PHASE

DEFINITION PHASE

ANALYSIS PHASE

DESIGN PHASE

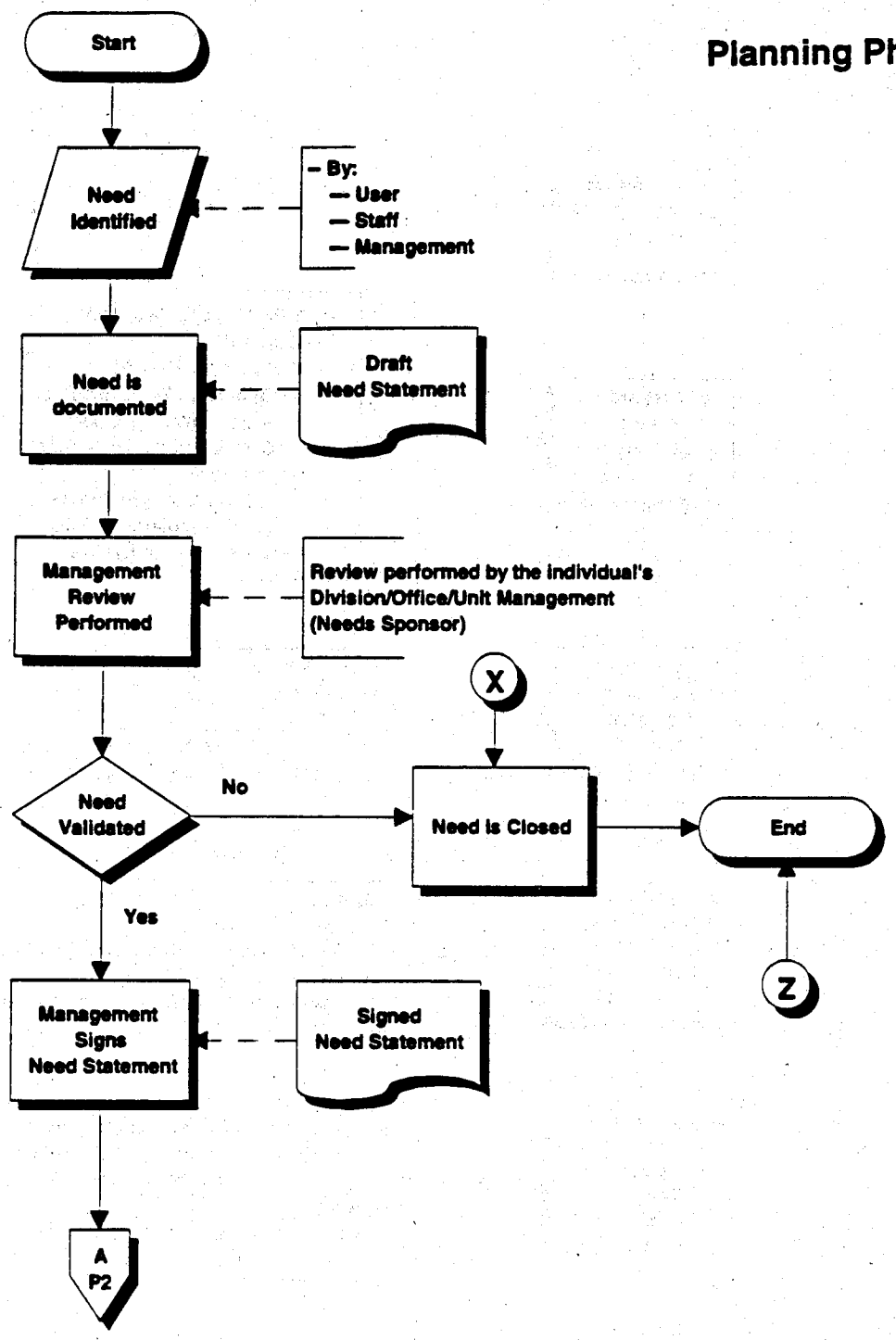
DEVELOPMENT PHASE

IMPLEMENTATION PHASE

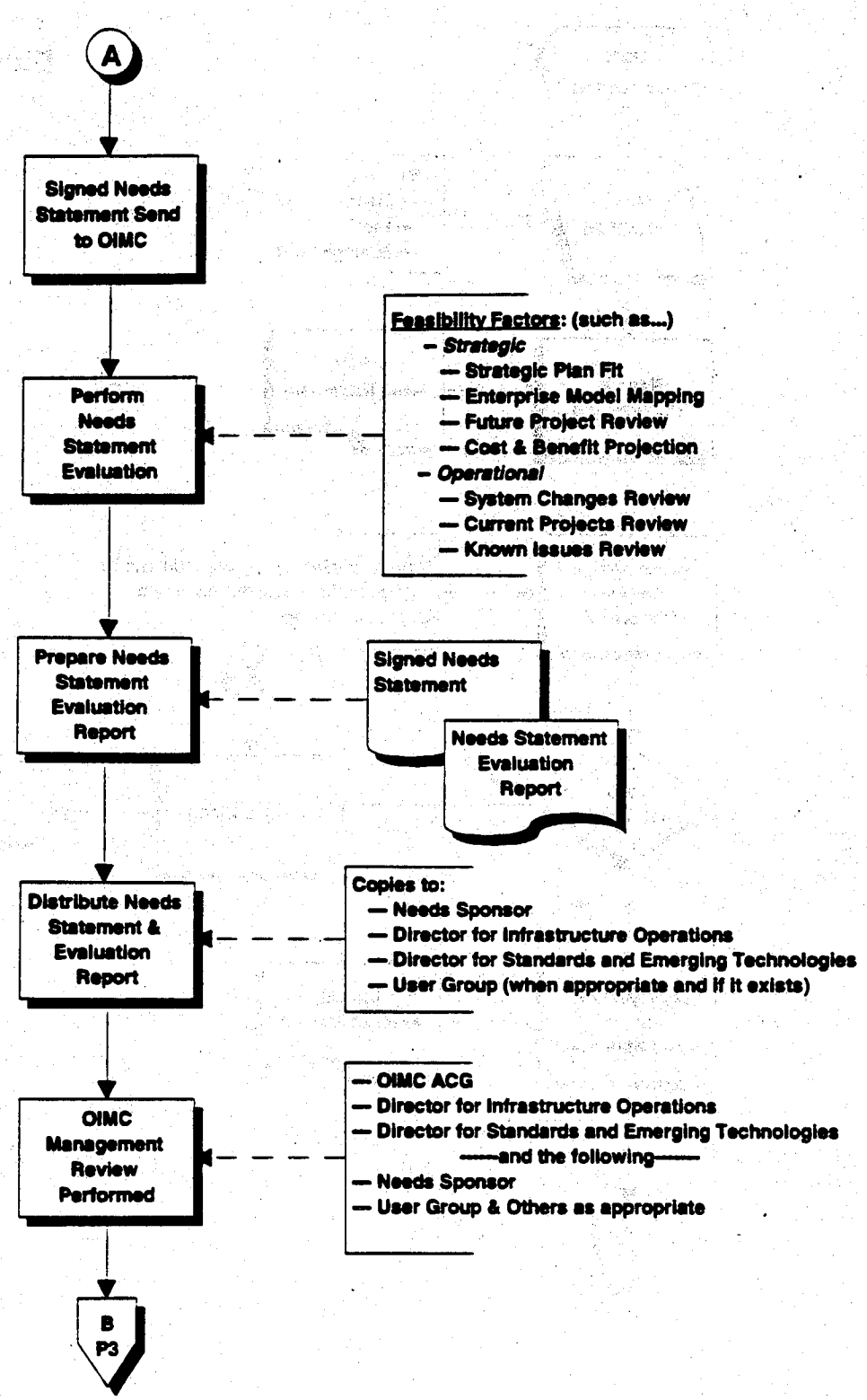
MAINTENANCE PHASE

Information Technology Methodology

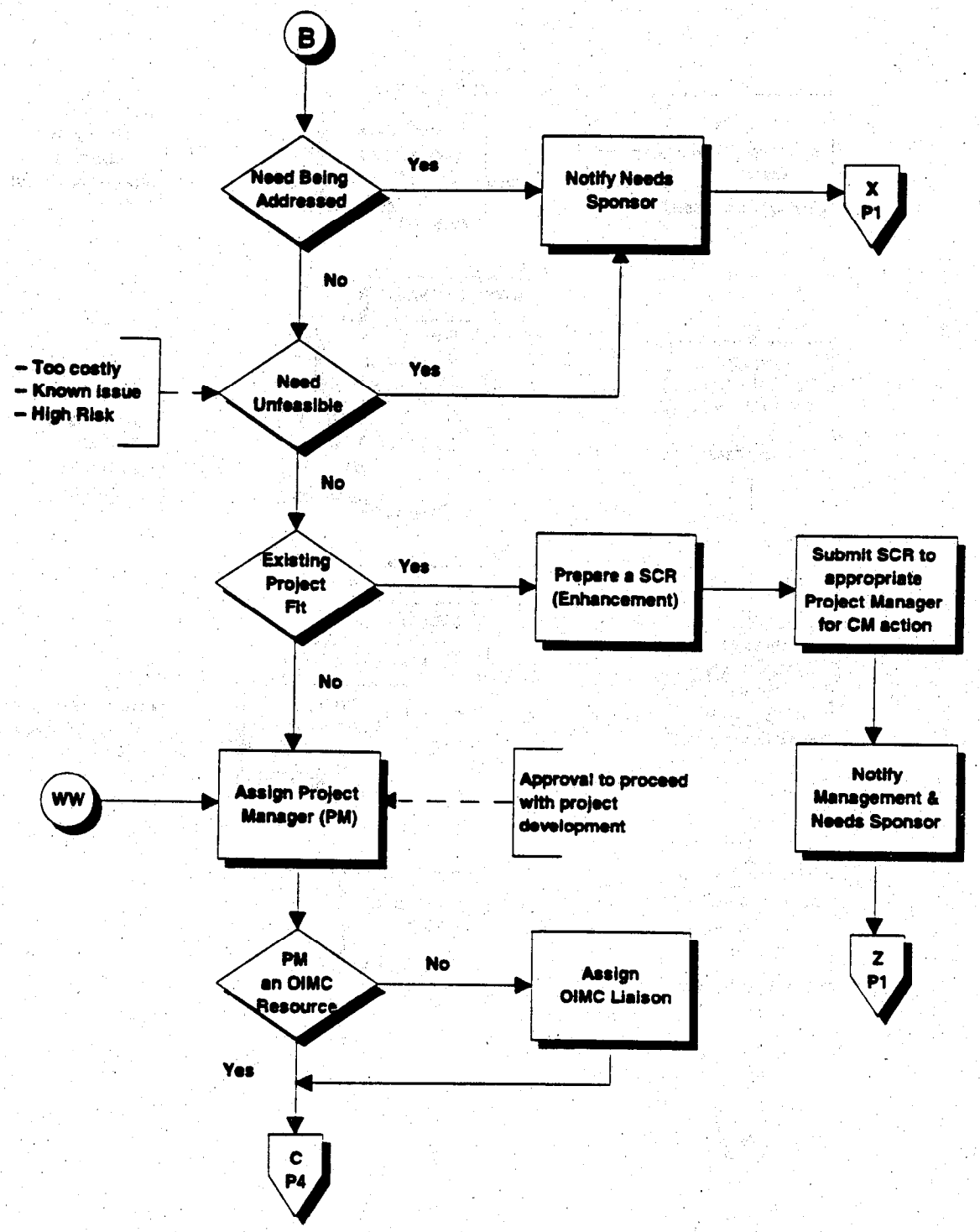
Planning Phase



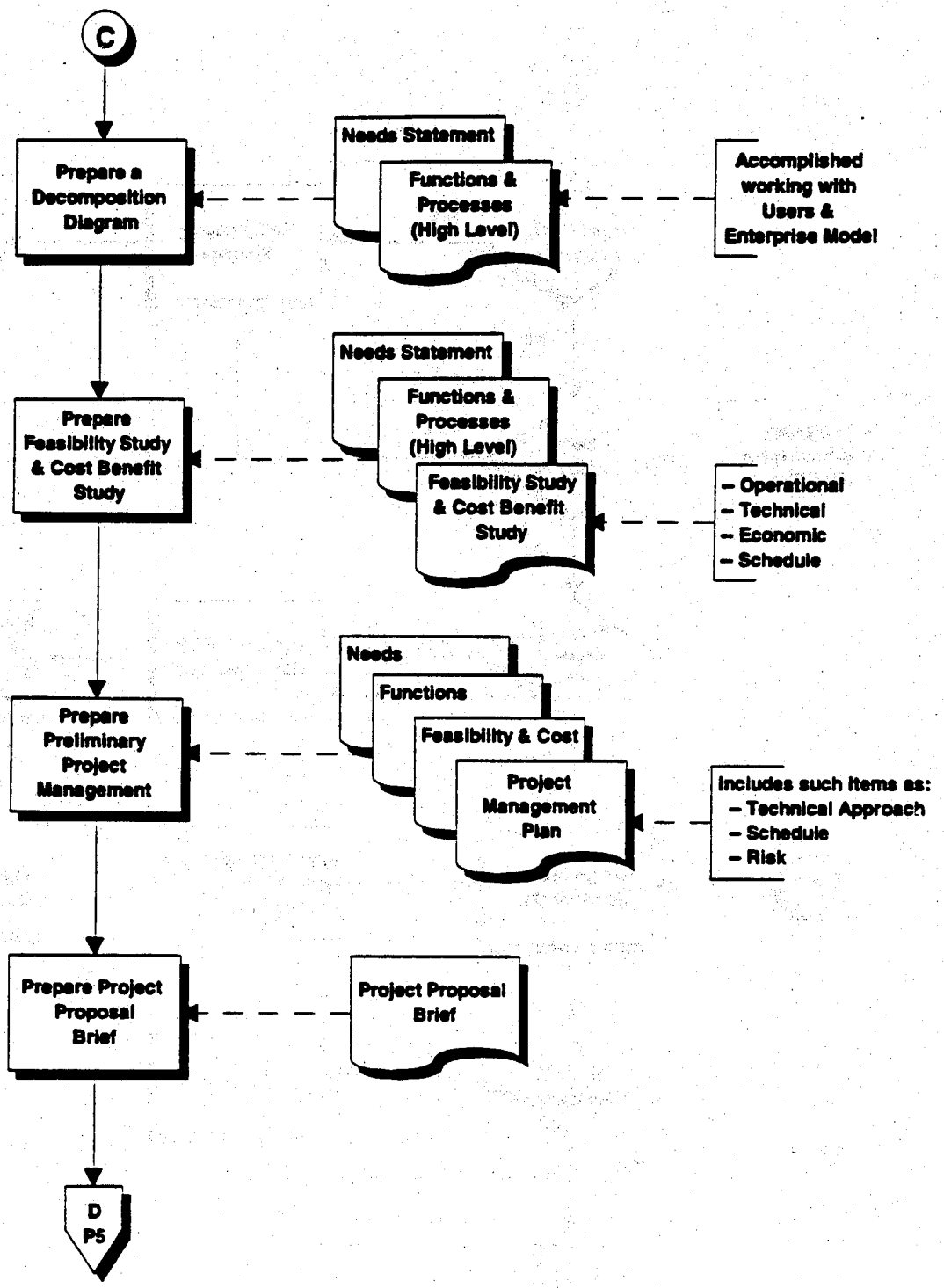
Planning Phase



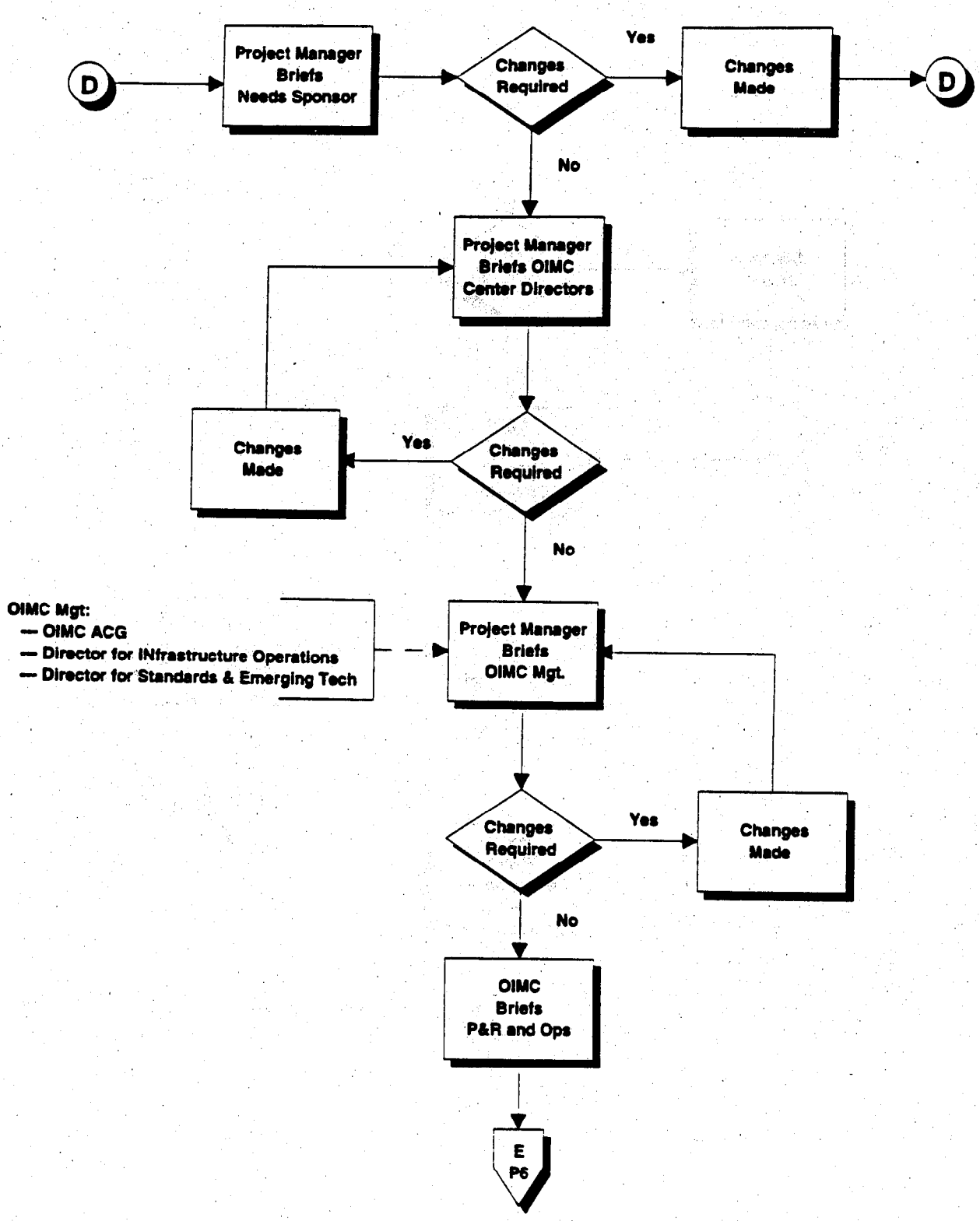
Planning Phase



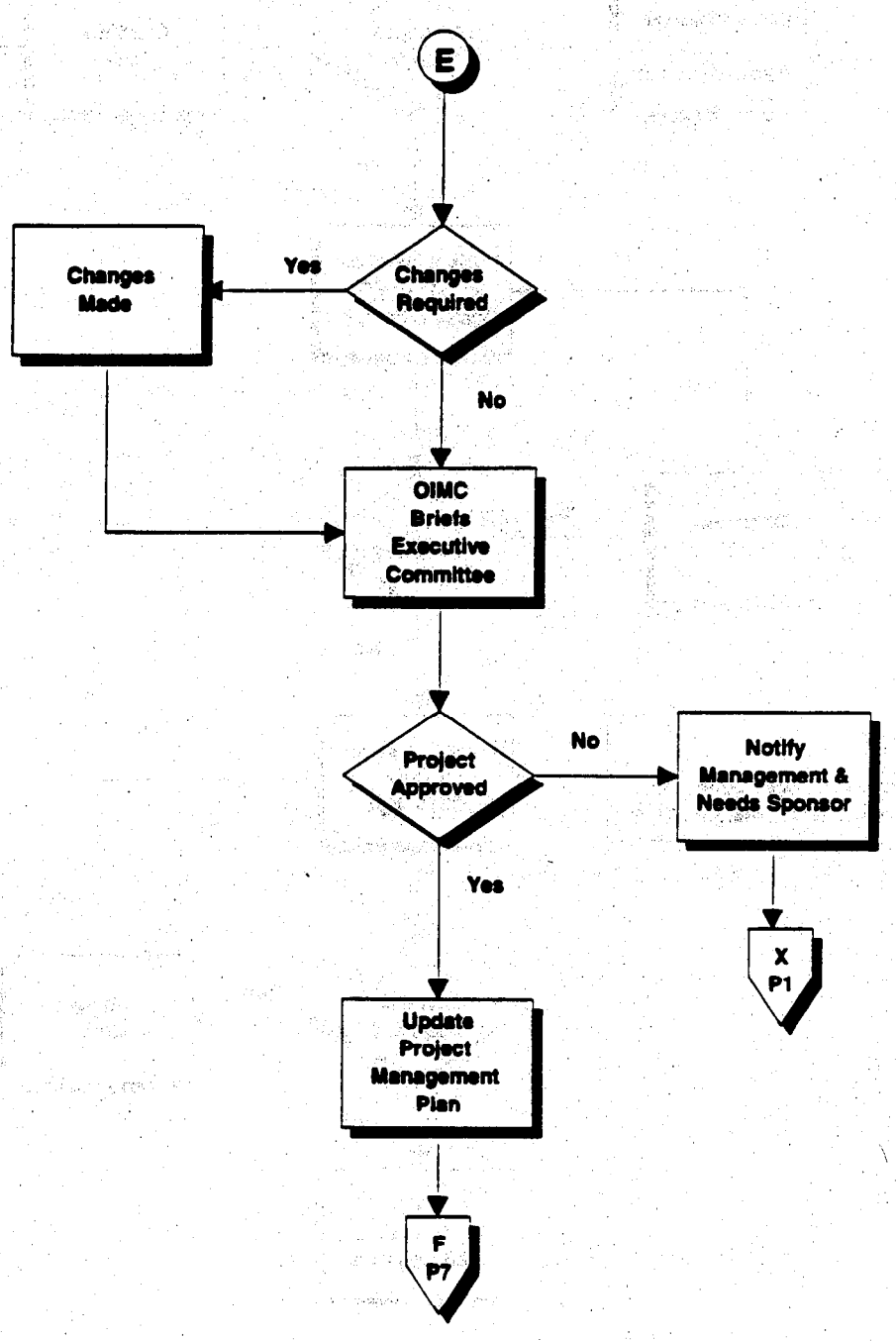
Planning Phase



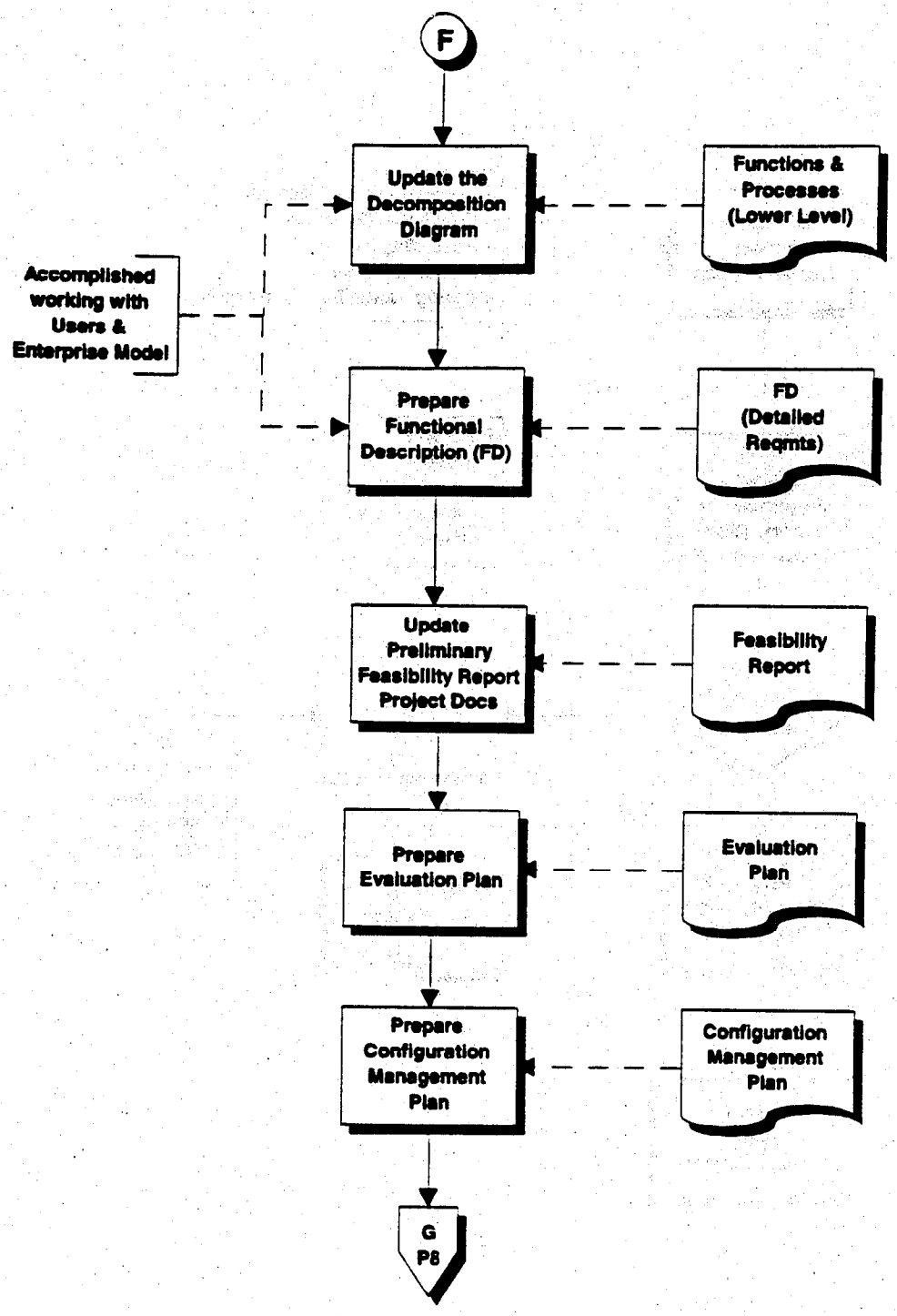
Planning Phase



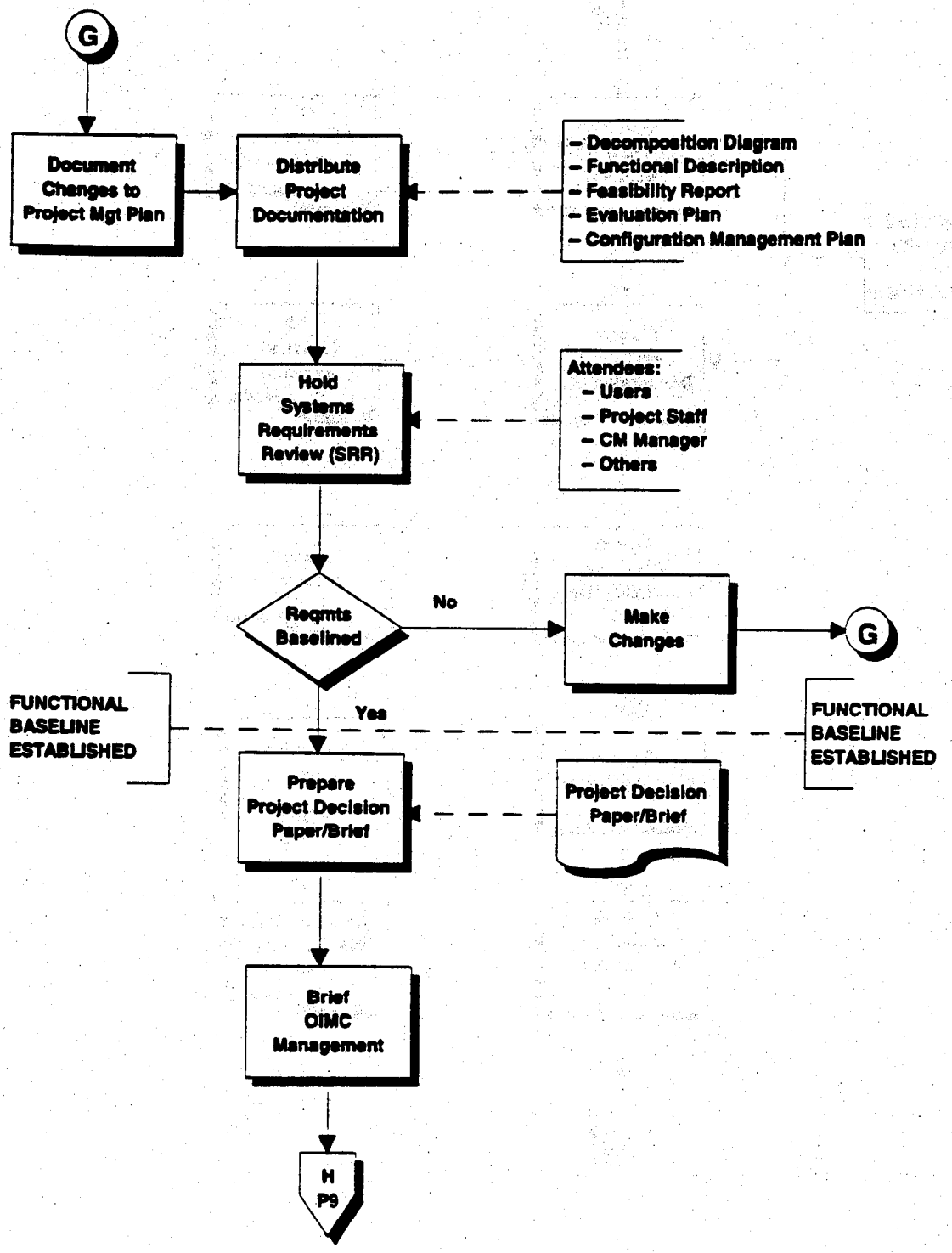
Planning Phase

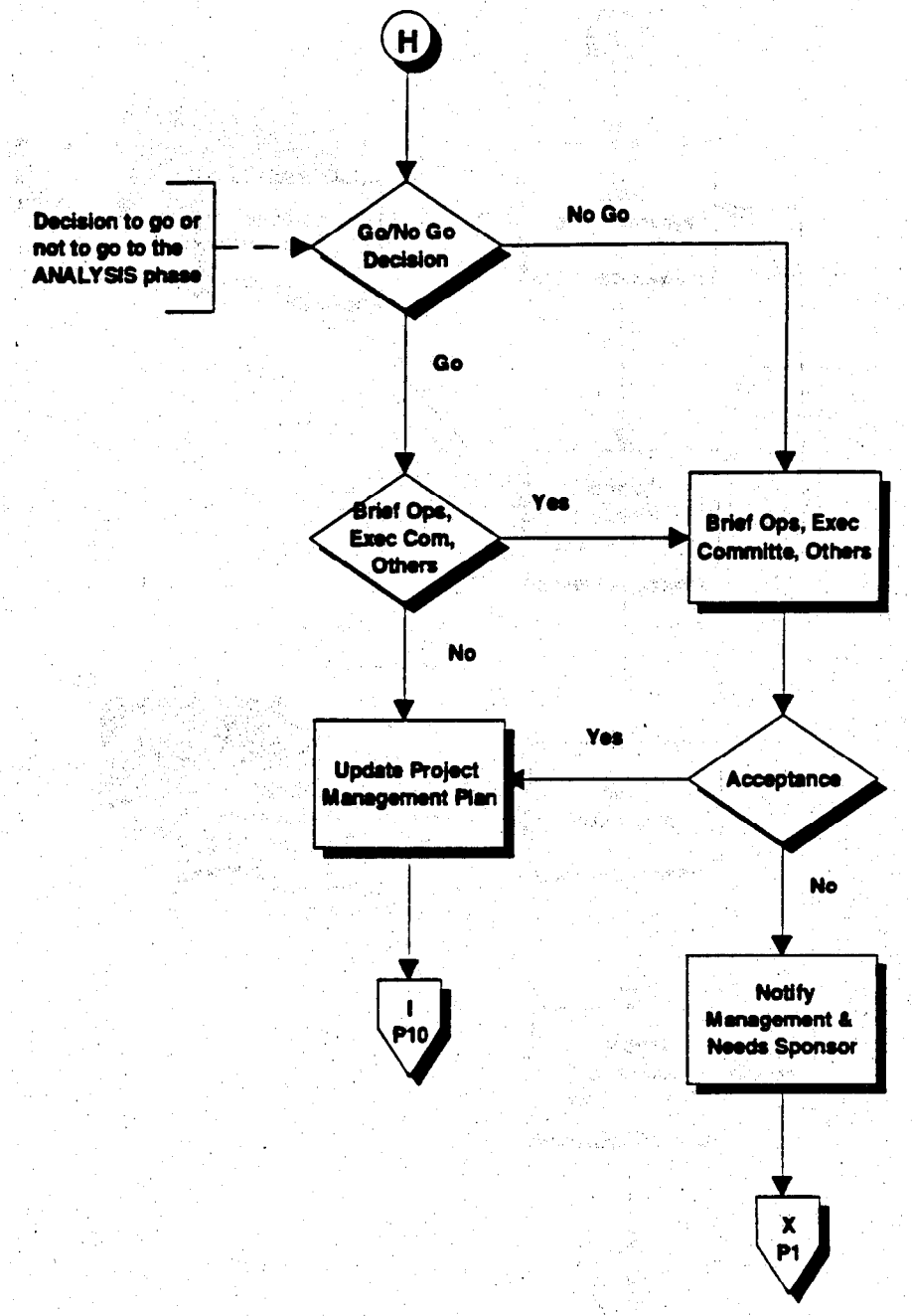


Definition Phase

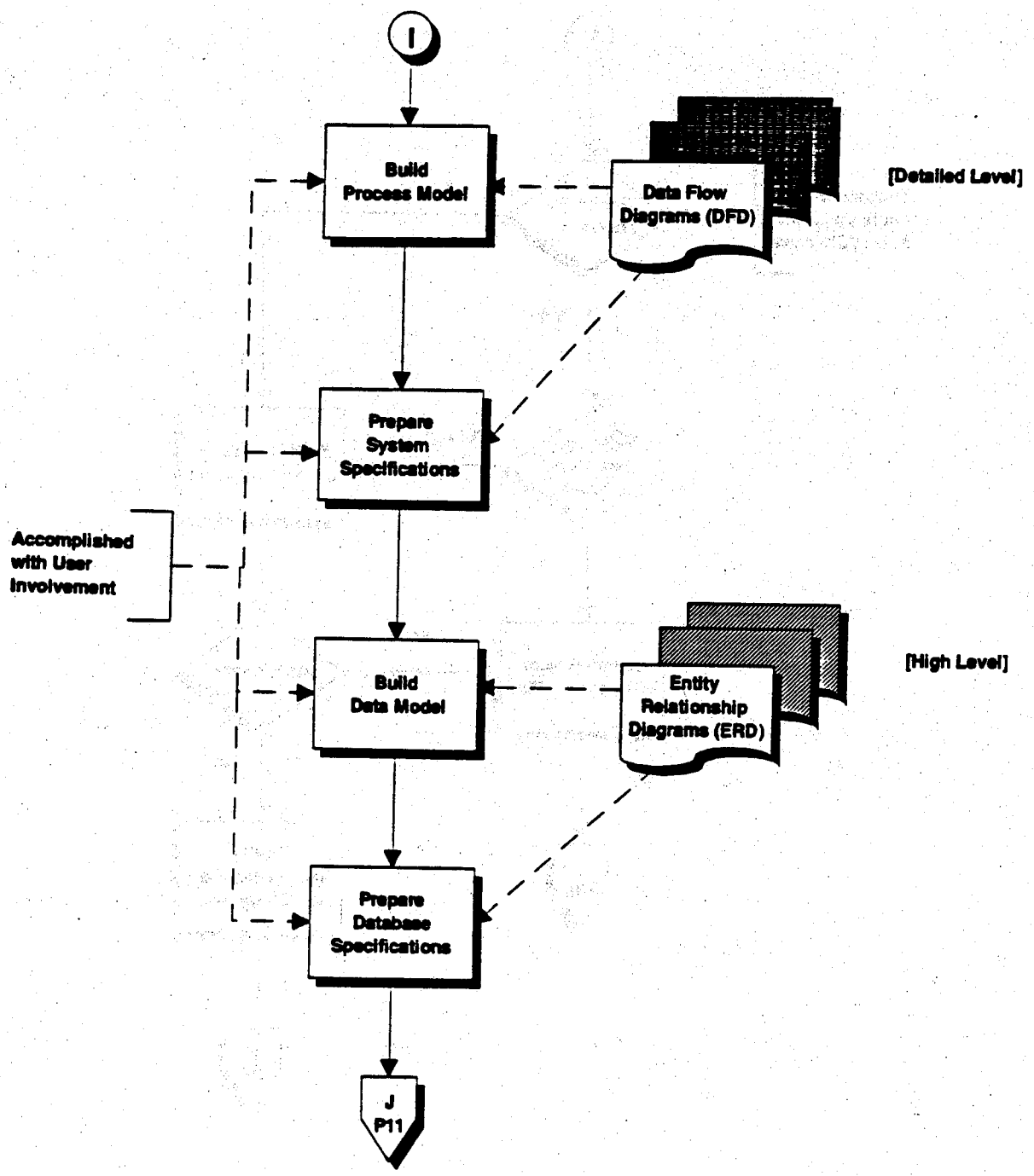


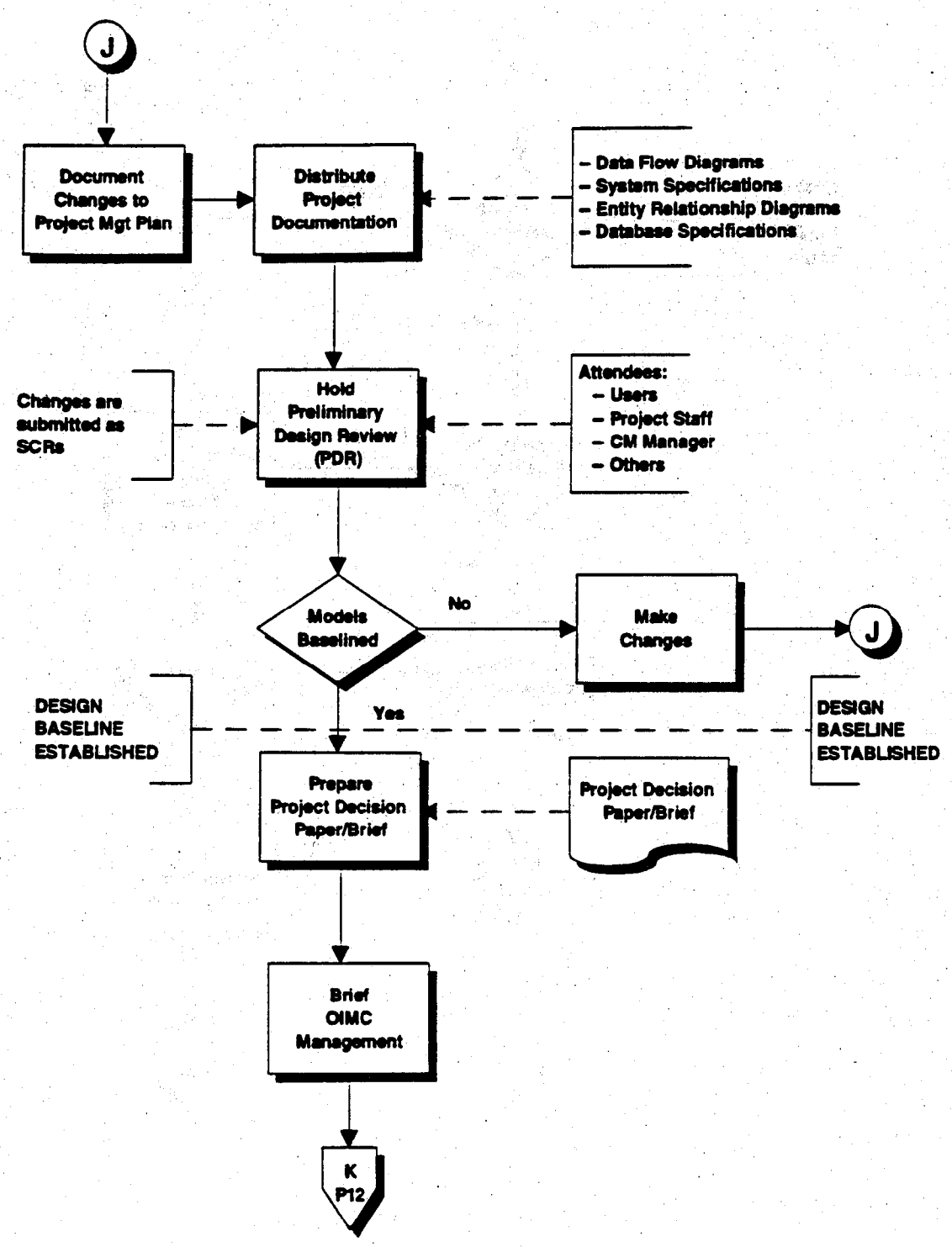
Definition Phase



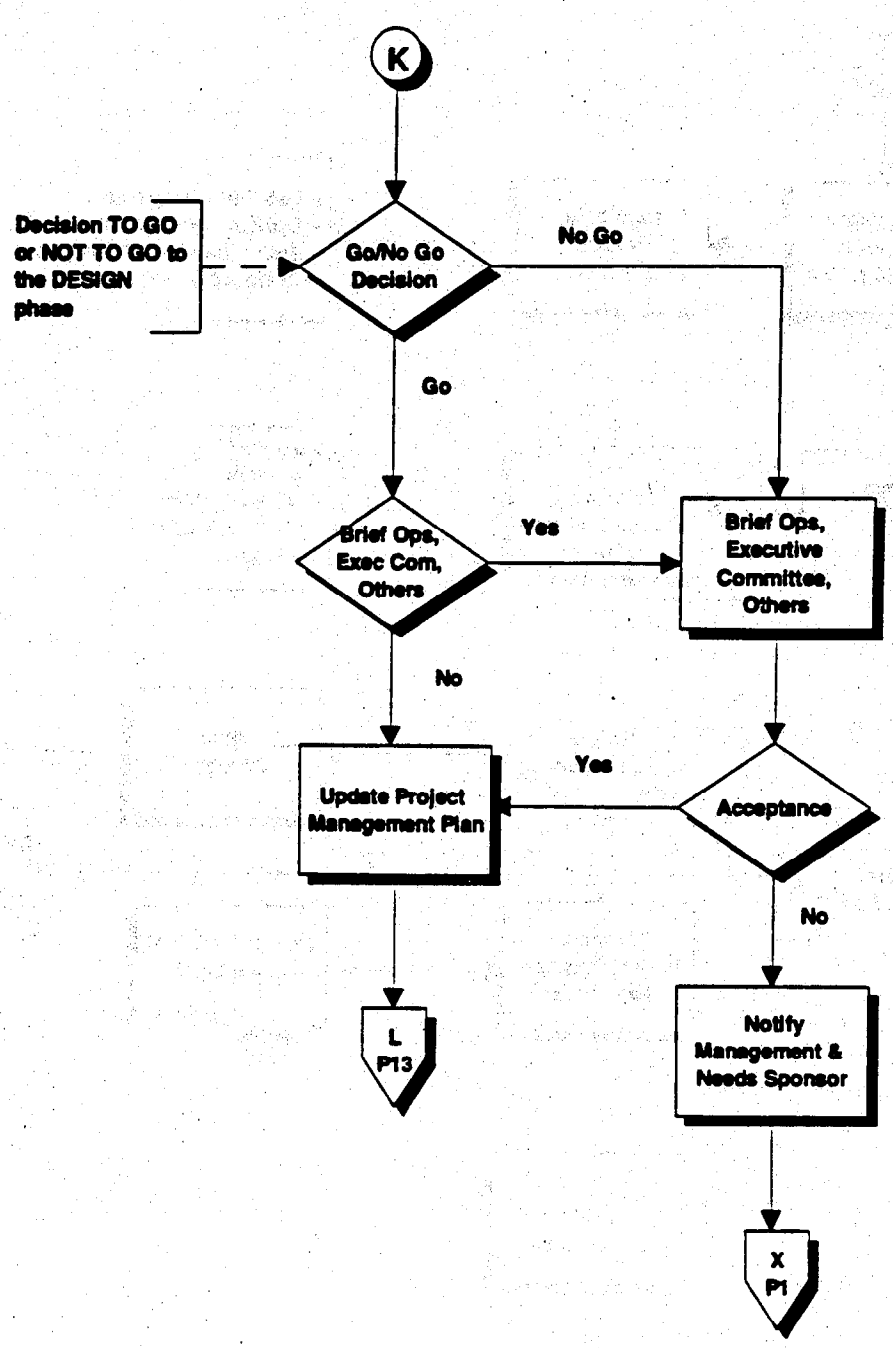

H
Decision to go or not to go to the ANALYSIS phase
Go/No Go Decision
No Go
Go
Brief Ops, Exec Com, Others
Yes
Brief Ops, Exec Committe, Others
No
Update Project Management Plan
Yes
Acceptance
No
I
P10
Notify Management & Needs Sponsor
X
P1

Analysis Phase

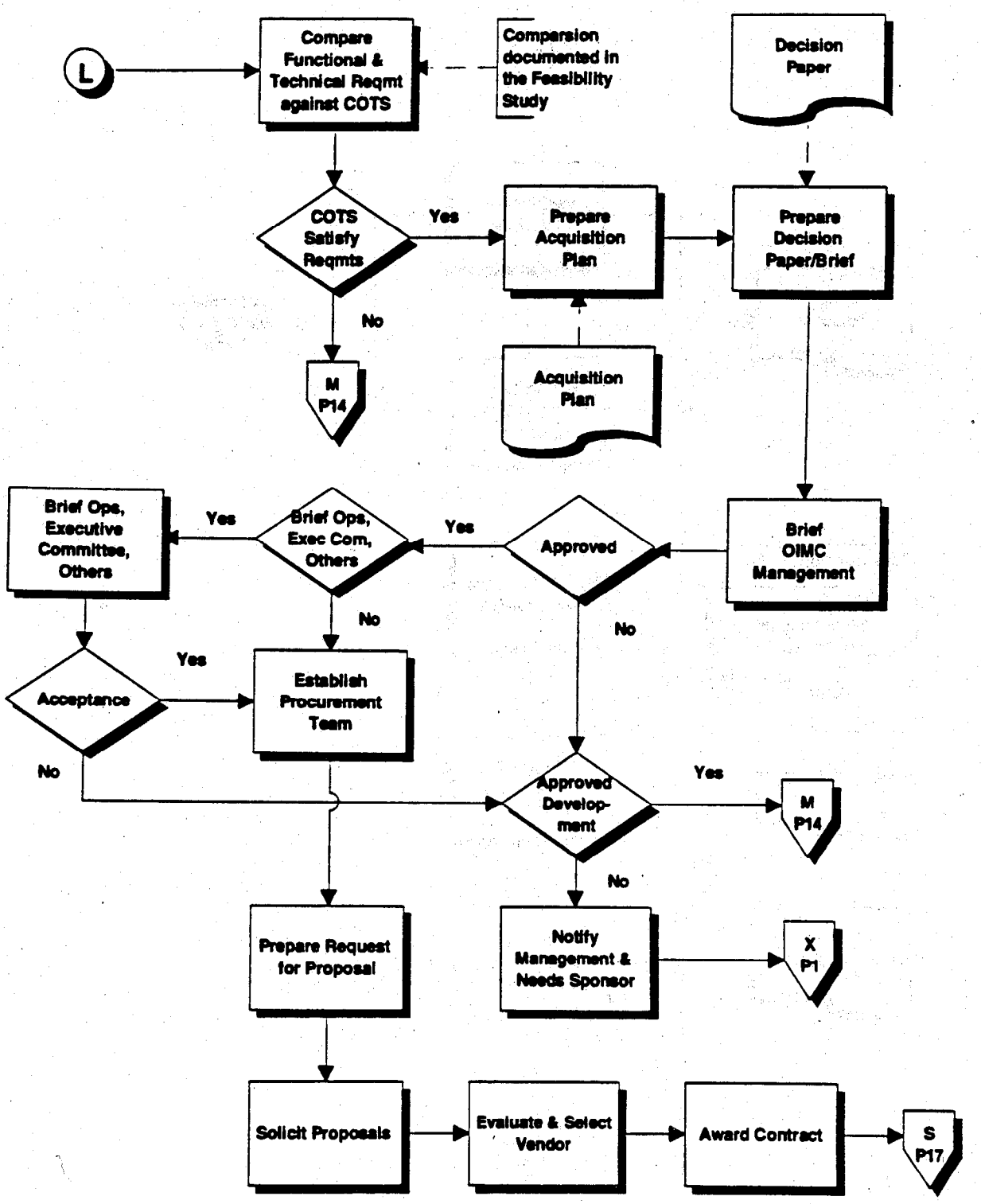



J
Document Changes to Project Mgt Plan
Distribute Project Documentation
- Data Flow Diagrams
- System Specifications
- Entity Relationship Diagrams
- Database Specifications
Changes are submitted as SCRs
Hold Preliminary Design Review (PDR)
Attendees:
- Users
- Project Staff
- CM Manager
- Others
Models Baselined
No
Make Changes
J
DESIGN BASELINE ESTABLISHED
Yes
DESIGN BASELINE ESTABLISHED
Prepare Project Decision Paper/Brief
Project Decision Paper/Brief
Brief OIMC Management
K
P12

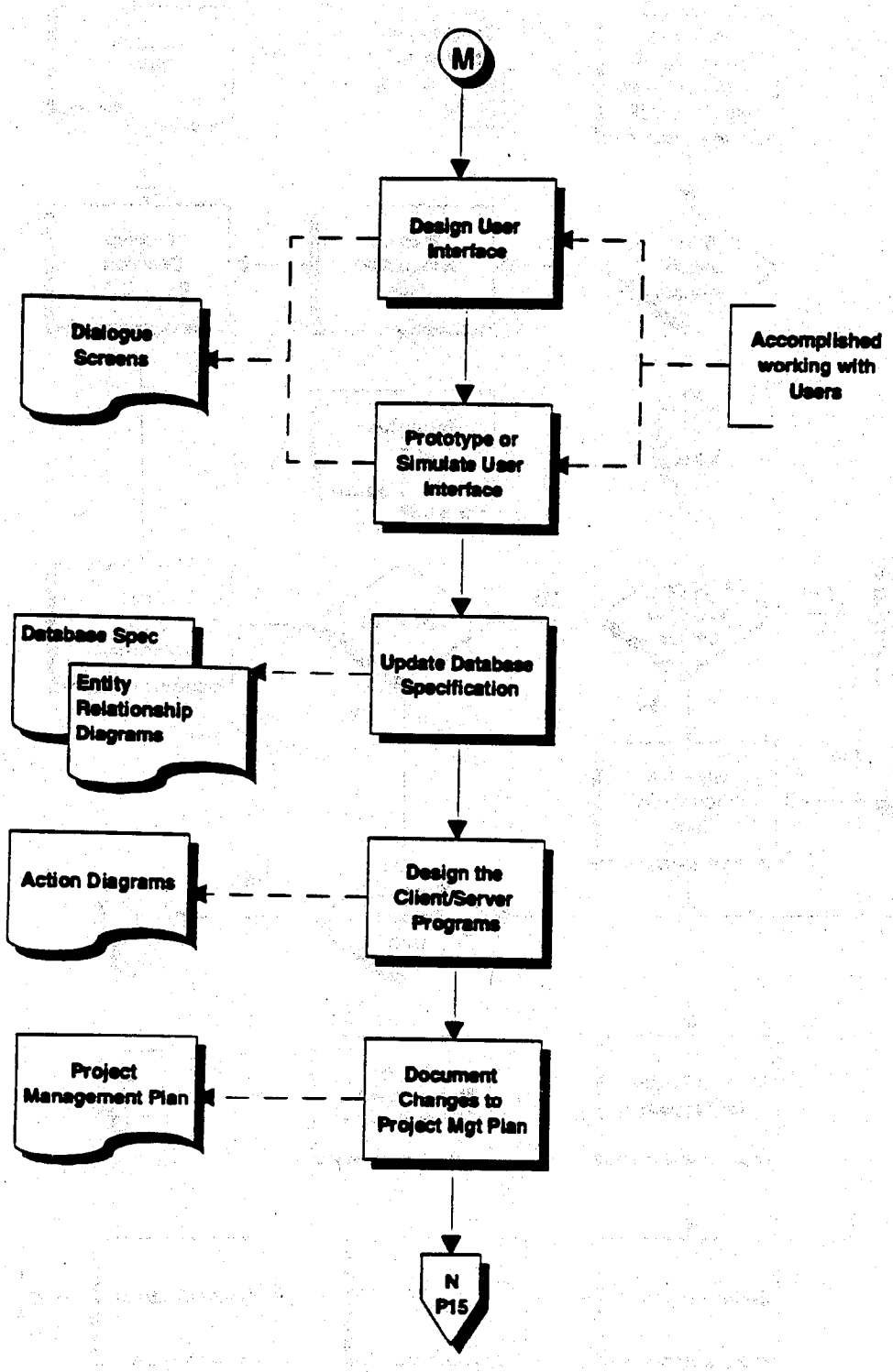
Analysis Phase



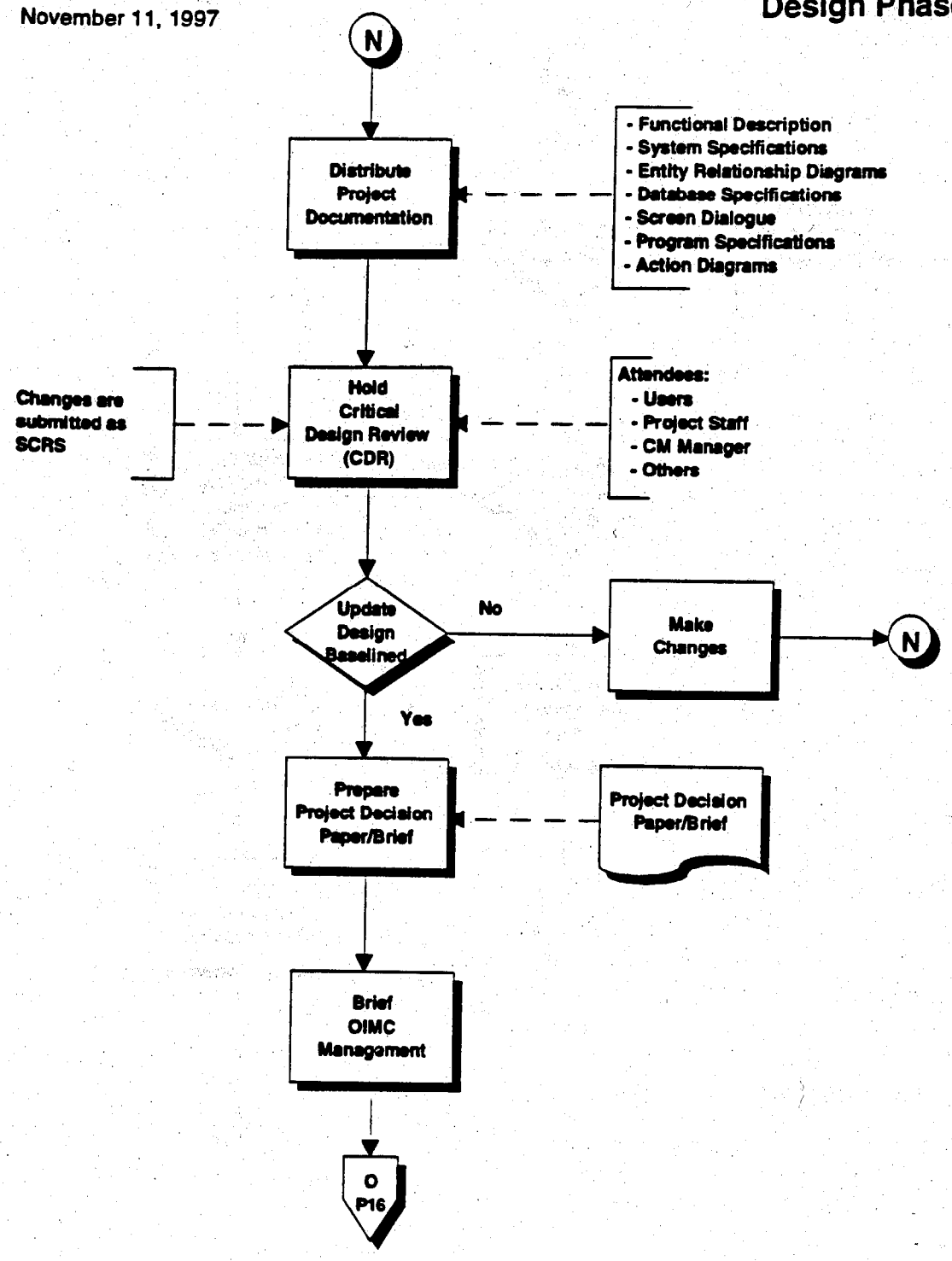
Design Phase



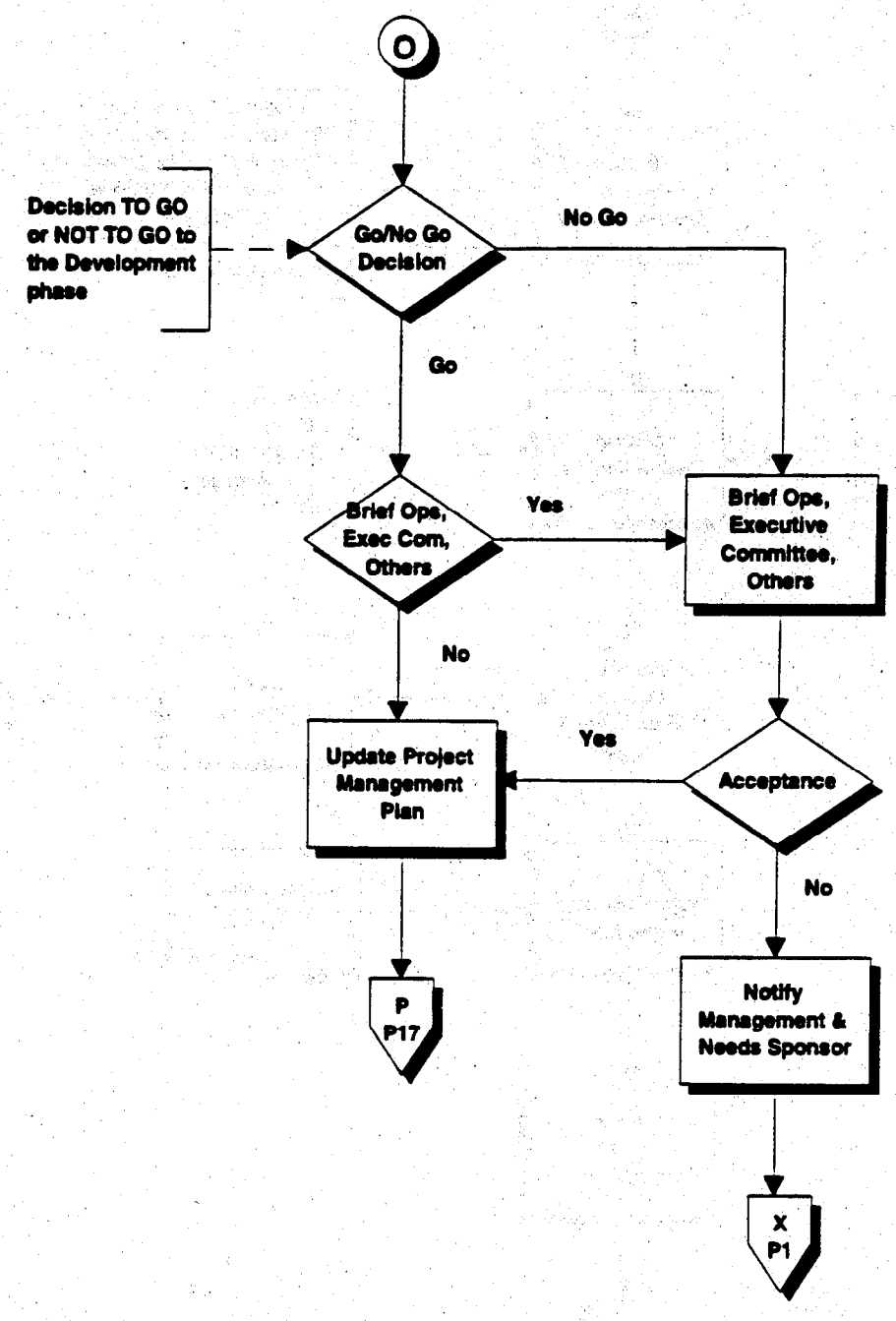
Design Phase



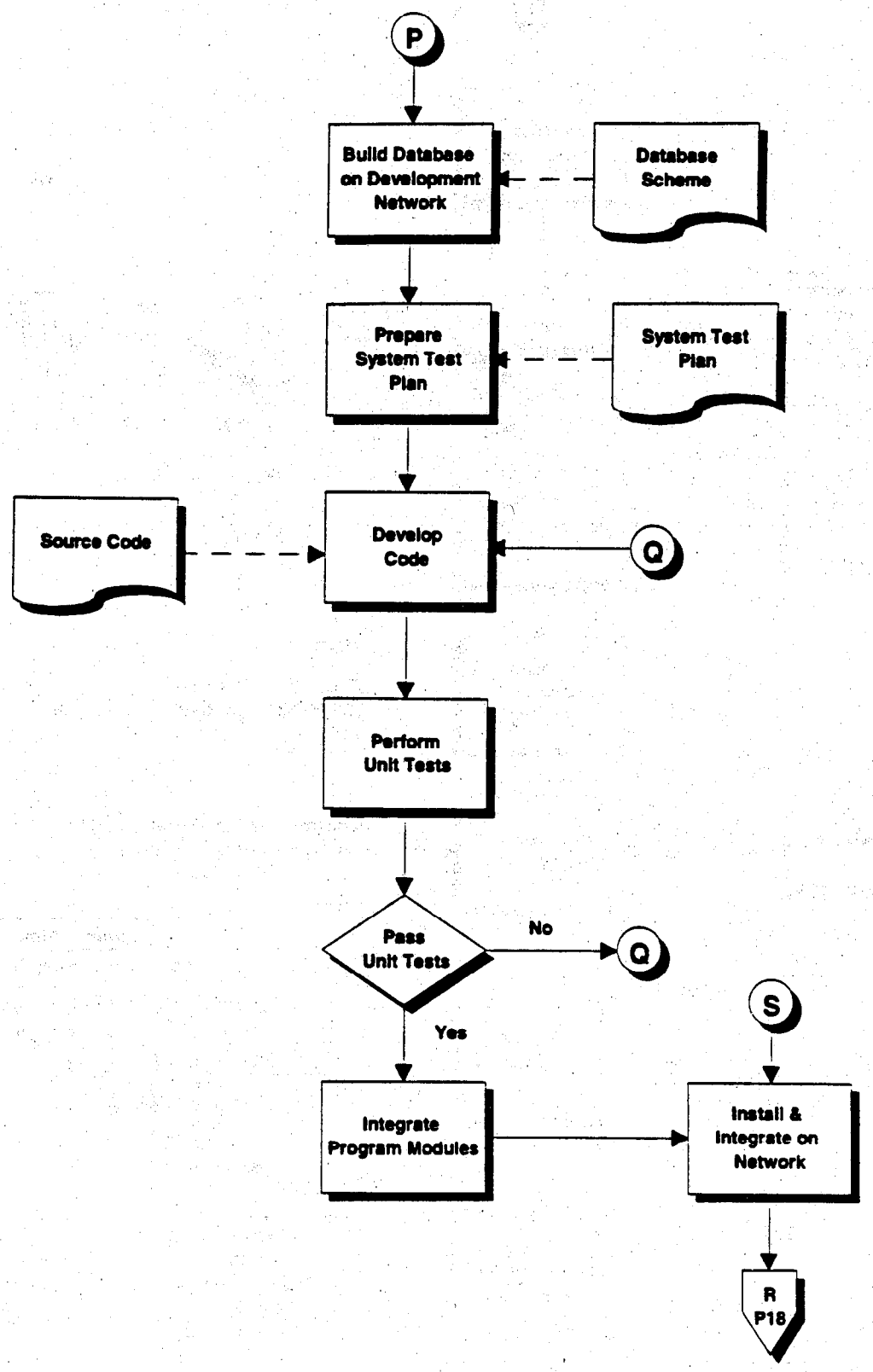
Design Phase



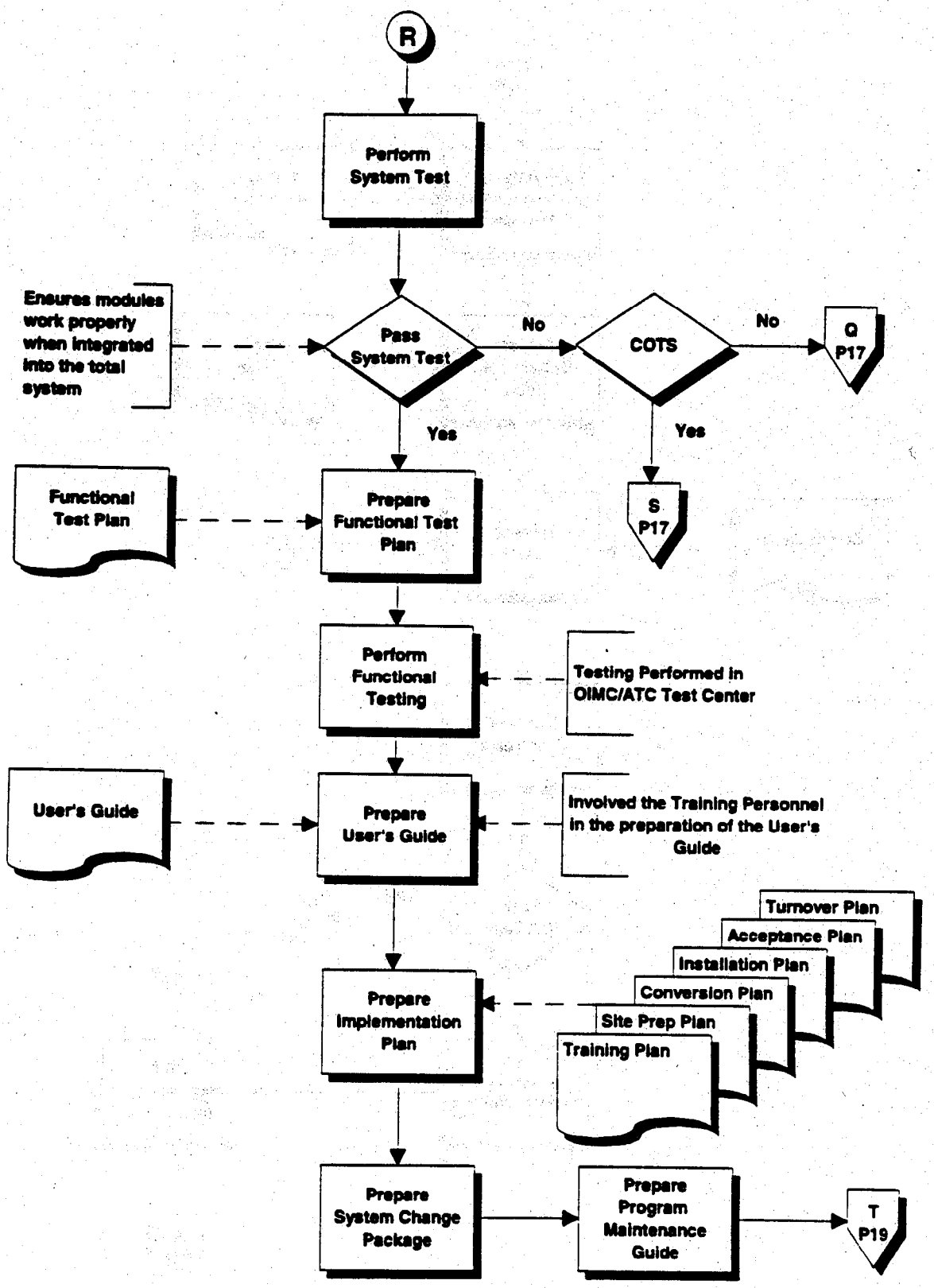
Design Phase



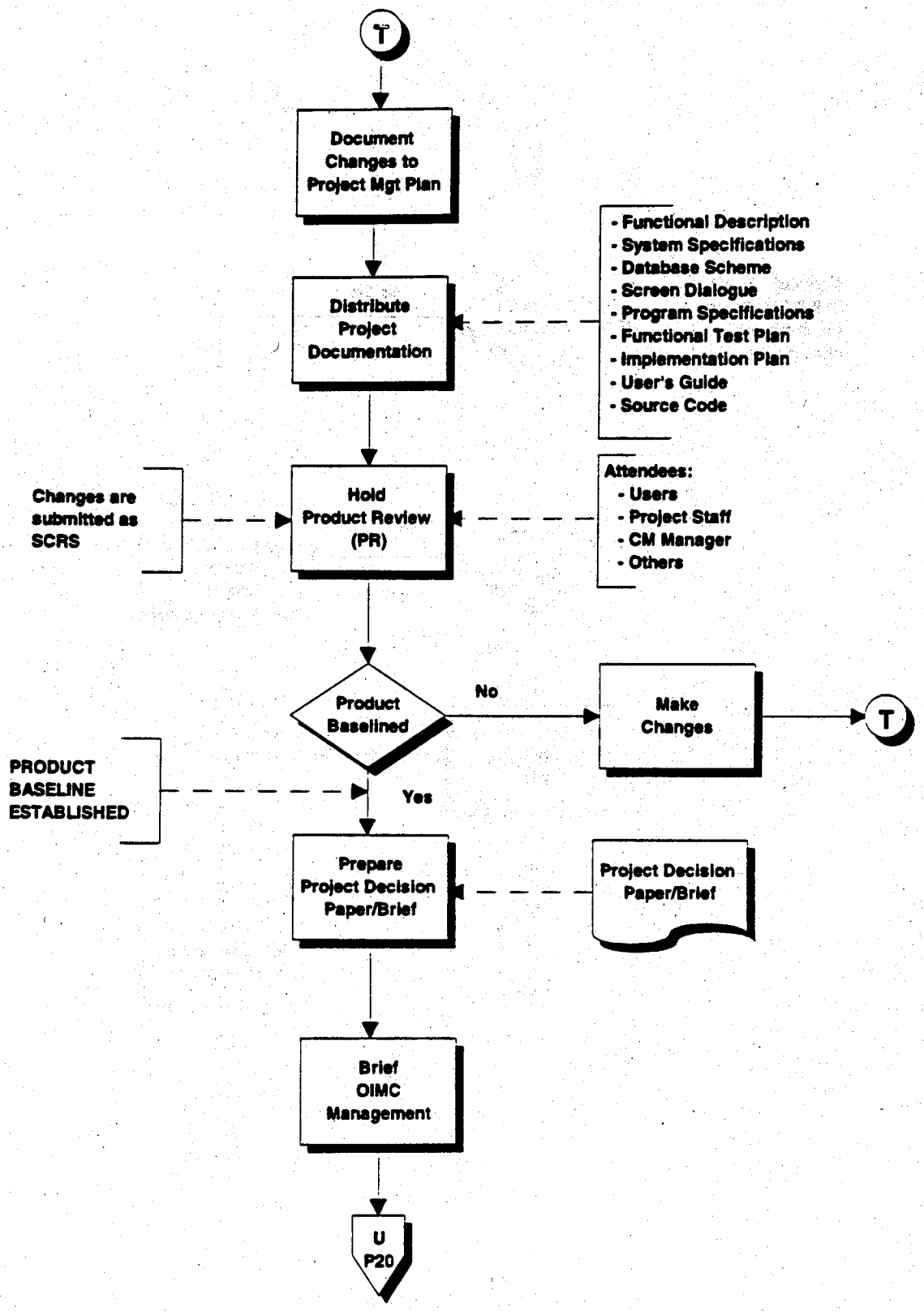
Development Phase



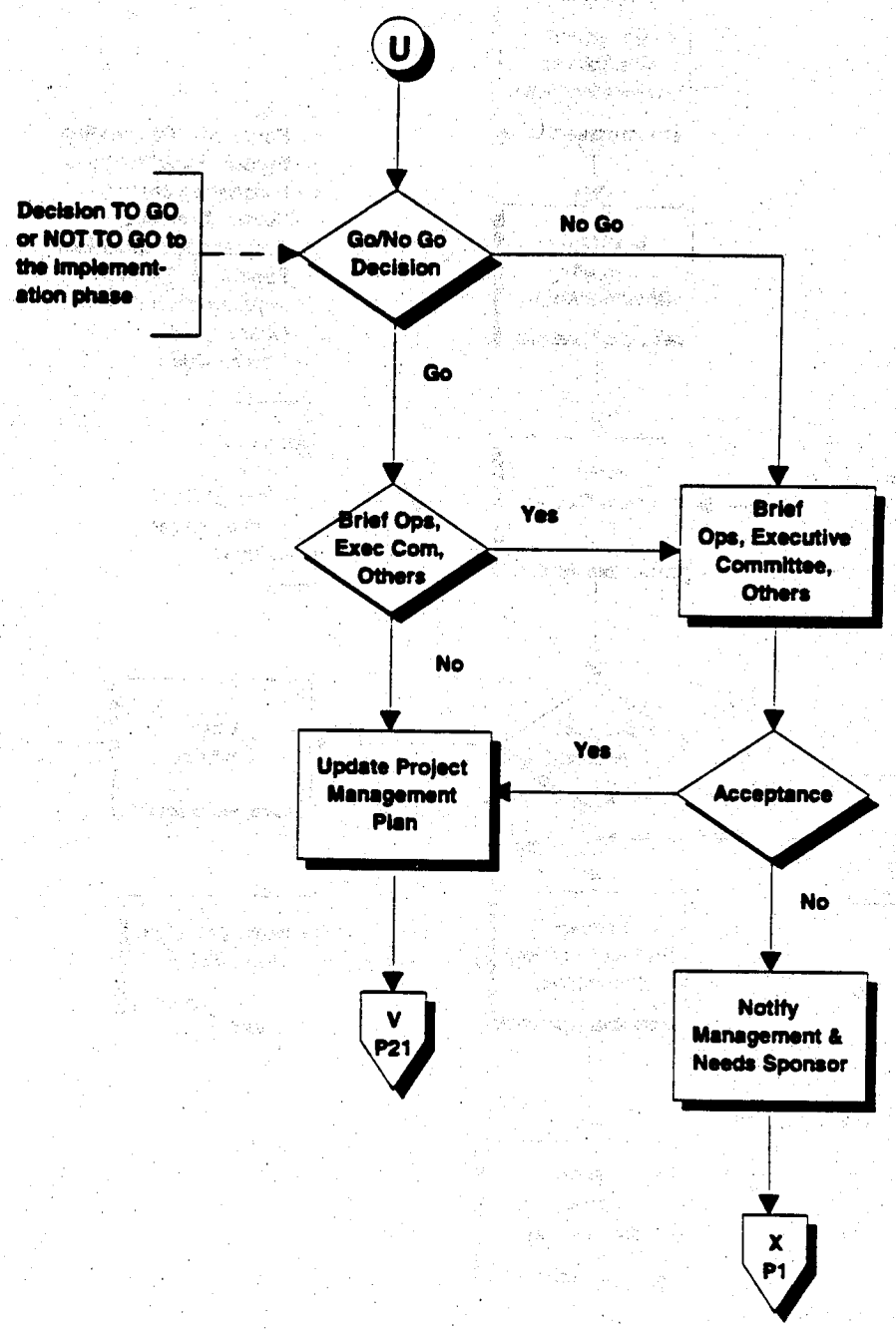
Development Phase



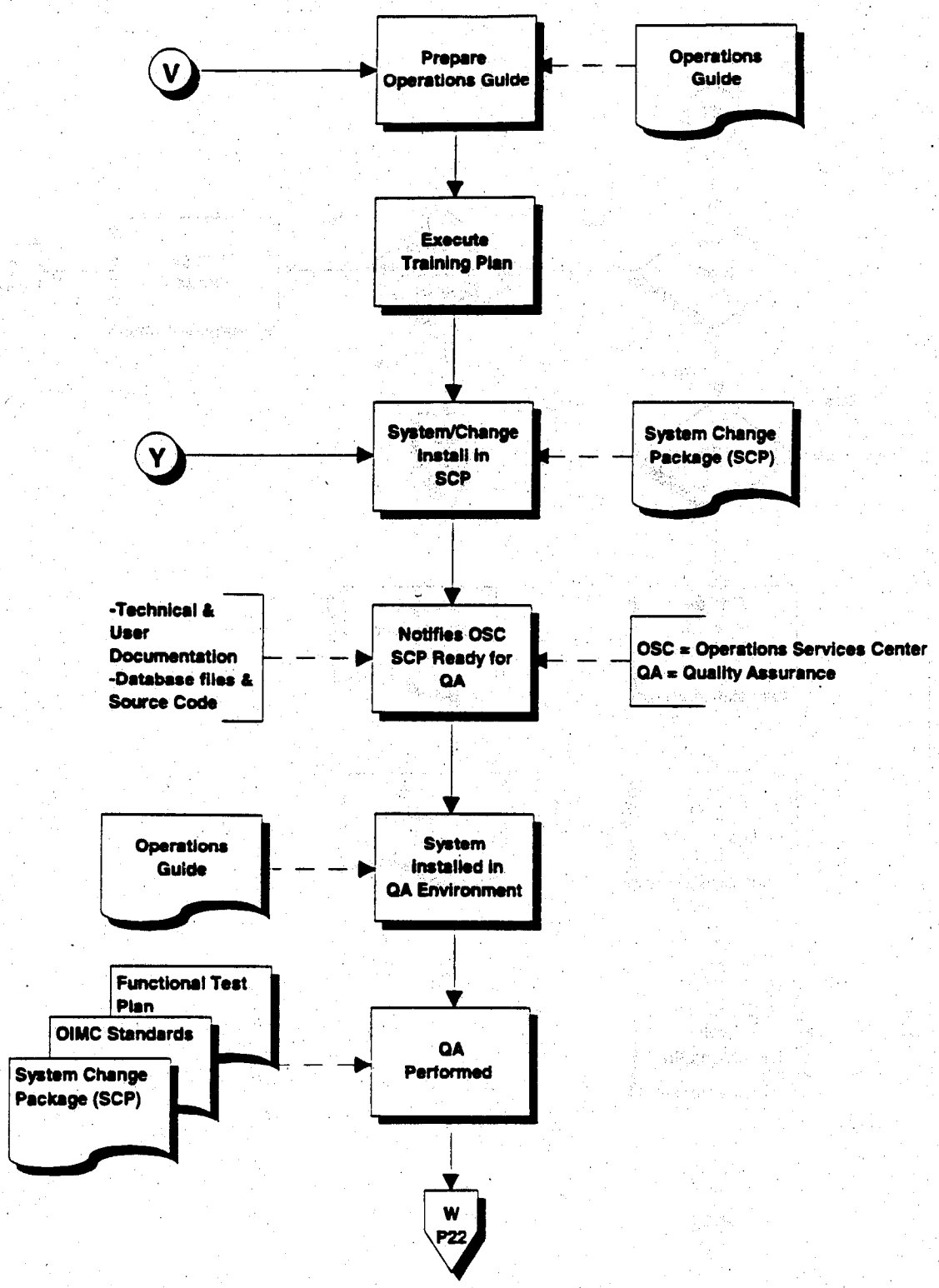
Development Phase



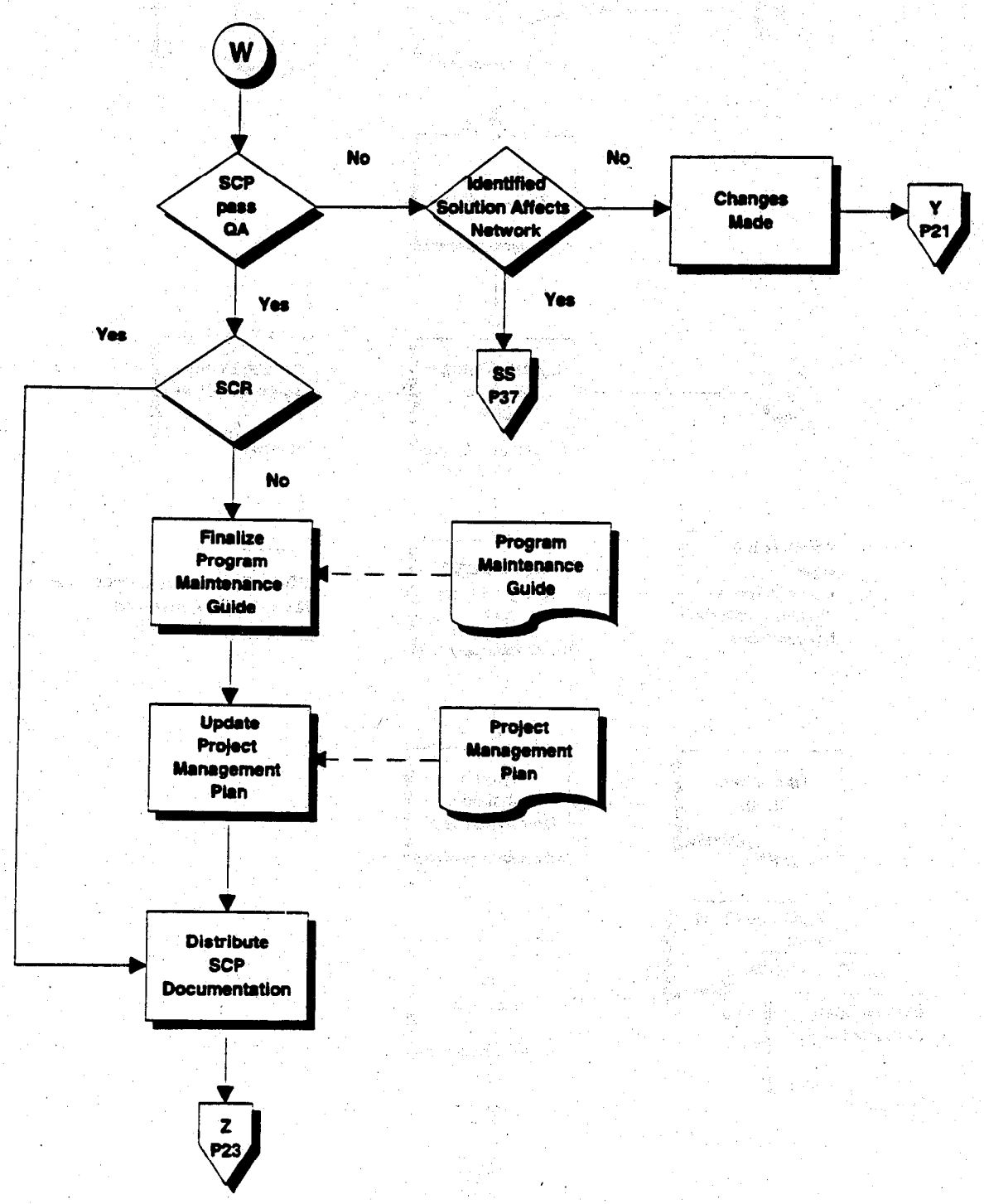
Development Phase



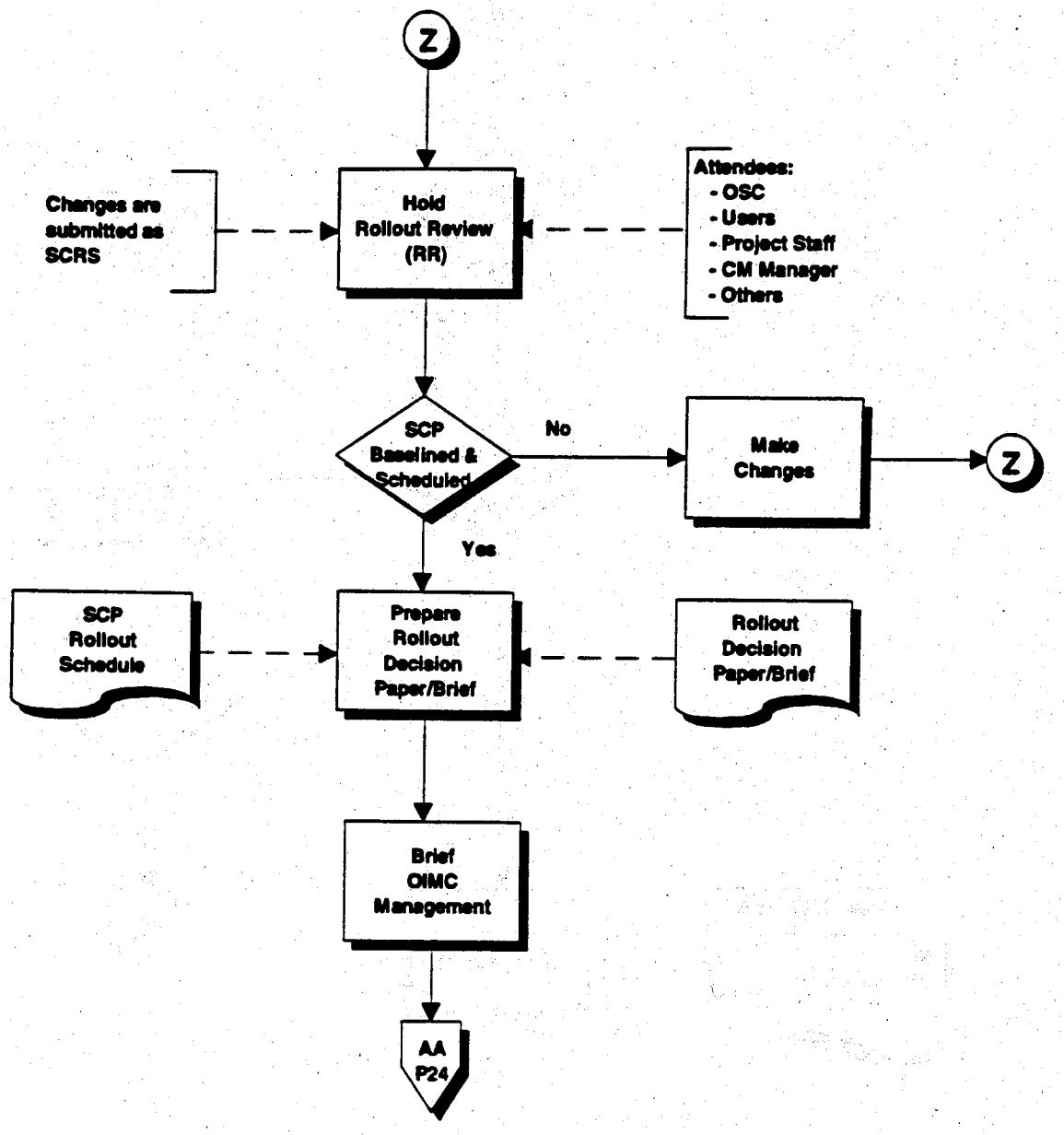
Implementation Phase



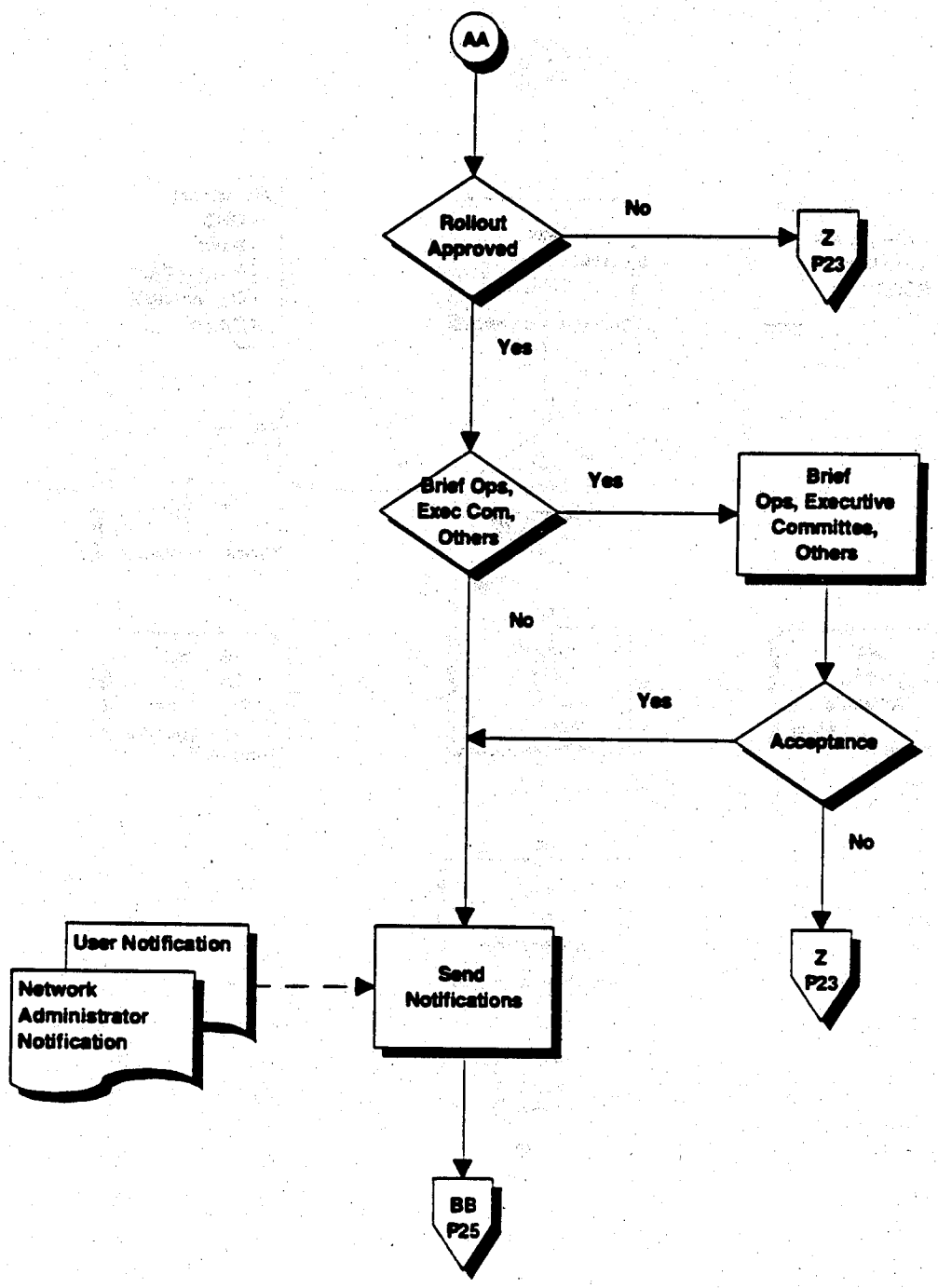
Implementation Phase



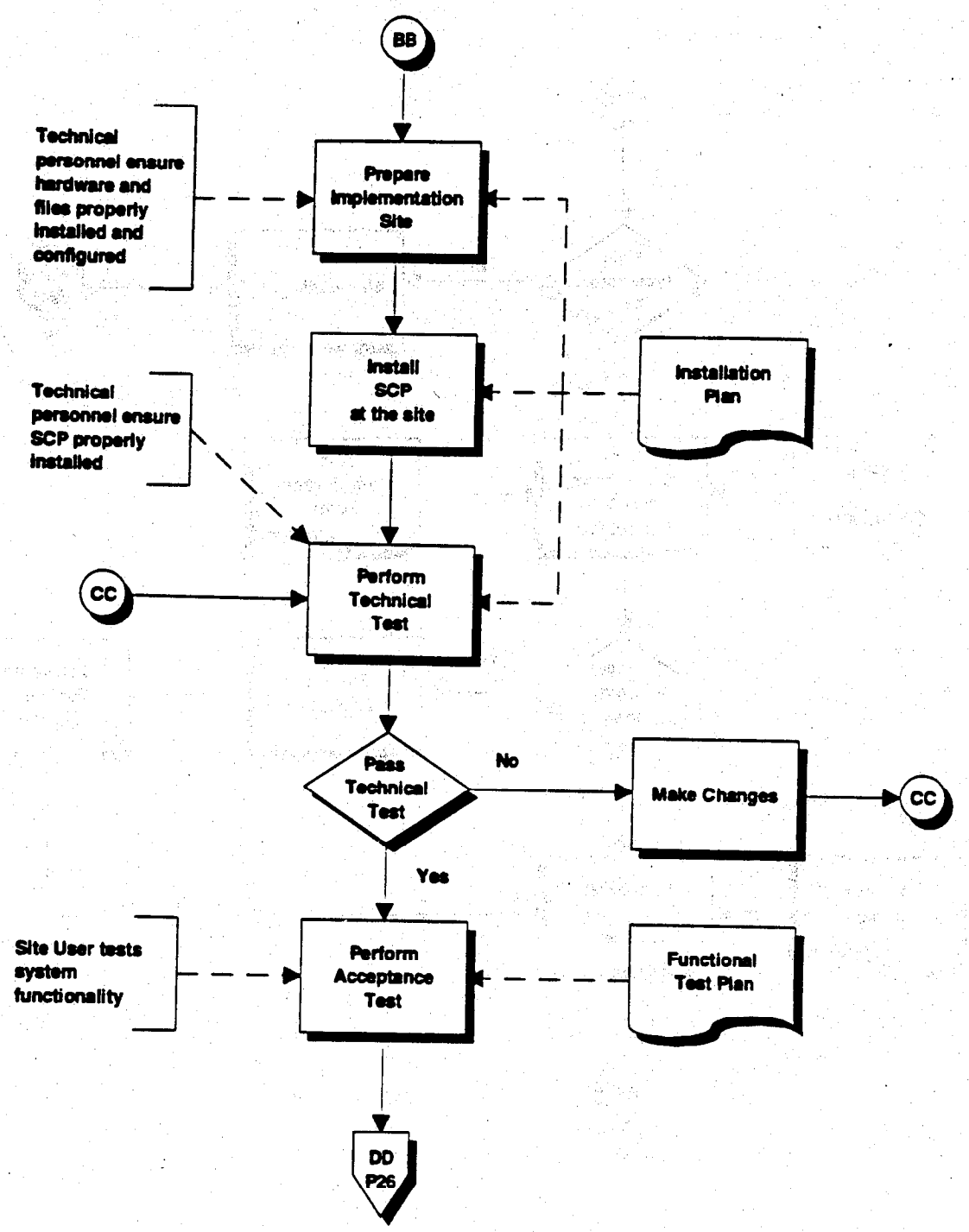
Implementation Phase



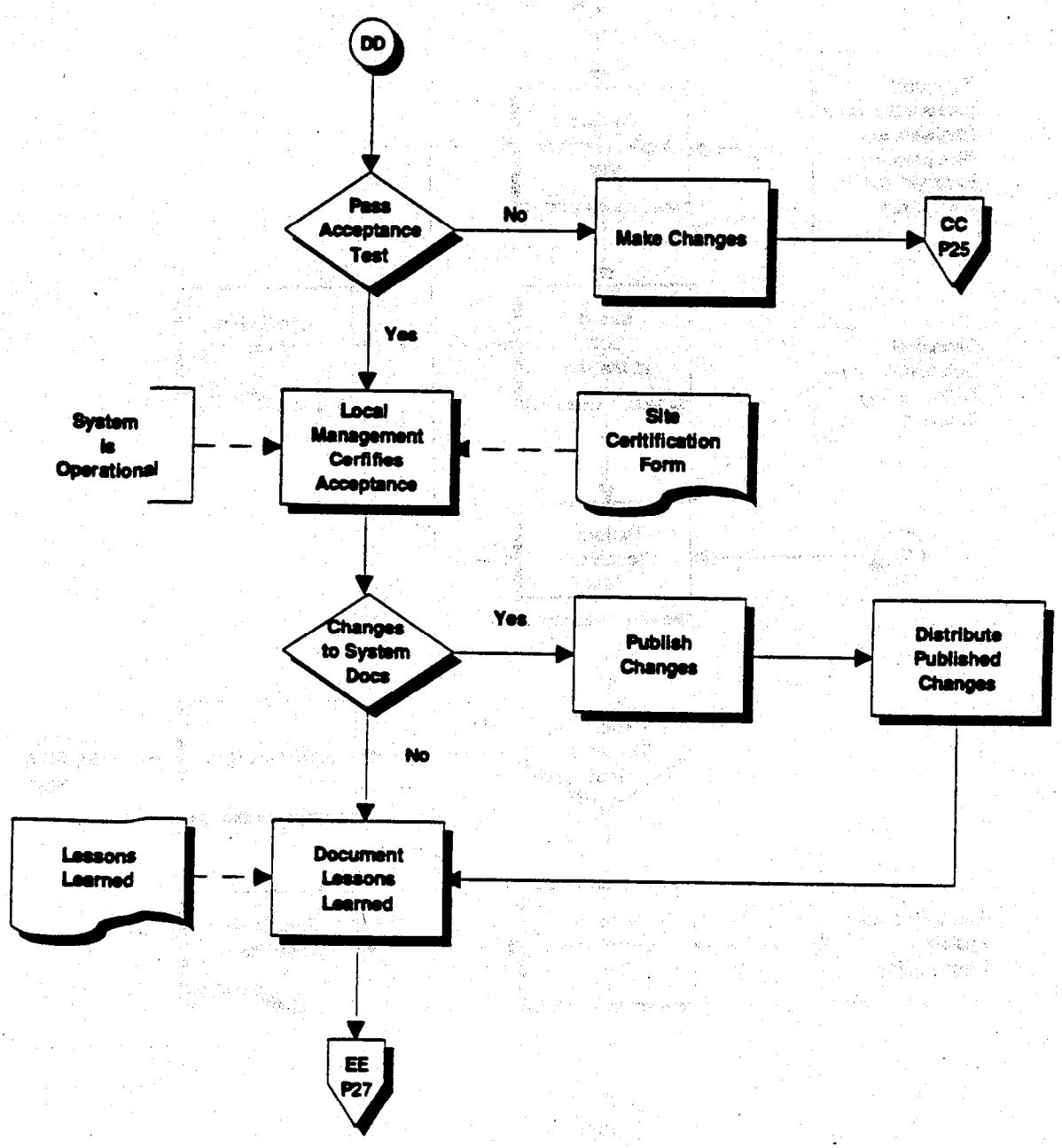
Implementation Phase



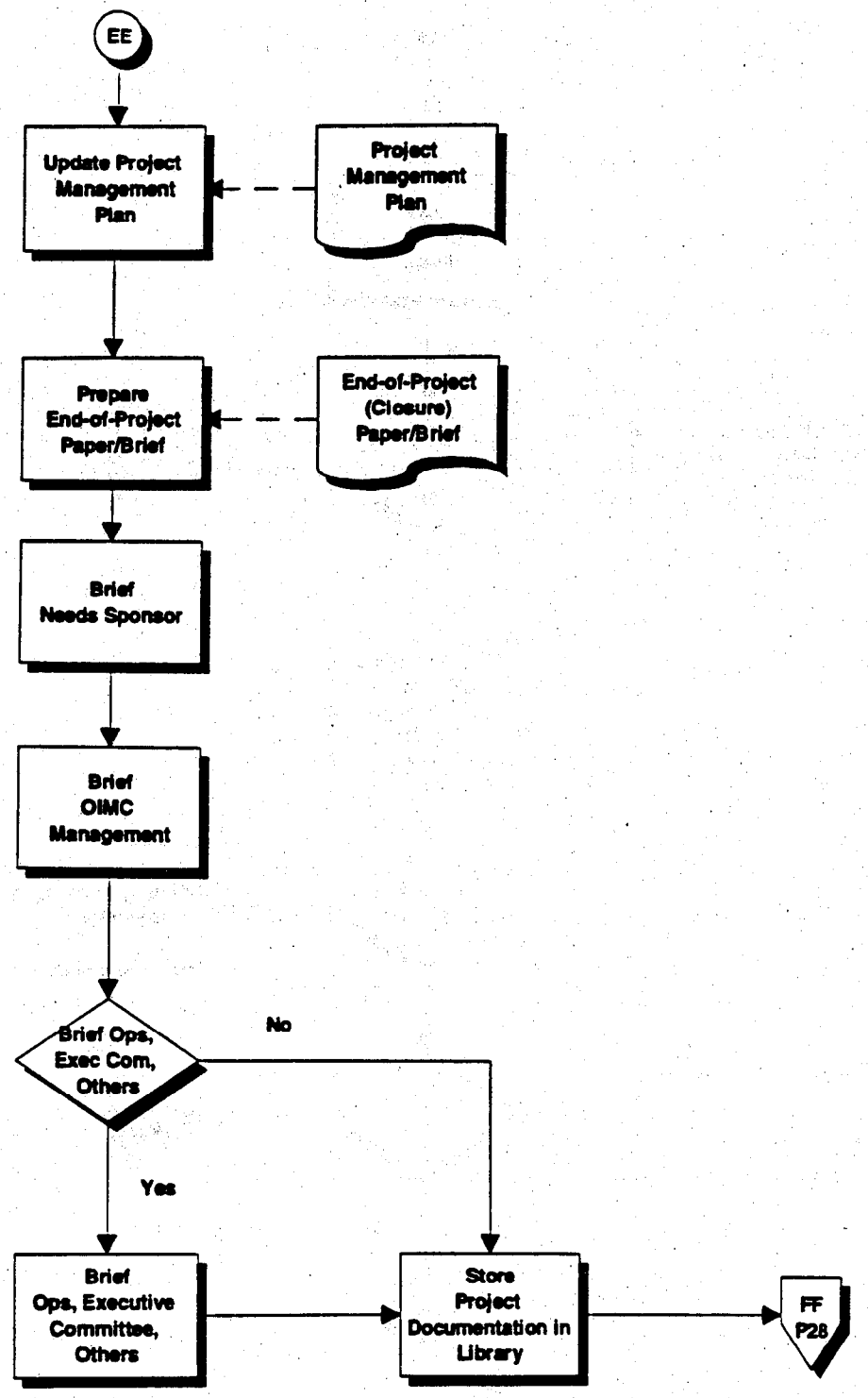
Implementation Phase



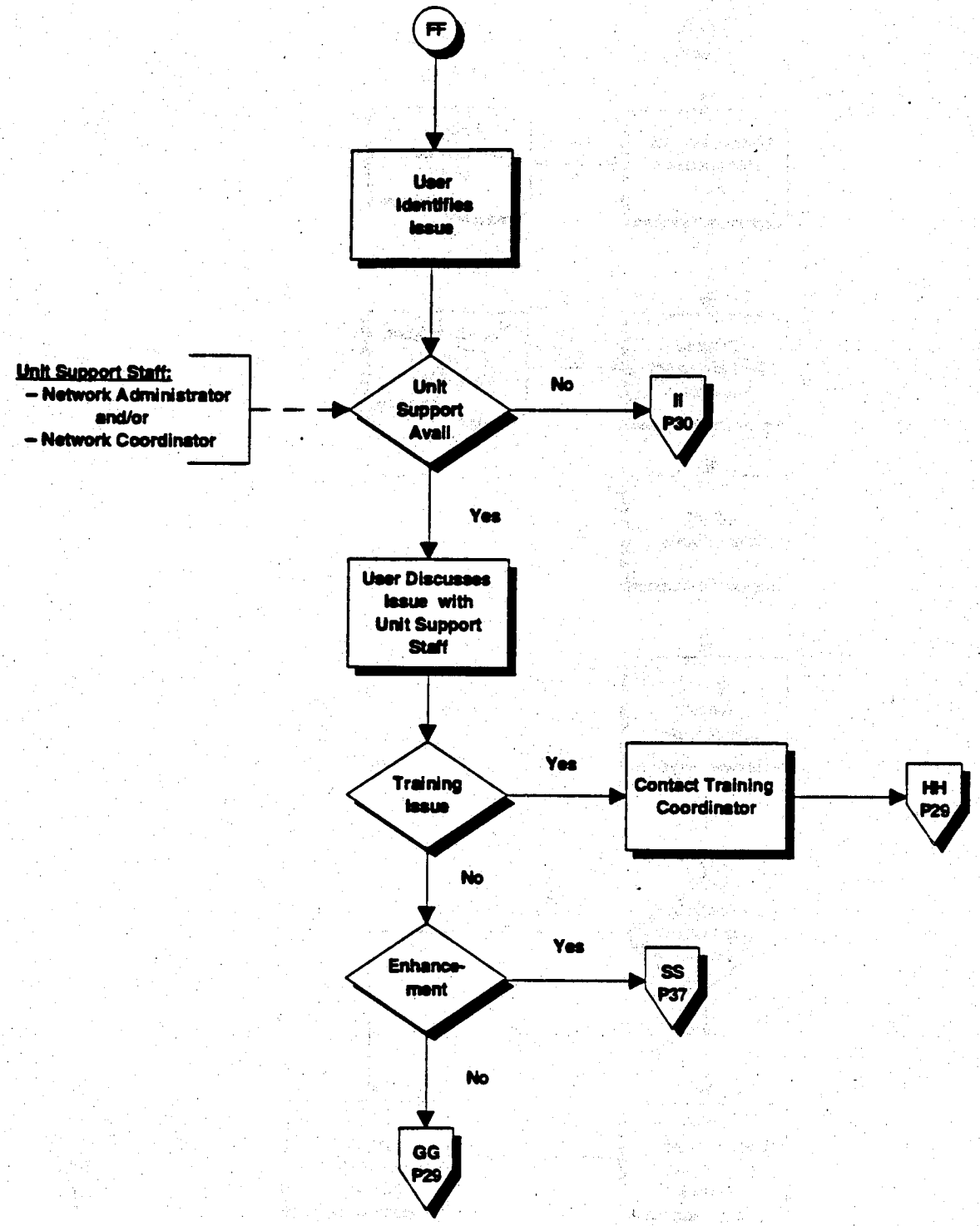
Implementation Phase

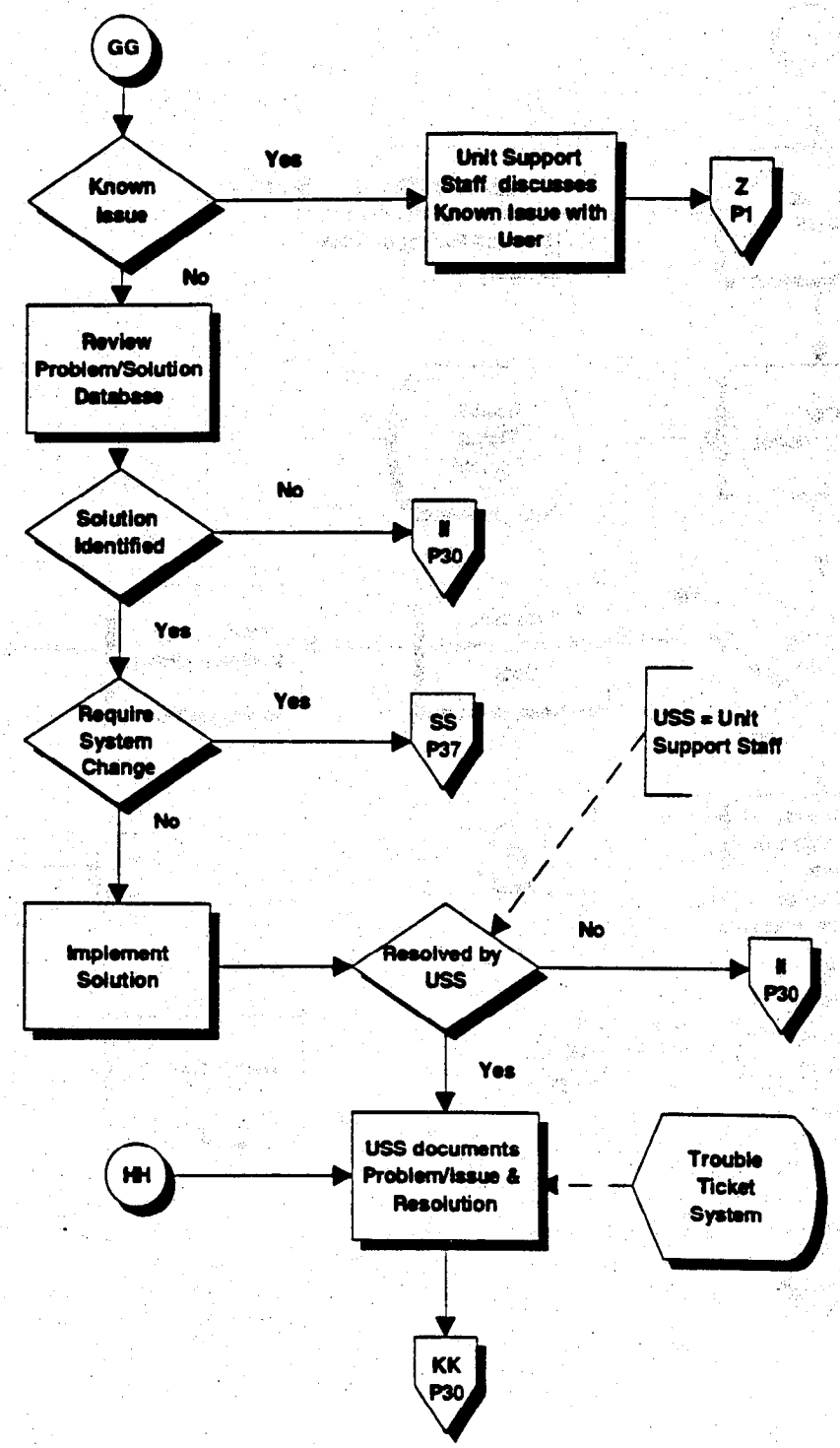


Implementation Phase

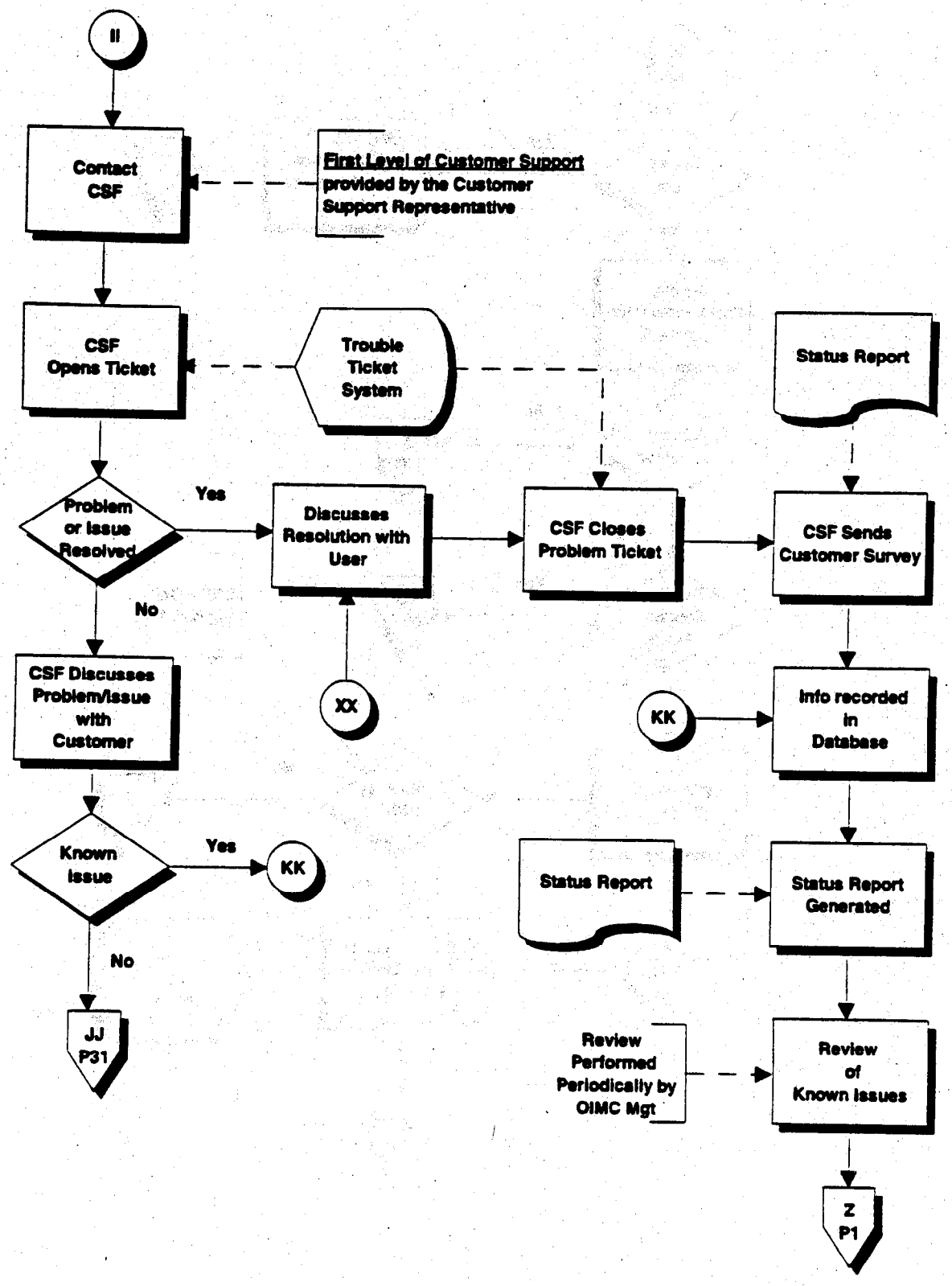


Maintenance Phase

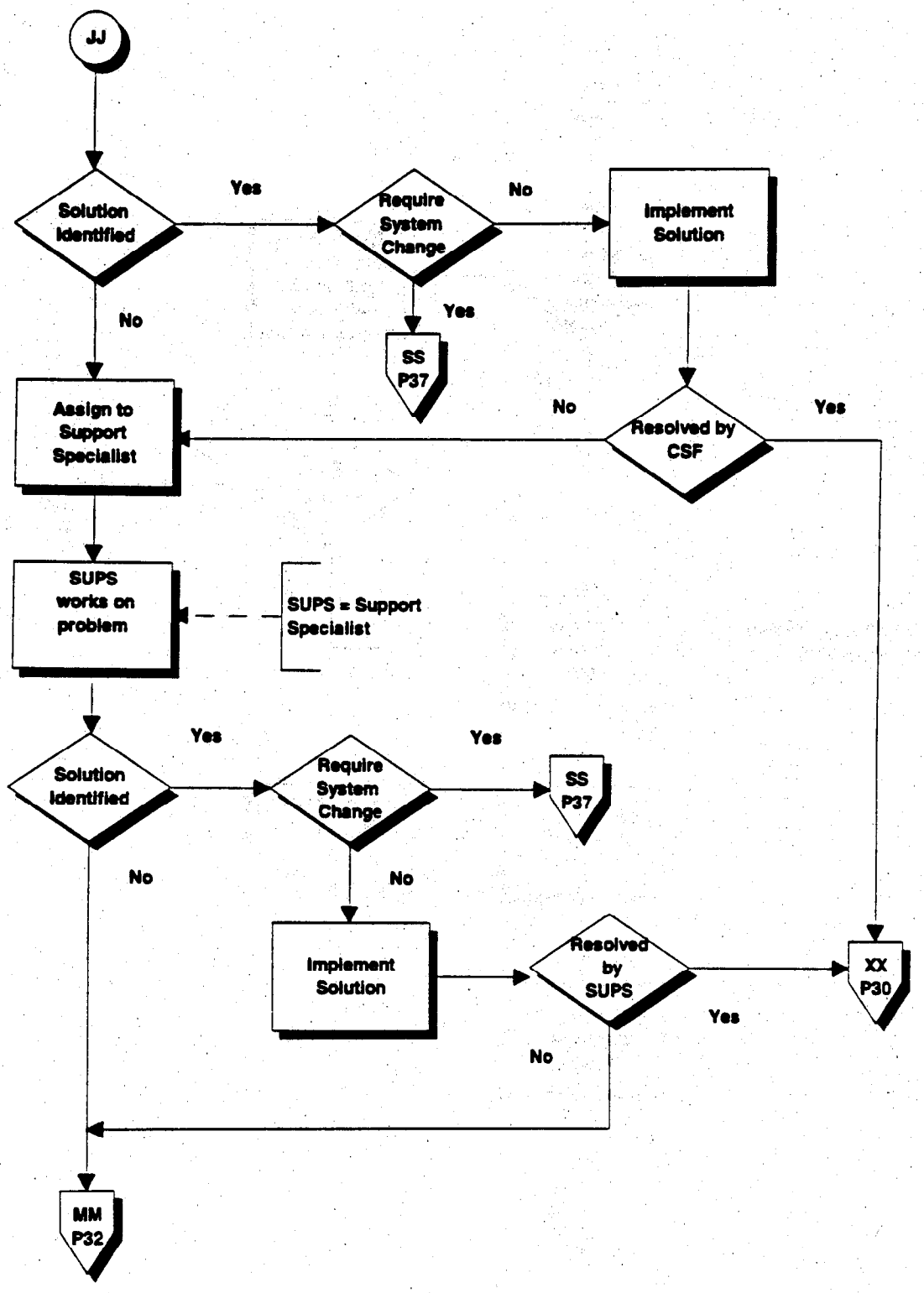


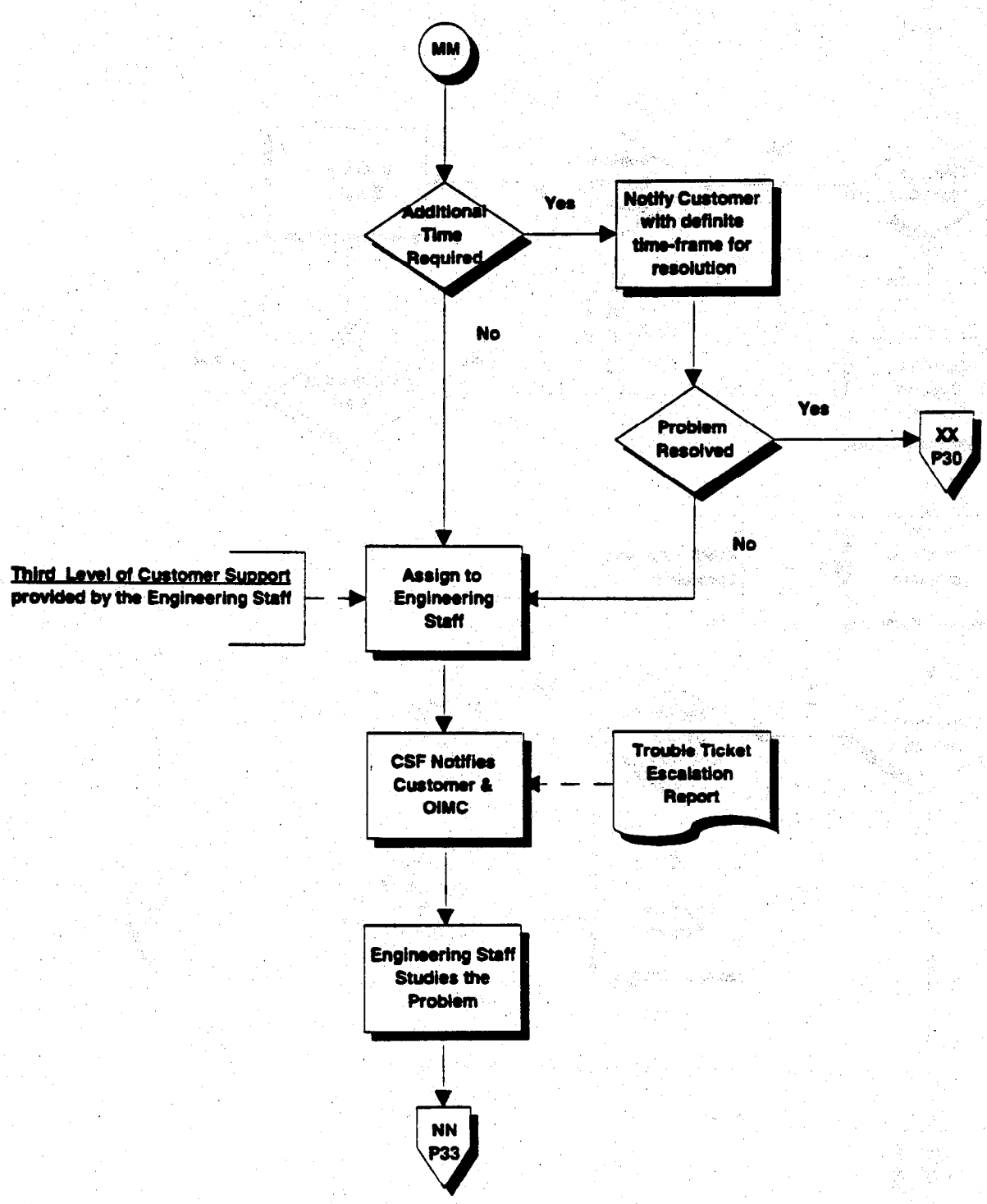

GG
Known Issue
Yes
Unit Support Staff discusses Known Issue with User
Z P1
No
Review Problem/Solution Database
Solution Identified
No
II P30
Yes
Require System Change
Yes
SS P37
USS = Unit Support Staff
No
Implement Solution
Resolved by USS
No
II P30
Yes
HH
USS documents Problem/Issue & Resolution
Trouble Ticket System
KK P30

Maintenance Phase

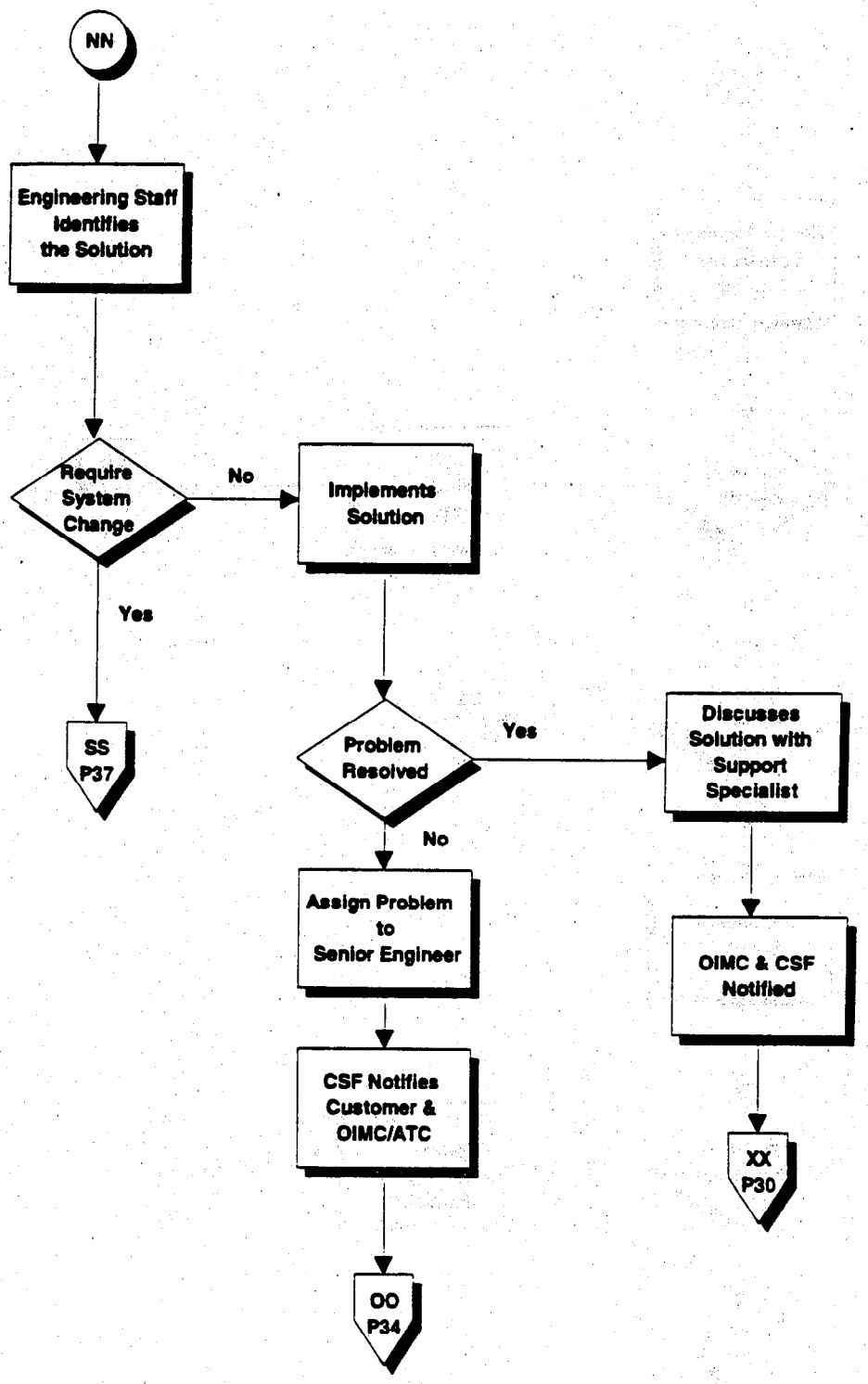


Maintenance Phase

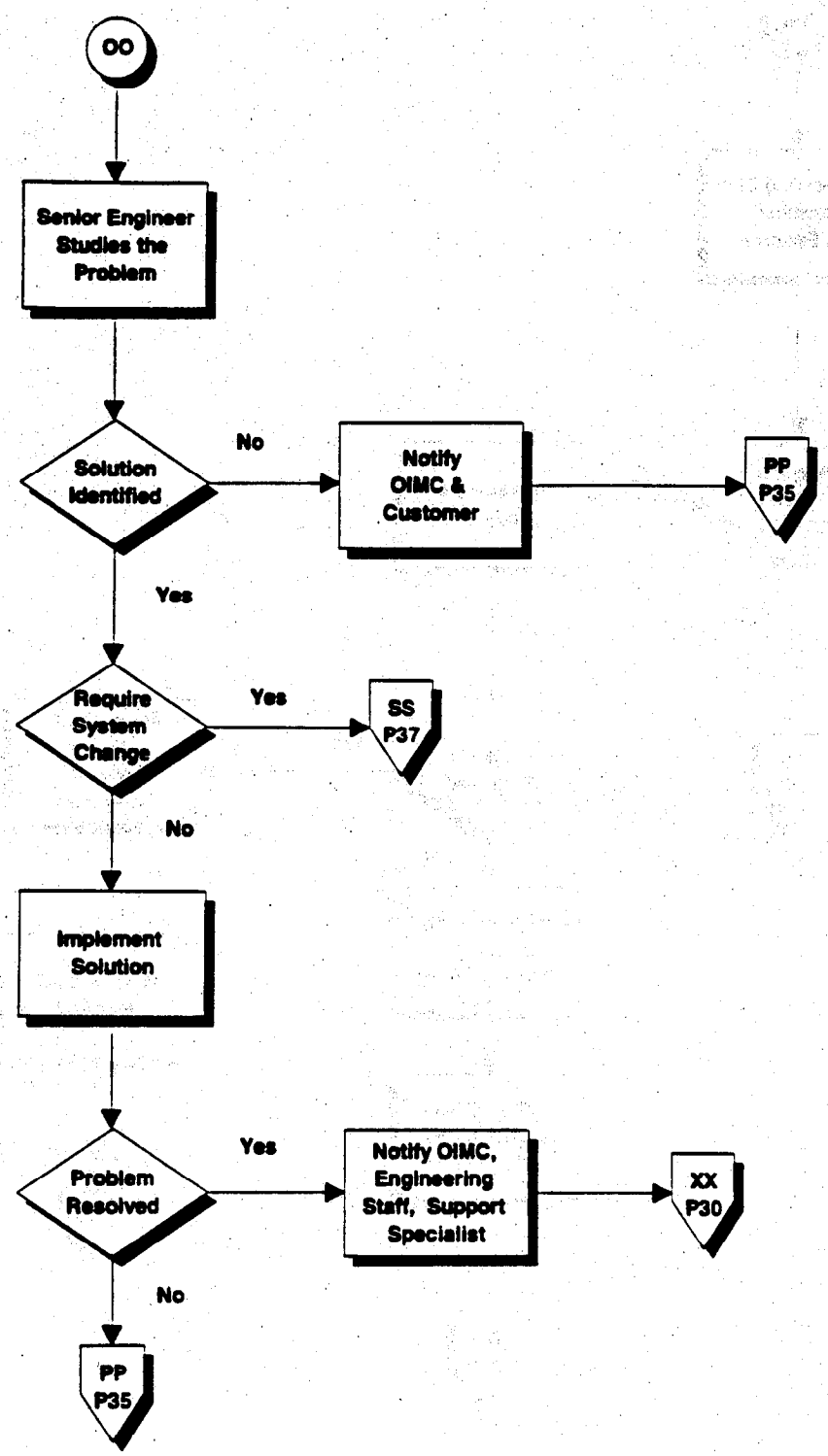



MM
Additional Time Required
Yes
Notify Customer with definite time-frame for resolution
No
Problem Resolved
Yes
XX P30
No
Third Level of Customer Support provided by the Engineering Staff
Assign to Engineering Staff
CSF Notifies Customer & OIMC
Trouble Ticket Escalation Report
Engineering Staff Studies the Problem
NN P33

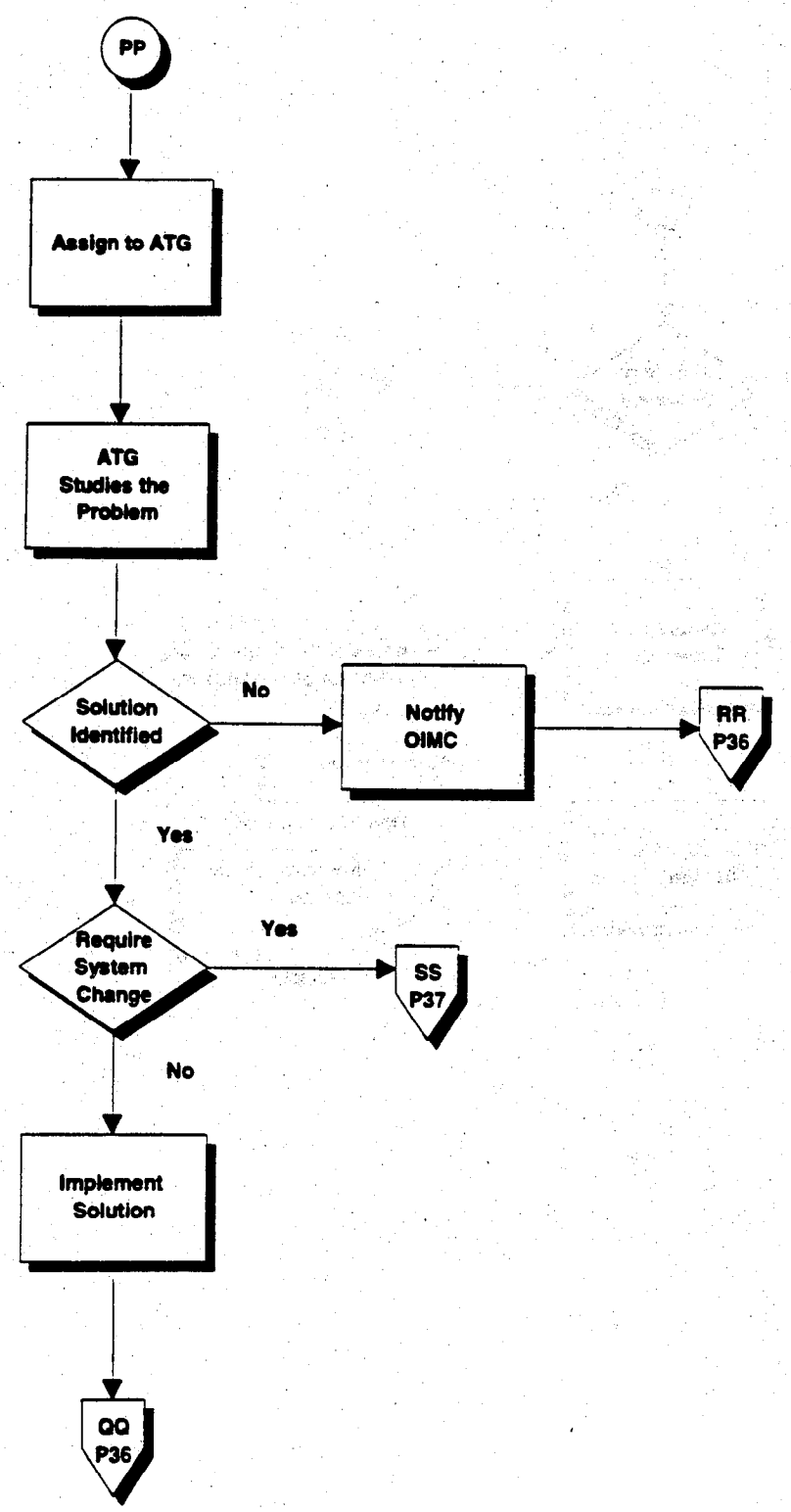
Maintenance Phase

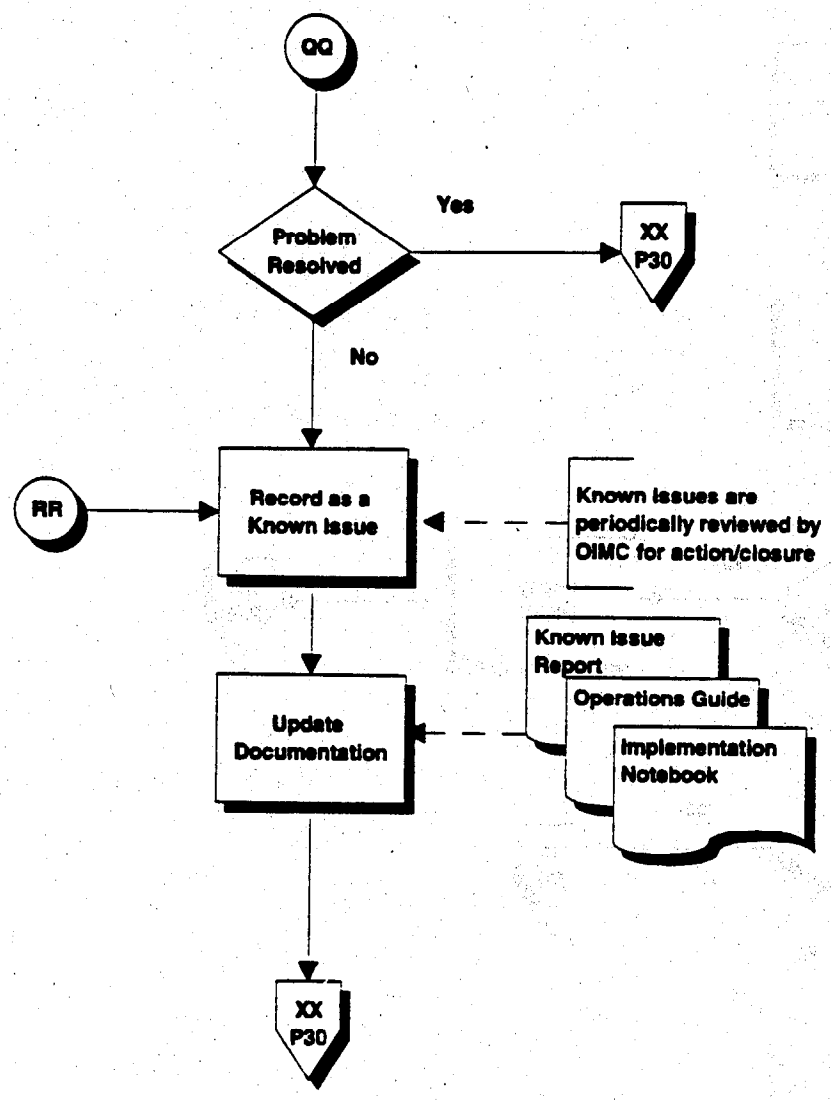


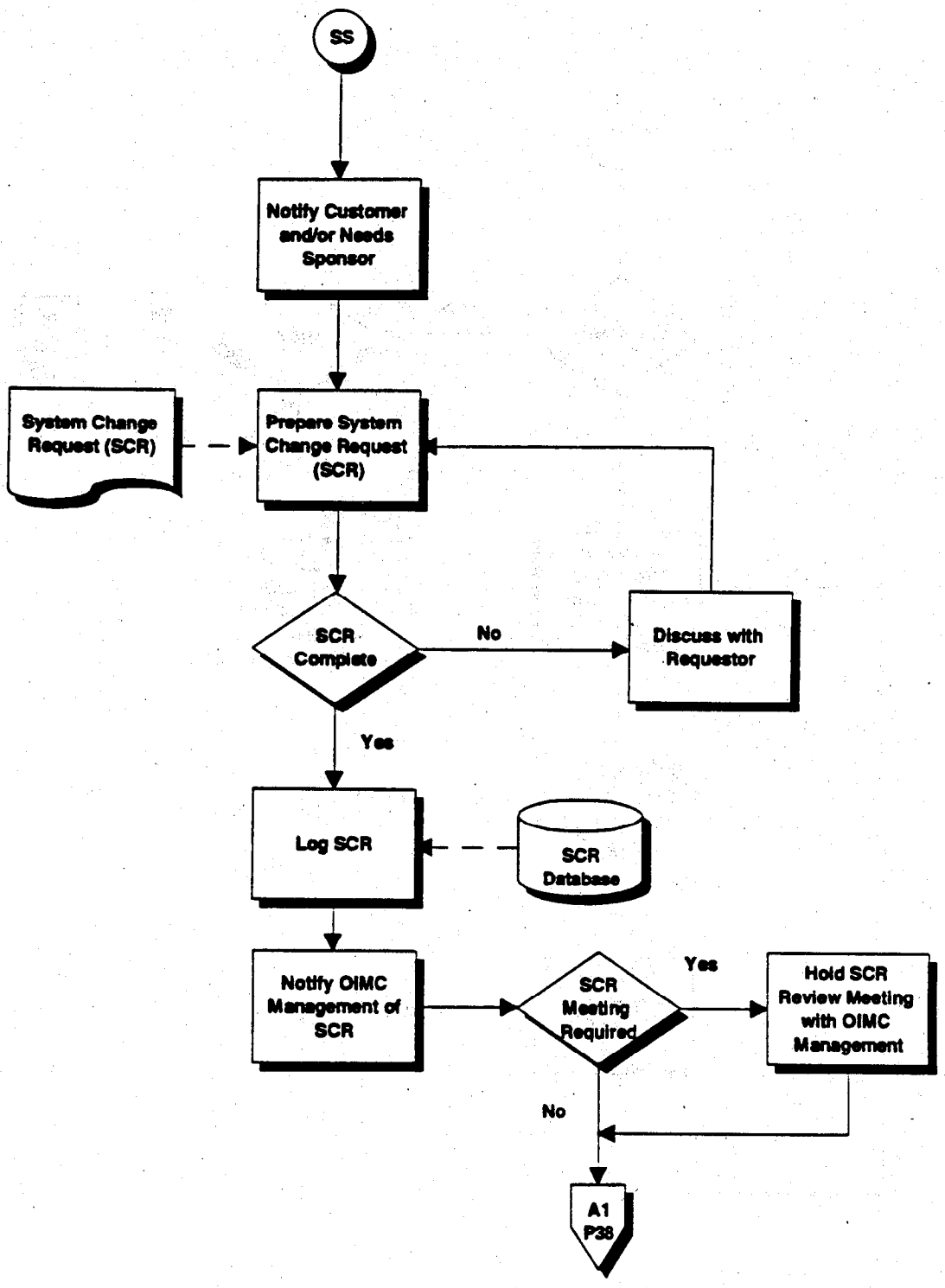
Maintenance Phase

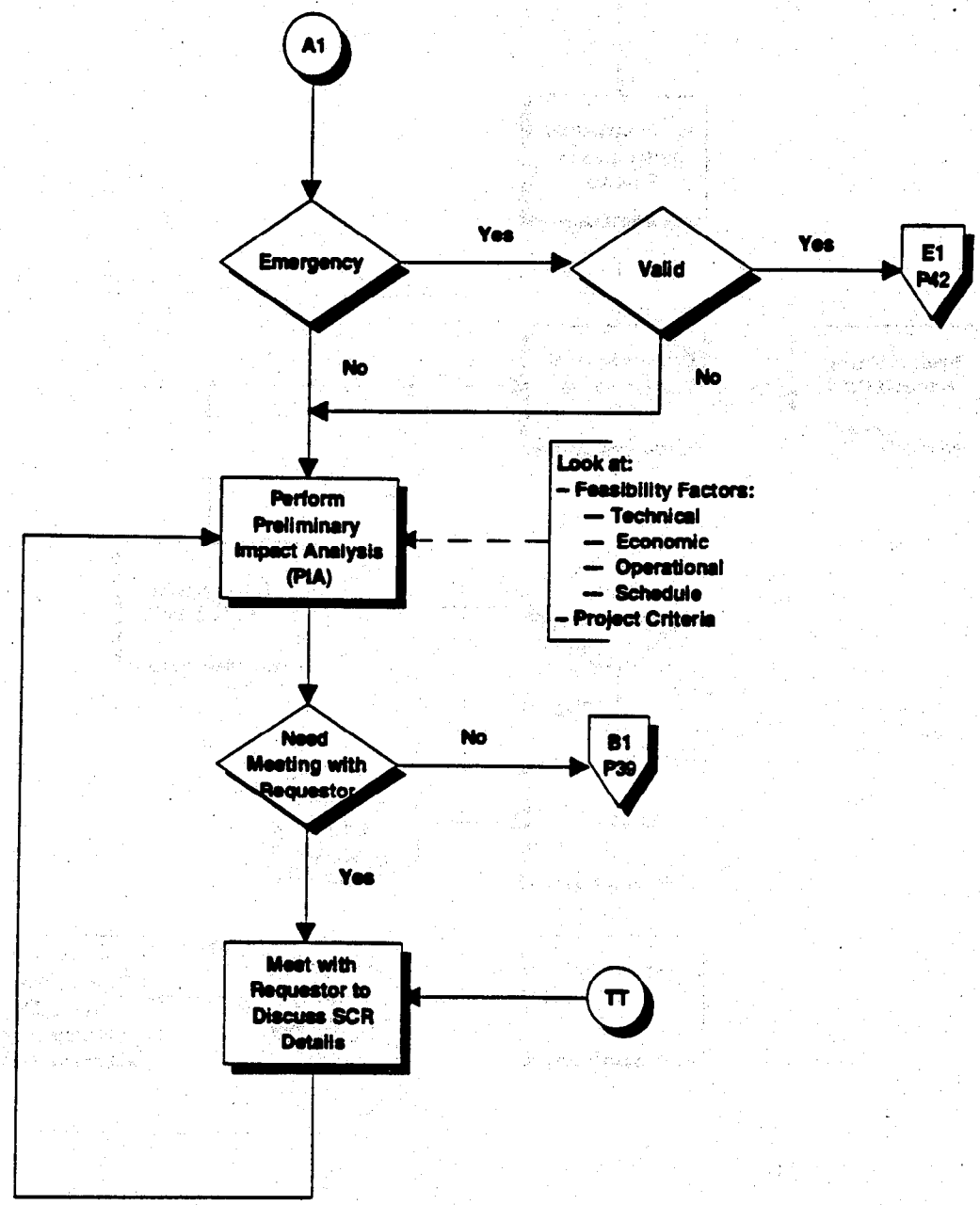


Maintenance Phase

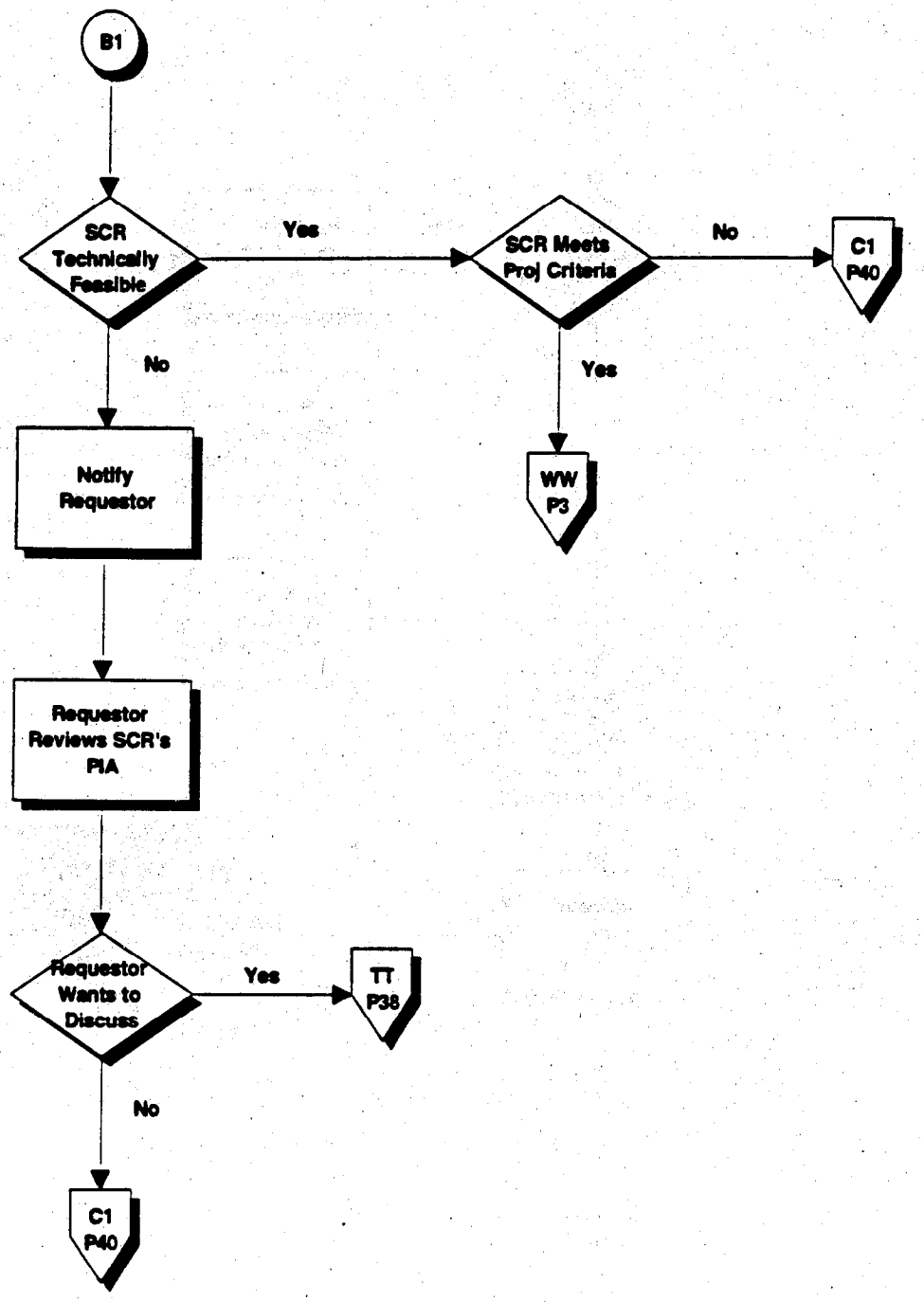


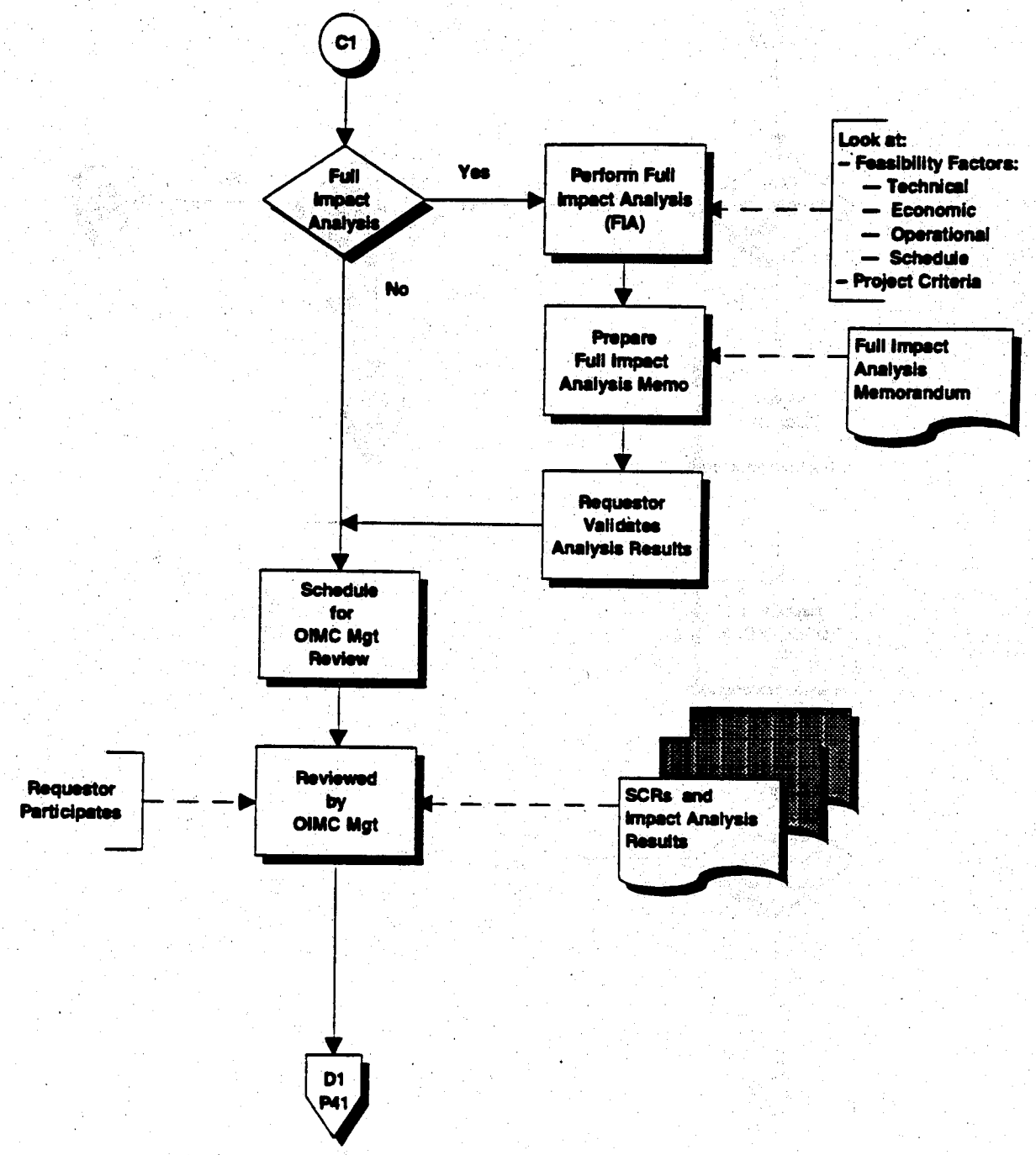

QQ
Problem Resolved
Yes
XX P30
No
RR
Record as a Known Issue
Known issues are periodically reviewed by OIMC for action/closure
Known Issue Report
Operations Guide
Implementation Notebook
Update Documentation
XX P30

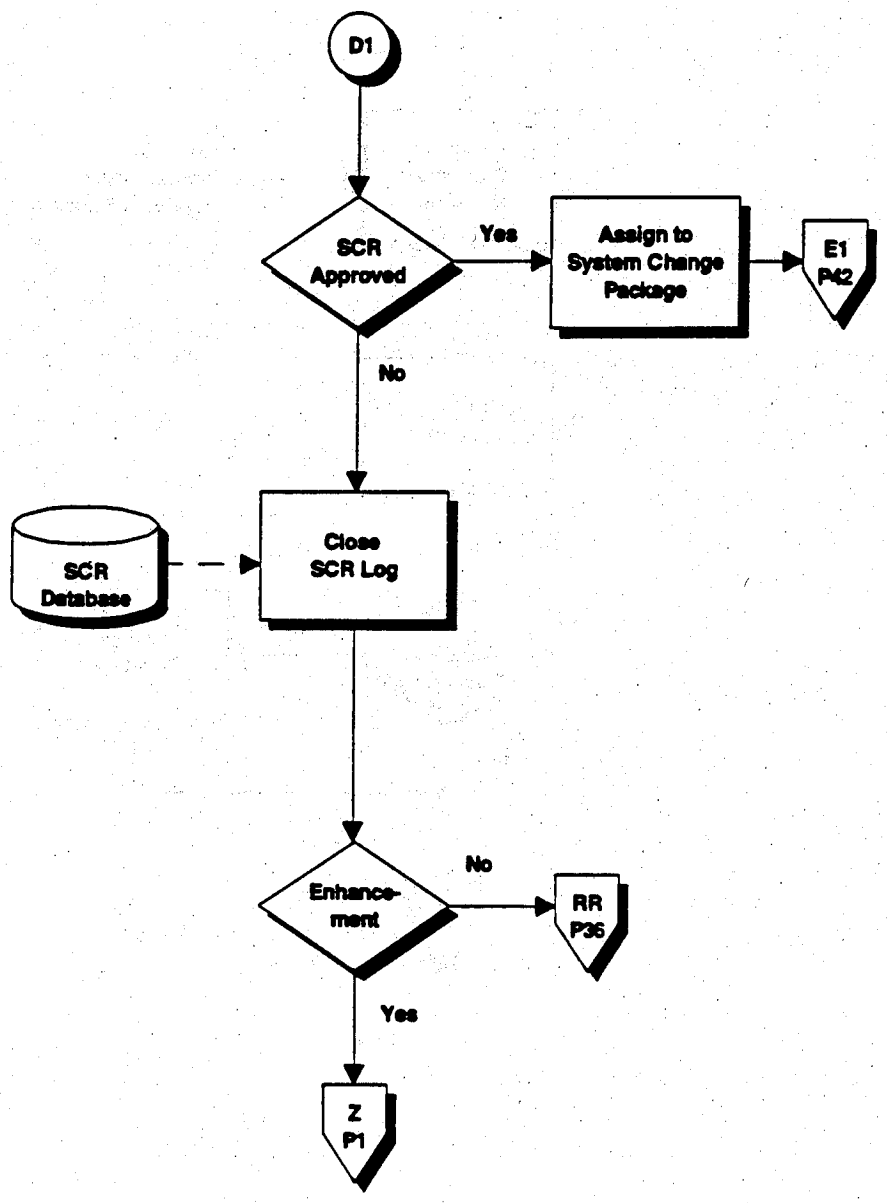

SS
Notify Customer and/or Needs Sponsor
System Change Request (SCR)
Prepare System Change Request (SCR)
SCR Complete
No
Discuss with Requestor
Yes
Log SCR
SCR Database
Notify OIMC Management of SCR
SCR Meeting Required
Yes
Hold SCR Review Meeting with OIMC Management
No
A1
P38

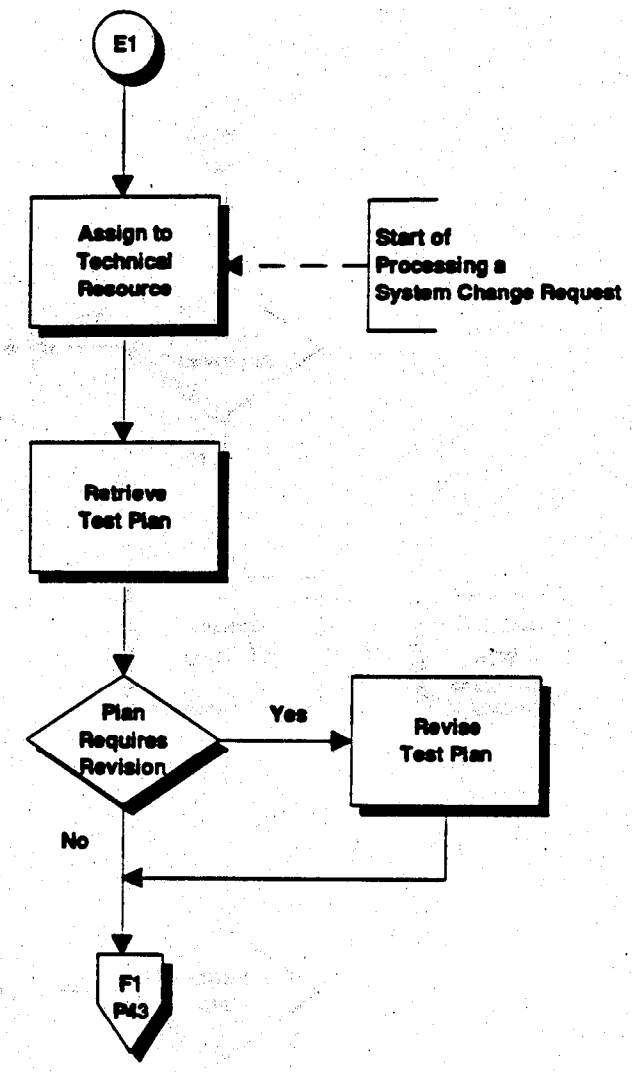

A1
Emergency
Yes
Valid
Yes
E1
P42
No
No
Perform Preliminary Impact Analysis (PIA)
Look at:
– Feasibility Factors:
— Technical
— Economic
— Operational
— Schedule
– Project Criteria
Need Meeting with Requestor
No
B1
P39
Yes
Meet with Requestor to Discuss SCR Details
TT

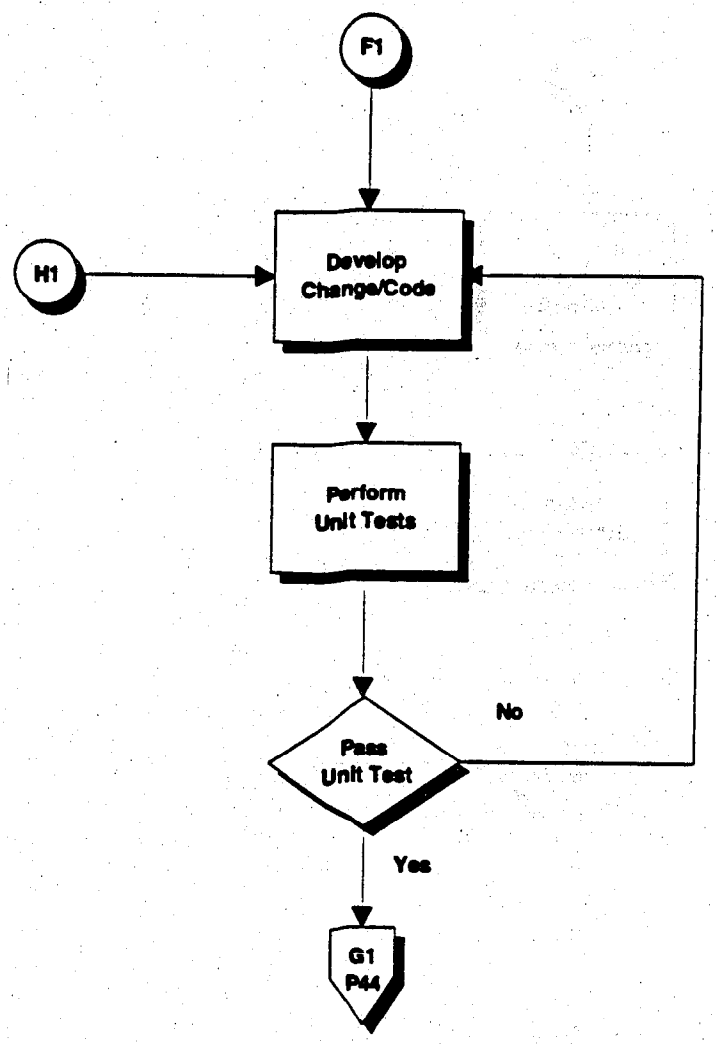
Maintenance Phase

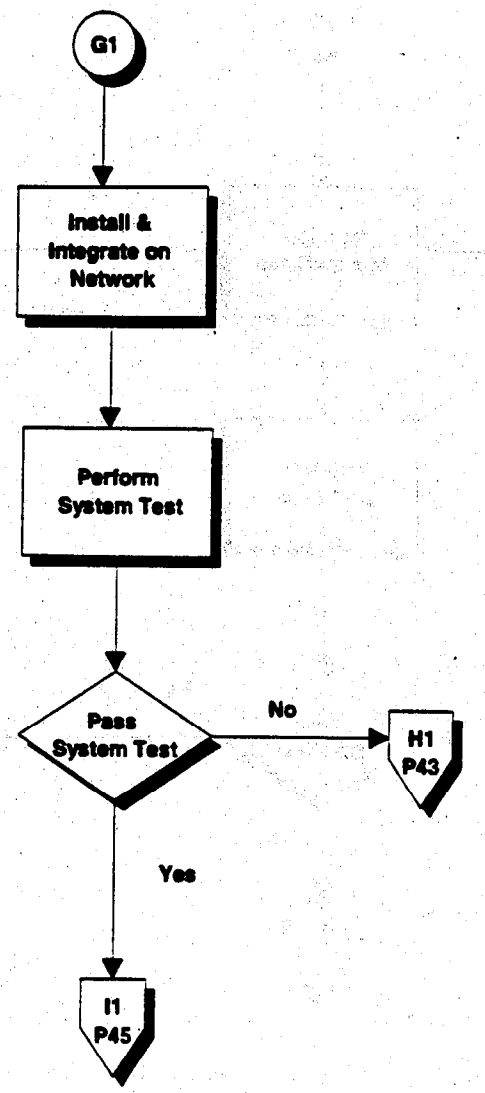



C1
Full Impact Analysis
Yes
No
Perform Full Impact Analysis (FIA)
Look at:
– Feasibility Factors:
— Technical
— Economic
— Operational
— Schedule
– Project Criteria
Prepare Full Impact Analysis Memo
Full Impact Analysis Memorandum
Requestor Validates Analysis Results
Schedule for OIMC Mgt Review
Requestor Participates
Reviewed by OIMC Mgt
SCRs and Impact Analysis Results
D1
P41

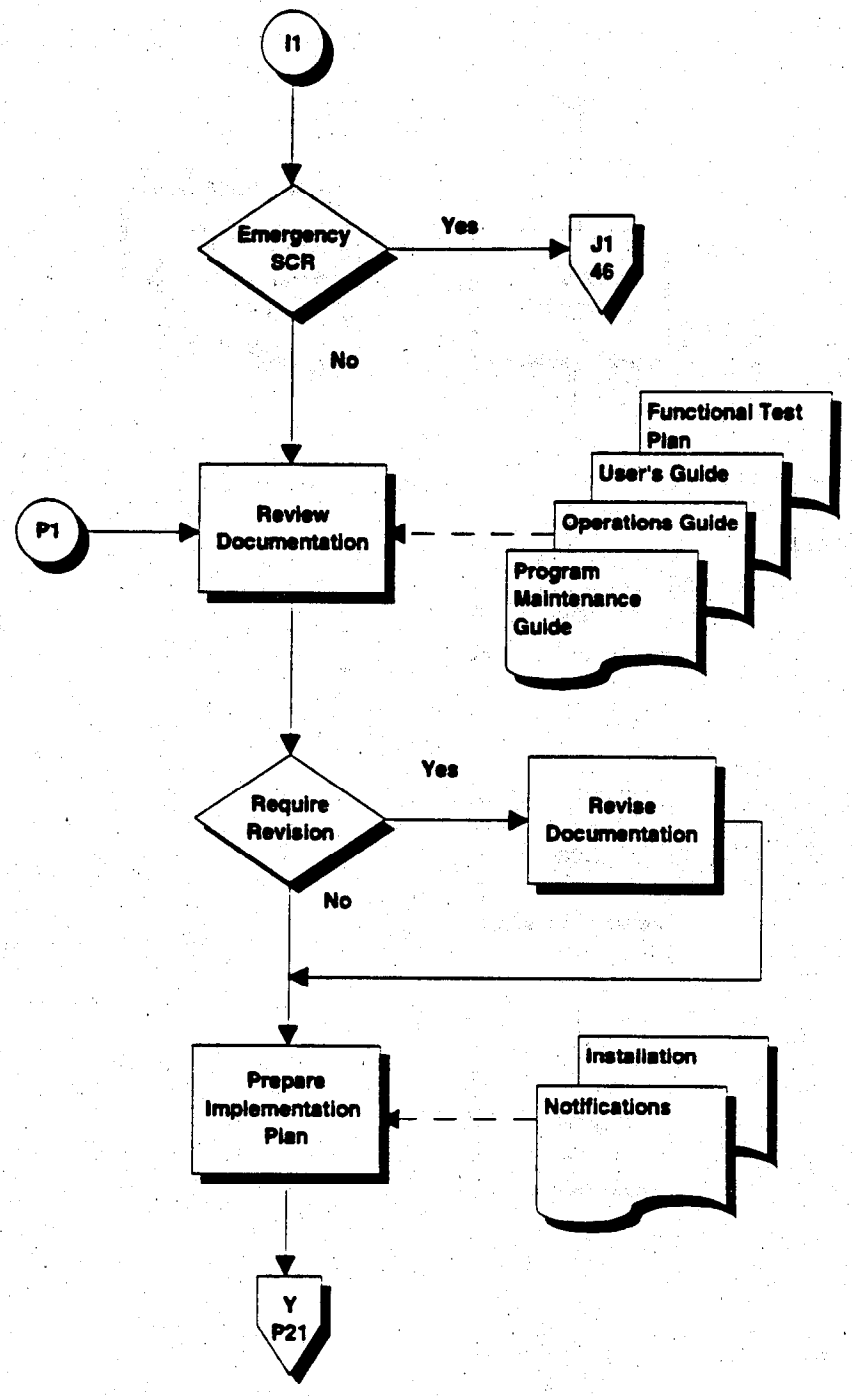

D1
SCR Approved
Yes
Assign to System Change Package
E1 P42
No
SCR Database
Close SCR Log
Enhance-ment
No
RR P36
Yes
Z P1

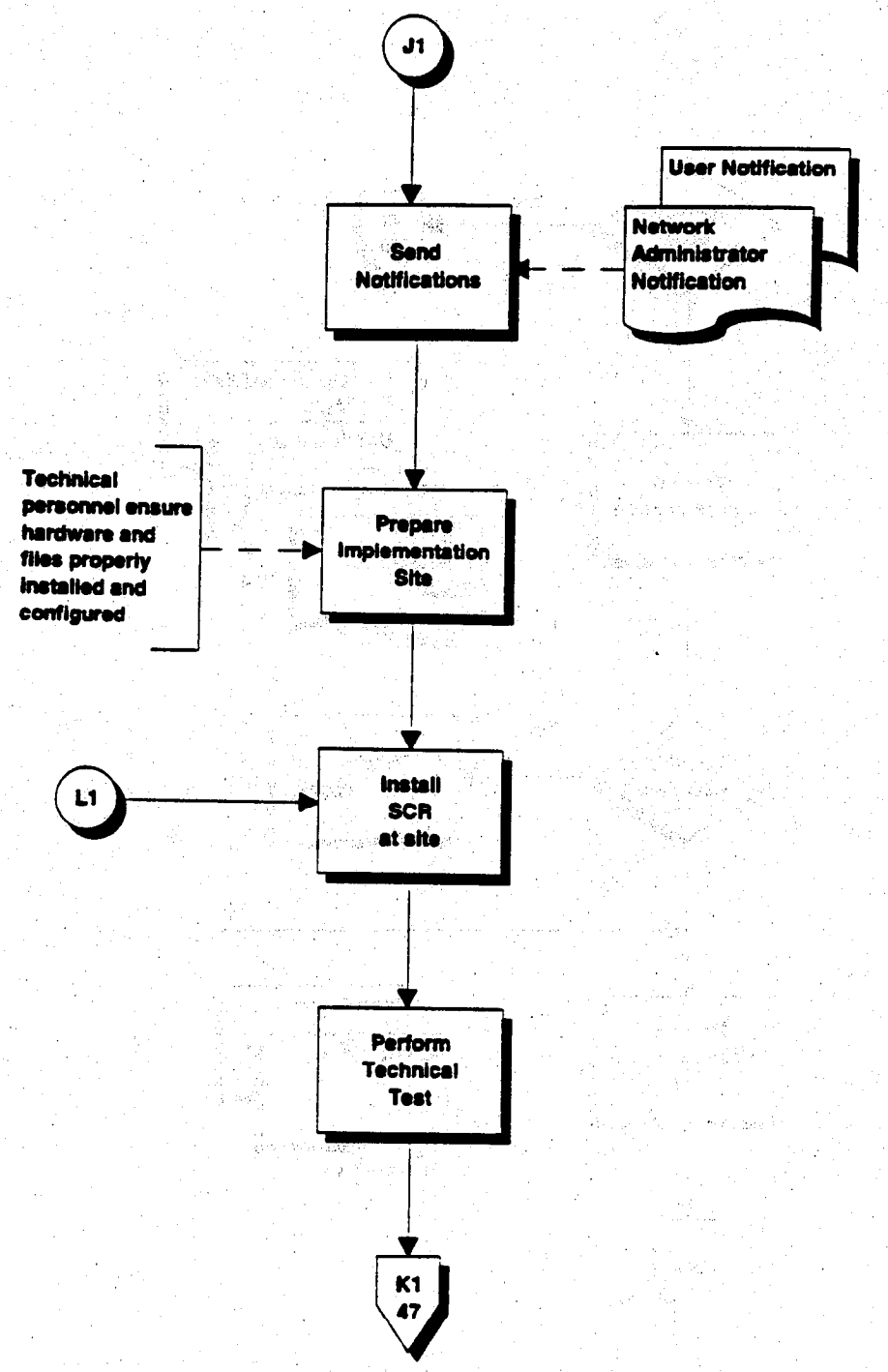

E1
Assign to Technical Resource
Start of Processing a System Change Request
Retrieve Test Plan
Plan Requires Revision
Yes
Revise Test Plan
No
F1
P43


F1
H1
Develop Change/Code
Perform Unit Tests
Pass Unit Test
No
Yes
G1
P44

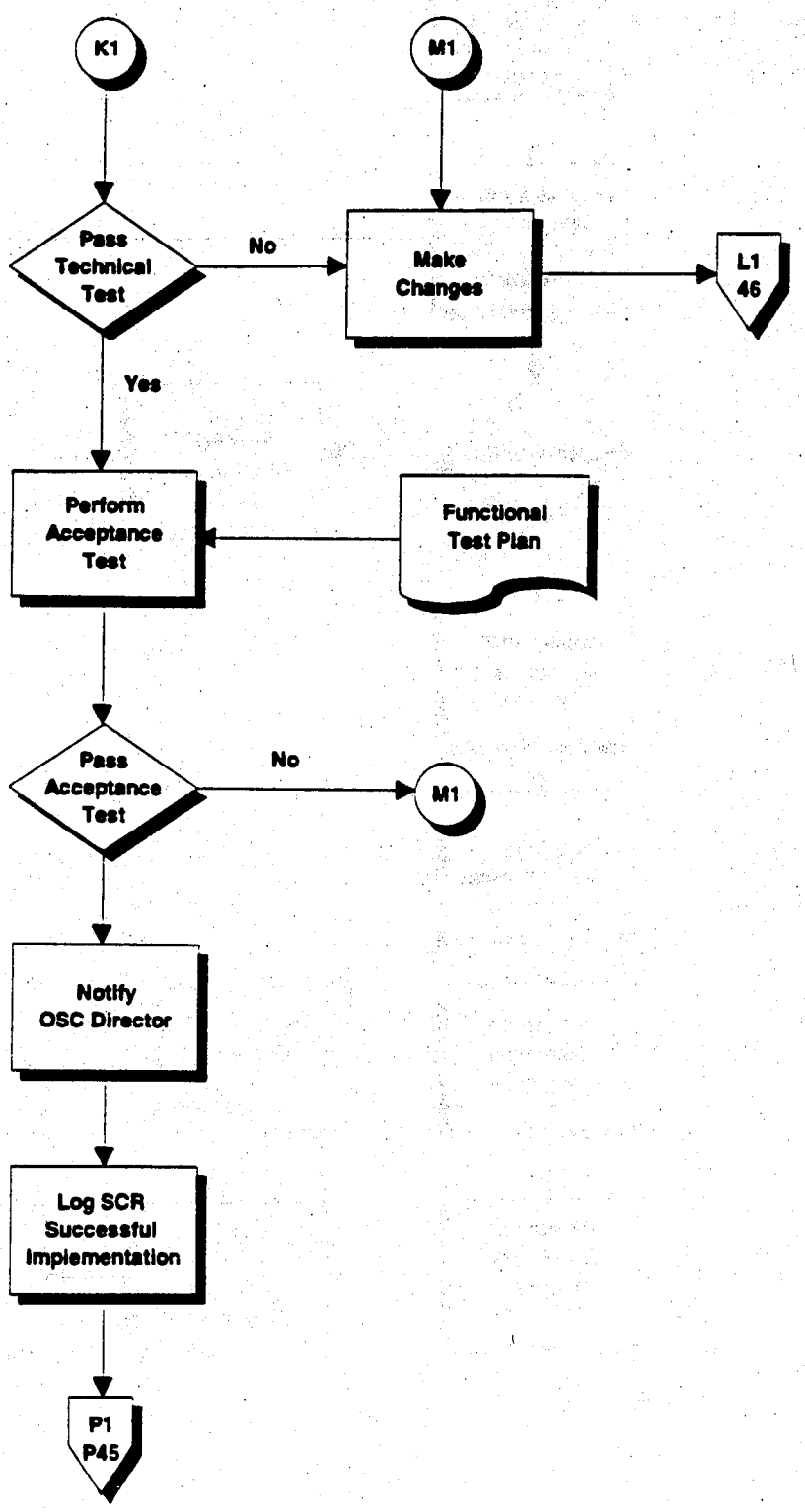

G1
Install & Integrate on Network
Perform System Test
Pass System Test
No
H1
P43
Yes
I1
P45

Maintenance Phase

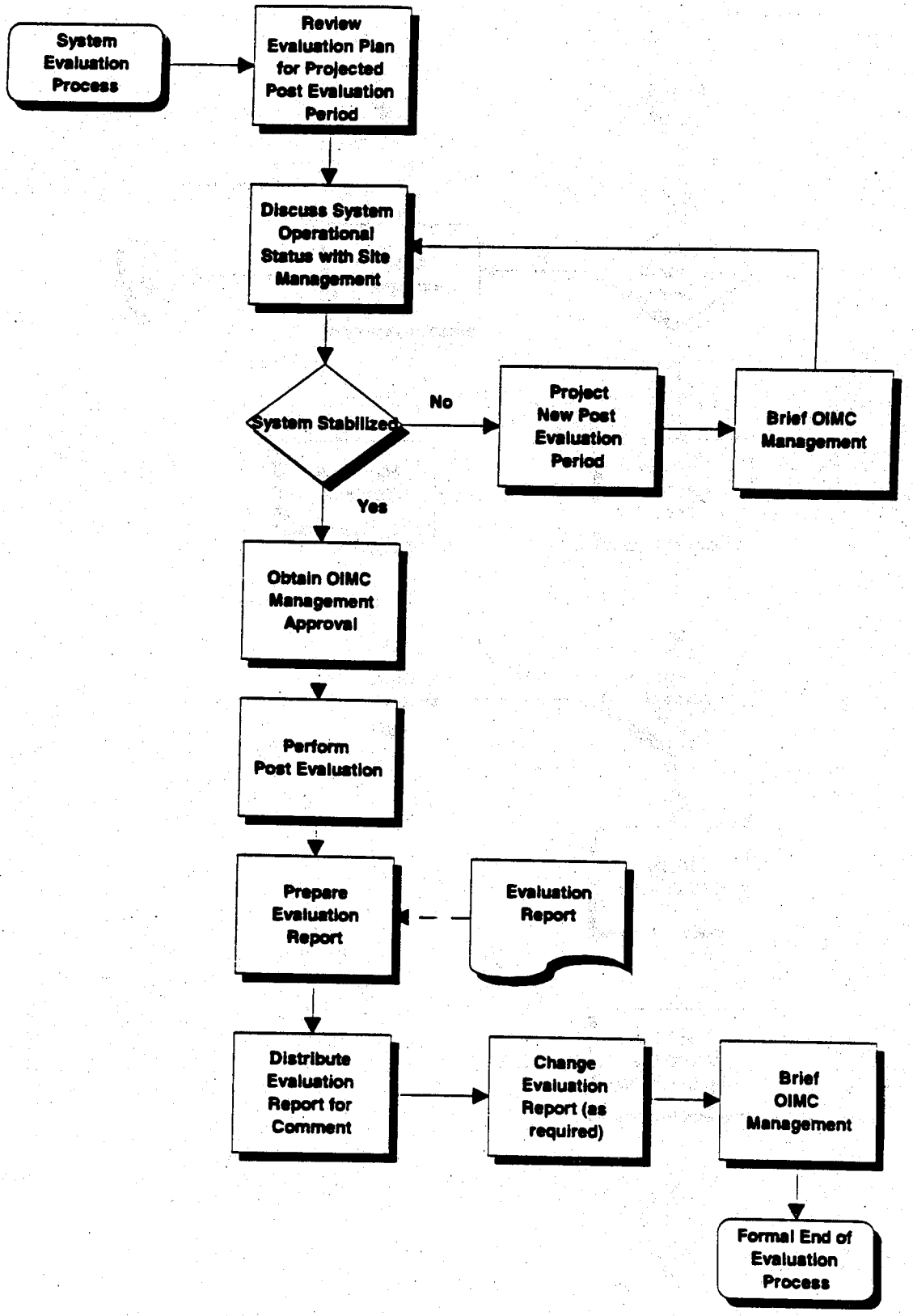



J1
User Notification
Send Notifications
Network Administrator Notification
Technical personnel ensure hardware and files properly installed and configured
Prepare Implementation Site
L1
Install SCR at site
Perform Technical Test
K1
47

Maintenance Phase



Maintenance Phase



CHAPTER 2.0

PLANNING PHASE

PURPOSE

The purpose of the Planning Phase of the IT process is to provide management with quality information to determine whether to commit resources to undertake the project and proceed to the next phase.

OVERVIEW

The principal activities in the Planning Phase are: needs validation, feasibility and cost/benefit analysis, and project planning. The Planning Phase begins when a need is identified and documented in a Needs Statement [SD1]. Besides documenting the need, the Needs Statement defines at a high level the requirements that must be met to fulfill the need. This statement is reviewed by Division/Unit management and forwarded to OIMC. OIMC evaluates the Needs Statement to ensure that the need is clearly defined, validated, sponsored, and beneficial. It also considers whether the need can be satisfied by other current or planned projects and satisfied technically. The results of this evaluation are documented in a Needs Statement Evaluation Report [SD2.] Following management's review and approval of that report, needs will be prioritized, incorporated into OIMC's budget, and presented to the Information Technology Investment Committee, as appropriate.

As funding becomes available, a Project Leader and Team will be assigned to the project. Working with OIMC, the team prepares a decomposition which identifies the high level activities associated with the needs statement. This decomposition is developed within the context of an existing overall agency framework. The Team also prepares a Feasibility Study [SD3] to evaluate the different alternatives that satisfy the need in terms of their advantages and disadvantages, and their life cycle cost and benefits. The results are documented in a Cost Benefit Study [SD4]. A Project Management Plan [SD5] is begun to lay out, among other things, the project's approach and schedule.

Finally, the team prepares a Project Proposal Briefing [SD6] to summarize the work performed during the Planning Phase. The Team briefs the project's sponsor, OIMC Center Directors, and OIMC management on the results of the work performed. OIMC management in turn keeps the Investment Committee and others as necessary informed on progress and problems.

KEY RESPONSIBILITIES

The following table shows key responsibilities for each of the major activities performed during the Planning Phase.

Planning Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Prepare Needs Statement [SD1]	FP1	Needs Sponsor	Division/Unit Management, Lead User Division/Unit Staff/Users
Prepare Needs Statement Evaluation Report [SD2]	FP2	OIMC Management	OIMC Project Coordinator, OSC Director, ATG Director, Needs Sponsor, Lead User
Obtain Management Review/Approval	FP3	ACG/IM&C	Director IO, Director S&ET Needs Sponsor
Prepare Preliminary Project Management Plan [SD5]	FP4	Project Manager	Project Team[1]
Conduct Feasibility Study [SD3]	FP4	Project Manager	Project Team

[1] A project team may consist of project manager, lead user, database analyst, and system analysts/modelers. Specific team members are identified when they have lead responsibility for the task.

Planning Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Perform Cost Benefit Study [SD4]	FP4	Project Manager	Project Team
Update Project Management Plan [SD5]	FP4	Project Manager	Project Team, Project Coordinator
Prepare Project Proposal Briefing [SD6]	FP4	Project Manager	Project Team
Obtain Management Approval	FP5	Project Manager	Information Technology Investment Committee, ACG/IM&C, Director IO, Director S&ET, Needs Sponsor, Project Team, and OIMC Center Directors

BASELINED DOCUMENTS

None

OTHER KEY DOCUMENTS

Decomposition

Identifies the high level activities associated with the needs statement as they relate to GAO's business enterprise framework.

Needs Statement [SD1]

Identifies the requirement and summarizes the specific need(s) generating the requirement addressing such items as: the business area involved; specific improvements expected, and the benefits to the overall GAO agency.

Needs Statement Evaluation Report [SD2]

Documents the results of the evaluation performed on the Needs Statement. The evaluation is conducted to ensure that the need is clearly described, validated, sponsored, beneficial, cannot be satisfied by current or planned projects, and can be technically satisfied.

Feasibility Study [SD3]

Documents the practical feasibility of satisfying the user's need(s).

Cost Benefit Study [SD4]

Identifies the costs and benefits associated with different implementing alternatives. Together with the Feasibility Study is used by management to select an approach to satisfying the needs documented in the Needs Statement.

Project Management Plan [SD5]

Contains all the information used by the project manager to guide the system through the system life cycle. It also becomes a repository for all the documentation generated in support of the system development/acquisition.

RELATED FORMS

System Change Request

Means for addressing a change or enhancement to an existing project or system and the justification for and the implications of the change.

PROCEDURES

Prepare Needs Statement [SD1]

As an ongoing process, OIMC works with Divisions/Units to identify their information and technology needs and projects. Needs are also identified through other committees such as the Information Technology Investment Committee (ITIC). Some of these needs/projects may have been anticipated and included in OIMC's Strategic Plan, Capital Investment Plan, and OIMC initiatives. For each need/project identified, a Needs Statement [SD1] should be prepared to define requirements and describe the current and proposed environments with respect to those requirements and the expected benefits/impact on operations. Additionally, the Needs Statement [SD1] should identify the time and resources the Division/Unit is willing to devote to help meet the needs and the priority of this need relative to its other information and technology needs.

The completed Needs Statement [SD1] must be reviewed and validated by the Division/Unit's management. This is especially important for any unforeseen or unanticipated needs that may be identified by Division/Unit staff during the course of the year that for one reason or another can not wait until the next input cycle. By validating the need, the Division/Unit takes ownership and becomes the Needs Sponsor.

Validated Needs Statements [SD1] are turned in to OIMC together with any other information requested in OIMC's call. Needs Statements

prepared outside the budget call process should be forwarded to OIMC management.

Prepares Needs Statement Evaluation Report [SD2]

OIMC management is responsible for preparing the Needs Statement Evaluation Report [SD2]. OIMC evaluates the strategic feasibility of the need. Working with ATG and OSC staff, the Data Management Group evaluates the technical and operational feasibility. Working with the lead user, the OIMC evaluates functional feasibility. The results of these evaluations are documented in the Needs Statement Evaluation Report [SD2].

Obtains Management Review/Approval

The Needs Statement Evaluation Report is distributed to ACG/IM&C, OIMC's Director IO and Director S&ET, and the Needs Sponsor for review and a briefing is held to discuss the need. If the ACG/IM&C finds that the need is currently being addressed or that fulfillment of the need is unfeasible, the needs statement is disapproved. The need may also be disapproved based on such factors as cost and risk.

All approved need statements are presented to the Information Technology Investment Committee for consideration. After a decision is made, an OIMC project coordinator should forward the list of approved projects/activities to the appropriate OIMC staff and the Need Sponsors. Specifically, within OIMC the list should be forwarded to the Center Directors, and the Network Configuration Manager.

If the need is approved and can be addressed in an existing or planned project, the OIMC project coordinator works with the lead user and the appropriate project manager (if assigned) and prepares a System Change Request. If the project has not yet begun, a System Change Request

may not be needed. The need statement can possibly be incorporated into the existing requirements. The Needs Statement and Evaluation Report will be forwarded to the Project Manager for inclusion.

If the need cannot be addressed in an existing or planned project, the ACG/IM&C assigns a project manager from OIMC or from the user community. If the project manager is from outside OIMC, he or she should work jointly with the OIMC project coordinator to coordinate activities within OIMC. Similarly, if the project manager is from OIMC, the Needs Sponsor will assign a lead user to coordinate activities within the user community.

After the project starts, the Project Manager notifies the OIMC Network Configuration Manager that the project has begun.

Prepare Preliminary Project Management Plan [SD5]

The Project Manager prepares a preliminary project management plan that will grow and expand over the life of the project. This Project Management Plan will serve as the vehicle for completing the remainder of the tasks in the planning phase. It serves as the repository for all project documentation. To the extent possible, the following sections of the Plan should be completed: Project Description, Project Approach, and Project Management. The Project Schedule section should identify the high level tasks that need to be completed together with estimated start and finish dates. These high level tasks should consist of the major activities associated with each of the subsequent system life cycle phases. Detailed level tasks must be identified for the Planning and Definition Phases . The project manager must use the OIMC-approved project schedule. For assistance, the project manager may consult the OIMC project coordinator or their unit representative.

As part of preparing the project management plan, a risk assessment is conducted and included in the PMP to provide OIMC management with

an indication of the issues and concerns associated with the project. The project manager uses the risk assessment tool that is in the project management plan standard to assess the risk associated with the project. Once identified, a risk assessment strategy is prepared to delineate the procedures that will be used to control and monitor the risks. The results of the risk assessment and the proposed risk management strategy are documented in the PMP and presented to OIMC management. In subsequent phases, the risk assessment tool is used by the project team to update the project's risk assessment and to report the status to OIMC management. The purpose of updating the risk assessment at the end of each phases is to assess whether or not the risk "profile" of the project has changed, indicating a possible effect in the project's cost, schedule or functionality.

The risk assessment tool is composed of risk criteria. The risk criteria are the factors (uncertainty) that may influence the outcome of the acquisition/development project. These risk factors are grouped together into profiles based on their shared meaning. The risk profiles identified are: management, technical, operational, financial, and schedule. The degree of risk associated with each factor is graded by rating the risk as low, medium or high. Scores for low, medium, and high are 1, 2, and 3 respectively, The score is calculated by multiplying the risk level by the weighing factor for the risk factor/criteria. The assessment tool should be completed by the project team (including the contractor).

The risk assessment should be conducted in the following manner:

- Distribute the assessment tool to each member of the team.
- Ask each team member to fill out one profile. They should read the risk criteria/factor, decide on the level of risk associated with the factor, multiply the risk level (1-3) by the weighing factor and record the score on the form.
- Discuss the results of the profile and based on these discussions, scores may be changed. No change is required.
- Repeat the above steps for each profile area.

- Collect the forms when all the profiles have been scored and discussed.
- Summarized (average) the scores for each profile.
- Record the totals on the Risk Assessment Summary Sheet in the column labeled "Score".
- Copy the recorded total to the appropriate Risk Level (low, medium, and high) based on the ranges specified for each risk level.
- Add all the recorded profile totals and record the grand total in the Overall risk box.
- Circle the risk level range that the grand total falls into.
- Determine the documents to be prepared based on the overall project risk score (low, medium, high) by referring to the Documentation Standards and Risk Level Listing. *Remember, this should only be used as a guide. The project manager has the responsibility to decide which documents are to be prepared. The project's document list is recorded in the PMP when first prepared and is presented to OIMC management for approval at the end of the Planning phase.*
- Brief the project team members.
- Prepare a Risk Assessment Strategy that describes the actions to be taken to control and monitor any risk factors that were scored as "high".
- Prepare a briefing chart that presents the risk assessment results and the plan to control and monitor "high" risk factors. In subsequent phases, prepare a Risk Assessment Status chart that informs OIMC management of any changes in the project's risk profile.

The project's risk profile can also be used to assist the project manager in determining the level of documentation needed for the project. A risk-based documentation guide is included in the appendix to this chapter. There are, of course, other factors which suggest required documentation. The following scenarios should be used to assist the project manager in identifying the appropriate documentation suite.

		Acquisition					Development
			COTS				
#	Documentation Title	HDW	New	Upgrade	Change	Modify	Software
1	Needs Statement	✓	✓	✓	✓	✓	✓
2	Needs Statement Evaluation Report	✓	✓	✓	✓	✓	✓
3	Feasibility Study	✓	✓	✓	✓	✓	✓
4	Cost Benefit Study	✓	✓	✓	✓	✓	✓
5	Project Management Plan	✓	✓	✓	✓	✓	✓
6	Project Proposal Brief	✓	✓	✓	✓	✓	✓
7	Functional Description		✓	✓	✓	✓	✓
8	Evaluation Plan		✓	✓	✓	✓	✓
9	Configuration Management Plan	✓	✓	✓	✓	✓	✓
10	Project Decision Brief [Advance to Analysis]		✓	✓	✓	✓	✓
11	System Specifications					✓	✓
12	Database Specifications					✓	✓
13	Project Decision Brief (Advance to Design)					✓	✓
14	Acquisition Plan	✓	✓	✓	✓	✓	
15	Project Decision Brief (Acquisition Approval)	✓	✓	✓	✓	✓	
16	User Interface Design Specifications					✓	✓
17	Program Specifications					✓	✓
18	Project Decision Brief (Advance to Development)					✓	✓
19	SystemTest Plan	✓	✓	✓	✓	✓	✓
20	Source Code/Script Development					✓	✓
21	Functional Test Plan		✓	✓	✓	✓	✓
22	Functional Test Report		✓	✓	✓	✓	✓
23	User's Guide					✓	✓
24	Implementation Plan	✓	✓	✓	✓	✓	✓
24a	Training Plan	✓	✓	✓	✓	✓	✓

		Acquisition					Development
		HDW	COTS				Software
#	Documentation Title		New	Upgrade	Change	Modify	
25	Project Decision Brief (Advance to Implement)	✓	✓	✓	✓	✓	✓
26	Operations Guide					✓	✓
27	Program Maintenance Guide	✓				✓	✓
28	System Change Package	✓	✓	✓	✓	✓	✓
29	Project Decision Brief (Deployment)	✓	✓	✓	✓	✓	✓
30	End-of-Project Brief (Advance to Maintenance)	✓				✓	✓
31	Full Impact Analysis Memo & Checklist						

Finally, the PMP also outlines the briefing schedule the project manager intends to use to keep OIMC management informed on the project's progress. At a minimum, this briefing schedule should contain the end-of-phase briefings outlined in each phase of the process. Additional briefings should be held for issues/items that warrant management input or approval during the phase.

Conduct Feasibility Study [SD3]

The Project Manager begins the Feasibility Study by first contacting OIMC to arrange for the preparation of a decomposition which fits within the overall agency framework. The project manager, together with the user and an OIMC analyst develop the decomposition, identifying the high level activities associated with the Needs Statement and their relationships to GAO's overall business enterprise framework. The project manager then begins the task of identifying alternatives for meeting the needs and the advantages and disadvantages of each from each of the following viewpoints: operational, technical, financial, schedule, and legal feasibility. As appropriate, the project manager should call on others in GAO, such as OIMC's Center Directors, economists, etc., to assist in this evaluation. Ideally, at least three alternatives for meeting the needs should be considered, one of which is to do nothing, i.e., maintain the status quo. The results of these efforts are documented in the Feasibility Study [SD3] and copies should be distributed for review and comment to members of the team and others that participated in the study.

Perform Cost Benefit Study [SD4]

Concurrent with initiation of the Feasibility Study [SD3] or shortly thereafter, the Project Manager will begin the Cost Benefits Study. This study expands on the Feasibility Study by looking into the life cycle costs and benefits for each of the alternatives identified in the Feasibility Study. The Project Manager should obtain assistance from the Office of Chief Economist to prepare the study, specifically help and guidance in computing present value costs and benefits and performing a Sensitivity Analysis, if applicable. Division economists also can be used for this purpose. The results of these efforts are documented in the Cost Benefit Study [SD4] and copies of the completed study are distributed for review and comment to members of the team and others that participated in the study.

Prepare Project Proposal Briefing [SD6]

After completing the Project Plan, the Project Manager and team prepares a Project Proposal Briefing. The purpose of this briefing is to obtain approval to proceed to the Definition phase and, if needed, acquire additional resources for the project. The briefing summarizes the project and presents the results of the work performed during the Planning Phase. It should also prompt the Project Manager to update the risk assessment and bring any significant changes to management's attention.

Obtain Management Approval (End-of-Phase Briefing)

Prior to the beginning of any briefing, the Project Manager should distribute copies of the briefing and all the documents prepared during the Planning phase to the individuals to be briefed. Preferably, these materials should be distributed at least two weeks in advance of any scheduled briefings.

The project manager consults with the OIMC Center Directors as appropriate prior to briefing OIMC Management. Once OIMC Management approves the project to proceed to the next phase, the Project Manager briefs the Needs Sponsor, user community and OIMC Center Directors as appropriate.

If OIMC Management approves the project to go on to the Definition Phase, the project manager baselines the schedule and the project continues.

If OIMC Management disapproves the project to go to the Definition Phase the project manager notifies the Need Sponsors, the lead user, and others as appropriate. The project manager prepares a written statement that explains why the project was disapproved. This statement is included in the Preliminary Project Management Plan and the plan is placed in OIMC's Technical Library for future reference.

Update the Project Management Plan [SD5]

The project manager updates the Project Management Plan with all the approved documentation changes. A copy of the changes is used to update the Project Management Plan that is filed/kept in the OIMC Technical Library. Once completed, the project formally proceeds to the Definition Phase.

CHAPTER 3.0

DEFINITION PHASE

PURPOSE

The purpose of the Definition Phase is to define the requirements in explicit enough terms to determine whether or not it is feasible to continue the project, and to establish the controls that will be used to manage the project, assuming it moves forward.

OVERVIEW

During the Definition Phase, the user's requirements are explicitly defined. These requirements are specified independently of *how* they will be addressed. Based on the detailed requirements, a more realistic estimate of the costs and effort to complete the project is made. The feasibility of the system is determined. A configuration management plan is completed that describes the procedures that will be used to control the changes to the user's needs during the development process.

At the end of the Definition Phase, two reviews are performed. The first review is between the GAO business area users and the analysts who assisted in preparing the requirements and other supporting documentation. This *System Requirements Review* involves the evaluation of the impact that the requirements have on the business area goals and the GAO enterprise. It is intended that this review "lock-in" the requirements and establish the *baseline* upon which the application is built or acquired.

The second review is performed by GAO management. The focus of this review is on the feasibility of completing the project. Factors considered in this review include: costs, benefits, and technical and functional feasibility. A "Go Decision" means that GAO is willing to commit the required resources to complete the next phase of the project. A "No-go Decision" means the project is terminated. Project approval provides the project team the resources required to complete the next phase of the project, the Analysis Phase.

KEY RESPONSIBILITIES

The following table shows key responsibilities for each of the major activities performed during the Definition Phase.

Definition Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Prepare Functional Description [SD7]	FP7	Project Manager	Project Team[1], Users, OIMC Data Management Group
Update Preliminary Feasibility and Cost Studies [SD3, SD4]	FP7	Project Manager	Project Team
Prepare Evaluation Plan [SD8]	FP7	Project Manager	Project Team, OIMC/ATG, OIMC/OSC, TI
Prepare Configuration Management Plan [SD9]	FP7	Project Manager	Project Team, OIMC Network Configuration Manager,
Document Changes to Project Plan	FP8	Project Manager	Project Team
Hold Systems Requirements Review	FP8	Project Manager	Project Team, OIMC Network Configuration Manager

1 A project team may consist of project manager, lead user, database analyst, and system analysts/modelers. Specific team members are identified when they have lead responsibility for the task.

Definition Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Prepare Project Decision Paper/Briefing [SD10]	FP8	Project Manager	Project Team
Obtain Management Review/Approval (End-of-Phase Briefing)	FP8	ACG/IM&C	Director IO, Director S&ET Needs Sponsor, OIMC Project Coordinator
Update Project Management Plan [SD5]	FP9	Project Manager	Project Team

BASELINED DOCUMENTS

Functional Description

Provides detail requirements specifications for solicitation of a development contractor to design a capability to satisfy GAO needs or to acquire a commercial software package to satisfy GAO needs.

Evaluation Plan

Describes how it will be determined whether or not the functional performance of the system addresses the need, including whether or not the costs and benefits were met and realized.

Configuration Management Plan

Describes how the integrity of the need is maintained and communicated through the definition, design, development and maintenance of the project.

OTHER KEY DOCUMENTS

None

RELATED FORMS

None.

PROCEDURES

Prepare Functional Description [SD7]

At this point in the life cycle, the proposed project has been evaluated by OIMC management and determined feasible. The next step is to expand on the initial need statement to explicitly define what the requirements of the project are. Although in this phase the requirements are defined only in terms of *what* functions must be addressed, this functional description (FD) is used to determine *how* the requirement will be addressed is subsequent phases.

The functional description that is detailed during this phase is the baseline functional requirement. It is a configuration item, meaning once it has been reviewed and accepted by both OIMC management and users, changes to it are controlled and must be approved by the project team.

Once users are satisfied that the FD explicitly defines their requirement, the project manager schedules a Systems Requirement Review (SRR) with the users, the project staff, the CM manager and any other appropriate staff. The purpose of a SRR is to formally agree on the requirements as described in the functional description. If changes need to be made, they are made and the document is reviewed again by all parties. Once the FD is formally accepted, the functional baseline has been established and the FD becomes a configuration item.

Update Preliminary Feasibility and Cost Studies [SD3, SD4]

After the functional description [SD7] is prepared, the Project Manager updates the preliminary feasibility study and cost benefit analysis which were prepared in the Planning Phase.

The feasibility study [SD3] identified the various alternatives for the project from the viewpoints of operational, technical, financial, schedule, and legal feasibility. This document is updated to reflect that more is now known about the project because the specific needs have explicitly defined in the FD.

This document will be used by OIMC management to determine whether or not the project should go forward to the analysis phase.

Prepare Evaluation Plan [SD8]

During this phase, the Project Manager prepares an evaluation plan which describes how the success of the project will be measured. This includes a description of how it will be determined whether or not the functional performance of the system addresses the need, whether or not the expected benefits were realized, and whether or not the system cost what was predicted.

The plan should describe the approach that will be used to compare the new system with the previous operation, how information will be collected, and when it will be collected. It should detail the

The functional description is developed within the context of an enterprise framework.[2] In the previous phase, the Planning Phase, the project manager would have provided OIMC the initial needs statement for review. OIMC determines where/how the proposed system relates to existing GAO business areas. The OIMC reviews the initial decomposition to identify in which business area(s) the system belongs and to identify potential relationships to existing systems. This information is provided to the project manager. OIMC continues to work with the team, however, in developing their requirements to assist in identifying additional relationships and to assist in ensuring consistency between applications.

The functional requirements are developed by the Project Team and users. It may also require the assistance of additional OIMC/ATG analysts. It is developed by taking the initial decomposition and "driving down" each process to its most elementary process. This documentation is captured by an analyst through the use of a modeling tool to facilitate its maintenance. This modeling must be done according to the modeling guidelines identified in the Modeling Standards Guide.

The processes can be identified through any number of ways, the most common being a joint application design (JAD) workshop where users are brought together with analysts to discuss the requirements together to minimize misunderstandings. Typically, these workshops take several days and while the users are communicating their requirements to the analysts, the analysts graphically capture the information and then present it back to the users to ensure they have adequately capture the need.

It is important during this process to identified shared functions and/or processes. If possible, existing code should be shared. Any inconsistencies should be brought to the attention of the data manager.

---

2 The enterprise framework represents a high-level model of the existing agency functions and processes.

measurements that will be used. These should coincide with the project objectives as outlined in the Project Management Plan.

The results of the evaluation are documented in the Evaluation Report. This Evaluation Report is prepared according to the time frames established in the Evaluation Plan. The Evaluation Plan lays out the points at which an evaluation is conducted. An Evaluation Report may be prepared at each interval or it may be appropriate to prepare a single Evaluation Report which summarizes each evaluation.

Prepare Configuration Management Plan [SD9]

During this phase, the Project Manager also develops a configuration management plan which describes how the integrity and continuity of the project will be controlled. This includes an explanation of how changes to documents prepared during the project will be managed.

If an item is identified as a configuration item, changes to it must be reviewed and approved by the project team and any others, as appropriate, depending on the nature of the change. If a change to a configuration item is required, the project manager should distribute the proposed change to all team members prior to meeting to discuss the proposed change. The team then meets and discusses the proposal. The project manager needs to identify in the plan how items which are turned down will be handled (i.e., how they will be documented and who will be notified and how). If a proposal is approved, the change is made and OIMC management and the Need Sponsor are notified, if appropriate.

Document Changes to Project Management Plan [SD5]

When the above activities have been completed, the Project Manager annotates the changes that need to be made the to Project Management Plan [SD5]. This includes a review of the tasks outlined in the project schedule and their associated estimated start and finish dates. These changes are identified so that when OIMC management is briefed at the

end-of-phase briefing, the Project Manager can inform management of changes to the schedule.

Hold Systems Requirements Review

After the work for this phase has been completed and prior to briefing OIMC management on the project's status, the project manager schedules a systems requirement review. The purpose of the SRR is to review and accept the functional requirement as the baselined requirements for the system. This serves as the basis for which future work is built on.

The SRR also serves to give the team the opportunity to review and revise the evaluation plan and the configuration plan.

Prepare Project Decision Paper/Briefing [SD10]

After completing the Project Plan, the Project Manager and team prepares a Project Proposal Briefing. The purpose of this briefing is to obtain approval to proceed to the Definition phase and, if needed, acquire additional resources for the project. The briefing summarizes the project and presents the results of the work performed during the Planning Phase. It should also prompt the Project Manager to update the risk assessment and bring any significant changes to management's attention.

Obtain Management Review/Approval (End-of-Phase Briefing)

Prior to beginning of any briefing, the Project Manager should distribute copies of the briefing and all the documents prepared during the Planning phase to the individuals to be briefed. Preferably, these materials should be distributed at least two weeks in advance of any scheduled briefings.

The project manager consults with the OIMC Center Directors as appropriate prior to briefing OIMC Management. Once OIMC

Management approves the project to proceed to the next phase, the Project Manager briefs the Needs Sponsor, user community and OIMC Center Directors as appropriate.

If OIMC Management approves the project to go on to the Definition Phase, the project manager baselines the schedule and the project continues.

If OIMC Management disapproves the project to go to the Definition Phase the project manager notifies the Need Sponsors, the lead user, and others as appropriate. The project manager prepares a written statement explaining was disapproved. This statement is included in the Preliminary Project Management Plan and the plan is placed in OIMC's Technical Library for future reference.

Update Project Management Plan [SD5]

The project manager updates the Project Management Plan with all the approved documentation changes. Once completed, the project formally proceeds to the Definition Phase.

CHAPTER 4.0

ANALYSIS PHASE

PURPOSE

The purpose of the Analysis Phase of IT process is to apply structured techniques to examine the user requirements. This analysis is performed to ensure that the definitions and relationships of the data and processes are consistent with the user requirements as a whole.

OVERVIEW

The principal activities in the Analysis Phase are: document the detailed process and data models, and develop the system design specification and the database specification. As the resident business expert, the user is asked to work closely with the analyst in modeling the proposed system based on the requirements defined in the Functional Description [SD9].

Joint Application Development workshops are held. The information gathered during these workshops is used to construct two system models, namely: the process model and the data model. The process model documents the processes and the flow of the data through the system. The data model records the data requirements for the new system and is the first step in designing the system's database and related files. These system models become the key elements in the System Specification [SD11] and the Database Specification [SD12]. Both specification documents are formally reviewed by the user, management, and technical staff at the preliminary design review meeting. The results of the review are used to update and baseline the specifications. Once the update has been completed, a Project Decision Brief [SD13] is then prepared to provide OIMC management with the information necessary to decide whether to approve/disapprove the project to proceed to the Design phase. The minutes of the meeting are used to update the Project Management Plan [SD5]. If the project is approved to continue, it moves into the Design Phase. If the project is terminated, the needs sponsor and user are formally notified, a closure statement is written for inclusion in the Project Management Plan [SD5], and the plan is saved in the OIMC Technical Library for future reference.

KEY RESPONSIBILITIES

The majority of the tasks contained in the Analysis Phase are the responsibility of the project team and OIMC/ATG. Refer to the table below for who is responsible for each of the analysis activities.

Analysis Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Build Process Model	FP10	Project Manager	Project Team[1], Users, OIMC/ATG,
Prepare System Specifications [SD11]	FP10	Project Manager	Project Team, Users, OIMC/ATG, OIMC/OSC
Build Data Model	FP10	Project Manager	Project Team, Users, OIMC/ATG, OIMC/OSC
Prepare Database Specifications [SD12]	FP10	Project Manager	Project Team, OIMC/ATG, OIMC/OSC
Document Project Management Plan Changes	FP11	Project Manager	Project Team
Hold Preliminary Design Review	FP11	Project Manager	Project Team, Users, OIMC/ATG, OIMC/OSC, Training Institute, Network Configuration Manager

[1] A project team may consist of project manager, lead user, database analyst, and system analysts/modelers. Specific team members are identified when they have lead responsibility for the task.

Analysis Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Prepare a Project Decision Paper/Brief [SD13]	FP11	Project Manager	Project Team
Brief OIMC Management	FP11	Project Manager	ACG/IM&C, Director IO, Director S&ET, Needs Sponsor
Update Project Management Plan [SD5]	FP12	Project Manager	Project Team

BASELINED DOCUMENTS

System Specifications [SD11]

Provides the technical staff and user with a detailed "design definition" of the system's functions, processes and data flow required to satisfy the user's information requirements.

Database Specifications [SD12]

Provides the technical staff and user with a detailed "data definition" of how the data requirements for the proposed system/change will be implemented.

OTHER KEY DOCUMENTS

Project Decision Brief [SD13]

Provides the necessary information for OIMC management to decide whether the project is approved/disapproved to proceed to the next phase of the system life cycle, Design

Joint Application Development Memorandum

Documents the results of meetings held between the user and technical staff as related to the development of the process and data models.

Project Management Plan [SD5]

Contains all the information used by the project manager to guide the system through the system life cycle. It also becomes a repository for all the documentation generated in support of the system development/acquisition.

RELATED FORMS

None.

PROCEDURES

Build Process Model

The purpose of the process model is to document the system's processes, inputs, outputs and data stores. Processes are the work performed on incoming data flow(s) to produce outgoing data flow(s). Inputs are the data that flow into a process. The outputs are data that flow from the processes, and a data store is a place where data accumulates. The tool used to depict the processes, data flows (inputs and outputs), and data stores is the data flow diagram.

The analysts and the users create a process model to gain a better understanding of which processes documented in the decomposition will be affected/changed by the new system. The decomposition was completed in the Definition phase and included as an appendix to the Functional Description [SD7]. This data flow modeling effort builds on the decomposition and allows both the user and analyst to agree on how the processes interface with each other by graphically documenting the data flows among the processes.

If Joint Application Development workshops were used in the Definition phase to create the decomposition, the same workshop participants should be used in the Analysis phase to create the process model. If Joint Application Development workshops were not used in the prior phase, they should be used to involve the user and gain their business input to the development of the process model. If the project manager is not familiar with holding a Joint Application Development workshop, OIMC management will provided the necessary expertise.

To prepare the data flow diagram, the following steps should be completed:

- *Prepare a context level data flow diagram.* This is the highest-level view of the process model. At the context

level, the proposed system is depicted as a single process. The purpose is to graphically show how the system will interface with other GAO systems.

- *Prepare the overview data flow diagram.* The purpose is to show the major processes of the system and their interaction among themselves. While the context level data flow diagram shows how the system will react to other GAO systems, the overview data flow diagram shows what are the major processes of the system and how they will work with each other within the system's boundary. The processes drawn and defined in the decomposition diagram, which was constructed in the Definition phase, are now used to prepare the overview and subsequent data flow diagrams. Any changes (addition, omission, or modification) to these decomposition processes are documented and used later by the project team to update previous baselined documents. It is important to maintain consistency (process names, definitions, etc.) between the decomposition diagram and the data flow diagrams as well as among the different levels of data flow diagrams.

- *Draw the primitive level data flow diagrams.* The purpose is to reach a level of detail that identifies the primitive data stores and data flows. Primitive means the process cannot be further defined by another level of detail.

- *Generate analysis reports.* The purpose of the analysis reports is to assist the modeler in maintaining data consistency between levels of data flow diagrams.

Prepare System Specifications [SD11]

Once the process model has been constructed and reviewed by the workshop participants, the project team should prepare the design specifications for the system. Refer to the documentation standards for the format.

While this task is presented after the activity of building the process model, it should be noted that much of the documentation to be included in the System Specifications comes from other documents already completed as well as from the information created during the process modeling workshop. In essence, the System Specifications is a point-in-time picture of the design of the system as represented by the process model and supportive information (data store listing, data flow listing, process and entity association matrices, etc.).

In the process of preparing the System Specifications, the project team should compare the processes and their definitions with those used in the decomposition. The data stores (names and what is stored) should be compared with other agency data stores to ensure data integrity. Changes to previous system documents (Functional Description, etc.) should be recorded. These changes are reviewed by the project manager to determine if the functional baseline established at the end of the Definition phase has been changed. If so, a system change request must be prepared. When the change is textual and does not require any additional time or monies to complete the project, the system change request is approved at the project level by the project manager. When the change requires additional time or monies to complete the project, it is must be approved by OIMC management. The change process is documented in the project's Configuration Management Plan [SD9].

When the System Specifications document is completed, it is distributed and reviewed by the project team. The document is updated as appropriate in accordance with the project's change management

process. Finally, the document will be formally distributed, reviewed and baselined at the preliminary design review.

Build Data Model

The purpose of the data model is to document the data the system needs to satisfy the functional requirements of the user. It models the data stores identified in the data flow diagrams (process model) independent of how the data is used. This does not imply that the data model cannot be built prior to the process model. It does imply there should be consistency between both models. The focus is on the data stores as entities and the relationship that exists among these entities. The entity relationship diagram is the data modeling tool used to define these relationships and record their structural properties, known as attributes. The data model provides an effective way to document, analyze and control the definition of the system data requirements. The data description becomes the blueprint for design of the database.

Before creating the data model, the project manager and the OIMC Data Manager should discuss how the Computer Assisted System Engineering tool is going to be used and how the team plans to integrate their data model with the overall GAO agency data model. The purpose of discussing these topics is to make sure that the project team takes advantage of prior experiences and work performed in the creation of data models, especially with the Computer Assisted System Engineering tool. It also alerts the OIMC Data Manager that future assistance may be required by the project team to accomplish their data modeling work.

To create the data model, the analyst must work with the user. This is accomplished by holding Joint Application Development workshops with the users. The workshop participants should be the same as those involved in preparing the process model.

To prepare the entity relationship diagram, the project team should:

- *Identify the entities.* An entity is anything about which the user wants to store data. Different methods can be used to identify entities. One method is to review with the user the data stores that were recorded in the data flow diagrams. If the process model was not created, then the focus should be on what data is captured, stored and organized by the user to produce the information required to get the job done. If the project involves modifying an existing system, the Computer Assisted Software Engineering tool can be used to reverse engineer the system's database to reveal its entities, attributes, and relationships. Whatever method is used, the entities must be identified and their properties (attributes/fields/data elements) must be defined. The user's business terminology should be used to name entities. These entity names should be compared with list of GAO enterprise entity names. There should not be any duplicates nor should two different entities have the same name or definition. Do not repeat the same attribute in different entities. An attribute should be associated with one and only one entity. The team should review the entities and their properties with the users.

- *Define the relationships between the entities.* A relationship is the link or association between the entities. The relationship is defined in both directions by specifying its properties which are: the relationship's name and its cardinality. Cardinality refers to the maximum and minimum number of occurrences of one entity associated with an occupance of the other entity. For example, in a decomposition, a *function* (entity type) *consists of* (relationship's name) *one or more* (cardinality) processes (entity type). After the relationships have been defined, they should be reviewed by the user. If using a Computer Assisted Software Engineering tool, a entity to entity matrix

can be generated to verify the relationships between the entities.

- *Draw the entity relationship diagram.* Following the information engineering modeling standards, the entity relationship diagram is drawn. The first level of the entity relationship diagram is called the context level. The context level data model only shows the names of the entities involved. The purpose is to indicate the enterprise entities that will be used to implement the system. The next level of the entity relationship diagram is called the essential level. In this case, the context level entity relationship diagram is expanded to include the entity relationships (name and cardinality) and properties/attributes. The essential entity relationship diagram reflects the system's data requirements when the database is constructed.

Prepare Database Specifications [SD12]

Once the data model has been constructed and reviewed by the users, the project team should prepare the Database Specifications [SD12] for the system. Refer to the documentation standards for the format.

Much of the documentation to be included in the Database Specifications comes from the information created during the data modeling workshop. In essence, the Database Specifications is a point-in-time picture of the design of the system's database as represented by the data model and supportive information. The specifications will be updated in the Design Phase when the data model is normalized.

In the process of preparing the Database Specifications, the project team should compare the entities and their definitions with those used in the process model. Changes to previous system documents should be recorded. These changes are reviewed by the project manager to

determine if the functional baseline established at the end of the Definition phase has been changed. If so, a system change request must be prepared. When the change is textual and does not require any additional time or monies to complete the project, the system change request is approved at the project level by the project manager. When the change requires additional time or monies to complete the project, it is must be approved by OIMC management. The change process procedures are documented in the project's Configuration Management Plan [SD9].

When the Database Specifications are completed, it is distributed and reviewed by the project team. The document is updated as appropriate in accordance with the project's change process. Finally, the document will be formally distributed, reviewed and baselined at the preliminary design review.

Document Changes to Project Plan

The project team prepares a documentation change package that will be used in the Preliminary Design Review. The change package must include at a minimum the following:

- changes to existing documents
- new documents created during the phase
- updated project schedule detailing the tasks for the next phase of the project
- updated Project Management Plan pages detailing the activities to be performed in the next phase of the project

The documentation change package is distributed to those individuals who are asked by the Project Manager to participant in the Preliminary Design Review. The participants should receive the change package two weeks prior to the Preliminary Design Review.

Hold Preliminary Design Review

Following completion of all the phase tasks and the documentation change package has been assembled, a Preliminary Design Review meeting is held. The review is scheduled at the end of the Analysis Phase and prior to the End-of-Phase Review. The meeting is chaired by the system's Project Manager. In addition to the project team, the OIMC Network Configuration Manager and Data Manager , representatives from OIMC/ATG, OIMC/OSC, Training Institute and the user community are in attendance.

The purpose of the Preliminary Design Review is to ensure that:

- the process model has been completed and reviewed for such items as:
  - no black holes, miracles or gray holes exist
  - followed standard naming conventions
  - communicates management's view of the business
- the System Specifications [SD11] provides the required detail to guide the design the system
- the data model has been completed and reviewed for such items as:
  - entities have been reviewed with the appropriate users
  - data requirements are in enough detail so that the database design process can be performed in the Design Phase
- the Database Specifications [12] provides the necessary information to guide the design of the database and files during the Design Phase.
- proposed changes generated during the Analysis Phase were acted upon and recorded in accordance with the project's configuration management procedures
- the system as described in both the System Specifications and Database Specifications meets the user's requirements as stated in the Functional Description [SD7].

With regard to satisfying the user's requirements, known functional deficiencies and their impact on user's expectations are also documented and presented at the Preliminary Design Review meeting. If the deficiency requires a change to the Functional Description [SD7] or any other system documentation, a System Change Request is prepared for review and presented for discussion at the Preliminary Design Review. The System Change Request is approved/disapproved in accordance with the project's Configuration Management Plan [SD9].

The outputs of the Preliminary Design Review meeting are the following:

- updated system documentation
- established design baseline
- written project status report

Prepare a Project Decision Paper/Brief

The project manager will prepare a Project Decision Briefing/Paper [SD13] to OIMC Management for review and approval. The purpose of this briefing is to present the results of Analysis Phase and the Preliminary Design Review to ACG/IM&C at the End-of-Phase Review meeting. It must contain the necessary information required by ACG/IM&C to decide whether the project should proceed to the Design Phase or be terminated. The briefing should succinctly recap the work accomplished in the phase. It should also prompt the Project Manager to update the risk assessment and bring any significant changes to management's attention. The extent and the type of summarization should be adapted to the complexity and size of the project. Refer to the Project Decision Briefing/Paper [SD13] standard to understand what information must be included.

Brief OIMC Management

The End-of-Phase Review is chaired by ACG/IM&C and is held at the end of the Analysis Phase. The review participants are:

- Director for Infrastructure Operations,
- Director for Standards and Emerging Technologies,
- Project Manager and team,
- Needs Sponsor
- User from the user community (selected by the Needs Sponsor)
- Training Institute representative
- OIMC/ATG representative
- OIMC/OSC representative
- OIMC Network Configuration Manager
- OIMC Data Manager
- Others (as invited by ACG/IM&C)

The objectives of the End-of-Phase meeting are::

- to review the work accomplished to date,
- to discuss any known functional deficiencies and issues,
- to decide whether the project should proceed to the Design Phase or be terminated.

It is the project manager's responsibility to scheduled the meeting and to provide the necessary documentation to the meeting's participants. The key briefer is the project manager. Since a milestone in the project's history has been reached, the project manager prepares an End-of-Phase memorandum that summaries the meeting's discussions and records the ACG/IM&C's decision. The End-of-Phase memorandum is distributed to the meeting's participants. A copy of the document is included in the Project Management Plan [SD5].

Update the Project Management Plan [SD5]

Following the briefing, the project manager updates the Project Management Plan with all the approved documentation changes. A copy of the changes is used to update the Project Management Plan that is filed/kept in the OIMC Technical Library. Once completed, the project formally proceeds to the Definition Phase.

CHAPTER 5.0

DESIGN PHASE

PURPOSE

The purpose of the Design Phase of the IT process is to evaluate and select the physical implementation alternative to satisfying the user's requirements. The decision to build or acquire would have been made by OIMC Management previously based on the results of the Feasibility Study [SD3] and the Cost Benefit Study [SD4]. If the decision was to build the system, the process and data models are further refined and used to describe the system's physical characteristics and how it will operate in the user's environment. If the decision was to acquire an existing commercial off-the-shelf system, the requirements reflected in the process and data models are used in the procurement selection process.

OVERVIEW

During the Design Phase, the system's functional requirements are compared to the functional capabilities provided by commercial-off-the-shelf systems. The results are used to determine whether to pursue the acquisition of a commercial-off-the-shelf system to satisfy the user's needs or to proceed with the development effort. If the decision is to acquire an existing commercial-off-the-shelf system, a procurement team is established. The team prepares the required procurement documentation, seeks management's approval and performs the acquisition. If the system is to be built, one of the first activities performed by the project team is to meet with the user(s) to design the user's interfaces with the system. The user's interfaces are simulated or prototyped so that the user can better understand their need. Finally, the process and data models are updated.

The design phase is concluded by a review by the users and management. A critical design review is held with the technical staff and the users in order to baseline the technical design that will be used to satisfy the user's functional requirements recorded in the Functional Description [SD7]. Management reviews the results of the critical design review so they can decide whether or not to commit the resources to complete the next phase of the project. If the project is approved to continue, it moves into the Development Phase. If the project is terminated, the needs sponsor and user are formally notified, a

closure statement is written for inclusion to the Project Management Plan [SD5], and the plan is saved in the OIMC Technical Library for future reference.

KEY RESPONSIBILITIES

The majority of the tasks contained in the Design Phase are the responsibility of the project team and OIMC/ATG. Refer to the table on the next page for who plays a role in each of the design activities.

Design Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Compare Functional & Technical Requirements against commercial off-the-shelf software packages	FP13	Project Manager	Project Team[1], Users, OIMC/ATG, OIMC/OSC, Training Institute, OIMC Data Management Group
Prepare Acquisition Plan [SD14]	FP13	Project Manager	Project Team, Users, OIMC/ATG, OIMC/OSC, IT Procurement
Prepare Decision Paper/Brief [SD15]	FP13	Project Manager	Project Team

[1] A project team may consist of project manager, lead user, database analyst, and system analyst/modelers. Specific team members are identified when they have lead responsibility for the task.

Design Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Brief OIMC Management	FP13	Project Manager	OIMC/ACG, Director for Infrastructure Operations, Director for Standards and Emerging Technologies, Project Team, Needs Sponsor, User, Training Institute, Network Configuration Manager, OIMC/ATG, OIMC/OSC, IT Procurement, Data Manager
Acquire the commercial off-the-shelf system	FP13	Project Manager	OAM, Project Team, IT Procurement
Design User Interface [SD16]	FP14	Project Manager	Project Team, Users, OIMC/ATG, Data Management Group
Update the Database Specifications [SD12]	FP14	Project Manager	Project Team, OIMC/ATG, Data Management Group
Design the Client/Server Programs	FP14	Project Manager	Project Team, OIMC/ATG

Design Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Document Project Management Plan Changes	FP14	Project Manager	Project Team
Hold a Critical Design Review	FP15	Project Manager	Project Team, User, OIMC/ATG, OIMC/OSC, Training Institute, Network Configuration Manager, Data Manager
Prepare Project Decision Paper/Brief [SD18]	FP15	Project Manager	Project Team
Brief OIMC Management	FP15	Project Manager	OIMC/ACG, Director for Infrastructure Operations, Director for Standards and Emerging Technologies, Project Team, Needs Sponsor, User, Training Institute, Network Configuration Manager, OIMC/ATG, OIMC/OSC, Data Manager

Design Activities and Responsibilities			
Major Activities	Flow Page	Responsibility/Lead	Key Players
Update Project Management Plan [SD5]	FP16	Project Manager	Project Team

BASELINED DOCUMENTS

Database Specifications [SD12]

Provides the technical staff and user with a detailed "data definition" of how the data requirements for the proposed system/change will be implemented. This document was initially prepared in the Analysis phase and is now updated in this phase. Its final version will become part of the Program Maintenance Guide [SD27]

Acquisition Plan [SD14]

Provides management with information on the acquisition objectives, defines the operational user requirements, identifies the acquisition and approval authorities, and specifies the acquisition strategy for obtaining the commercial off-the-shelf system. This document is coordinated with the Office of Acquisition and Management.

User Interface Design Specifications [SD16]

Provides the technical staff with the design of the input and output requirements of the proposed system. Its final version will become part of the Program Maintenance Guide [SD27]

Program Specifications [SD17]

Provides the programmer with the logic of a program(s) in sufficient detail to permit coding. Its final version will become part of the Program Maintenance Guide [SD27]

OTHER KEY DOCUMENTS

Acquisition Decision Brief [SD15]

Provides the necessary information for OIMC and OAM management to decide whether the Acquisition Plan contains the appropriate information for the successful acquisition of a commercial off-the-shelf system.

Project Decision Brief [SD18]

Provides the necessary information for OIMC management to decide whether the project is approved/disapproved to proceed to the next phase of the system life cycle, Development

RELATED FORMS

None.

PROCEDURES

If OIMC Management's decision was to build the system, the project team starts the design process by directing their focus on the further refinement of the data model created in the Analysis phase. Refer to the Design User Interface activity and a discussion of prototyping for further information. If the decision is to buy the system, the next major activity is the development of the Acquisition Plan [SD14].

Compare Functional and Technical Requirements against Commercial Off-the-Shelf Software Packages

Before a decision can be made on which software package(s) GAO should buy, the project team should solicit the help of the users, and

form an evaluation group. Copies of the system documentation (e.g. functional description, system specifications, etc.) generated to date are distributed to the group members. Based on the users' requirements as reflected in these documents, the evaluation group documents management's constraints (e.g. budget limit, time required, etc.) and develops the criteria that will be used to evaluate whether any commercial off-the-shelf software package can satisfy the users' needs. The team selects a minimum set of criteria and constraints that will be used to narrow the range of software packages to a few before the full evaluation is performed. Once accomplished, the selected software packages are then evaluated. The evaluation results and the group's recommendation are recorded in a memorandum to OIMC/ATG. As a minimum, the memorandum must include the following items: the criteria and constraints that were used to select the software packages for full evaluation; the software packages that were evaluated, the criteria that was used to perform the evaluation, the group's recommendation and the justification for the recommendation. Based on this evaluation, the group may recommend that OIMC Management reconsider its decision to buy Commercial Off-the-Shelf Software and build an application to satisfy the user's requirements. This may occur if the evaluation shows that there isn't any software available to meet the requirements at a reasonable cost. A copy of the memorandum is placed in the Project Management Plan [SD5].

Prepare an Acquisition Plan [SD14]

The Acquisition Plan [SD14] defines the objectives, operational requirements, acquisition authority, approval authority, approval process and acquisition strategy for obtaining the commercial off-the-shelf system to support the user's requirements.

At this point in the system life cycle there is a commitment only to consider the acquisition of the system. The purpose of the preparing the Acquisition Plan [SD14] is to provide OIMC and OAM with enough information to make an informed decision on whether acquiring the capability through the purchase of a commercial off-the-shelf system is the best solution and meets budgetary constraints. The key objective of the plan is to provide the necessary information and justification to make the acquisition decision. Refer to the documentation standard for the format and content of the plan.

When preparing the plan, the project team should solicit the assistance of others with experience in software acquisition (Manager IT Procurement, OAM) and training (Training Institute). When completed, the project manager should critically examine the Acquisition Plan prepared by the team to ensure that the necessary procurement actions are clearly delineated and directed to fulfilling the acquisition, testing and implementation requirements. Depending upon the scope of the acquisition, the project manager distributes the Acquisition Plan to the appropriate OIMC Directors for comment. If required, changes are made.

Prepare Acquisition Decision Paper/Brief [SD15]

The project team prepares an Acquisition Decision Paper/Brief to present the Acquisition Plan [SD14] to OIMC/ACG for approval. It must contain the necessary information required by the Directors for Infrastructure Operations and for Standards and Emerging Technologies, to advise ACG/IM&C on whether to approve or disapprove the acquisition. The briefing should highlight the acquisition strategy, present the budget impact, and discuss how the software package satisfies the user's needs. It should also prompt the Project Manager to update the risk assessment and bring any significant changes to management's attention. The briefing details should be adapted to the

scope of the acquisition. Refer to the Project Decision Briefing/Paper [SD15] standard to understand what information must be included.

Brief OIMC Management

Two weeks prior to the meeting, the briefing and the Acquisition Plan are distributed to the following attendees:

- ACG/IM&C
- OAM
- Director for Infrastructure Operations,
- Director for Standards and Emerging Technologies,
- OIMC Directors,
- Needs Sponsor,
- OIMC Data Manager,
- OIMC Network Configuration Manager, and
- Training Institute (when appropriate)

The project manager is the key presenter. The objectives of the meeting are::

- to review the acquisition strategy and procurement schedule,
- to discuss the risks, tradeoffs, and availability of competition,
- to validate the procurement funds required, and
- to approve/disapprove the acquisition

Refer to the documentation standard [SD15] for the specific areas that must be presented at the meeting. The results of the meeting is recorded in a memorandum and placed in the Project Management Plan. The possible outcomes are: buy, make, or terminate the project. If the decision is to buy, the project team proceeds to execute the tasks in the Acquisition Plan to acquire the software. If the acquisition is disapproved, the project team should review with OIMC Management the merits of building the system or terminating the project. If the project is terminated, the needs sponsor is formally notified, a closure

statement is written for inclusion to the Project Management Plan [SD5], and the plan is saved in the OIMC Technical Library for future reference.

Acquire the Commercial Off-The-Shelf System

If acquisition is approved, a procurement team is established in accordance with GAO procurement policies to prepare a Request for Proposal. The Request for Proposal communicates to prospective vendors the proposed system's functional and technical requirements and solicits competitive proposals and quotes. The requirements are categorized into mandatory and desirable. Mandatory means that the system "must satisfy" these requirements. Desirable means that "it would be nice" if the system satisfied these requirements.

Once the Request for Proposal is completed, the procurement team prepares the Proposal Evaluation Plan. The Proposal Evaluation Plan contains the *evaluation criteria* (functional and technical) that will be used to validate the vendors claims that the software package satisfies the mandatory requirements. The plan also includes an explanation of the *scoring system* that will be used to assign points on "how well" the vendor satisfies the functional and technical requirements listed in the Request for Proposal.. As directed by the Office of Acquisition Management, the Request for Proposal and the Proposal Evaluation Plan are distributed for comment. Based on the comments received, the documents are revised. The Office of Acquisition issues the Request for Proposal to the marketplace.

The proposal evaluation process is divided into two parts:

- functional and technical evaluation, and
- cost evaluation

Each vendor proposal is evaluated and assigned a score based on the functional and technical criteria listed in the Proposal Evaluation Plan. After the proposals have been evaluated, all the proposals are reevaluated based on costs.

The proposals are ranked and a recommendation is prepared by the procurement team for management's approval. Once the approval is given, the award is announced by the Office of Acquisition Management to all vendors who submitted proposals. The winning vendor is contacted and a contract is negotiated. A proposal debriefing is given to the losing vendors. The purpose of the debrief is to indicate to the losing vendors the weaknesses in their proposals.

Once the contract award made, the project moves into the Development Phase. The commercial off-the-shelf system is installed on the network and functional testing begins. After the completing the functional testing, the system must still be integrated into a system change package, and undergo quality assurance testing prior to being rolled out GAO wide. Refer to the Development Phases for further information.

Design User Interface [SD16]

After a decision has been made to build the system, the first step is to design how the system will appear to the user through screens, reports, and menus. The design layouts of the hardcopy reports, report screens, dialogue screens, and data entry screens are recorded in the User Interface Design Specifications [SD16]. These specifications describe how the database will be accessed and populated.

If a Computer Assisted System Engineering tool is available, the project team meets with the user(s) and prototypes the user interface with the proposed system. The process and data models created during the Analysis Phase are the source for:

- what processes are to be automated
- what screens are required for each process
- what data elements will be used
- what database tables must be created to support the screens, reports, and menus

One of the advantages of prototyping is that the user gets to see the model working and can make changes as needed to better reflect their requirements. However, the prototyping activity does not replace the need for documentation.

If a Computer Assisted System Engineering tool is not available, the input and output products should still be prototyped, possibly using a graphical user interface program. In either case, the user interface design specifications must be recorded in a repository for later use in the preparation of the required code. These specifications are record in an encyclopedia when using Computer Assisted System Engineering tool or in a relational database if the engineering tool is not available.

Refer to the User Interface Design Specification [SD16] documentation standard to understand what information must be included. The final version will be included the Program Maintenance Guide [SD27].

Design the Client/Server Programs

The purpose of the Program Specifications [SD17] is to present overall organization of the modules and to describe the logic of the processing required in the program module(s) in sufficient detail to permit coding by the programmer. The project team uses two structured techniques to document system's design, namely: the structured chart and the program definition language/pseudocode.

The structure chart depicts the program modules in a hierarchy diagram. The modules at the top are factored into submodules, and further

exploded into sub-submodules. The modules are executed from top-to-bottom, and in a left-to-right sequence. The structure chart shows the connections between the models and indicates the type of information exchange between the models. The value of the structure chart is that it provides a graphical outline of all the modules to be programmed. The program definition language/pseudocode is then used to describe in detail what processing must be perform to transform the inputs to the module into required outputs.

Refer to the Program Specifications [SD17] documentation standard to understand what information must be included. The final version will be included the Program Maintenance Guide [SD27].

Update the Database Specifications [SD12]

During the Analysis Phase, the data model in the form of an entity relationship diagram was created and reviewed by the user. In the design phase, the data model is further refined by the project team so it can be physically implemented as a nonredundant, flexible database. To accomplish this goal, the project team normalizes the data model to the third normal form. Normalization is a three step process. The first step is to remove all repeating groups and identifying the primary key (first normal form). The second step is to make sure that all nonkey attributes are fully dependent on the primary key (second normal form). Finally, the third step is to remove all nonkey attributes that are dependent on other nonkey attributes (third normal form).

Based on the application of normalization, the data model may need to be redrawn to accommodate new entities and/or new data relationships. When the data model is finished, the project manager holds a meeting with a group of informed business experts in the area covered by the data model. The purpose of the meeting is to review and pass judgement over the validity of the representation depicted in the entity relationship diagrams.

Once this accomplished, the physical database schema is documented. The data structures, access methods, table organizations and any other physical attributes required to implement the logical database schema are documented. A description on how the physical database will support the input and output process requirements is recorded. All of this information is used to update Database Specification.

Refer to the Database Specifications [SD12] documentation standard to understand specifically what information must be included. The final version will be included the Program Maintenance Guide [SD27].

Document Project Management Plan Changes

The project team prepares a documentation change package that will be used in the Critical Design Review. The change package must include at a minimum the following:

- changes to existing documents
- new documents created during the phase
- updated project schedule detailing the tasks for the next phase of the project
- updated Project Management Plan pages detailing the activities to be performed in the next phase of the project

The documentation change package is distributed to those individuals who are asked by the Project Manager to participant in the Critical Design Review. The participants should receive the change package two weeks prior to the Critical Design Review.

Hold Critical Design Review

In order to prepare for the End-of-the-Review chaired by ACG/IM&C, a Critical Design Review meeting is held. The review is scheduled at the

end of the Design Phase and prior to the End-of-Phase Review. The meeting is chaired by the system's Project Manager. In addition to the project team, the OIMC Network Configuration Manager and Data Manager , representatives from OIMC/ATG, OIMC/OSC, Training Institute and the user community are in attendance.

The objectives of the Critical Design Review are:

- is to review the documentation generated during the Design Phase,
- to ensure the detail design, as reflected in the User Interface Design Specifications and the Program Specifications, satisfies the functional requirement established in the Functional Description.
- to discuss, record and approve/disapprove any changes generated during the Design Phase in accordance with the project's configuration management procedures

With regard to satisfying the user's requirements, known functional deficiencies and their impact on user's expectations are also documented and presented at the Critical Design Review meeting. If the deficiency requires a change to the Functional Description [SD7] or any other system documentation, a System Change Request is prepared for review and presented for approval at the Critical Design Review meeting.

The outputs of the Critical Design Review meeting are the following:

- updated system documentation
- written project status report

Prepare a Project Decision Paper/Brief [SD18]

The purpose of the Project Decision Briefing/Paper is to present the results of Design Phase and the Critical Design Review to ACG/IM&C

at the End-of-Phase Review meeting. It must contain the necessary information required by ACG/IM&C to decide whether the project should proceed to the Development Phase or be terminated. The briefing should succinctly recap the work accomplished in the phase. The extent and the type of summarization should be adapted to the complexity and size of the project. Refer to the Project Decision Briefing/Paper [SD18] standard to understand what information must be included.

Brief OIMC Management

The End-of-Phase Review is chaired by OIMC/ACG and is held at the end of the Design Phase. The review participants are:

- Director for Infrastructure Operations,
- Director for Standards and Emerging Technologies,
- Project Manager and team,
- Needs Sponsor
- User from the user community (selected by the Needs Sponsor)
- Training Institute representative
- OIMC/ATG representative
- OIMC/OSC representative
- OIMC Network Configuration Manager
- OIMC Data Manager
- Others (as invited by ACG/IM&C)

The objectives of the End-of-Phase meeting are::

- to review the work accomplished to date,
- to discuss any known functional deficiencies and issues,
- to decide whether the project should proceed to the Development Phase or be terminated.

It is the project manager's responsibility to scheduled the meeting and to provide the necessary documentation to the meeting's participants two weeks prior to the meeting. The key briefer is the project manager. Since a milestone in the project's history has been reached, the project manager prepares an End-of-Phase memorandum that summaries the meeting's discussions and records the ACG/IM&C's decision. The End-of-Phase memorandum is distributed to the meeting's participants. A copy of the document is included in the Project Management Plan [SD5].

Update Project Management Plan [SD5]

Following the briefing, the project manager updates the Project Management Plan with all the approved documentation changes. A copy of the changes is used to update the Project Management Plan that is filed/kept in the OIMC Technical Library. Once completed, the project formally proceeds to the Development Phase.

CHAPTER 6.0

DEVELOPMENT PHASE

PURPOSE

The objective of the Development Phase of the IT process is to construct the new system or system change based on the specifications created in the Design phase.

OVERVIEW

The principal activities in the Development Phase are programming and testing. Based on the specifications developed in the Design phase, the programmers create the database and generate the source code. The System Test Plan, the Functional Test Plan [SD21] and a User's Guide [SD23] are prepared. Both unit and system testing are performed. The implementation activities are planned and documented in the Implementation Plan [SD24]. The Implementation Plan [SD24] contains sub-plans that address such areas as training, installation, and data conversion. During the Development Phase, two management reviews are held. The first review, called the Product Review, involves the project staff and users. The purpose of the Product Review is to establish a baseline of the system that will be implemented in the user's environment. It is performed to ensure that the baselined system satisfies the user requirements that were specified in the Functional Description [SD7]. The second review, called the End-of-Phase Review, is performed by OIMC management. Management reviews the results of the Product Review meeting and decides whether or not to commit the resources required to complete the Implementation Phase. If the project is terminated, the needs sponsor and user are formally notified, a closure statement is written for inclusion to the Project Management Plan [SD5], and the plan is saved in the OIMC Technical Library for future reference.

KEY RESPONSIBILITIES

Development Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Prepare System Test Plan [SD19]	FP17	Project Manager	OIMC/ATG
Build database and create code	FP17	Project Manager	OIMC/ATG
Perform unit and system testing	FP17	Project Manager	OIMC/ATG
Prepare Functional Test Plan [SD21]	FP18	Project Manager	Project Team[1], OIMC/ATG, Training Institute, OIMC/OSC
Prepare User's Guide [SD23]	FP18	Project Manager	Project Team, Training Institute, OIMC/ATG, OIMC/OSC
Perform Functional Testing	FP18	Project Manager	Project Team, Users, OIMC/CSF, Training Institute, OIMC/ATG, OIMC/OSC

[1] A project team may consist of a project manager, lead user, database analyst, and system analysts/modelers.

Development Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Prepare Implementation Plan [SD24]	FP18	Project Manager	Project Team, OIMC/ATG, OIMC/OSC, OIMC/CSF, Training Institute
Prepare Training Plan [SD24a]	FP18	Project Manager	Project Team, Training Institute, OIMC/OSC, OIMC/ATG
Create the System Change Package [SD28]	FP21	Project Manager	Project Team, OIMC/ATG, OIMC/OSC
Document Project Management Plan Changes	FP19	Project Manager	Project Team
Hold Product Review	FP19	Project Manager	Project Team, User, OIMC/ATG, OIMC/OSC, Training Institute Network Configuration Manager, Data Manager
Prepare Decision Brief/Paper [SD25]	FP19	Project Manager	Project Team

Development Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Hold End-of-Phase Review	FP19	Project Manager	OIMC/ACG, Director for Infrastructure Operations, Director for Standards and Emerging Technologies, Project Team, Needs Sponsor, User, Training Institute, Network Configuration Manager, OIMC/ATG, OIMC/OSC, Data Manager
Update Project Management Plan [SD5]	FP20	Project Manager	Project Team

BASELINE DOCUMENTS

System Test Plan [SD19]

Communicates the nature and extent of the tests to be performed by the technical staff deemed necessary to provide a bases for implementation of the system.

Source Code/Script Development [SD20]

Describes the construction of the system in sufficient detail to permit a programmer to understand the data flow within the system from the source code/script

Functional Test Plan [SD21]

Describes the procedures and tests that will be used to determine whether the proposed system performs the functions required by the user to accomplish their work. The objective of the testing is to demonstrate the reliability and functionality of the software.

User's Guide [SD23]

Provides users with an understanding of the components of the system, its capabilities, and step-by-step instructions of the tasks that can be performed in the system.

Implementation Plan [SD24]

Communicates the nature and extent of the activities (installation, training, data conversion) that will be performed to successfully implement the system in the user's operational environment.

OTHER KEY DOCUMENTS

Other key documents that may be produced during the Development Phase but not baselined are:

Functional Test Report [SD22]

Documents the results of the integration, system, and functional tests performed on the system. The memorandum contains the following information:

- Description of the tests performed
- Problems experienced and documented
- Enhancements made
- Summary of the test results

Impact Analysis Memorandum

Summarizes the results of the Impact Analysis using the Impact Analysis Factors Checklist. An impact analysis may be required when evaluating a System Change Request.

Technical Memorandum

Summarizes the results of the unit, integration, and system testing perform on the system/system change. It certifies that the system is ready for quality assurance testing.

Project Decision Briefing/Paper [SD25]

The purpose of the Project Decision Briefing/Paper is to present the results of Development Phase and contains the necessary information required by OIMC/ACG to decide whether the project should proceed to the next system life cycle phase or be terminated.

End-of-Phase Memorandum

The purpose of the End-of-Phase memorandum summaries the meeting's discussions and records the OIMC/ACG's decision on whether the

project should proceed to the next system life cycle phase or be terminated.

RELATED FORMS

System Change Request

Describes the recommended change(s) to be made to the proposed/operating system which in turn will require modifications to existing baseline documents such as the Functional Description, System Specifications, or Database Specifications. These requests are acted upon by the project team in accordance with the procedures described in project's Configuration Management Plan. This form is available from one of the following sources: the Project Configuration Manager, the Network Configuration Manager, or the Customer Support Facility. It is also available and can be completed in electronic form.

Impact Analysis Checklist

This checklist is provided by the Project Configuration Manager or the Network Configuration Manager to individuals asked to participate in conducting an Impact Analysis of System Change Request.

PROCEDURES

Prepare System Test Plan [SD19]

The purpose of the System Test Plan [SD19] is to document the structural tests that will be performed by the technical staff to ensure that the code follows the established programming standards and implements the design specifications (e.g. Program Specifications). It is prepared by the project team and should be prepared prior to developing the code. The test plan focuses its attention on tests that

will be perform to examine the system's technical structure and operational reliability.

Three test areas that must be documented in test plan are: unit testing, integration testing, and system testing. Unit testing deals with a single program module. Integration testing addresses the interfaces among the modules. System testing focuses on the integration of the system hardware and software to verify that the system meets its design requirements in the network environment. System testing evaluates the system's security features, the ability of the system to perform backup tasks and to recover from an abrupt system shutdown, and how well the system operates at peak workloads, system stress level. Refer to the System Test Plan [SD19] standard to understand what the plan must include.

Build the Database and Code

One of the first activities performed in the Development Phase is the construction of a new database or change to an existing database on the network. The new system must not only operate on the network but must be able to use the network to acquire and distribute data according to the user's business rules.

During the Analysis Phase, the process model and data model were documented in the System [SD11] and Database Specifications [SD12], respectively. Using these specifications, the database(s) is built by the database analyst, who was involved in creating the data model. The user provides the business data that will be used to populate the database. Any revisions made to the database schema are noted. These changes will eventually be recorded in a System Change Request and reviewed at the end of the Development Phase during the Product Review meeting. This is done to ensure that the existing baseline documentation (in this case, the database specifications) will be updated to reflect the current database structure.

The Program [SD17] and User Design Interface [SD16] Specifications developed in the Design Phase provide the programmer the necessary design information to prepare the code. To ensure a quality product, programming documentation standards are established and followed by the project team. These standards are documented in the Source Code/Script Development [SD20] document. Refer to the Source Code/Script Development [SD20] document to understand what the document should include. The completed code must implement the design. When design changes are required, project manager is consulted. Any revisions made to the Program [SD17] and/or User Design Interface [SD16] Specifications are noted. These changes are recorded in a System Change Request and reviewed during the Product Review meeting.

Perform Unit and System Testing

Testing is an iterative process. The tests to be performed are documented in the System Test Plan [SD19] which is prepared by the project team and should be written before any programming begins. In general, three types of testing are performed: unit, integration, and system testing. Unit testing checks for syntax and logic errors. Integration testing checks the communication links among the program modules. System testing examines the operation of the system as a whole in the network environment. While unit testing is performed by the programmer that generated the code, the individual(s) that will be responsible for integration and system testing will depend on the project's size and complexity.

Prepare a Functional Test Plan [SD21]

While the System Test Plan [SD19] addressed the structural integrity of the system, the Functional Test Plan [SD21] focuses on the system's functionality. Refer to the Functional Test Plan [SD21] documentation

standard to understand what the plan must include. The purpose of the Functional Test Plan [SD21] is to describe the procedures and tests that will be used to determine whether the proposed system performs the functions/activities required by the user to accomplish their work. These functions were described in the Functional Description [SD7]. Each test performed on the system is based on a test scenario. The test scenario is a step-by-step procedure that exercises a portion of the system. Test data is used as input to the test scenario to execute a specific function of the system. The test data is the same business data provided by the user earlier in the development process to test the database.

A user and a representative from the Training Institute are part of the team responsible for preparing the Functional Test Plan [SD21]. The user provides the necessary business knowledge and terminology required in the test scenarios for other users to better understand and perform the test scenario. Early involvement of the Training Institute in the development process enhances their efforts to support the project team in two areas: preparing the User's Guide [SD23] and teaching the users about the system's functions/capabilities.

Prepare a User's Guide [SD23]

While the underlying objective of Functional Test Plan [SD21] is to test the system's functionality, it provides the framework for the preparation of the User's Guide, and with minimal modifications becomes the Acceptance Test. The purpose of the User's Guide is to provide users with an understanding of the components of the system and its capabilities. It also provides the users with a detailed set of step-by-step instructions of how to use the system to perform a particular task. Since the source for the User's Guide is the Functional Test Plan (test scenarios), the team that was responsible for preparing the Functional Test Plan is also responsible for writing the User's Guide. Functions tested in the Functional Test Plan are considered capabilities in the

User's Guide. The steps documented in the test scenario are the same step-by-step instructions followed by the user in the User's Guide to exercise a capability. Refer to the User's Guide standard to understand what the guide must include. Because of the close dependency between the Functional Test Plan and the User's Guide, the User's Guide should not be completed until the system has passed functional testing, and if required, the Functional Test Plan has been revised.

Perform Functional Testing

Once the Functional Test Plan [SD21] has been completed, a functional test team is established. The functional test team must have one or more users. The purpose of the performing the functional tests in the developer's environment (OIMC/ATG) is to provide an early opportunity to revise the software as well as the Functional Test Plan [SD21] before declaring the system ready for quality assurance testing in a simulated operational environment (OIMC/OSC).

The functional testing process involves the following steps:

- Record the test scenario in the Test Tracking Tool (T^3) database[2]
- Perform the test scenarios
- Document the errors
- Record the test results in the T^3 database
- Discuss the recorded errors with the technical staff
- Retest the software
- Record retest results in the T^3 database (success or known issue)

The formality/structure of the testing depends upon the system's complexity and size. Functional testing ends when the system exhibits

[2] The Test Tracking Tool is database that provides the test manager the capbility: to record test scenarios, to document test execution results and known issues, to generate management reports, and to perform ad hoc queries.

a high level of reliability in providing the functionality described in the Functional Description [SD7]. At the end of the testing process, two items must be completed: the test scenarios and a Technical Test memorandum. The Technical Test memorandum is signed by the project manager, written to the Director of OIMC/ATG stating that the system has "successfully passed unit, integration, system, and functional testing and is ready for quality assurance testing". Attached to the Technical Test memorandum is the Functional Test Report [SD22] which contains the following information:

- Description of the tests performed
- Problems experienced and documented
- Enhancements made
- Summary of the test results

Refer to the Functional Test Report [SD22] standard to understand what must be included. Most of the reports are generated from the Test Tracking Tool database.

Prepare an Implementation Plan [SD24]

The purpose of the Implementation Plan [SD24] is to document the activities that will be performed to successfully install and operate the system in the user's environment. An implementation team should be established. The team membership (expertise) depends upon the size and complexity of the system/system change package to be installed. Documentation of the plan can be started early in the life cycle process but must be completed at the end of the Development Phase. The reason for the deadline is that the procedures and instructions documented in the plan will be tested at the beginning of the Implementation Phase when the system undergoes quality assurance testing.

Quality assurance testing is a preliminary test of the Implementation Plan [SD24] since the system is installed in a "simulated" rather than a "live" user operational environment.. This preliminary implementation allows the engineers the opportunity to change the system prior to it being installed in the user's environment. It represents the last chance to modify the system without having any impact on the user. If modifications are required after the quality assurance testing has been completed, the system is return to the Development Phase. Changes are made to the system. When the system certified "ready for quality assurance", it is reinstalled in the simulated environment (OIMC/OSC) and the testing process starts over.

The key areas that must be addressed in the Implementation Plan [SD24] are:

- **Site Preparation.** The installation of the system/system change must be coordinated with the user's site(s) and the appropriate OIMC Service Center Directors. The activities involved in preparing the user's site to meet the system's environmental requirements are documented in this section of the Implementation Plan [SD24].

- **Training.** Working closely with the user, user's management, and in coordination with the Training Institute, the training needs are identified by the project implementation team. These training needs are communicated to the Training Institute and a meeting is held with the Training Institute to discuss how they will be satisfied. Under the guidance of the Training Institute, a training plan is developed by the project implementation team. The system's size and complexity determines the amount of participation required from the user's community, OIMC/ATG, OIMC/OSC, and the Training Institute to develop and implement the training plan. The training plan's schedule is updated weekly and presented by the Training Institute at project's review meetings in order to monitor the execution of the plan. The key

focus of the schedule is to ensure:the system has been successfully passed quality assurance testing, the user's guide and any other training aids have been completed, and the user has been trained before their expected use of the system. The activities involved in preparing the Training Plan are documented in this section of the Implementation Plan [SD24]. If the project significantly impacts the user, however, a separate Training Plan may be required and should be referenced in the Implementation Plan. See Training Plan [SD24b] standard.

- **System Conversion.** In coordination with OIMC/ATG and OIMC/OSC, the project implementation team conducts a series of meetings with the user and user's management to determine the best strategy that will be employed to smoothly convert from the current system to the new fully functional system. These system conversion activities are documented in this section of the Implementation Plan [SD24]. The size and complexity of the task will vary from one situation to another.

- **Installation.** The purpose of installation is to place the system into operation. In coordination with OIMC/ATG and OIMC/OSC, the project implementation team documents the step-by-step procedures that will be used: to backup the current system, to install the system/system change package, to test the new system, to backup the new system, and to test the recovery procedures that will be used to recover from an abrupt power failure.

- **Acceptance Testing**. The purpose of acceptance testing is to ensure the delivered software and/or hardware satisfies the needs of the user as stated in the Functional Description [SD7]. It is performed at the user's site and by the user. The objective is to demonstrate to the user the system's reliability and functionality. The test scenarios that were used in the Functional Test Plan [SD21], and the User's Guide [SD23] are again used to perform

the acceptance testing at the user's site. The implementation team working with the users prior to installation determined which test scenarios will be used. The selected test scenarios are documented in this section of the Implementation Plan [SD24].

- **System Turnover.** The purpose of system turnover is to record the successful completion of the acceptance test and to formally acknowledge the system is fully operational. In this section of the Implementation Plan [SD24], the specific activities that will be performed to turnover the system to the user are documented. Once the system is operational, the user must understand how to resolve situations that prevent them from using the system's functionality to accomplish their work. This section contains a description of the procedures that will be used to report system problems and enhancements.

Create the System Change Package [SD28]

After the Guide is completed, the Project Manager puts together a System Change Package (SCP). To achieve economies in deploying changes over the network, one or more systems or system changes, including software upgrades, bug fixes, etc. will generally be combined into one package. In such instances, the OIMC/SE&I assigns a staff member as a SCP Manager. The SCP Manager is responsible for putting together the SCP and to oversee its deployment. Individual Project Managers and others responsible for items/changes in the package will provide the SCP Manager with all requested data and inputs necessary to complete the package. At a minimum, the package must contain the following information before it is forwarded for Quality Assurance testing: system change summary (excluding the installation schedule) and installation instructions, functional test procedures, system resources, and a documentation inventory. All items necessary to complete the package must be in the package before the SCP can be approved for deployment.

Document Changes to the Project Management Plan [SD5]

The project team prepares a documentation change package that will be used in the Product Review. The change package must include at a minimum the following:

- changes to existing documents
- new documents created during the phase
- updated project schedule detailing the tasks for the next phase of the project
- updated Project Management Plan pages detailing the activities to be performed in the next phase of the project

The documentation change package is distributed to those individuals who are asked by the Project Manager to participant in the Product Review. The participants should receive the change package two weeks prior to the Product Review.

Hold Product Review

In order to prepare for the End-of-Phase Review chaired by OIMC/ACG, a Product Review meeting is held. The review is held prior to the End-of-Phase Review. The meeting is chaired by the system's Project Manager. In addition to the project team, the OIMC Network Configuration Manager and Data Manager , representatives from OIMC/ATG, OIMC/OSC, Training Institute and the user community are in attendance.

The purpose of the Product Review meeting is to review the documentation generated during the Development Phase and to ensure:

- the program specifications were implemented as written
- the script/code and database(s) reflect the physical implementation of the models created in the Design Phase.

- technical tests performed were properly conducted and that discrepancies reported during the tests have been properly acted on
- proposed changes generated during the Development Phase were acted upon and recorded in accordance with the project's configuration management procedures
- the system meets the user's requirements as stated in the Functional Description [SD7].

With regard to satisfying the user's requirements, known functional deficiencies and their impact on user's expectations are also documented and presented at the Product Review meeting. If the deficiency requires a change to the Functional Description [SD7] or any other system documentation, a System Change Request must be prepared in advance for review and approval at the Product Review meeting.

Functional capability that cannot be performed by the system but remains as a user requirement is referred to as a " Known Issue ". Known issues must be documented and presented at the End-of-Phase review.

The outputs of the Product Review meeting are the following:

- updated system documentation
- established product baseline
- written project status report
- known issues

Prepare a Project Decision Paper/Brief [SD25]

The purpose of the Project Decision Briefing/Paper is to present the results of Development Phase and the Product Review to ACG/IM&C at the End-of-Phase Review meeting. It must contain the necessary information required by ACG/IM&C to decide whether the project

should proceed to the Implementation Phase or be terminated. The briefing should present the work accomplished in the phase. It should also prompt the Project Manager to update the risk assessment and bring any significant changes to management's attention. The extent and the type of summarization should be adapted to the complexity and size of the project. Refer to the Project Decision Briefing/Paper [SD25] standard to understand what information must be included.

Hold End-of-Phase Review

The End-of-Phase Review is chaired by OIMC/ACG and is held at the end of the Development Phase. The review participants are:

- Director for Infrastructure Operations,
- Director for Standards and Emerging Technologies,
- Project Manager and team,
- Needs Sponsor
- User from the user community (selected by the Needs Sponsor)
- Training Institute representative
- OIMC/ATG representative
- OIMC/OSC representative
- OIMC Network Configuration Manager
- Others (as invited by ACG/IM&C)

The objectives of the End-of-Phase meeting are::

- to review the work accomplished to date,
- to discuss any known functional deficiencies and issues,
- to decide whether the project should proceed to the Implementation Phase or be terminated.

It is the project manager's responsibility to scheduled the meeting and to provide the necessary documentation to the meeting's participants. The

key briefer is the project manager. Since a milestone in the project's history has been reached, the project manager prepares an End-of-Phase memorandum that summaries the meeting's discussions and records the ACG/IM&C's decision. The End-of-Phase memorandum is distributed to the meeting's participants. A copy of the document is included in the Project Management Plan.

Update Project Management Plan [SD5]

Following the briefing, the project manager updates the Project Management Plan with all the approved documentation changes. A copy of the changes is used to update the Project Management Plan that is filed/kept in the OIMC Technical Library. Once completed, the project formally proceeds to the Implementation Phase.

CHAPTER 7.0

IMPLEMENTATION PHASE

PURPOSE

The purpose of the Implementation Phase of the IT process is to successfully install the system in the user's operational environment.

OVERVIEW

The principal activities in the Implementation Phase are: quality assurance testing, system installation, acceptance testing, and system turnover. The Implementation Phase begins when a "Go" decision is made to implement the system. One of the first tasks to occur in this phase is to begin preparation of the Operations Guide [SD26]. The operations guide is a baselined document that is designed to provide the operations staff with technical information that describes how the system operates and what tasks must be performed to ensure smooth operation.

While the Operations Guide [SD26] is being prepared, the system is assigned to a System Change Package [SD28] and installed in the OIMC/OSC's Quality Assurance environment so that the system can be tested and certified for deployment. The Quality Assurance environment is representative of the operational environment that the System Change Package [SD28] is going to be installed in. The System Change Package is tested by conducting the test scenarios documented in the Functional Tests Plan [SD21] and other test plans that were prepared during the Development Phase. Problems identified during testing are documented, fixed and retested until the System Change Package [SD28] passes Quality Assurance testing. *Solutions to problems which require a change to the existing network configuration must be documented in a System Change Request (SCR) and approved by OIMC Management.*

When Quality Assurance testing is successfully completed, the Program Maintenance Guide [SD27] is prepared and the Project Management Plan [SD5] is updated. The Program Maintenance Guide [SD27] is designed to provide the maintenance programmer with the information necessary to understand the system's structural logic. When these technical documents have been updated and prepared, a Deployment Review is held to baseline and schedule the delivery of the System Change Package [SD28]. A Project

Decision Brief [SD29] is then prepared to provide management with the information necessary to approve the System Change Package [SD28] for deployment.

After approval, notifications are sent to users and Network Administrators informing them of the upcoming change. In preparation for the deployment, OIMC/OSC personnel verify that the users' sites are properly configured to receive the System Change Package [SD28]. The System Change Package [SD28] is installed at the site and tested both technically and functionally to ensure that it functions as designed. Local management at the site then certifies acceptance of the System Change Package [SD28].

After all operational sites have received the System Change Package [SD28], any remaining changes are made to system documents and any lessons learned are documented. The Project Management Plan [SD5] is updated again and the End-of-Project Brief/Paper [SD30] is prepared for OIMC management, the needs sponsor, and the GAO Executive Committee.

KEY RESPONSIBILITIES

The majority of the tasks contained in the implementation phase are the responsibility of OIMC/OSC. However, there are other tasks that fall outside the responsibility of OSC. For example, the operations guide is prepared by the system developer (OIMC/ATG). Refer to the table below for who is responsible for each of the implementation activities.

Implementation Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Prepare Operations Guide [SD26]	FP21	Project Manager	Project Team[1], OIMC/ATG, OIMC/OSC

[1] A project team may consist of a project manager, lead user, database analyst, and system analysts/modelers.

Implementation Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Execute Training Plan [SD24b]	FP21	Project Manager	Project Team, Training Institute
Install System Change Package [SD28] in Quality Assurance Environment	FP21	OIMC/OSC	Project Team, OIMC/ATG. OIMC/OSC
Perform Quality Assurance Testing on the System Change Package [SD28]	FP21	OIMC/OSC	Project Team, User, Training Institute, OIMC/OSC
Finalize Program Maintenance Guide [SD27]	FP22	Project Manager	Project Team, OIMC/ATG, OIMC/OSC
Update Project Management Plan [SD5]	FP22	Project Manager	Project Team
Hold Rollout Review	FP23	Project Manager	Project Team, User, OIMC/ATG, OIMC/OSC, Training Institute Network Configuration Manager, Data Manager
Prepare Rollout Decision Brief/Paper	FP23	Project Manager	Project Team

Implementation Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Brief OIMC Management	FP23	Project Manager	ACG/IM&C, Director for Infrastructure Operations, Director for Standards and Emerging Technologies, Project Team, Needs Sponsor, User, Training Institute, Network Configuration Manager, OIMC/ATG, OIMC/OSC, Data Manager
Install System Change Package [SD28] at the User Site	FP25	OIMC/OSC	OIMC/OSC, Project Team
Perform Technical Test	FP25	OIMC/OSC	OIMC/OSC, LAN Administrators
Perform Acceptance Test	FP25	Site User	User, OIMC/OSC, Project Team
Modify System Documentation	FP26	Project Manager	Project Team, OIMC/ATG, OIMC/OSC, Training Institute

Implementation Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Document Lessons Learned	FP26	Project Manager	Project Team, OIMC/ATG, OIMC/OSC, Training Institute
Prepare End-of-Project Paper/Brief [SD30]	FP27	Project Manager	Project Team
Brief Management	FP27	Project Manager	ACG/IM&C, Director for Infrastructure Operations, Director for Standards and Emerging Technologies, Project Team, Needs Sponsor, User, Training Institute, Network Configuration Manager, OIMC/ATG, OIMC/OSC, Data Manager

BASELINED DOCUMENTS

Operations Guide [SD26]

Provides the technical staff with a description of the software and of the operational environment to ensure smooth system operation.

Program Maintenance Guide [SD27]

Provides the maintenance programmer with information necessary to understand the system's programs, their operating environment, and their maintenance procedures.

OTHER KEY DOCUMENTS

System Change Package [SD28]

Consolidates all the technical and user documentation and system resources (code, files, databases, etc.) required to install a change to an existing system baseline.

Project Decision Brief [SD29]

Provides the necessary information for OIMC management to decide whether the System Change Package [SD28] is ready for deployment.

End-of-Project Brief [SD30]

Provides OIMC management with valuable information about the results of the project that may benefit the acquisition/development of future systems.

RELATED FORMS

System Change Package [SD28] Deployment Schedule

Presents the System Change Package [SD28] delivery time to each installation site and includes the tasks (from installation to system turnover) to be performed. Developed by the project team, it is finalized and presented at the Project Decision Briefing for system deployment.

Site Certification Form

Certifies that the user (by signature) agrees that the System Change Package [SD28] was successfully installed and is operational. Any unresolved issues or problem are listed. The form is included in the Implementation Plan and signed by the user at the site.

Lessons Learned

Provides feedback on the assessment performed by the project team on the project's results against planned expectations. Includes recommendations for future improvements. Lessons learned are presented to OIMC management at the End-of-Project briefing.

PROCEDURES

Prepare Operations Guide

The Project Manager working with appropriate technical personnel oversees the preparation of the Operations Guide. The guide describes the system's operation in terms of the general flow of the processing operations and its operation within the network environment. It identifies the software packages used by the system, the servers, workstations or other equipment being used, and any tables that are referenced, created, or updated by the system. It contains the procedures that need to be performed by the system administrator to support the system's operation, including emergency or non-routine operations. It includes security procedures as well as a list of known issues and problems that could not be resolved and their impact on the user environment. Additionally, the Guide describes who has the responsibility for maintaining the system and the configuration management process that is to be used to modify the system during the maintenance phase.

Execute the Training Plan [SD24b]

Base on the contents of the Training Plan, the Project Manager working the Training Institute and OIMC/OSC staff, implement the training the activities described in the Training Plan.

Install System Change Package in Quality Assurance Environment

When the SCP is ready, the System Change Package Manager delivers it to OSC's Network Application and Implementation Group for installation and quality assurance testing in OIMC/OSC's Operations Test Center. Prior to or concurrent with this delivery, the SCP Manager, with assistance from OIMC/ATG staff, arranges to brief the Network Application and Implementation Group on the package contents. Attendees from the Network Application and Implementation Group should include the Group's Manager, the Operations Test Center Manager, the Functional Test Manager, and the Rollout Manager.

The Operations Test Center Manager configures the center so the SCP can be installed, establishes the test accounts, and performs appropriate technical testing. As problems are encountered, the Operations Test Center Manager works with OIMC/ATG staff to resolve the problems and, as appropriate, revises the installation instructions.

The Functional Test Manager reviews the functional test plans for completeness and arranges for individuals to perform the tests. The Operations Test Center Manager notifies the Functional Test Manager when testing can begin. The Operations Test Center Manager reports delays to the Functional Test Manager so that appropriate schedule adjustments can be made.

The Rollout Manager coordinates and communicates with the sites' staff to determine the rollout schedule, provides documentation, arranges site staffing, and ensures closure/certification.

Perform Quality Assurance Testing on the System Change Package

Once technical testing has been completed and the Operations Test Center Manager allows functional testing to begin. As each test is completed, any problems are recorded. Once initial testing is completed, the Functional Test Manager summarizes the problems and sends copies to the Operations Test Center Manager and the SCP Manager. *Solutions to problems which require a change to the existing network configuration must be documented in a System Change Request (SCR) and approved by OIMC Management.* The changes to the system are made and the system is retested. This process is repeated until no further testing is necessary. Unresolved issues are recorded in the Known Issues and Problems section in the SCP.

Finalize Program Management Guide

During Quality Assurance (QA) Testing, the Project Manager oversees the completion of the Program Maintenance Guide which was begun in the Development Phase. The Project Manager ensures that the results of the Quality Assurance Testing are reflected in the guide.

Update Project Management Plan

The Project Management Plan must be updated to incorporate by reference the additional documentation prepared during Implementation in support of the project. If any required documents were not prepared, this and the reason(s) for it must be included in the Plan and brought to managements attention when briefing them on the project's status. Any new issues and recommendations also should be noted and these too should be brought to managements attention so that they can be addressed in a timely manner. This also is a good time to record any additional information on Lessons Learned. Copies of the revised Plan are distributed for review and comment to the Project Team and others that participated in updating the Plan/Schedule.

The Package Manager working with the Technical Personnel should begin preparing a Rollout Schedule. If training is to be provided in conjunction with the rollout, the schedule must be coordinated with the Training Institute and, to the extent appropriate, the schedule should reflect the tasks necessary to deliver that training. Project Managers in turn should update their Project Schedule to show any actual starts and finishes and any changes in the estimated starts and finishes dates as provided for in SCP Rollout Schedule. The revised Project Schedules should be distributed for comment together with any changes made to the Project Management Plan.

Hold Rollout Review

After the project plan is updated, the Rollout Manager schedules a Rollout Review. At least a week before this review, copies of the SCP [SD28] are distributed to Review participants. The review participants include: the project manager(s), the Network Configuration Manager, CSF Manager, Training Institute, OIMC/ATG and OIMC/OSC staff. The Rollout Review is held to ensure that all required documents have been prepared (i.e., SCP is complete) and the SCP is ready to be rolled out to the operations environment.

Following the review, changes are made and, if necessary, a second Rollout Review is held. Otherwise, the SCP is baselined.

Prepare Rollout Decision Paper/Brief [SD29]

In preparation to brief OIMC Management, the Rollout Manager prepares a rollout schedule. The schedule must be coordinated with the following staff: Needs Sponsor, to ensure priorities are considered in building the schedule; each unit, to ensure the rollout will not conflict with other major events; local LAN Admin staff and testers will be available to support the rollout; Office or Real Property Systems (ORPS), to ensure there is no conflict with scheduled building maintenance, staff relocations, or power outages; and the OIMC Network Configuration Group, to ensure other system maintenance plans

do not conflict. OIMC/ OSC is the official repository for the baselined SCP. The documents are stored in the OIMC/OSC Technical Library. The Project Manager shall provide OIMC/OSC with copies of any documents or change pages as a result of Acceptance Testing.

Brief OIMC Management

The Package Manager arranges to brief OIMC Management and others on the SCP and the Rollout Schedule. The Package Manager will make any requested changes, and if the changes to be made are substantial, OIMC Management can request a follow up briefing before giving its approval to deploy the SCP. Upon receiving approval to deploy the SCP, the Project Manager will forward the User and Network Administrator Notifications to the Deployment Manager for distribution consistent with the Rollout Schedule.

Install System Change Package at the User's Site

The Rollout Manager ensures that the implementation site has been properly prepared (i.e., applicable hardware and software are available to implement the SCP). If necessary, a pre-rollout meeting is held with the appropriate staff at the site to brief them on what is to be done, what, if anything, to expect, and to solicit support with various aspects of the rollout, such as acceptance testing. When the site has been prepared, the technical staff installs the SCP following the procedures in the Installation Plan.

Perform Installation Test

Following the installation of the SCP, the OIMC/OSC staff performs the technical tests in the Installation Test Procedures and records any problems. Any necessary changes are made and retested as appropriate.

Perform Acceptance Test

After technical testing has been completed, the local users perform acceptance testing. OIMC/OSC coordinates and oversees acceptance testing at the site. Acceptance testing is performed in accordance with the Functional Test Plan [SD21] and SCP.

The test results are summarized. OIMC/OSC works with the Rollout Manager, Project Manager, OIMC/ATG and OIMC/OSC staff, to make appropriate changes. The changes are retested.

Following completion of Acceptance Testing, the OIMC/OSC will meet with site personnel (LAN Administrator, LAN Coordinators, and/or others) to brief them on the installation, test results, known issues/problems, and any special procedures for maintaining the system. Copies of the Known Issues and Problems together with any pertinent Operating Guides are left at the site. The site's Director of Operations is asked to complete a Site Certification Form attesting that the SCP was installed and acceptance testing completed. The form also identifies any outstanding issues and lists all the operating guides that are to be left at the site.

Modify System Documentation

Changes made in response to both the installation and functional tests must be fully documented in an Installation Change Log. After the completion of each site installation, a meeting is held to review the installation activities at that site and the changes made. Participants should include: installation team, Roll-out Manager, Project Manager, Training Institute, CSF Manager, OIMC/ATG and OIMC/OSC. Specifically, the group determines what, if any, changes should be made to the Installation Procedures and whether any changes and/or additional testing needs to be done at sites that had previously received the SCP. The Rollout Manager records the actions to be taken and ensures that those actions have been implemented. Any unresolved issues should be

recorded and distributed to OIMC/OSC, sites at which the SCP had already been installed, and the CSF.

Document Lessons Learned

When installation at all sites is completed, the Project Manager meets with all the key participants in the project over its life cycle. The purpose is to review their collective experience in the development and implementation of the system and to suggest ways to improve the process. The project manager documents the lessons learned in the Project Management Plan.

Prepare End-of-Project Paper/Brief

After the SCP has been fully deployed, the Project Manager should meet with the Project Team to review the whole project to identify any remaining issues that need to be brought to managements attention and to further update lessons learned. The Project Manager updates the Project Management plan and prepares an End-of Project Briefing. At a minimum, the brief should cover any outstanding issues and lessons learned and identify all new items added to the list of Known Issues and Problems as a result of testing and implementing the SCP.

Brief Management

The Project Manager arranges to brief OIMC Management, the Needs Sponsor/Users, the Training Institute, the Director's of ATG and OSC, and the Network Configuration Manager. OIMC Management will inform the Information Technology Investment Committee on completion of the project and any other aspects of the project they deem appropriate.

Following the briefing, the project manager updates the Project Management Plan with any approved documentation changes. A copy of the changes is used to update the Project Management Plan that is filed/kept in the OIMC Technical Library. Once completed, the project formally ends and the system is now maintained in accordance with the procedures described in the Maintenance Phase.

CHAPTER 8.0

MAINTENANCE PHASE

PURPOSE

The objective of the Maintenance Phase of the IT process is to provide the appropriate mechanisms and tools to evaluate and enhance the operational system.

OVERVIEW

The OIMC/IM&C is responsible for maintaining GAO's system of local area networks and the applications that run on them. No individual may make configuration changes without approval from the OIMC/IM&C. The only exception to this rule is for an emergency change as discussed in this chapter.

An application enters the Maintenance Phase of the IT process when it becomes operational. Once an application is placed into production, it is continually evaluated[1] to identify problems or enhancements to improve upon the efficiency and/or effectiveness of the application. The procedures outlined here describe why and how an application changes, the difference between a problem and an enhancement, and what can happen to a proposed change, depending on the type of change it is.

A system enhancement is a proposed improvement to the operational system. This can range from an upgrade to an existing commercial software component, to adding new, custom functionality. An enhancement can be proposed by a user or OIMC may solicit enhancement suggestions. In either case, enhancement proposals are reviewed to determine whether they can be handled through the system change request process (described later) or whether they are significant enough that they warrant becoming a project.

An application problem can be of two types: emergency and non-emergency. An emergency means a problem exists which threatens the integrity of the system or which threatens to halt the system inappropriately. A non-emergency problem means a "bug" exists in the existing system and a scheduled fix must be implemented.

---

[1] This may be a formal process initiated by OIMC with surveys, etc., or it can be an informal process initiated by an individual.

In either case, system enhancement or system problem, the system modification is handled through a System Change Request process. System Change Requests are reviewed by OIMC management and can either be approved or disapproved.

When changes are made to existing systems, it is paramount that components of the IT process detailed in the preceding chapters are met. Existing system documentation must be updated, training issues need to be considered, testing needs to be addressed, etc. Depending on the nature of the change, all baseline documentation should be considered to determine whether or not it is affected by the change. This is explained in further detail in Chapter 1.

KEY RESPONSIBILITIES

Maintenance Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Identify Issue for Resolution	FP28	Any functional or technical user	Unit Level Support Staff
Report Problem for Resolution	FP30	Unit Level Support Staff	User, OIMC/OSC, CSF OIMC/ATG
Record Unresolved Problem as Known Issue	FP36	Customer Support Facility	User, OIMC/OSC, CSF OIMC/ATG
Review Known Issues	FP36	ACG/IM&C	Director for Infrastructure Operations, Director for Standards and Emerging Technologies, Network Configuration Manager
Prepare a System Change Request	FP37	Network Configuration Manager	OIMC/ATG
Notify OIMC Management of SCR	FP37	Network Configuration Manager	OIMC/ATG, OIMC/OSC

Maintenance Activities and Responsibilities			
Major Activities	**Flow Page**	**Responsibility/Lead**	**Key Players**
Initiate a Preliminary Impact Analysis	FP38	Network Configuration Manager	Director for Infrastructure Operations, Director for Standards and Emerging Technologies
Prepare Impact Analysis	FP40	Network Configuration Manager	OIMC/OSC, OIMC/ATG, Training Institute, Users
Approve/Disapprove SCR	FP41	ACG/IM&C	Director for Infrastructure Operations, Director for Standards and Emerging Technologies
Process a System Change Request	FP42	Network Configuration Manager	OIMC/ATG, OIMC/OSC
Process Emergency System Change Requests	FP45	Network Configuration Manager	OIMC/ATG, OIMC/OSC
Close System Change Request	FP41	Network Configuration Manager	OIMC/ATG, OIMC/OSC
Execute Evaluation Plan	FP48	Project Manager	Project Team
Prepare Evaluation Report	FP48	Project Manager	Project Team
Present Evaluation Report to OIMC Management	FP48	Project Manager	ACG/IM&C, Director for Infrastructure Operations, Director for Standards and Emerging Technologies OIMC/ATG, OIMC/OSC, Need Sponsor

BASELINE DOCUMENTS

Depends upon the system change being made.

OTHER KEY DOCUMENTS

Support/Expertise Database

The database is used to record problems (open trouble tickets) reported to GAO/OSC's Customer Support Facility and their disposition. The database is used by support staff and others to address recurring problems, identify trends, monitor and track problem resolution, and generate status reports.

Impact Analysis Memorandum

This document summarizes the results of the Impact Analysis using the Impact Analysis Factors Checklist.

Customer Satisfaction Survey

Used to obtain feedback on users' satisfaction with the service and response they received from the Customer Support Facility.

RELATED FORMS

System Change Request

Describes the change/enhancement being proposed to a system or application or to the baseline documents supporting those systems/applications.

Impact Analysis Checklist

Identifies the various areas that might be impacted by changes contained in a System Change Request.

PROCEDURES

Identify Issue for Resolution

All issues should be reported to the support staff designated by each unit, including, but not necessarily limited to, the local LAN Managers/Administrators. Unit level support staff discuss the issue with the user and, if possible, replicate the problem. Unit Level Support staff should consult OIMC/OSC's "Known Issues" database[2] to determine if the issue is known but there is no immediate technical resolution and/or a "workaround" exists.

If the issue relates to the user's lack of training or experience, unit level support staff should assist the user. Unit level support staff should report training-related issues to the unit's training coordinator and the Customer Support Facility.

If the issue cannot be resolved, it is considered a problem and the Customer Support Facility is contacted.

Report Problem for Resolution

Problems should be reported to the CSF by the unit level support staff. Users should contact the CSF to report a problem if support staff are not immediately available.

Problems involving network security or other sensitive system issues must be submitted by a LAN Manager or Administrator to the OIMC/OSC Director. If sent by electronic mail, the message should not contain the specific details of the problem.

---

[2] "Known Issues" database refers to the database that is used to record problems that have been documented and reviewed, but which cannot be resolved at the time they are discovered. This database is kept to avoid analyzing problems which have surfaced previously. It is also periodically reviewed to reevaluate whether or not a problem can be solved at a future point.

The CSF uses a problem resolution escalation process. The detailed process is documented in the Escalation Procedures found in the OIMC/Unit Service Level Agreements. A general description follows.

All system changes must be coordinated with the Network Configuration Manager prior to implementation. This means that when a solution has been identified it must be communicated to the Network Configuration Manager to determine whether or not a System Change Request (SCR) is required.

Level 1 Support

The Customer Support Representatives are the first line of support and can resolve routine issues. Upon receiving a problem report, they diagnose the general nature and severity of the problem, open a trouble ticket to record pertinent information on the problem, and, as appropriate, consult the "Expertise"[3] and Known Issues databases for possible solutions.

If the customer support representative cannot resolve the problem, the problem is escalated to the next level of technical support.

Level 2 support

At this level of support, the problem is assigned to the specialist that possesses the expertise to solve the problem. The Support Specialist works with the customer to resolve the problem. If the specialist cannot resolve the problem, it is escalated to the next support level.

Throughout the escalation and resolution process, it is the responsibility of the Support Specialist to coordinate resources for resolution and to communicate the status to the affected personnel.

---

3 "Expertise" database refers to the database that is used to record problems reported to OSC's Customer Support Facility. Each problem's disposition is also recorded.

Level 3 support

When the Support Specialist cannot resolve the problem, it is escalated to the engineering staff. The engineer tries to resolve the problem. If necessary, the engineer consults with the Network Manager, OIMC/ATG staff, and others having specific knowledge with respect to the hardware or software in question. If the engineer cannot resolve the problem, it is escalated to the next support level.

Level 4 support

If the engineers exhaust all options available to them and the problem cannot be resolved, the problem is presented to a Senior Engineer. Problems that reach this level are indicative of a needed system enhancement or system change. If the Senior Engineer cannot resolve the problem, it is forwarded to the OIMC Network Manager as an unresolved problem.

Record Unresolved Problem as Known Issue

If the problem is escalated to the OIMC Network Manager, the OIMC Network Manager schedules a technical meeting with personnel from OIMC/OSC, OIMC/ATG, and others as appropriate. The purpose of the meeting is to discuss resolution of the problem. The meeting's results are conveyed to the Support Specialist who, in turn, informs the user, LAN Administrator, and others, as appropriate, of what is to be done to resolve the problem. If the problem cannot be resolved in a reasonable time because of technical and/or resource constraints, the Support Specialist enters the problem into the Known Issue database. The Support Staff Specialist also works with OIMC/OSC staff to update the appropriate Operations Guide and Implementation Plan to record the new Known Issue.

Review Known Issues

Periodically, the Network Configuration Manager provides OIMC's Director for Standards and Emerging Technologies and the Director for Infrastructure Operations with all known issues for review. The Directors review these lists to determine if any of these issues can now be addressed. Issues which previously could not be addressed because they were technical or financially unfeasible may now be possible to resolve. If the issue can be resolved, the Directors recommend it become a project, and propose a responsible organization and a projected start date to the ACG/IM&C for approval.

If the ACG/IM&C approves the project, the OIMC Network Manager updates the Known Issues databases, informs the responsible organization, and prepares a System Change Request. The System Change Request contains the information the project manager needs to resolve the problem. If the ACG/IM&C does not approve the project, the problem remains in the Known Issues database for consideration at a later date.

Prepare a System Change Request

Whenever the resolution of a problem requires a change in the configuration or baseline documentation of any system or application, a System Change Request (SCR) must be prepared. If the problem has been escalated through the Customer Support Facility, the Network Configuration Manager prepares the SCR. In other instances, OIMC/OSC or OIMC/ATG staff may prepare the SCR.

A System Change Request must be prepared and submitted to the Network Configuration Manager for all enhancements. Enhancements are upgrades or additions to the existing network components for such purposes as improving performance and reliability or adding new functionality. Enhancements include, but are not limited to, the addition of new hardware or software to the network, upgrades to any existing hardware or software, and requests to provide GAO-wide access

to specific informational resources. The Network Configuration Manager must be consulted to determine whether or not an item or action is a change or enhancement that must be covered by a System Change Request.

The System Change Request form contains the name, organization, and phone number for the individual requesting the change/enhancement, the name and phone number of the Operations Director or their equivalent that is endorsing the enhancement, the type of change and its priority, a brief description of the change/enhancement, and the justification for and implications of the change. See Appendix A at the end of this chapter for the form and its instructions.

Completed SCRs are forwarded to the Network Configuration Manager, preferably electronically. The Network Configuration Manager will review the SCR for completeness. Incomplete SCRs -- for example, enhancements that do not have a unit endorsements -- are returned.

Notify OIMC Management of SCR

When the Network Configuration Manager determines that a solution to a problem requires a System Change Request (SCR), the SCR is prepared, and a copy is forwarded to OIMC Management for review. *OIMC Management must approve the SCR before it can be initiated.*

Initiate a System Change Request

If the SCR pertains to an existing system or application for which there is an active configuration management process, the Network Configuration Manager forwards the completed SCR to the appropriate Configuration Manager for that system/application for processing. Otherwise, the completed SCRs is forwarded to the Director for Infrastructure Operations and the Director for Standards and Emerging Technologies for preliminary analysis.

OIMC management makes a preliminary analysis of the technical feasibility of the request and assesses the impact of the request on the environment. The results of the preliminary analysis are presented to the ACG/IM&C. If the request qualifies as a project, the SCR is returned to the requestor with a recommendation that it be processed as a project in accordance with applicable OIMC Policies and Procedures. If the ACG/IM&C and directors need additional information or clarification, they may meet with the requestor to obtain more information. If more information in needed, the directors request the Network Configuration Manager prepare an full Impact Analysis.

Prepare Impact Analysis

When an Impact Analysis is requested, the Network Configuration Manager prepares an Impact Analysis Package. The Impact Analysis Package contains a transmittal letter, a copy of the SCR, and an Impact Analysis Checklist.[4] The transmittal letter provides additional background information on the SCR and identifies the date for completing the Impact Analysis (generally, two weeks). This package is sent to the appropriate individuals based on the contents of the System Change Request.

Recipients of the Impact Analysis Package review the SCR against each of the areas on the Impact Analysis Checklist. For each item checked, the recipient must prepare a short written statement describing the anticipated impact of the proposed change. These statements together with the Checklist and SCR are returned to the Network Configuration Manager by the date requested.

The Network Configuration Manager prepared a memorandum to the ACG/ IM&C, summarizing the results of the Impact Analysis. To the extent possible, the memorandum contains recommendations with supporting rationale, identifies any issues resulting from the

[4] The Impact Analysis Checklist identifies the various areas that might be impacted by changes contained in a System Change Request.

recommendation, and suggestions of how to address these issues. Copies of the memorandum are distributed to the originator and others, as appropriate.

Approve/Disapprove SCR

Following their preliminary analysis of an SCR or after reviewing the Impact Analysis, the ACG/ IM&C and directors decide whether to approve or disapprove the SCR. It can also be deferred for further evaluation.

The Network Configuration Manager informs the originator and the need's sponsor of OIMC management's decision and rationale. If the problem was escalated through the CSF, the Network Configuration Manager also informs the appropriate unit support specialist who, in turn, records the results in the trouble ticket. The Network Configuration Manager also records the OIMC management's decision in the SCR log.[5] The originator and/or sponsor can request the Network Configuration Manager schedule a meeting with OIMC management to review and discuss the decisions. The results of the meeting are documented by the Network Configuration Manager and conveyed to all appropriate parties.

Process a System Change Request

Approved SCRs are prioritized and assigned technical resources for development and implementation. There are three priority categories.

---

[5] The SCR log is a record of all System Change Requests that have been initiated and their dispensation.

Priority	Response Time
Emergency	Within 24 hours
Urgent	Within 30 days
Routine	Beyond 30 days

An emergency priority is for a change that is needed to correct (1) a system halt or failure (abnormal termination in the operational environment) that prohibits users from accessing or processing data on the network or (2) a security problem that, if not accomplished without delay, may seriously compromise system integrity.

An urgent priority is for a change that if not accomplished expeditiously, may prevent the user community from accessing or processing data on the network. An urgent priority also pertains to changes needed to correct or prevent corruption/degradation in a network component. A newly implemented mandate or law also constitutes an urgent priority.

A routine priority is for those instances that are neither an emergency or urgent priority.

A SCR assigned an Urgent Priority must be processed immediately unless it can be included in a System Change Package that is scheduled for timely implementation (rollout). A System Change Package consists of one or more changes (enhancements or software upgrades) grouped together to maximize the use of limited resources. Implementing packaged changes also controls the volume and frequency with which users are confronted with change. Updates are typically made quarterly but may be scheduled more or less frequently as circumstances warrant.

The ACG/IM&C and directors assign an individual with responsibility for overseeing development and implementation of the SCR.

Following SCR approval, the individual responsible for the development/implementation of the SCR reviews the existing system documentation and prepares a project management plan. The project management plan outlines the activities needed to develop and implement the SCR, and outlines the system documentation that will be

Guidance on the System Change Request Form is contained on page 2.

SYSTEM CHANGE REQUEST (SCR)

Submission Information

Name:	Organization:	Phone No.:	Date:

Name of the Operations Director Approving Submission of this SCR:

Phone No.:	Date Approved:

Change Information

Type: (Check One)
[ ] Address Problem--Trouble Ticket Number(s) _____
[ ] Enhancement
[ ] Other

Priority: (Check One) [ ] Emergency [ ] Urgent [ ] Routine

For Emergency Changes Only: When and where was the change made and who authorized the change:

Change Request/Description: [Describe the nature of the change(s) being requested e.g. install/test HRIS on all GAO servers or change/modify WordPerfect's standard text button bar, etc.]

Change Justification/Implications: [State the reason(s) for the requested change. If needed to address a problem, describe the problem and its cause. If needed to meet a requirement, state what functional requirement will be meet. Also describe the anticipated impact(s) of the change on the Network, LAN Administrators, and Users. If a change was made to address an emergency, describe the tests performed to test the change and attach a copy of any Administrator/User Notification used. Attach additional pages as needed.)

Return/cc:Mail the completed SCR to Tom Storm, Network Configuration Manager, Room IN38, GAO Bldg., (202-512-2690).

Rev. 12/18/95

GUIDANCE ON SYSTEM CHANGE REQUEST

The Director of OIMC's Advance Technology Center (ATC) and the Director of OIMC's Operations Suppor Center (OSC) are jointly responsible for approving all configuration changes and enhancements in or to O's networks. No individual should make any configuration change or enhancement to GAO's network ...out an approved System Change Request (SCR) from the Directors ATC and OSC. The only excepti to this rule is for emergency changes as discussed below.

Configuration changes that require an approved SCR include but are not limited to the following: adding executables (.exe, .com, and .pif files) to the network; changing any program configuration files like ccmail.cfg, CaLander.cfg, or any other GAO -wide software application; adding a GAO-wide Bulletin Boar to cc:Mail; changing a workstation's image; and changing any front-end INI or INS files used to initialize users or Windows. Enhancements include but are not limited to such things as the addition of new softwa software upgrades, addition of new systems or applications, changes/improvements to existing application and requests to provide GAO-wide access to specific informational resources.

The System Change Request form contains space for recording information on the individual requesting t change/enhancement, the unit Operations Director's approval, the type of change and its priority, a brief description of the change/enhancement, and the justification/implications for the change. Additional sheet may be added as needed. The form should be completed in WordPerfect, approved by the unit's Operati Director, and forwarded to Tom Storm, Network Configuration Manager (NCM), preferably as a cc:Mail attachment. When the SCR is to be forwarded via cc:Mail, the unit's Operations Director must be carbon copied on the cc:Mail message. This will serve as evidence of their approval for submission of the SCR. The NCM will review the SCR for completeness. If workload permits, the NCM will try to contact the requestor for any additional information needed, otherwise incomplete SCRs will be returned.

The completed SCR will be forward to the Director, ATC and the Director, OSC for advance review. The SCR will be scheduled for review at the next meeting of the Network Administration/Configuration Group, ch presently meets every Tuesday, provided that the Directors have had at least two full working days review/consider the SCR. The group is chaired jointly by the Directors of ATC and OSC. When the group convenes, the Directors will entertain comments from the group on each SCR on the agenda and then decide on what action to take on the request. The decision of the Director's will be conveyed back to the requestor by the NCM. In the case of an approved SCR, the NCM will brief the requestor on what happer next, and if appropriate, on any other OSC requirements that will have to be met in connection with the requested change/enhancement. Approved requests will be added to the list of special projects and prioritized accordingly.

Emergency changes can be approved directly by the Director, OSC, or his designee. An emergency chan is any change needed to correct (1) a system halt or failure (abnormal termination in the operational environment) that prohibits users from accessing or processing data on the network or (2) a security problem that, if not accomplished without delay, may seriously compromise system integrity. As soon as practical but no later than one work day following the Director's approval of an emergency change, an SC should be prepared and forwarded to the NCM.

Any questions on this guidance or completion of the form should be directed to Tom Storm, NCM, at 202-512-2690.

affected by the SCR. These activities are done in accordance with applicable OIMC procedures and standards.

Process Emergency System Change Request

Emergency changes can be approved directly by the Director of OIMC's Operations Support Center (OSC) or his/her designee. An emergency change is any change needed to correct (1) a system halt or failure (abnormal termination in the operational environment) that prohibits users from accessing or processing data on the network or (2) a security problem that, if not accomplished without delay, may seriously compromise system integrity.

SCR's for emergency changes must be forwarded directly to the Director OIMC/ OSC, for approval. In determining whether to approve an emergency SCR, the Director OIMC/OSC reviews the validity of the emergency and the appropriateness of the requested change. If approved, the Director records the approval of the SCR. If needed, additional technical resources are assigned to implement the change.

Following approval, the individual responsible for implementing the change forwards the original approved SCR to the Network Configuration Manager. If the approved SCR is forwarded electronically, it must be routed through the Director OIMC/OSC as proof of receipt and as verification of approval. A copy of the approved emergency SCR must also be sent to the Director for Infrastructure Operations. When an emergency SCR indicates that a front-end/template change is required, the Network Configuration Manager processes the SCR in accordance with the applicable procedures for non-emergency changes.

The change must be tested in a test environment unless the individual responsible for implementing the change can show sufficient reason and justification for not testing the change. When no testing is conducted, the Director OIMC/OSC must ensure that all appropriate alternatives for testing have been considered and that safeguards are in place to return the production environment to its prior state. The Director also is responsible for assessing the risks of making the change in the production environment.

The individual responsible for implementing the emergency change is responsible for: preparing administrator and/or user notifications, setting up the implementation site, installing the change, and performing system and functional testing. If the change fails, the individual must restore the environment to its prior state. The results of the implementation are reported to the Director/OSC and to the Network Configuration Manager. All of these activities must be carried out in accordance with applicable OIMC Procedures and Standards.

Following implementation of the emergency change, the individual responsible for making the change revises, as necessary, the appropriate baseline documentation. The revised documents or change pages must be forwarded to the Network Configuration Manager who distributes and catalogues the changes as appropriate. If no changes are needed to these documents, the Network Configuration Manager should be so informed.

When an emergency SCR is disapproved, the requestor should either (1) submit the SCR to the Network Configuration Manager for non-emergency processing, (2) reevaluate the problem to determine if there is another solution, or (3) escalated the problem in accordance with the procedures described above.

Close System Change Request

If the SCR pertains to a problem, the Network Configuration Manager notifies the Support Specialist that the SCR has been implemented. When the SCR is an enhancement, the Network Configuration Manager notifies the originator and/or need sponsor, and others, as appropriate, that the SCR has been implemented. The Network Configuration Manager then updates the SCR log for closure.

If a non-emergency SCR is disapproved, the originator or requestor can escalate the problem above the ACG/IM&C to the Information Technology Investment Committee for discussion. The closed SCR is recorded in the log, along with the ACG/IM&C's decision and supporting documentation. If the Information Technology Investment Committee decides to open the SCR for action, it follows the procedures outlined above.

Execute Evaluation Plan

The Evaluation Plan [SD8] which was prepared in the Definition Phase is executed according to the timeframes specified. The evaluation should not be conducted until the system has been stablized. The stablization period may vary from 3 to 6 months after the system has been declared operational at the site. The actual start of the evaluation is determined by the project manager, the site users, and coordinated with OIMC management.

Prepare Evaluation Report

The Evaluation Report documents the results of the evaluation. The report must be coordinated with site users and the need sponsor for comment. Changes are made if required. The report and a briefing are presented to OIMC management and need sponsor.

Present Evaluation Report to OIMC Management

A briefing is scheduled with OIMC management, the need sponsor, and others, as appropriate, to present the results of the evaluation as documented in the Evaluation Report. Recommendations may be made by OIMC management to present the results to the GAO community.

Appendix A

United States General Accounting Office

GAO

April 1998

GAO Information Technology Methodology and Standards

Part 2 of 2
(Standards)

OIMC-98-0001

571210

Needs Statement

Table of Contents

Needs Statement

1.0 VALIDATION OF NEED(S)

Qualify the need for a proposed functional requirement.

1.1 Requirement Statement

Define the requirement and summarize the specific need(s) generating the requirement, addressing:

- Business/application area concerned by the need.
- The specific inadequacies and limitations creating the need.
- The specific improvements the capabilities sought by the requirement expect to provide.
- The benefits to the overall GAO agency.

1.2 Division/Office Commitment

Specify the point of contact (POC) that has been assigned within the Division/Office to address questions regarding this need statement. Identify the time and resources the division/office is willing to devote to the project.

1.3 Priority of the Need

Provide an indication of the relative priority of this requirement in relation to other requirements for data automation support within your organization and, if known, within GAO's IRM Strategic Plan and/or Capital Investment Plan.

2.0 REQUIREMENT DESCRIPTION

Provide a brief background and description of the current application environment and the proposed requirement sufficient to promote general understanding of the application.

2.1 Background

Briefly explain the significant events leading to a request for the requirement. Is the requirement needed to solve a problem, if so, describe the problem area. If the requirement is intended to improve productivity, describe how it will enhance the process.

2.2 Current Environment

Briefly indicate the major functions performed and current methods/procedures employed to satisfy the current operational requirements.

2.3 Proposed Environment

Describe the proposed environment by explaining the new methods/procedures employed to satisfy the current operational requirements. Specify the differences between the current and proposed environments.

2.4 Anticipated Impact

Describe the expected benefits and the impact on local and global GAO operations.

3.0 SUMMARY RECOMMENDATIONS

Provide appropriate recommendations on the development/acquisition of an application to satisfy the need relative to GAO's Mission, and if known, to GAO's OIMC Strategic Plan.

APPENDIX

A - Need Validation Coordination Sheet

B - *If required.*

C - *If required*

Need Statement

Validation Coordination Sheet

_____
(Title of Need)

Comment(s)

_____ _____
Head of Division/Office Operations Date

Comment(s):

_____ _____
OIMC ACG Date

Needs Statement Evaluation Report

Table of Contents

Needs Statement Evaluation Report

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the needs statement evaluation is conducted to ensure that the need is clearly described, validated, sponsored, beneficial, cannot be satisfied by current or planned projects, and can be technically satisfied.*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the evaluation. An assumption is a statement that may or may not true, but must be accepted as at least part of the basis for your reasoning.

1.4 Constraints

Present any known or anticipated constraints to the need such as financial constraints, legislative or policy constraints, and changing hardware or software environment.

1.5 Criteria

Refer to the Needs Statement Evaluation Report checklist for the list the criteria used in evaluation. The checklist should be included as part of the report (Appendix A)

1.6 Terms and Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.7 References

Identify existing references which would provide further support for the evaluation and recommendation.

2.0 REQUIREMENTS

2.1 Needs Statement

Define the requirement and summarize the specific need(s) generating the requirement. Refer to the Needs Statement (Attachment B) and Needs Evaluation Coordination Sheet (Attachment C)

2.2 Proposed Environment

Describe the proposed environment by explaining the new methods/procedures employed to satisfy the current operational requirements. Specify the differences between the current and proposed environments. Refer to the Needs Statement paragraph 2.3.

3.0 EVALUATION RESULTS

In this section, provide high-level management with comments resulting from answering any of the evaluation factors with a "No" on the Needs Statement Evaluation Report checklist. If all evaluation factors have been responded to with a "Yes" and there are no further comments, then a statement such as "*The Needs Statement has been reviewed and complies with the needs documentation standard.*" should be made. For any evaluation factor responded to with a "No", provide enough information so the Needs Sponsor can understand why the Needs Statement did not conform with the documentation standard. A paragraph should be devoted to each "No" response. The title of the paragraph should be the italic word or phase used in the evaluation factor.

4.0 RECOMMENDATION AND ISSUES

4.1 Recommendation

Recommend the action that should be taken based on the evaluation. State the reasoning that supports the recommendation.

4.2 Issues

Identify any respective issues that may occur in implementing the recommendation. If known, discuss what needs to be done to resolve the issue(s).

APPENDICES

A - Needs Statement Evaluation Report Checklist

B - Needs Statement

C - Needs Evaluation Coordination Sheet

Blank

Date: 11/11/97
Ver: 3

Needs Statement Evaluation Report
Checklist

Yes	No	N/A	Evaluation Factors
			1. The *purpose* of the needs statement is clearly stated.
			2. The needs statement reflects the users' needs to carry out their role in GAO's mission.
			3. The needs statement specifies and justifies the priority of the need.
			4. The needs statement has been *validated* by the users' management.
			5. Existing *system architecture and functions* to be supported (i.e. description) are clearly defined.
			6. The differences between the current and proposed environment are explained.
			7. *Justification* for the change(s) is clearly stated (i.e. solve a problem, compliance with a new agency policy, or enhance a process).
			8. *Sponsorship* for the change has been proposed.
			9. *Funding* source has been identified.
			10. *User staff time* has been proposed for participation in the project, especially in the definition, testing and implementation activities.
			11. The potential *tangible benefits* are documented.
			12. The needs statement reflects the users' needs as indicated in *GAO's IRM Strategic Plan and/or the Capital Investment Plan.*
			13. The needs statement *can not be satisfied* by current or planned projects.
			14. The needs statement *can be technically* resolved.
Date:			**Prepared by:**

Feasibility Study

Table of Contents

APPENDICES

Feasibility Study

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the feasibility study is an investigation conducted to establish the practical justification of..... in terms of following quantifiable features:*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the study. An assumption is a statement that may or may not true, but must be accepted as at least part of the basis for your reasoning.

1.4 Constraints

Present any known or anticipated constraints to the project such as financial constraints, legislative or policy constraints, and changing hardware or software environment.

1.5 Criteria

List the criteria used in study. The criteria are those standards, requirements, or limitations used to evaluate the various alternatives proposed to satisfy the stated need as documented in the Needs Statement.

1.6 Terms and Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.7 References

Identify existing references which would provide further support for the feasibility study and the final recommendation.

2.0 REQUIREMENTS

2.1 Needs Statement

Define the requirement and summarize the specific need(s) generating the requirement. Refer to paragraph 1.1 in the Needs Statement.

2.2 General Description

2.2.1 Current Environment

Briefly indicate the major functions performed and current methods/procedures employed to satisfy the current operational requirements. Refer to the Needs Statement paragraph 2.2.

2.2.2 Proposed Environment

Describe the proposed environment by explaining the new methods/procedures employed to satisfy the current operational requirements. Specify the differences between the current and proposed environments. Refer to the Needs Statement paragraph 2.3.

2.3 Detail Description

2.3.1 Decomposition

Provide a decomposition[1] that identifies the business functions and processes independent of any organization chart. The decomposition is an annex to this study.

---

1 A decomposition is a tree-structured model that decomposes (breaks down) functions into processes and elementary processes

2.3.2 Specific Objectives

State the detailed objectives of the proposed change. Relate/link each objective to one or more processes defined in the decomposition in paragraph 2.3.1.

3.0 ALTERNATIVES

3.1 Alternative #1 - Status Quo

3.1.1 Description

Describe the characteristics of the alternative. In the case of the *status quo* alternative, summarize the features already documented in paragraph 1

3.1.2 Advantages

Describe the expected advantages accrued from implementing the alternatives. Feasibility factors to be addressed but not limited to are: operational, technical, economic, schedule, and legal feasibilities.

3.1.3 Disadvantages

Describe the potential disadvantages of implementing the alternatives. Feasibility factors to be considered but not limited to are: operational, technical, economic, schedule, and legal feasibilities.

3.2 Alternative *#n* - *Title*

3.2.1 Description

Describe the characteristics of the alternative.

3.2.2 Advantages

Describe the expected advantages accrued from implementing the alternatives. Feasibility factors to be addressed but not limited to are: operational, technical, economic, schedule, and legal feasibilities.

3.2.3 Disadvantages

Describe the potential disadvantages of implementing the alternatives. Feasibility factors to be considered but not limited to are: operational, technical, economic, schedule, and legal feasibilities.

4.0 ALTERNATIVE COMPARISON

Prepare a matrix that compares the advantages and disadvantages of all the alternatives describe in paragraph 3.

5.0 RECOMMENDATION AND ISSUES

5.1 Recommendation

Recommend which alternative is the way to satisfy the user's requirement(s). State the reasoning that supports the recommendation.

5.2 Issues

Identify the respective issues, if any, that may occur in implementing the recommendation. If known, discuss what needs to be done to resolve the issue.

APPENDICES

A - **Preliminary Feasibility Analysis Report**
(refer to an Annex of the Project Management Plan)

B - **Needs Statement**
(refer to an Annex of the Project Management Plan)

C - **Decomposition**

D - Specific Objectives

Cost Benefit Study

Table of Contents

APPENDICES

Cost Benefit Study

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the cost benefit study is a systematic approach to the problem of choosing how to employ scarce resources based on the investigation of the costs and benefits of proposed alternatives.*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the study. An assumption is a statement that may or may not true, but must be accepted as at least part of the basis for your reasoning.

Two significant assumptions that must be made in the study concern the "economic life" of each alternative and the period over which we will compare the alternatives. The economic life of a project is the period of time over which the benefits to be gained from a project may reasonably be expected to accrue. The economic lives of the alternatives will ultimately govern the time period to be covered by the cost benefit study. When faced with two or more alternatives with different economic lives, the analyst must make an assumption as to when to begin the period of comparison.

1.4 Constraints

Present any known or anticipated constraints to the project such as financial constraints, legislative or policy constraints, and changing hardware or software environment.

1.5 Terms and Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.6 References

Identify existing references, such as Sensitivity Analysis and Residual Value Estimate which would provide further support for the cost benefit study and the final recommendation.

2.0 REQUIREMENTS

2.1 Needs Statement

Define the requirement and summarize the specific need(s) generating the requirement. Refer to paragraph 1.1 in the Needs Statement.

2.2 General Description

Describe the proposed environment by explaining the new methods/procedures employed to satisfy the current operational requirements. Specify the differences between the current and proposed environments. Refer to paragraph 2.2.2 Proposed Environment in the Feasibility Study.

2.3 Objectives

State the detailed objectives of the proposed change. For this information, refer to paragraph 2.3.2 Specific Objectives in the Feasibility Study.

3.0 ALTERNATIVES

3.1 Alternative #1 - Status Quo

3.1.1 Description

Describe the characteristics of the alternative. In the case of the *status quo* alternative, summarize the features already documented in paragraph 2.2.1 Current Environment in the Feasibility Study.

3.1.2 Costs

Describe the expected costs accrued from not making any change. The expected costs should be broken down into two categories: Non-Recurring and Recurring Costs.

3.1.3 Benefits

Describe the expected dollar benefits of the alternative. The expected benefits should be broken down into two categories: Tangible and Non-tangible.

3.2 Alternative #n - *Title*

3.2.1 Description

Describe the characteristics of the alternative.

3.2.2 Costs

Describe the expected costs accrued implementing the alternative. The expected costs should be broken down into two categories: Non-Recurring and Recurring Costs.

3.2.3 Benefits

Describe the expected dollar benefits of the alternative. The expected benefits should be broken down into two categories: Tangible and Non-tangible..

4.0 ALTERNATIVE COST BENEFIT COMPARISON

4.1 Alternative Cost Over System Life

For each alternative, present costs in the period in the system life in which they will occur (year, quarter, or month). Cost should be broken down in the following way:

- Non-recurring Costs

- Recurring Costs

- Total Costs
  - Is the total of non-recurring and recurring costs.

- System Life Costs
  - Calculated the system life costs by dividing the total cost by the period of the system life.

- Present Value Costs
  - Calculate the present value cost over the entire system life using the appropriate present value factors.

- Residual Value Estimate
  - Calculate the remaining economic value of ownership of all computing resources as of the last month of the system life. Make the present value calculation to the discounted residual value.

4.2 Benefits

For each alternative identify the period of benefits. Enter the tangible (quantifiable dollar) benefits for the period in which they are accrued, and make present value calculations.

4.3 Net Present Value

Calculate the new present value by subtracting the adjusted cost from the total present value of benefits.

4.4 Benefit/Cost Ratio

Calculate the benefit/cost ratio by dividing the total present value of benefits by the adjusted cost.

4.5 Payback Period

Calculate the year or month in which the sum of benefits first exceeds the sum of the costs expressed in current dollar.

5.0 SENSITIVITY ANALYSIS (Optional)

Sensitivity analysis is a tool used for assessing the extent to which costs and benefits are sensitive to change in key factors, e.g., length of system life; workload, requirements, configuration of equipment or software.

5.1 Methodology

Describe the approach and model used for conducting the sensitivity analysis. Describe, giving examples where applicable, the analysis of factors determined to warrant sensitivity analysis. For example, the length of system life, workload, requirements and etc.

5.2 Results

Discuss the results of performing the sensitivity analysis using the factors described in paragraph 5.1 on page 5

6.0 RECOMMENDATION AND ISSUES

6.1 Recommendation

Recommend which alternative is the way to satisfy the user's requirement(s). in the most cost effective manner. State the reasoning that supports the recommendation.

6.2 Issues

Identify the respective issues, if any, that may occur in implementing the recommendation. If known, discuss what needs to be done to resolve the issue.

APPENDICES

A - Needs Statement
(refer to an Annex of the Project Management Plan

B - Needs Statement Evaluation Report
(refer to an Annex of the Project Management Plan

C - **Specific Objectives**
(refer to Annex (Feasibility Study) of the Project Management Plan

D- **Cost Worksheet**
(hardcopy and disk)

E- **Benefit Worksheet**
(hardcopy and disk)

F **Sensitivity Analysis Worksheet**
(hardcopy and disk)

Project Management Plan

Table of Contents

Project Management Plan

1.0 PROJECT DESCRIPTION

1.1 Purpose

Briefly describe what is to be accomplished by the project, in objective terms.

1.2 Description

Bulletize the major tasks to be accomplished in the completing the project.

1.3 Objectives

List the specific objectives to be achieved. These objectives are the critical success factors for the project. The objectives should be stated in such a way that it can be assessed at the completion of the project whether or not the objectives have been met.

1.4 Impact

This paragraph describes the anticipated impact of the proposed change (requirement/system) on the current environment.

1.4.1 Organizational Impact

Identify any new requirements that will be generated once the project objectives have been completed. These could include such items as user training, system operation and maintenance. If appropriate, identify the number of current personnel requirements eliminated.

1.4.2 Financial Impact

Provide a summary of cost factors associated with the successful completion of the major tasks specified in paragraph 1.2. The cost factors may include such items as: personnel (GAO staff and contractual services), hardware, software, and supplies.

1.5 Application to GAO Strategic Plan

Describe how the successful implementation of this requirement is linked to the execution of GAO's Strategic Plan.

2.0 PROJECT APPROACH

2.1 Methodology

The purpose of this section is to document the approach that will be used to satisfy the requirement. Describe the sequence of phases the project will pass through and list the summary level tasks/activities that will be performed in each phase.

2.2 Acquisition Strategy

If an acquisition is planned, briefly describe how the software and/or hardware will be acquired. These activities should have been included in one of the phases defined in paragraph 2.1 as a single summary item/task.

2.3 Training Strategy

State the purpose of the training. Describe who will be trained. List the specific training objectives to be achieved by the training program for each group. Indicate how the training objectives will be accomplished.

2.4 Critical Success Factors

List the "things that must happen" if the objectives in paragraph 1.3 are to be achieved.

2.5 Risk Assessment

Identify the risk and uncertainty areas relevant to the accomplishment of the project and the means by which their consideration in planning is assured. Areas to be addressed are: technical, operational, financial, and schedule. Use the risk assissment tool (Annex A) to perform the risk assessment

3.0 PROJECT MANAGEMENT

3.1 Management Sponsorship

To provide management sponsorship for the proposed system of requirement. a steering committee will be created and its members identified. The steering committee members will consist of SES level staff who have an interest in or approval over the functional area the development project will support. The steering committee is usually involved in resolving issues and providing scope to the proposed system or requirement. The relationships between the steering committee and the user, and the steering committee and the organization responsible for providing the proposed system or stated requirement must also be identified.

3.2 Project Manager and Team

List the project manager and members of the project team, their role/title, a brief description of their responsibility and experience.

3.3 Project Control

Describe the process that will be used to keep management appropriately informed. Identify the reviews that will be performed and the participants. Discuss how changes will be controlled during the project (i.e. schedule changes, configuration management). Indicate when management will be briefed. At a minimum, management should be briefed at the end of each phase. Additional briefings may be appropriate, however, to solicit management input or approval during a phase.

3.4 Management Support

Identify the organizational elements within GAO that are to provide support, and describe the anticipated extent to which the support will be provided.

3.5 Contractor Support

Identify the contractor support that will be required, and describe the anticipated extent to which the support is needed.

4.0 PROJECT SCHEDULE AND STATUS

4.1 Project Task and Description

List the tasks to be performed and for each task describe the work to be accomplished. The tasks should address the topic areas listed in the OIMC Management Council Project Planning Criteria, page 4. If the task and description are included as a note in the Project Management Software package, a hardcopy of the notes should be provided as part of this project plan in the appropriate annex.

4.2 Project Schedule

Prepare a detail schedule of project tasks with duration, milestones and relationship among tasks and project beginning and end. A hardcopy of the schedule should be provided as part of this project plan in the appropriate annex.

4.3 Project Status

This section contains the latest status of the project. Documents such as project schedules and briefs are saved in an annex (Project Status) to the project management plan.

5.0 PROJECT COSTS, BENEFITS, AND BUDGETS

5.1 Cost Estimate

Provide a gross estimate for the cost factors described in paragraph 1.4.2. This information will eventually be used to prepare a budget for the execution of the project. The information in this section correspond with the data presented in the Cost Benefit Study, highlighting both short and long term costs as appropriate.

5.2 Benefits

In subparagraphs, list the potential tangible and intangible benefits to be accrued. The information in this section should correspond with the data presented in the Cost Benefit Study, highlighting both short and long term benefits as appropriate.

5.3 Project Budget

This section contains a summary of the budget for project life cycle. The actual budget and updates should be contained in a specified annex.

5.4 Project Budget Status

Describe the major differences between the cost benefit study results obtained from that prepared for paragraphs 5.1 and 5.2 and the most recent budget.

6.0 ISSUES AND RECOMMENDATIONS

6.1 Issues

Identify the respective major issues, if any, that may occur during the life cycle of the project. Use subparagraphs, if need be, to group the issues.

6.2 Recommendations

Recommend what needs to be done to resolve or satisfactorily manage the issues documented in paragraph 6.1

7.0 PROJECT DOCUMENTATION

Identify each phase of the project as a subparagraph. List the name and brief purpose of the documents to be published during each phase. When the project is underway, a third subparagraph is added to contain the executive summary of the document. This executive summary should correspond to the executive summary contained in the document itself. An example is given below.

7.1 Planning Phase

7.1.1 Needs Statement (*List the Annex that the document can be found.*)

7.1.1.1 Purpose

The purpose of the Needs Statement is documented. The information should correspond to the data in the Needs Statement.

7.1.1.2 Summary

The summary should correspond to the executive summary section of the Needs Statement.

7.1.2 Needs Statement Evaluation Report (*List the Annex that the document can be found.*)

7.1.2.1 Purpose

The purpose of the Needs Statement Evaluation Report is explained. The information should correspond to the data in the Needs Statement Evaluation Report.

7.1.2.2 Summary

The summary should correspond to the executive summary section of the Needs Statement Evaluation Report.

7.1.3 Feasibility Study *(List the Annex that the document can be found)*

7.1.3.1 Purpose

The purpose of the Feasibility Study is defined. The information should correspond to the data in the Feasibility Study.

7.1.3.2 Summary

The summary should correspond to the executive summary section of the Feasibility Study.

7.1.4 Cost Benefit Study *(List the Annex that the document can be found)*

7.1.4.1 Purpose

The purpose of the Cost Benefit Study is defined. The information should correspond to the data in the Cost Benefit Study.

7.1.4.2 Summary

The summary should correspond to the executive summary section of the Cost Benefit Study.

7.2 Definition Phase

7.3 Analysis Phase

7.4 Development Phase

7.5 Implementation Phase

7.6 Maintenance Phase

8.0 PROJECT LESSONS LEARNED

8.1 Summary

This section contains the lessons learned. The value is to provide historical information and insight that can help project managers better plan and execute future projects. The lessons learned are categorized into subparagraphs (see below).

8.1.1 Requirements Assessment
8.1.2 Critical Success Factors
8.1.3 User Interface
8.1.4 Management
8.1.5 Personnel
8.1.6 Methodology
8.1.7 Cost Estimate & Budget
8.1.8 Risk Assessment
8.1.9 Schedule
8.1.10 Documentation

8.2 Recommendations

ANNEX A

Risk Assessment

Management Profile

Criteria	Score	Low[1]	Medium	High
Management Support WT = 20		Top and middle management support	Middle management support	Little or no middle management support.
User Involvement WT = 17		1 to 3 dedicated users assigned to team	More than 3 dedicated users assigned to team	No dedicated user(s) assigned to the team
Customer Involvement WT = 10		Regular meetings held	Intermediate meetings held	No involvement, only request
Technical Personnel Involvement WT = 8		1 to 3 dedicated technical individuals assigned to team	More than 3 dedicated technical individuals assigned to team	No dedicated technical individuals assigned to team
Technical Personnel Experience WT = 12		High level of experience	Average level of experience	Low level of experience
Team Roles and Responsibilities WT = 12		Defined, assigned responsibilities	Some roles defined	Undefined or unassigned.
Quantifiable Benefits WT = 7		Defined and measurable	Defined with some intangible benefits	Majority are intangible benefits
Configuration Management Approach WT = 7		4 or less configuration items	5 to 9 configuration items	10 or more configuration items
Political WT = 8		Little projected sensitivity	Some limited sensitivity	Extreme sensitivity

[1] Scores for low, medium, and high are 1, 2, and 3 respectively. The score is calculated by multiplying the risk level by the weighting factor for the criteria.

Risk Assessment

Management Profile Total =		

Operational Profile

Criteria	Score	Low	Medium	High
Requirements Definition WT = 25		Well defined	Defined in general terms	Ill defined
Requirements Size WT = 15		25 or less processes	26 to 50 processes	More than 50 processes
Requirements Stability WT = 17		No change to requirement(s) during the develop-ment/acquisition	Some change to the requirements during the develop-ment/acquisition	Rapidly changing requirements during the development/acquisition
Requirements' Scope WT = 17		Satisfy a subgroup (e.g. issue area)	Satisfy a division or unit	Satisfy GAO wide
Requirements' Impact on Workplace WT = 15		Minimal change to the way the user does business	Some change to the way the user does business	Significant change made to the way the user does business
Requirements' Interdependency WT = 12		Processes have little interdependency [25% or less]	Processes have a moderate amount of interdependency [26% to 50%]	Processes are highly interdependent [Greater than 50%]
Operational Profile Total =				

Technical Profile

Criteria	Score	Low	Medium	High
Development Hardware WT = 8		Same as the operational/user environment	Some known differences with the operational/user environment	Different than the operational/user environment.

Risk Assessment

Development Software WT = 18		Commercial Off-the-Shelf software "as is"	New Commercial Off-the-Shelf with some modification	New development.
Data Architecture WT = 15		Uses existing databases	Uses existing databases with addition of some new data elements	Uses existing databases with the addition of some data elements and creates new tables.
Business Area Analysis WT = 13		Business area is documented to the primitive level	Business area documented at the context level.	Undocumented Business area.
Test Environment WT = 15		Representative of the user environment	Some aspects are not representative	Major disconnects with the user environment.
Test Results WT = 13		Test errors/failures are correctable	Some errors/failures are not correctable before implementation	Major corrections necessary.
System Conversion Strategy WT = 7		Pilot	Parallel	Direct/ Phase
Data Integrity Design WT = 13		Fully supports relational integrity	Supports with some exceptions	No relational integrity exists.
Impact on User's hardware application WT = 6		No change required at user's workstation	Minimum change required (e.g. hard drive)	Requires change to be made to the computer, video and/or printer.
Facilities WT = 4		Little or no modification required	Some modifications required.	Major modification required.
System Documentation WT = 10		Correct and available	Available, some deficiencies exists.	No documentation, major revision required.
Technical Profile Total =				

Financial Profile

Criteria	Score	Low	Medium	High

Risk Assessment

Development/Acquisition Cost WT = 41		Less than $50,000	$50,000 to $100,000	Greater than $100,000
Budget WT = 59		Sufficient budget allocated	Some questionable allocations	Budget allocation in doubt
Financial Profile Total =				

Schedule Profile

Criteria	Score	Low	Medium	High
Delivery Time WT = 100		Less than 4 weeks	1 to 3 months	More than 3 months
Schedule Profile Total =				

Risk Assessment Summary Sheet

Profile	Score	Risk Level		
		Low	Medium	High
		100-165	166-235	236-300
Management				
Operational				
Technical				
Financial				
Schedule				
SUMMARY =				
OVERALL RISK =		500-825	826-1175	1176-1500

Risk Assessment
Project Life Cycle

Profile	Score						
	Phases						
	Initial	Planning	Definition	Analysis	Design	Development	Implementation
Management							
Operational							
Technical							
Financial							
Schedule							
OVERALL RISK							

Project Proposal Briefing

The Project Proposal Briefing Guidelines:

- **Standard Format**

  The GAO standard format for briefing charts must be used.

- **Briefing Charts**

  As a minimum, the Project Proposal briefing must contain the following elements:

  - ✓ Purpose
  - ✓ Objectives
  - ✓ Relevancy to GAO Strategic Plan
  - ✓ Project Approach
  - ✓ Project Risk Assessment
  - ✓ Acquisition Strategy
  - ✓ Training Strategy
  - ✓ Critical Success Factors
  - ✓ Project Membership
  - ✓ Impacts (Organizational and Financial)
  - ✓ Anticipated Benefits
  - ✓ Project Phases
  - ✓ Project Schedule
  - ✓ Project Cost
  - ✓ Project Approval Means
  - ✓ Issues (if any)
  - ✓ Training
  - ✓ Requisition

- **Publication**

  The briefing charts should be printed using the audience notes format. The number of copies depends upon the participants. A copy of the briefing charts, handouts, and any speaker notes should be filed in an Annex of the Project Management Plan.

Functional Description

Table of Contents

APPENDICES

A - **Feasibility Study**
(refer to an Annex of the Project Management Plan)

B - **Detailed Decomposition**
(Appendix to this document)

C **Function and Process Definitions**
(Appendix to this document)

D - **Cost Benefit Study**
(refer to an Annex of the Project Management Plan)

Functional Description

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the purpose of the functional description is to provide detail requirements specifications for solicitation of a development contractor to design a capability to satisfy GAO needs* If the approach was to acquire commercial software, the statement would read "... *for the acquisition of a commercial software package to satisfy GAO needs.*"

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the study. An assumption is a statement that may or may not be true, but must be accepted as at least part of the basis for your reasoning.

1.4 Constraints

Present any known or anticipated constraints to the project such as financial, personnel and time constraints.

1.5 Definitions

Define any terms used in the document that are unique to the user's community.

1.6 Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.7 References

Identify existing references which would provide further support for the functional description. At this stage of the IE Process this section may include, but not limited to, the following references (date and PMP Annex number should be included):

- Needs Statement
- Needs Statement Evaluation Report
- Feasibility Study
- Cost Benefit Study
- Project Management Plan

2.0 REQUIREMENTS

2.1 Need Statement

Define the requirement and summarize the specific need(s) generating the requirement. Refer to paragraph 1.1 in the Needs Statement.

2.2 General Description

2.2.1 Current Environment

Briefly indicate the major functions performed and current methods/procedures employed to satisfy the current operational requirements. Refer to the Needs Statement paragraph 2.2.

2.2.2 Proposed Environment

Describe the proposed environment by explaining the new methods/procedures employed to satisfy the current operational requirements. Specify the differences between the current and proposed environments. Refer to the Needs Statement paragraph 2.3.

2.3 Detail Description

2.3.1 Functional Overview

Provide a detailed narrative that describes to a low level of detail *what* the application/capability is expected to do using the detailed decomposition presented in paragraph 2.3.2. The script is written in user terms and incorporates the functions and processes identified in the detailed decomposition. As a minimum, there should be at least one paragraph for each major function identified. The detailed decomposition should be used as the outline for the functional overview. The key element to emphasize is *what* the application/capability is expected to do.

2.3.2 Detail Decomposition

Present the detail decomposition that was prepared with user participation and identified the elementary processes[1]. The detailed decomposition should be based on the high-level decomposition presented in the feasibility study and should be a component of the overall agency enterprise model[2]. The detailed decomposition is an appendix to this document..

2.3.3 Specific Objectives

The specific objectives listed in the feasibility study should be presented in this section, reviewed and, if required, changed. The same should be done for the objectives presented in the feasibility study based on the functional description review. Review the linkage between the objectives and the processes in the detailed decomposition (paragraph 2.3.2). Make changes (add/delete) where appropriate. This information should be gathered from the user through interviews and/or Joint Application Development (JAD) sessions. The finished product which consists of the detailed decomposition (including elementary processes),

---

1 As defined by James Martin in his trilogy on Information Engineering, an *elementary process* is "the smallest unit of activity of meaning to the end user, and which when complete leaves the information area in a self-consistent state."

2 Using the enterprise model is key to integrating any proposed change through shared databases

the objectives and the linkage of the objectives to the business processes must be reviewed and validated by the users.

3.0 ISSUES AND RECOMMENDATIONS

3.1 Issues

Identify any issues that may occur in satisfying the user requirements. If there are no issues, the statement "No issues at this date." is recorded.

3.2 Recommendations

If known, discuss what needs to be done to resolve the issue(s). Recommend the actions needed to taken to close the issue. If a recommendation is plan, state the reasoning that supports the recommendation. If there are no recommendations, the statement "No recommendations at this date." is recorded.

APPENDICES

A - **Feasibility Study**
(refer to an Annex of the Project Management Plan)

B - **Detailed Decomposition**
(Appendix to this document)

C **Function and Process Definitions**
(Appendix to this document)

D - **Cost Benefit Study**
(refer to an Annex of the Project Management Plan)

Evaluation Plan

Table of Contents

APPENDICES

A - Cost Benefit Study
(refer to an Annex of the Project Management Plan

B - Functional Description
(refer to an Annex of the Project Management Plan

C - Data Collection Forms
(Appendix to this plan)

Evaluation Plan

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. For example, *the evaluation plan has been written:*

- *to access the functional performance of the application/capability,*
- *to quantify its impact on the economy and effectiveness of GAO operations,*
- *to determine to what extent the expected cost benefits predicted in the Cost Benefit study are achieved,*
- *and others...*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the plan. An assumption is a statement that may or may not be true, but must be accepted as at least part of the basis for your reasoning. An example is "*the effect of delays in gathering information or conducting the evaluation will be minimal.*"

1.4 Constraints

Present any known or anticipated constraints to preparing and/or executing the evaluation plan such as financial, legislative, policy, schedule and/or manpower constraints. An example is "*the timing of the data collection periods depends on the schedule for training of the application/capability's staff to use the application, implementation of the application, and the full data conversion*"

1.5 Definitions

Define any terms used in the document that are unique to the evaluation process

1.6 Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.7 References

Identify existing references which would provide further support for the evaluation plan and the final results. At this stage of the IE Process this section may include, but not limited to, the following references (date and PMP Annex number should be included):

- Needs Statement
- Needs Statement Evaluation Report
- Feasibility Study
- Cost Benefit Study
- Project Management Plan
- Functional Description

2.0 METHODOLOGY

2.1 Evaluation Approach

The evaluation of the application/capability is based on a "before and after" study of the effect of the application/capability on the user's environment. Describe how the proposed operation will be compared to a baseline system of operations, referred to as the Current System. Present a high-level definition of the data collection periods and the collection methods or procedures that will be used.

2.2 Data Collection Periods

For each collection period, discuss what will be accomplished. Specify the parameters that will be used to determine whether the application/capability has stabilized prior to collecting subsequent data.

2.3 Data Collection and Analysis Methods

Specify the data collection method(s) that will be used:

- to measure the personnel time required in the activities under study,
- to measure the effectiveness of the application/capability
- to determine the level of acceptance by the users
- to measure the reliability of the application/capability

2.4 Data Collection Resources

Identified the number of individuals that will be used to collect and record the data. Specify the guidelines for the selection of the individuals and any training required.

2.5 Evaluation Milestones

List the milestones which will be accomplished in the evaluation, length of time required for each milestone, and forecasted start and completion dates for each milestone.

3.0 MEASURES

The measurements are based on the objectives identified in the PMP. Present the measurements that will be investigated in the evaluation. For each measure, describe the measurement, background and rationale, data requirements, and the data collection and analysis method(s). To the extent possible, the measures should be subdivided into major categories (such as personnel time, user acceptance) as appropriate.

3.1 Objective #1 (From PMP)

3.1.1 Measure #1

3.1.1.1 Description

Describe the measure.

3.1.1.2 Data Requirements

Define the data that is needed to compute the time required for this activity.

3.1.1.3 Data Collection and Analysis

Explain how the data will be collected and analyzed.

3.1.2 Measure #2

3.1.2.1 Description

Describe the measure.

3.1.2.2 Data Requirements

Define the data that is needed to compute the time required for this activity.

3.1.2.3 Data Collection and Analysis

Explain how the data will be collected and analyzed.

3.2 Objective #2 (From PMP)

3.2.1 Measure #1

3.2.1.1 Description

Describe the measure.

3.2.1.2 Data Requirements

Define the data that is needed to compute the time required for this activity.

3.2.1.3 Data Collection and Analysis

Explain how the data will be collected and analyzed.

3.2.2 Measure #2

3.2.2.1 Description

Describe the measure.

3.2.2.2 Data Requirements

Define the data that is needed to compute the time required for this activity.

3.2.2.3 Data Collection and Analysis

Explain how the data will be collected and analyzed.

4.0 REQUIREMENTS AND BENEFITS COMPARISON

Prepare a matrix that cross references the functional requirements in the Functional Description, the processes in the Decomposition, the benefits predicted in the Cost Benefit Study and the measurementsincluded in section 3.0 of this plan.

5.0 ISSUES AND RECOMMENDATIONS

5.1 Issues

Identify any issues that may occur in preparing or executing this plan. If there are no issues, the statement "No issues at this date." is recorded.

5.2 Recommendations

If known, discuss what needs to be done to resolve the issue(s). Recommend the actions needed to be taken to close the issue. If a recommendation is made, state the reasoning that supports the recommendation. If there are no recommendations, the statement "No recommendations at this date." is recorded.

APPENDICES

A - Cost Benefit Study
(refer to an Annex of the Project Management Plan

B - Functional Description
(refer to an Annex of the Project Management Plan

C - Data Collection Forms
(Appendix to this plan)

Configuration Management Plan

Table of Contents

APPENDICES

Configuration Management Plan

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the purpose of the Configuration Management Plan defines the implementation of the configuration management process through which the integrity and continuity of the design, development, and maintenance of the application/capability are recorded, communicated and controlled by the project manager.*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the plan. An assumption is a statement that may or may not be true, but must be accepted as at least part of the basis for your reasoning.

1.4 Constraints

Present any known or anticipated constraints to implementing the configuration management process such as financial, personnel and time constraints.

1.5 Definitions

Define any terms used in the document that are unique to configuration management such as baseline, configuration control board, and system change request.

1.6 Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.7 References

Identify existing references which were used in the preparation of the Configuration Management Plan. At this stage in the IT process, this section may include, but not be limited to, the following references (date and PMP Annex number should be included):

- Needs Statement
- Needs Statement Evaluation Report
- Feasibility Study
- Project Management Plan
- Functional Description

2.0 CONFIGURATION MANAGEMENT PROCESS OVERVIEW

2.1 Configuration Management Approach

Describe the configuration management process for this project over the life cycle of the project. Discuss the various reviews that are held during each phase for the purpose of managing the configuration of the application/capability.

2.2 Baseline Management

Define baseline management. The baselines include the functional baseline, the design baseline and the product baseline. These are described in the procedures. Provide a chart to show by life cycle phases the configuration items to be baselined, the reviews to be performed and the baseline established.

2.3 Organizational Responsibilities

Describe the organization and/or individual responsibilities for all those involved in the configuration management process.

3.0 CONFIGURATION IDENTIFICATION

3.1 Purpose

Explain the purpose of configuration identification. For example, *the purpose of configuration identification is to specify what item(s) (e.g. software, hardware, specifications, configuration items, etc.) used or generated during the Information Technology life cycle are to be identified as a configuration item.*

3.2 Assignment of Configuration Identifiers

Describe the configuration identification process and standards used to identify the configuration item(s) in the application/capability. Methods for establishing the configuration item should include the manner of identifying (e.g., naming, numbering, etc.) the application and its associated components.

3.3 Configuration Items

List the configuration items identified for the application/capability. Briefly describe each item.

4.0 CONFIGURATION CONTROL

4.1 Purpose

Explain the purpose of configuration control. For example, *configuration control is to "manage change" through the evaluation and approval/disapproval of proposed changes to a configuration item.*

4.2 Change Control Process

4.2.1 Change Flow

Discuss the initiation, transmittal, review, evaluation, disposition and tracking of problems and change requests. Use a flowchart or some graphic which illustrates the change control flow.

4.2.2 Change Type

Classify changes by type and the criteria for identifying each type. Describe what determines the classification to be assigned. Reference the graphic presented in paragraph 4.2.1 to provide further information on how a change's classification affects the overall change process.

4.2.3 Change Control Priorities

Define the different priorities that can be assigned to a change. Describe the impact of the priority assigned to a change. Reference the graphic presented in paragraph 4.2.1 to provide further information on how a change's priority affects the overall change process.

4.2.4 Configuration Control Board

Explain the function of the Configuration Control Board. Identify the board's members and their responsibility. Reference the graphic presented in paragraph 4.2.1 to provide further information on how the board functions in the overall change process.

4.3 Release Management

Describe the activities to be performed to formally control the receipt, storage, and release of deliverable configuration items.

5.0 CONFIGURATION STATUS ACCOUNTING

5.1 Purpose

Describe the purpose of configuration status accounting. For example, *one purpose of configuration status accounting is to track changes proposed to the configuration of the application/capability.*

5.2 Status Reports and Briefings

Define the configuration status accounting system's reports and briefings in terms of purpose, and general content. Sample standard reports should be included as an appendix to the configuration management plan.

Project Decision Briefing
[Approval to Advance to Analysis Phase]

The Project Decision Briefing Guidelines:

- **Standard Format**

  The GAO standard format for briefing charts must be used.

- **Briefing Charts**

  As a minimum, the Project Decision briefing must contain the following elements:

  ✓ Purpose
  ✓ GAO IT Life Cycle Overview
  ✓ Activities Performed
  ✓ Functional Description Review
  ✓ Configuration Management Plan Review
  ✓ Evaluation Plan Review
  ✓ System Requirements Review
  ✓ Project Budget and Status
  ✓ Project Schedule and Status
  ✓ Project Risk Analysis
  ✓ Decision to Advance Means
  ✓ Issues (if any)

- **Publication**

  The briefing charts should be printed using the audience notes format. The number of copies depends upon the participants. A copy of the briefing charts, handouts, and any speaker notes should be filed in an Annex of the Project Management Plan.

System Specifications

Table of Contents

APPENDICES

System Specifications

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the purpose of the system specifications is threefold: to provide the detailed definition of the system functions; to communicate the details of the on-going analysis to the users and to define in detail the interfaces with other systems that will be utilized.* If the approach was to acquire commercial software, the statement would read "... *to provide a detailed description of the system functions that will be used in the acquisition process to evaluate the commercial software packages.*"

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the study. An assumption is a statement that may or may not be true, but must be accepted as at least part of the basis for your reasoning.

1.4 Constraints

Present any known or anticipated constraints to development/acquisition of the system capabilities such as financial and/or technical constraints.

1.5 Definitions

Define any terms used in the document that are unique to the technical community.

1.6 Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.7 References

Identify existing references which would provide further support for the system specifications. At this stage of the IE Process this section may include, but not limited to, the following references (date and PMP Annex number should be included):

- Needs Statement
- Needs Statement Evaluation Report
- Feasibility Study
- Functional Description
- Project Management Plan

2.0 REQUIREMENTS

2.1 Need Statement

Define the requirement and summarize the specific need(s) generating the requirement. Refer to paragraph 1.1 in the Needs Statement.

2.2 General Description

2.2.1 Current Environment

Briefly indicate the major functions performed and current methods/procedures employed to satisfy the current operational requirements. Refer to the Needs Statement paragraph 2.2.

2.2.2 Proposed Environment

Describe the proposed environment by explaining the new methods/procedures employed to satisfy the current operational requirements. Specify the differences between the current and proposed environments. Refer to the Needs Statement paragraph 2.3.

2.3 Detail Description

2.3.1 Detail Decomposition

Provide a narrative of the major functions and processes described in the detailed decomposition that was presented in the functional description. Reference to the detailed decomposition in the functional description document must be made.

2.3.2 Specific Objectives

Review the linkage between the system objectives in the feasibility study and the elementary processes[1] presented in the detailed decomposition of the functional description. Make changes where appropriate and coordinate the changes with the user. Develop a table that associates the elementary processes with the major functions of the system.

3.0 PROCESS MODEL

The purpose of this section is to present the results of organizing and documenting the system's processes, inputs, outputs, and data stores. Process modeling is the technique that is used to accomplish the task. The data flow diagram (DFD) is the process modeling tool used to graphically depict the flow of data through the system.

3.1 DFD Standards

Briefly describe the GAO conventions and guidelines used to prepare the DFD. There should be sufficient detail in the description, so that the user can understand the basic symbol set and how to read the diagram. Reference to GAO IT modeling standards should be made.

---

[1] As defined by James Martin in his trilogy on Information Engineering, an *elementary process* is "the smallest unit of activity of meaning to the end user, and which when complete leaves the information area in a self-consistent state."

3.2 Application Context Process Model

This process diagram shows how the proposed system (or change) fits into the GAO business environment. The proposed system is one process and everything else is an external agent, data stores, and/or other systems (represented as processes) in the GAO environment. There should be an overview GAO business area model based on the GAO Enterprise as the departure point for developing this application context process model.

A narrative describing the application context process model is written to guide the reader through the DFD. The DFD is included as an appendix.

3.3 Overview Data Flow Diagram.

The *decomposition*[2] is used as an outline in conjunction with the *application context diagram*[3] to create an *overview DFD* of the proposed system. The overview DFD shows more detail of the proposed system while still retaining the details of the application context diagram. At the overview level, the processes contain within the proposed system are shown. The interactions (interfaces) between the external agents (and other GAO process/systems) and the proposed system processes are presented in greater detail. The finished product is balanced[4]

A narrative describing the overview DFD is written to guide the reader through the DFD. The DFD is included as an appendix.

---

2 As described in paragraph 2.3 1 and presented in the functional description

3 As described in paragraph 3 2

4 Balance refers to making sure that no details are lost when a process presented at one level of a DFD is exploded down to a more detailed level

3.4 Primitive Level Data Flow Diagrams

The processes presented in the overview DFD are exploded to the lowest level of detail referred to as the "primitive level". The GAO conventions (numbering system, etc) for identifying the various processes and diagram levels assist both the technical and user personnel in understanding the data flows and data stores required to design the proposed system.

A narrative describing the primitive data flow diagrams is written to guide the reader through the primitive DFD. The primitive DFD is included as an appendix.

3.5 Data Store Listing

List the data stores depicted at all DFD levels and indicate the DFD level where the data store was used.

3.6 Data Flow Listing

Provide a listing of the data flows used at all DFD levels identifying the following: data flow name, definition, DFD level where the data flow was used.

3.7 Association Matrix

Present an association matrix that associates processes with entities. Other association matrices may be generated. The matrices are included as an appendix to this document.

4.0 OPERATING ENVIRONMENT

4.1 Hardware Environment

Provide a description of the equipment required for the operation of the proposed system. Include a description of the equipment presently available as well as a more detailed discussion of the characteristics of any new equipment necessary.

4.2 Support Software Environment

Provide a description of the support software with which system to be developed must interact. If operation of the system to be developed is dependent upon forthcoming changes to support software, the nature, status, and anticipated availability data of such changes must be identified.

4.3 Interfaces

Provide a listing of the interfaces to other systems as graphically depicted in the Application Context Process Model in paragraph 3.2. For each interface, such information as the following is specified:

- Name of the Interface
- Type of Interface (e.g. program interface)
- Data transfer requirements to and from the subject
- Formats of the interchanged data
- Interface procedures, including telecommunications consideration.

4.4 Data Storage Requirements

Project the storage and growth requirements (e.g. triggers, stored procedures, etc.) for the application of the system life.

5.0 ISSUES AND RECOMMENDATIONS

5.1 Issues

Identify any issues that may occur in completing the DFDs to the primitive level. If there are no issues, the statement "No issues at this date." is recorded.

5.2 Recommendations

If known, discuss what needs to be done to resolve the issue(s). Recommend the actions needed to taken to close the issue. If a recommendation is planned, state the reasoning that supports the recommendation. If there are no recommendations, the statement "No recommendations at this date." is recorded.

APPENDICES

A - **Application Context Process Model**
(Appendix to this document)

B - **Overview DFD**
(Appendix to this document)

C **Primitive Level DFD**
(Appendix to this document)

D - **Data Store Listing**
(Appendix to this document)

E- **Data Flow Listing**
(Appendix to this document)

F- **Association Matrix**
(Appendix to this document)

Database Specifications

Table of Contents

APPENDICES

A - ERD Application Model
(Appendix to this document)

B - Entity Definitions
(Appendix to this document)

C Attribute Definitions
(Appendix to this document)

D - Primary and Foreign Key Listing
(Appendix to this document)

E- Logical Database Schema
(Appendix to this document)

F- Physical Database Schema
(Appendix to this document)

Database Specifications

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the purpose of the database specifications is to document how the data requirements for the proposed system/change will be implemented. It contains a description of the database structure which includes such items as data elements, records, keys, relationships etc..*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the study. An assumption is a statement that may or may not be true, but must be accepted as at least part of the basis for your reasoning.

1.4 Constraints

Present any known or anticipated constraints to development/acquisition of the system capabilities such as financial and/or technical constraints.

1.5 Definitions

Define any terms used in the document that are unique to the technical community.

1.6 Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.7 References

Identify existing references which would provide further support for the database specifications. At this stage of the IE Process this section may include, but not limited to, the following references (date and PMP Annex number should be included):

- Needs Statement
- Needs Statement Evaluation Report
- Feasibility Study
- Functional Description
- System Specifications
- Project Management Plan

2.0 DATA MODEL

The purpose of this section is to present the results of analyzing and describing the data needed by the user of the proposed system/change. The data description becomes the blueprint for database design. The Process model documented in the System Specifications described the data as it is transformed by the processes of the proposed system/change. The Process model, however, did not specify the relationships an organization needs among the data entities[1]. To accomplish this task, the Information Engineering technique known as *data modeling* is used. The entity relationship diagram (ERD) is the data modeling tool used to define the data structure which includes such items as the entities (tables), attributes[2] (columns), and relationships[3] (foreign keys[4]).

2.1 ERD Standards

Briefly describe the GAO conventions and guidelines used to prepare the ERD. There should be sufficient detail in the description, so that the user can understand the basic symbol set and how to read the diagram. Reference to

---

1 An *entity* is something about which data is collected -an object or event.

2 An *attribute* is a characteristic or fact about an entity

3 A *relationship* is defined by its cardinality Cardinality refers to how many instances of one entity can describe one instance of the other entity in the relationship.

4 A *foreign key* is a key that has been included in related record as a data element to describe the relationship between the two records

GAO IT modeling standards pertaining to the construction of data models should be made.

2.2 Application ERD Model

Present the application ERD model. The GAO data architecture is the foundation for the development of the application ERD model. The application ERD graphically depicts the entities and relationships between the entities required to design the database. A narrative describing the application ERD is written to guide the reader through the data model. The ERD is included as an appendix.

2.3 ERD Model Validation

The entities, relationships, and attributes in the EDR model are validated using the DFDs created and documented in the System Specifications.

- ERD *entities* are compared to the DFD data stores
- ERD *relationships* are compared to DFD data stores that are used together in the same process
- ERD *dependencies* are compared to how the data is created in the DFD
- ERD *attributes* are compared to the DFD data flows

The validation also includes a comparison against GAO data standards. The results of these comparisons are documented as well as any recommended ERD changes. If the recommended change is implemented, the change and implementation date are recorded in this section.

2.4 Entities and Relationships

Identify and define all entities to be stored and their relationship, one to one, one to many or many to many. Define the methods of file storage, the format and layout of each file. List the data stores depicted at all DFD levels and indicate the DFD level where the data store was used. The entity definitions are included as an appendix.

2.5 Attributes

Identify and define attributes associated with each entity. The attribute definitions are included as an appendix.

2.6 Keys

Identify and describe primary and foreign key data.

3.0 DATABASE DESIGN

3.1 Logical Database Design

Present the logical database schema. Describe the results of validating the logical schema using the application ERD model presented in paragraph 2.2. If any recommended changes are made to the logical database schema, the change and change date are recorded in this section. The logical database schema is included as an appendix.

3.2 Physical Database Design

Present the physical database schema. Define the data structures, access methods, file organizations and any other physical attributes required to implement the logical database schema. Describe the technical architecture that will be used to implement the processes specified in the functional and system design process. Explain how the database will support the input and output process requirements. The physical database schema is included as an appendix.

4.0 DATABASE MANAGEMENT SYSTEM

4.1 Database Requirements

Provide a description of the database management system (DBMS) capabilities that will be required to physically implement the database.

4.2 DBMS Security Requirements

State the data security and privacy requirements for the proposed system/change. Describe how the DBMS satisfies these requirements.

4.3 Data Exchange between Databases

Provide a listing of the data that will be routinely/intentionally exchanged between the proposed system and other information systems. The description should include such information as: the data element and its properties, the name of the information system, and the reason for the exchange. Describe how the DBMS will implement the data exchange.

4.4 Data Storage Requirements

Project the storage and growth requirements (e.g. triggers, stored procedures, etc.) for the application over its system life cycle.

5.0 ISSUES AND RECOMMENDATIONS

5.1 Issues

Identify any issues that may occur in completing the DFDs to the primitive level. If there are no issues, the statement "No issues at this date." is recorded.

5.2 Recommendations

If known, discuss what needs to be done to resolve the issue(s). Recommend the actions needed to taken to close the issue. If a recommendation is planned, state the reasoning that supports the recommendation. If there are no recommendations, the statement "No recommendations at this date." is recorded.

APPENDICES

A - ERD Application Model
(Appendix to this document)

B - Entity Definitions
(Appendix to this document)

C Attribute Definitions
(Appendix to this document)

D - Primary and Foreign Key Listing
(Appendix to this document)

E- Logical Database Schema
(Appendix to this document)

F- Physical Database Schema
(Appendix to this document)

Project Decision Briefing
[Approval to Advance to Design Phase]

The Project Decision Briefing Guidelines:

- **Standard Format**

  The GAO standard format for briefing charts must be used.

- **Briefing Charts**

  As a minimum, the Project Decision briefing must contain the following elements:

  ✓ Purpose
  ✓ GAO IT Life Cycle Overview
  ✓ Activities Performed
  ✓ Process Model Review
  ✓ System Specifications Review
  ✓ Data Model Review
  ✓ Database Specifications Review
  ✓ Configuration Management Action
  ✓ Preliminary Design Review
  ✓ Project Budget and Status
  ✓ Project Schedule and Status
  ✓ Project Risk Analysis
  ✓ Decision to Advance Means
  ✓ Issues (if any)

- **Publication**

  The briefing charts should be printed using the audience notes format. The number of copies depends upon the participants. A copy of the briefing charts, handouts, and any speaker notes should be filed in an Annex of the Project Management Plan.

Acquisition Plan

Table of Contents

APPENDICES

A - **Needs Statement**
(refer to an Annex of the Project Management Plan)

B - **Feasibility Study**
(refer to an Annex of the Project Management Plan)

C - **Cost Benefit Study**
(refer to an Annex of the Project Management Plan)

D - **System Specifications**
(refer to an Annex of the Project Management Plan)

E- **Procurement Schedule**
(hardcopy and disk)

F **Budget Impact Analysis**
(hardcopy and disk)

Acquisition Plan

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the acquisition plan defines the objectives, operational requirements, acquisition authority, approval authority, approval process and acquisition strategy for obtaining an Automated Data Processing (ADP) capability to support the GAO mission.*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.2.1 Assumptions

List the assumptions pertaining to the study. An assumption is a statement that may or may not be true, but must be accepted as at least part of the basis for your reasoning.

1.3 Constraints

Present any known or anticipated constraints to the acquisition such as financial constraints, procurement regulations, legislative or policy constraints, and changing hardware or software environment.

1.4 Terms and Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.5 References

Identify existing references which would provide further support for the ADP acquisition.

2.0 REQUIREMENTS

2.1 Need Statement

Define the requirement and summarize the specific need(s) generating the requirement. Refer to paragraph 1.1 in the Needs Statement.

2.2 General Description

2.2.1 Current Environment

Briefly indicate the major functions performed and current methods/procedures employed to satisfy the current operational requirements. Refer to the Needs Statement paragraph 2.2.

2.2.2 Proposed Environment

Describe the proposed environment by explaining the new methods/procedures employed to satisfy the current operational requirements. Specify the differences between the current and proposed environments. Refer to the Needs Statement paragraph 2.3.

2.3 Detail Description

This section is required when the acquisition involves software development. Highlight the major functions and processes described in the detailed decomposition that was presented in the functional description. Reference to the detailed decomposition in the functional description document must be made. The information for this paragraph can be found in the Application's System Specifications.

2.4 Process Model

This section is required when the acquisition involves software development. In this section three levels of the data flow diagrams (DFDs) are presented, namely: Context Process Model, the Overview DFD for the application and the Primitive Level DFD. These DFDs were created in the Analysis Phase of the project and documented in the Application's System Specifications.

3.0 ACQUISITION AUTHORITY

3.1 General

Briefly describe the general policy regarding the procurement of COTS software, and other contractual support for the General Accounting Office.

3.2 Objectives

List the objectives of the procurement.

3.3 Responsibilities

Name the individuals/organizational elements and describe their responsibilities in accomplishing the procurement activities.

3.4 Regulatory & Policy Compliance

Provide a statement which indicates that the agency has reviewed and complied (or will comply) with all applicable policies, regulations, OMB circular and etc. List those deviations to the regulations that apply and provide an explanation for each regulatory deviation.

4.0 ACQUISITION STRATEGY

4.1 Implementation Process

Describe the approach that will be used to acquire the desired capability. Indicate whether the proposed procurement approach is competitive or noncompetitive (sole source). This information was originally documented in the Project Management Plan.

4.2 Procurement Schedule

Present the procurement schedule. In this section, the activities described in paragraph 4.1 are projected over a timeline. The schedule should be listed as an appendix to this document.

4.3 Budget Impact

Apply the funding required for the acquisition against GAO's budget and described the results. Are funds available? The budget impact analysis should be listed as an appendix to this document.

5.0 RECOMMENDATION AND ISSUES

5.1 Recommendation

Recommend the action(s) to be taken to execute the Acquisition Plan.

5.2 Issues

Identify issues, if any, that may occur in executing the recommendation. If known, discuss what needs to be done to resolve the issue. If there are no issues, so state.

APPENDICES

A - **Needs Statement**
(refer to an Annex of the Project Management Plan)

B - **Feasibility Study**
(refer to an Annex of the Project Management Plan)

C - **Cost Benefit Study**
(refer to an Annex of the Project Management Plan)

D - **System Specifications**
(refer to an Annex of the Project Management Plan)

E- **Procurement Schedule**
(hardcopy and disk)

F **Budget Impact Analysis**
(hardcopy and disk)

Project Decision Briefing
[Acquisition Approval]

The Project Decision Briefing Guidelines:

- **Standard Format**

  The GAO standard format for briefing charts must be used.

- **Briefing Charts**

  As a minimum, the Project Decision briefing must contain the following elements:

  ✓ Purpose
  ✓ GAO IT Life Cycle Overview
  ✓ Activities Performed
  ✓ Project Risk Analysis
  ✓ Operational Requirements
  ✓ Acquisition Strategy
  ✓ Responsibilities
  ✓ Procurement Schedule
  ✓ Budget Impact
  ✓ Regulatory & Policy Compliance
  ✓ Recommendation
  ✓ Issues (if any)

- **Publication**

  The briefing charts should be printed using the audience notes format. The number of copies depends upon the participants. A copy of the briefing charts, handouts, and any speaker notes should be filed in an Annex of the Project Management Plan.

User Interface Design Specifications

Table of Contents

APPENDICES

A - **Functional Description**
(refer to an Annex of the Project Management Plan)

B - **System Specification**
(refer to an Annex of the Project Management Plan)

C - **Input Products**
(hardcopy and disk)

D - **Output Products**
(hardcopy and disk)

User Interface Design Specifications

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the User Interface Specifications defines the design of both the input and output requirements of the proposed system.*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the user's interface. An assumption is a statement that may or may not be true, but must be accepted as at least part of the basis for your presentation.

1.4 Constraints

Present any known or anticipated constraints to the user interfacing with the proposed system such as the type of monitor to be used.

1.5 Terms and Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.6 References

Identify existing references which would provide further support for this design specification.

2.0 REQUIREMENTS

2.1 Objectives

Present the specific objectives the proposed system are to accomplish. Refer to both the Feasibility Study and the Functional Description.

2.2 Major Functions

Highlight the proposed major system functions and processes described in the detailed decomposition presented in the functional description.

2.3 Performance Summary

Show the linkage of the objectives to the proposed system functions. Refer to the feasibility study and the functional description. The degree of accomplishing the objective represents the quality of the system's performance in satisfying the user's requirement.

3.0 INPUT DESIGN

3.1 Purpose

Briefly describe the user involvement in the interface design of the screens.

3.2 Methodology

Describe the steps taken to develop the inputs for the proposed system. The description should include such tasks as:

- Identify the data flows on the data flow diagrams that must be designed as computer inputs.
- Define input design requirements
- Describe the technique used to prototype the input

3.3 Input Specifications

3.3.1 Input Identification

Based on the data flow diagrams, list by name all input product to the proposed system. For each input product (i.e. source documents, input screen, forms, etc.) assign a code/number that uniquely identifies the input.

3.3.2 Input Products

For each input product named in paragraph 3.3.1, 4.3.1, the following elements should be recorded:[1]

- Input Product Name
- Identification Number
- Purpose
- Attributes[2]
- Input Method & Medium
- Data Flow Diagram Identification
- Objective
- System Function

If a Computer Assisted System Engineering (CASE) tool is being used, the input product can be easily prototyped for review and validation by the user. If a CASE tool is not available, the input product should still be prototyped, possibly using a graphical user interface program. In either case, the input design specifications must be recorded in a repository for later use in the preparation of the required code. These specifications are recorded in an encyclopedia when using a CASE tool or in a relational database program if a CASE tool is not available.

The input products are attached to this document as an appendix.

---

1 The input design specifications vary according to the type of input. This list is offered as an example.

2 This information should be based on the Entity Relationship Diagrams prepared and documented in the Database Specifications. Any changes to the attributes during the construction of the input requires an update to the database specification.

4.0 OUTPUT DESIGN

4.1 Purpose

Briefly describe the purpose of output design, for example, *output design is the process of converting the user's description of the outputs to a computer-based business system. The outputs are the justification for the proposed system from the user's point of view.*

4.2 Methodology

Describe the steps taken to develop the outputs for the proposed system. The description should include such tasks as:

- Identify the data flows on the data flow diagrams that must be designed as computer outputs.
- Define output design requirements
- Describe the technique used to prototype the output

4.3 Output Specifications

4.3.1 Output Identification

Based on the data flow diagrams, list by name all output product (i.e. reports, display screens, forms, etc.) to the proposed system. For each output product assign an code/number that uniquely identifies the output.

4.3.2 Output Products

For each product named in paragraph 4.3.1, the following elements should be recorded:[3]

- Output Name
- Identification Number
- Purpose
- Attributes
- Output Method & Medium
- Data Flow Diagram Identification
- Objective
- System Function

If a Computer Assisted System Engineering (CASE) tool is being used, the output product can be easily prototyped for review and validation by the user. If a CASE tool is not available, the output product should still be prototyped, possibly using a graphical user interface program. In either case, the output design specifications must be recorded in a repository for later use in the preparation of the required code. These specifications are record in an encyclopedia when using a CASE tool or in a relational database program if a CASE tool is not available.

The output products are attached to this document as an appendix.

[3] The output design specifications vary according to the type of output. This list is offered as an example.

APPENDICES

A - **Functional Description**
(refer to an Annex of the Project Management Plan)

B - **System Specification**
(refer to an Annex of the Project Management Plan)

C - **Input Products**
(hardcopy and disk)

D - **Output Products**
(hardcopy and disk)

Program Specifications

Table of Contents

APPENDICES

A - **Functional Description**
(refer to an Annex of the Project Management Plan)

B - **System Specification**
(refer to an Annex of the Project Management Plan)

C - **User Interface Design Specifications**
(refer to an Annex of the Project Management Plan)

D - **Structure Charts**
(hardcopy and disk)

E - **Pseudocode/Action Diagrams**
(hardcopy and disk)

Program Specifications

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the purpose of the Program Specification is to describe the program design in sufficient detail to permit program production by the programmer.*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the program development effort. An assumption is a statement that may or may not be true, but must be accepted as at least part of the basis for your presentation.

1.4 Constraints

Present any known or anticipated constraints to developing the program.

1.5 Terms and Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.6 References

Identify existing references which would provide further understanding of the program specifications contained herein.

2.0 MANAGEMENT

2.1 Programming Team

List the members of the programming team and their individual responsibilities.

2.2 Programming Schedule

Provide the programming schedule. This schedule should explode to a greater detail the programming timeline on the project schedule.

3.0 ENVIRONMENTS

3.1 Software

Provide a description of the software that will be used to develop the computer programs. Include both support software and test software, if needed. The correct nomenclature and documentation references of each such software system and program should be provided. Include reference to the languages (compiler, assembler, program, query, etc.) and to the operating system to be used. If the operation of the computer programs to be developed is dependent upon forthcoming changes to support software, the nature, status, and anticipated availability date of such changes must be identified and discussed.

3.2 Hardware

3.2.1 Development Hardware Environment

Provide a description of the hardware and operating system that will be used to develop the computer programs.

3.2.2 Operational Hardware Environment

Provide a description of the hardware and operating system that will be used to operate the system in the user's environment.

3.2.3 Environmental Differences

If the operational hardware is different from the hardware used in the development environment, list the differences. Explain how the difference(s) in hardware and/or operating system will be accommodated to ensure that the programs will run in the operational environment. If no differences exist, so state.

3.3 Interfaces

Provide a description of the interfaces with other applications programs, including those of other operational capabilities and from other government organizations. For each interface, the following should be specified:

- Type of interface (terminal, program, etc)
- Description of operational implications of data transfer, including security considerations
- Data transfer requirements to and from the subject program (including data content, format, and volume), and characteristics of communications media/system used for transfer.
- Interface procedures
- Data conversion requirements, if any

3.4 Storage

Provide a description of storage requirements for the programs. Include internal storage requirements; use of internal storage and secondary storage such as disk and the estimated quantity of storage required for each.

3.5 Security

Describe the access levels of the program including the computer program itself, inputs, outputs, and databases. If there are no security requirements, so state.

3.6 Data

Provide a description of the data environment of the program. Include descriptions of the files, tables, dictionaries, program interrelationships with the tables, storage allocation and data retention requirements.

4.0 MODULE DESIGN

4.1 Structure Chart[1]

Provide a structure chart(s) that depict the modules of the proposed system. Briefly describe the purpose of the high-level modules. Number the modules and sub-modules. The same numbering scheme will be used when developing the programs/code.

4.2 Pseudocode[2] /Action Diagrams

Provide the pseudocode/action diagram associated with each of the modules presented in the structure chart. Computer-Assisted Systems Engineering (CASE) tools include the capability for developing pseudocode or action diagrams. Some CASE tools also have a graphical capability to create input-process-output (IPO) charts.

APPENDICES

A - **Functional Description**
(refer to an Annex of the Project Management Plan)

B - **System Specification**
(refer to an Annex of the Project Management Plan)

C - **User Interface Design Specifications**
(refer to an Annex of the Project Management Plan)

D - **Structure Charts**
(hardcopy and disk)

E - **Pseudocode/Action Diagrams**

---

1 A structure chart is a diagram that shows the modules and sub-modules used in a system and the relationship among them. Also called a hierarchy chart.

2 Pseudocode refers to the English-like representation of program logic.

(hardcopy and disk)

Project Decision Briefing
[Approval to Advance to Development Phase]

The Project Decision Briefing Guidelines:

- **Standard Format**

  The GAO standard format for briefing charts must be used.

- **Briefing Charts**

  As a minimum, the Project Decision briefing must contain the following elements:

  ✓ Purpose
  ✓ GAO IT Life Cycle Overview
  ✓ Activities Performed
  ✓ Acquisition Review
  ✓ User Interface Design Specifications Review
  ✓ Program Specifications Review
  ✓ Critical Design Review
  ✓ Configuration Management Action
  ✓ Project Budget and Status
  ✓ Project Schedule and Status
  ✓ Project Risk Analysis
  ✓ Regulatory & Policy Compliance
  ✓ Decision to Advance to Development Means
  ✓ Issues (if any)

- **Publication**

  The briefing charts should be printed using the audience notes format. The number of copies depends upon the participants. A copy of the briefing charts, handouts, and any speaker notes should be filed in an Annex of the Project Management Plan.

System Test Plan

Table of Contents

APPENDICES

A - Test Milestone Schedule

B - Test Scenarios

System Test Plan

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the purpose of the Test Plan is to communicate the nature and extent of the tests to be performed by the technical staff deemed necessary to provide a basis for implementation of the proposed system.*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the testing effort. An assumption is a statement that may or may not be true, but must be accepted as at least part of the basis for your presentation.

1.4 Constraints

Present any known or anticipated constraints to testing the proposed system.

1.5 Terms and Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.6 References

Identify existing references which would provide further understanding of the testing contained herein.

2.0 MANAGEMENT

2.1 Test Team

List the members of the test team and their individual responsibilities. Explain the expertise the test members should possessed. For example, *each member of the test team should be knowledgeable in the following software:*

- *Windows 3.1*
- *PowerBuilder*[1]
- *Sybase*[2]
- *etc.*

2.2 Test Milestone Schedule

Provide the milestone chart. The schedule should be directly related to the overall structure chart. The chart should include such activities as unit testing, integration testing, and system testing. Be sure to include time for both correcting any problems discovered during the testing period and for retesting the system to ensure the problems have been resolved. The test milestone schedule is attached to the plan as Appendix A.

3.0 METHODOLOGY

3.1 Testing Process

State the steps that will be used to test the system. For example, the testing process involves the following steps:

---

1 PowerBuilder is a graphical microcomputer-based client/server windows development application software package. The software provides the programmer with the necessary tools to write script to build Microsoft windows.

2 Sybase is an on-line, transaction-processing, relational database management system that uses a client/server architecture.

- *Unit/Module Testing*

  Unit (or module) testing, the lowest level of testing, is performed to insure that the unit/module conforms to its specifications and is ready to be integrated with other modules.

- *Integration Testing*

  Integration testing consists of the systematic combination and execution of module components to insure that the interfaces between the modules are correct.

- *System Testing*

  System testing is the process of testing the integrated hardware and software system to verify that the system meets its specified structural requirements in the network environment.

Use a separate paragraph (3.1.1, 3.1.2, etc.) for each step and describe the tasks that are to be accomplished. These individual tasks should taken into account when preparing the test milestone schedule.

3.2 Testing Guidelines

Guidelines should be written for:

- *Program Leader*
- *Individual Programmers*

Each guideline should be documented in a separate paragraph.

3.3 Storage

Provide a description of storage requirements for performing the integration and system test. Include an estimated quantity of storage required for each.

3.4 Security

Describe the access levels of the program(s) including the computer program itself, inputs, outputs, and databases. If there are no security requirements, so state.

3.5 Test Data

Provide a description of the data environment required to perform the integration and system tests. Discuss any data that must be loaded prior to performing the test. State who has the responsibility for loading the test data. This task should be included on the test schedule mentioned in paragraph 2.2. Include descriptions of the files, tables, storage allocation and data retention requirements.

4.0 TEST SPECIFICATIONS

4.1 Structure Chart[3]

Provide the structure chart(s) that depicts the modules of the proposed system. Briefly describe the purpose of the high-level modules. Number the modules and sub-modules. The same numbering scheme will be used when developing the programs/code. This chart was developed earlier in the IE process and documented in the Program Specifications; section 4.0, Module Design, paragraph 4.1, Structure Chart.

---

[3] A structure chart is a diagram that shows the modules and sub-modules used in a system and the relationship among them. Also called a hierarchy chart.

4.2 Description

Describe the tests that are used by the programmers in performing the integration and system tests. Explain the format of the test scenario. As a minimum the test scenario should contain the following elements:

- Date
- Test No.
- Capability (to be tested)
- Pass & Fail Box
- Capability Description
- Note to the Tester
- Test Scenario Step
- Test Results
- IE Process Title & ID[4]
- Tester Name & Date

If possible, the test scenarios should be divided into two groups, namely: integration and system. A description of each test group should be provided and followed by the list of test scenarios.

4.3 Tests

A brief statement is made which indicates that the two groups of test scenarios can be found in the attached appendix.

APPENDICES

A - Test Milestone Schedule

B - Test Scenarios

---

[4] It is important to relate the capability to be tested to the IE model (Process Model or Data Model). When code/data changes are made based on the test results, the appropriate structured model must be changed. This link between the test scenario and the model provides an audit trail that the update has been properly accomplished.

Source Code/Script Development

Table of Contents

Source Code/Script Development

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the purpose of the Source Code/Script Development is to describe the construction of the system in sufficient detail to permit a programmer to understand the data flow within the system from the source code/script.*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the development effort. An assumption is a statement that may or may not be true, but must be accepted as at least part of the basis for your presentation.

1.4 Constraints

Present any known or anticipated constraints to development effort.

1.5 Terms and Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.6 References

Identify existing references which would provide further understanding of the program modules.

2.0 DEVELOPMENT ENVIRONMENT

2.1 Hardware

List the hardware that was used to develop the software. If the development hardware is different than the test and production hardware, explain how these differences were addressed. This information should agree with the information in the program specifications.

2.2 Software

List the software that was used to develop the proposed system. Include the system software (operating system, etc.) as well as the programming language. If a Computer-Assisted System Engineering (CASE) was used to generate code. Indicate how this was accomplished. If the CASE tool was not used to generate code, indicate how it was generated and the code's relationship to the ERD and DFD. This information should agree with the information in the program specifications.

3.0 MODULE DESIGN

3.1 Structure Chart[1]

Provide the structure chart(s) that depict the modules of the production system. Briefly describe the purpose of the high-level modules. The modules and submodules have been numbered. The same numbering scheme is used when developing the programs/code. The charts are placed in Appendix A.

3.2 Script Comment

Each programming module has a standard template that contains information about the module. This Module ID section of the script contains the following information elements:

- Parent ID#

---

[1] A structure chart is a diagram that shows the modules and sub-modules used in a system and the relationship among them. Also called a hierarchy chart.

- Name:
- Type:
- Description
- DBMS Stored Procedure(s):
- COTS Interface:
- DDL/API/SDK:
- Security:
- Last Updated:
- Author:

The primary key that links the script to the system is the *Parent ID#* which in an interactive system would be the Screen Code established for the specific window based on the options selected by the user. This linkage of script to the individual's windows via the *Parent ID#/Screen Code* provides the programmer and the configuration manager the capability to maintain the script documentation. As the primary key, the *Parent ID#/Screen Code* allows the programmer to communicate to the user what windows need to be tested.

3.3 Security

The classified components of the module are implemented as directed by the program specifications. This implementation should be noted in the Module ID. If there were no security requirements, it is so stated.

4.0 SOURCE CODE/SCRIPT

A list of the modules are presented and the actual source code is placed in Appendix B.

APPENDICES

A - Structure Chart
(hardcopy and disk)

B - Source/Script (by module)
(hardcopy and disk)

Functional Test Plan

Table of Contents

Functional Test Plan

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the purpose of the Functional Test Plan is to describe the procedures and tests that will be used to determine whether the proposed system performs the functions required by the user to accomplish their work. The objective of the testing is to demonstrate the reliability and functionality of the software.*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the testing effort. An assumption is a statement that may or may not be true, but must be accepted as at least part of the basis for your presentation.

1.4 Constraints

Present any known or anticipated constraints to testing the proposed system.

1.5 Terms and Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.6 References

Identify existing references which would provide further understanding of the functional testing contained herein.

2.0 MANAGEMENT

2.1 Test Team

List the members of the functional test team and their individual responsibilities. Explain the expertise the test members should possess. For example, *each member of the test team should be knowledgeable in the following software:*

- *Windows 3.1*
- *WordPerfect 5.2 for Windows*
- *Quattro Pro for Windows*
- *etc.*

2.2 Functional Test Schedule

Provide the functional test schedule. The schedule should include time for both correcting any problems discovered during the testing period and for retesting the system to ensure the problems have been resolved. The functional test schedule should be attached to the plan as Appendix A.

3.0 METHODOLOGY

3.1 Testing Process

State the steps that will be used to test the system. This is done to enable the tester to use this document to test the application. For example, *the standard testing process involves the following steps:*

- *Testing the Software*
- *Documenting errors*
- *Meeting with the technical staff*
- *Retesting the software*
- *Generating a test report*

Use a separate paragraph (3.1.1, 3.1.2, etc.) for each step and describe the tasks that are to be accomplished. These individual tasks should taken into account when preparing the test schedule.

3.2 Test Environment

3.2.1 Configuration

Document the test environment configuration, including the network and server(s).

3.2.2 Test Accounts

Ensure that each member has access (an account) to the appropriate server(s). Identify groups and the test accounts they need in order to test the applications.

3.2.3 Storage

Provide a description of storage requirements for performing the functional test. Include internal storage requirements; use of internal storage and secondary storage such as disk and the estimated quantity of storage required for each.

3.2.4 Security

Describe the classified components of the program including the computer program itself, inputs, outputs, and databases. If there are no security requirements, so state.

3.2.5 Data

Provide a description of the data environment required to perform the functional test. Discuss any data that must be loaded prior to performing the test. State who has the responsibility for loading the test data. This task should be included on the test schedule mentioned in paragraph 2.2. Include descriptions of the files, tables, storage allocation and data retention requirements.

3.3 Testing Guidelines

Present guidelines for:

- *Test Team Leader*
- *Individual Tester for Performing First Round of Testing*
- *Individual Tester for Performing Second Round of Testing*
- *Instructions for the Programmer*

Each guideline should be documented in a separate paragraph. Refer to the appendix for the *minimum* standard instructions/tasks that should be documented in each guideline.

4.0 TEST SCENARIOS

Provide a matrix which identifies how the test scenarios are related to the specific objectives in Section 2, entitled Requirements in the Functional Description

A brief statement is made which indicates that the test scenarios can be found in the attached appendix.

APPENDICES

A - Functional Test Schedule

B - Test Guidelines and Forms

C - Test Scenario Form

APPENDIX A

Functional Test Schedule

Appendix B

Testing Guidelines and Forms

Guidelines

- *Test Team Leader*
- *Individual Tester for Performing First Round of Testing*
- *Individual Tester for Performing Second Round of Testing*
- *Instructions for the Programmer*

Forms

- *Overall Test Summary Form*
- *Problem Resolution Form*
- *Individual Test Summary Form*

Instructions for the Test Team Leader

- Provide each test team member a copy of all test scenarios.
- Prepare the necessary test data and have it loaded into the system.
- Assign the tests to each team member.
- Monitor the testing performed by the individual testers. Provide assistance where needed.
- Collect all test results, and after a review, record the results on the Overall Test Summary form. (See Appendix B for a sample form.)
- Prepare a list of failures.
- Make a copy of the failed tests and set up a meeting with the technical staff to discuss errors.
- Provide the failed tests copies to the technical staff at the meeting. They serve as incident reports, and will be used to track the progress of the problem resolution.
- Assign scenarios with failures from the first tests to team members for the second round of testing.
- Redistribute the completed test scenarios from the first test. Those test scenarios that failed now have an attached Problem Resolution form from the programmer. The actions taken by the programmer to resolve the software problem are documented on the Problem Resolution form. See Appendix C for a sample form.
- Collect all test results from the second test.
- Prepare a test report that contains information such as the summary of results, the completed test scenarios, and the test group meeting minutes.

Instructions for the Tester (1st Round)

- Document the individual workstation configuration (CPU, Printer, etc.) being used for the test.
- Perform all tests assigned by the test leader.
- Follow the test scenarios as written. If a tester finds errors in instructions given to the tester to complete the test scenarios, these errors must be documented on the test sheet. The rest results must correspond to the actual steps/instructions completed during the test.
- Perform tests outside the listed scenarios, if necessary, but document them using the established test forms.
- Use a "tester disk" (if provided) that contains test data to be used for those test that involve loading data from a disk drive.
- Perform any prerequisite work, if applicable, as documented in the "Note to Tester" on each System Test.
- Perform the steps listed in the Test Scenario. If a step cannot be completed, the test end and the "Fail" column is marked and dated.
- Document the condition(s) leading up to a failed step (besides normal execution of the test scenario) in the Test Results box.
- Record the test results on the Individual Test Summary form. See Appendix D for a sample form.
- Turn the completed tests and test summary form over to the test team leader.

Instructions for Tester (2nd Round)

- Document the individual workstation configuration (CPU, Printer, etc.) being used for the test.

- Perform any prerequisite work, if applicable, as documented in the "Note to Tester" on each System Test.

- Perform the steps listed in the Test Scenario. If a step passes after it failed in the original test, it should be marked in the "Pass"column and dated. All subsequent steps after an original failed step should be marked and dated. If a step still cannot be completed, the test ends and the "Fail" Column should be marked and dated.

- Provide any additional information or the condition(s) leading up to a step that failed the second time (besides normal execution of the test scenario) in the Second Test Results box.

- Record the test results on the Individual Test Summary form.

- Turn the completed tests and test summary over to the test team leader.

Instructions for Programmers

- Attend post-test technical meeting with the test team to discuss the results of the initial tests.
- Document all software changes made to the application, using the Problem Resolution form.
- Attach the completed Problem Resolution form to the test scenario that failed and return the entire set to the test leader to initiate the second test.

Insert Test Summary

PROBLEM RESOLUTION

Capability:	Tested On:	Test #:

Problem Description:

Solution:

Programmer Test Results:

Programmer:	Date:

Tester ID: _____ Test Dates: _____ Site: _____

[*Insert System Name*] INDIVIDUAL TEST SUMMARY	Pass	Fail
[Insert the Category or Group Name]		
A-01		
A-02		
A-03		
A-04		
A-05		
[Insert the Category or Group Name]		
B-01		
B-02		
B-03		
B-04		
B-05		
B-06		
[Insert the Category or Group Name]		
C-01		
C-02		
C-03		
C-04		
C-05		
C-06		
C-07		

[*Insert System Name*] INDIVIDUAL TEST SUMMARY	Pass	Fail
[Insert the Category or Group Name]		

[*Insert System Name*] INDIVIDUAL TEST SUMMARY	Pass	Fail
[Insert the Category or Group Name]		
[Insert the Category or Group Name]		
[Insert the Category or Group Name]		

[*Insert System Name*] INDIVIDUAL TEST SUMMARY	Pass	Fail
[Insert the Category or Group Name]		
[Insert the Category or Group Name]		
[Insert the Category or Group Name]		
[Insert the Category or Group Name]		

Appendix C

Test Scenario Form

System Test	Date:	No.

Capability:	Pass	Fail
Capability Description:		

Note to Tester:

Test Scenario:	Screen Code #	Pass	Fail
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

Test Results:	
IE Process Title:	Process ID:
Tester:	

Second Test Results:
Tester/Date:

Functional Test Report

Table of Contents

APPENDICES

A - Functional Test Schedule

B - Testing Guidelines

C - Test Scenarios

D - Problems Experienced

E - Problem Resolutions

Functional Test Report

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the purpose of the Functional Test Report is to document the results of the functional test performed on the proposed system.*

The following information is contained in this report:

- *Description of the procedures used to perform the tests*
- *Problems experienced and documented*
- *Enhancements made*
- *Summary of the test results*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the testing effort. An assumption is a statement that may or may not be true, but must be accepted as at least part of the basis for your presentation.

1.4 Constraints

Present any constraints experienced when testing the proposed system.

1.5 Terms and Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.6 References

Identify existing references which would provide further understanding of the functional testing results contained herein.

2.0 TEST RESULTS

2.1 Summary Test Results

Provide the overall test summary and individual test summaries

2.2 Problems Experienced

List and describe the problems experienced during the testing period. Provide the test scenarios that contain the problem description. These scenarios should be placed in Appendix D.

2.3 Problems Resolved

Describe the work accomplished to resolve the problems experienced during the testing period. The Problem Resolution forms should be placed in Appendix E.

2.4 Enhancements

Describe any enhancements that were documented and made to the proposed system. Include the actions taken to update the various system documents such as the Functional Description, System Specifications, etc.

2.5 Known Issues

Indicate those problems that could not be resolved, the reason why and the impact on the user environment if a user's capability is affected.

3.0 RECOMMENDATION

Recommend the actions, if any, that should be taken based on the results of the test report.

APPENDICES

A - Functional Test Schedule

B - Testing Guidelines

C - Test Scenarios

D - Problems Experienced

E - Problem Resolutions

User's Guide

Table of Contents

User's Guide

1.0 INTRODUCTION

1.1 Purpose

State the purpose of the document. *For example, the purpose of the user's guide is to provide users with an understanding of the components of the [insert system name] system, its capabilities, and step-by-step instructions of the tasks that can be performed in the system."*

1.2 What is the [insert system name]

Describe the major features of the system. Explain the benefits of the system. These benefits were documented in both the Functional Description and the Cost Benefit Study.

1.3 Getting Around in the [insert system name]

Explain the conventions used by the user to move throughout the system via screen selections.

1.4 User's Checklist

Present a checklist that can be used by the user to determine areas of proficiency and weakness in using the software. Include this checklist at Appendix A.

1.5 Technical Support

Explain how users report problems. If a Help Desk or Customer Support Facility is available, provide the following information:

- Mission of the Help Desk or Customer Support Facility

  For example, the mission of the Customer Support Facility is to provide a responsive, escalating, customer focused support mechanism for user requests for assistance and support, network management, and technical assistance for common user application groups.

- How to contact the Customer Support Facility.

1.6 Commonly Asked Questions

Provide in Appendix B a list of commonly asked questions and answers. This can be used by the system novice until they become more experience with the new system.

2.0 CATEGORY/GROUP

2.1 Capability Description

Describe the capability that is provided by the system for the given category of tasks. The functional test plan categories and test scenarios are used for the user's guide. The capability descriptions were documented in the test scenarios.

2.2 Task Name

The task name and the steps to be executed are the directly related to the test scenario. Each test scenario is a separate task to be performed. The steps documented in the test scenario are the instructions in the user's guide.

2.3 Note to Users

Additional guidance to assist the user in the performance of the task are documented in a section called *Note to User*

3.0 CATEGORY/GROUP

3.1 Capability Description

Describe the next capability that is provided by the system for the given category of tasks.

3.2 Task Name

Document the steps to be performed based on the test scenario by the same name in the Functional Test Plan.

3.3 Note to Users

Where appropriate, provide additional guidance to assist the user in the performance of the task. Documented this additional guidance in a section called *Note to User*

APPENDICES

A - **User's Checklist**
(Appendix to this document)

B - **Commonly Asked Questions**
(Appendix to this document)

Implementation Plan

Table of Contents

APPENDICES

Implementation Plan

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the purpose of the Implementation Plan is to communicate the nature and extent of the activities that will be performed to successfully implement the system in the user's operational environment.*
The six key elements of the Implementation Plan[1] are:

- *Site Preparation*
- *Training*
- *System Conversion*
- *Installation*
- *Acceptance Test*
- *System Turnover*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the implementation effort. The assumptions should focus on the key factors, processes, and variables affecting the implementation. The identification of these assumptions permits the decision maker to understand and question the implementation strategy and the bounds within which they were considered.

---

[1] For large projects, an individual plan may be written for each of the key elements. For smaller projects, a single paragraph for each key element may be all that is required. The primary objective is to provide enough information so management understands how the implementation will be executed.

1.4 Constraints

Present any known or anticipated constraints to implementing system. They may be physical, as with a fixed deadline; financial, as with a fixed or limited amount of resources; or institutional, as with organizational policy.

1.5 Terms and Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.6 References

Identify existing references which would provide further understanding of the activities involved in implementing the system.

2.0 MANAGEMENT

2.1 Implementation Team

List the members of the implementation team and their individual responsibilities. Explain the expertise the members bring to the implementation team.

As a minimum the following areas should be addressed:

- *development team*
- *training*
- *operations*
- *implementation project manager*

2.2 Implementation Schedule

Provide the milestone chart. The schedule must include all the implementation activities divided into sections that are related to the key elements documented in the Purpose section of the Implementation Plan. If required, additional sections may be added to the schedule. Be sure to include time for both correcting any problems discovered during the acceptance testing period and for retesting the system to ensure the problems have been resolved. The implementation schedule is attached to the plan as Appendix A.

3.0 TRAINING

3.1 Purpose

State the purpose of training. *For example, the purpose of training is to enable the user and/or technical staff to maximize their effectiveness in using the system's capabilities in the performance of their job.*

3.2 Audience

Describe who will be trained. Usually, there are two groups, namely:

- the *users*[2] who directly interact with the system to perform their job
- the *technical staff* who will be responsible for the operation and maintenance of the system

State the specific training objectives to be achieved by the training program for each group.

3.3 Program

Describe the training program(s) that will be used. Which of the following or combination thereof will be used to provide the necessary instruction:

- *In-House Training*. Will the Training Institute be tasked to train system users to use the new system. What documentation will be prepared? Who will be involved in preparing and reviewing the

[2] Users include managers and other decision makers.

training documentation? Who will be the instructor(s)?

- *Vendor Training.* Will the vendor be tasked to train system users to use the new system... What documentation will be prepared? Who will be involved preparing and reviewing the training documentation? Who will be the instructor(s)?

- *Outside Training.* Will outside training services be used such as a professional training institute (i.e. LearningTree) or training seminars (i.e. SkillPath) to provide the required hands-on training. Does the course/seminar outline meet the training objectives established for the system? What documentation will be provided? How will this training be transferred to other users?

- *On-the-Job Training.* What documentation will be used to train the user in the work environment? Who will provide training support to the users during the initial system learning period?

3.4 Activities

List the activities that need to be accomplished to provide the user and/or staff training. Specify the criteria that will be used to determine whether the activity has been successfully completed.

These activities should be presented on the Implementation Schedule (paragraph 2.2) under the heading "Training".

4.0 SITE PREPARATION

4.1 Purpose

State the purpose of site preparation. *For example, the purpose of site preparation is to meet environmental[3] standards that will ensure a smooth installation of software and/or hardware when it arrives on site.*

---

[3] The term "environmental" refers to wiring, cables, etc.

4.2 Security

Describe any security preparations that must be taken. If there are no security requirements, so state.

4.3 Activities

List the activities that need to be accomplished to the site prior to the installation of the system/system change. Specify the criteria that will be used to determine whether the activity has been successfully completed.

These activities should be presented on the Implementation Schedule (paragraph 2.2) under the heading "Site Preparation".

5.0 SYSTEM CONVERSION

5.1 Purpose

State the purpose of system conversion. *For example, the purpose of system conversion is to describe the process of changing from the old system to the new system. Two major topics are addressed, namely: conversion strategy and data conversion.*

5.2 Conversion Strategy

Describe which of the following installation strategies or combination thereof will be used to convert from the existing to the new system.

- *Direct Conversion.* On a particular date, the old system is turned-off and the new system is placed into operation.
- *Phased Conversion.* The new system is implemented into the operational environment over time gradually replacing the existing system.
- *Parallel Conversion.* Both the new and old system operate together for a period of time. When the new system is judged to be operating according to specifications, the old system is terminated.

- *Pilot Conversion.* The conversion is performed at one or two sites. Problems are resolved and then the system is deployed to other sites. The other sites benefit from the pilot installation.

Describe the advantages and disadvantages of the installation strategy of choice.

5.3 Data Conversion

Describe how files and databases will be loaded for the new system. If the installation involves restructuring existing databases, prepare a data migration plan which discusses how the original database environment will be backed up. Describe how the existing data will be restructured for the new files/databases. What control procedures will be used to ensure data integrity? Will computer programs be used to populate the new files/databases? If so, how will the finished production file/databases be tested to determine whether the conversion was successful?

5.4 Activities

List the activities that need to be accomplished to execute the installation strategy and perform the required data conversion. Specify the criteria that will be used to determine whether the activity has been successfully completed.

These activities should be presented on the Implementation Schedule (paragraph 2.2) under the heading "Conversion".

6.0 INSTALLATION

6.1 Purpose

State the purpose of installation. *For example, the purpose of installation is to place the system into operation.*

6.2 Instructions

Document the step-by-step procedures to be used:

- to install the system/system change
- to backup the system
- to recover from abrupt power failure

These procedures are attached to the plan as an appendix.

6.3 Installation Problem/Change Log

Prepare a *Problem/Change Log*. The purpose of the log is to record problems experienced during installation and changes made to resolve these problems. At a minimum, the log should contain the following elements:

- System Title/System Change Identification
- Installation Site
- Procedure Used
- Problem encountered
- Change(s) made

The *Problem/Change Log* is attached to the plan as an appendix.

6.4 QA Checklist

Prepare a checklist that outlines the tasks associated with the installation of the system/system change. Space should be provide by each checklist item for recording who performed the check (initials) and the date the check was made. The checklist is used to ensure that the installation instructions in paragraph 6.2 were followed, the system can be backup and can recover from an abrupt power failure. The installation *QA Checklist* is attached to the plan as an appendix.

6.5 Notifications

Prepare the two notifications that will be sent to the site at a predetermined time prior to installation. The two notifications are the Administrator's Notification and the User's Notification.

6.5.1 Management Notification

The purpose of the Management Notification is to inform GAO management that a change in their operating environment is about to occur. This gives them and opportunity to prepare at their respective sites.

6.5.2 Administrator's Notification.

The purpose of the Administrator's Notification is to inform the local administrator about the pending system/system installation and about any system tasks they must perform prior to installation. A memo format is used. See the key elements in the User's Notification, paragraph 6.5.3 for the topics to address in the memo. The difference between the two notifications besides the audience is the technical content. The notification is attached to the plan as an appendix.

6.5.3 User's Notification.

The purpose of the User's Notification is to inform the users at the site about the pending system/system installation and about any functional tasks they should perform prior to installation. The notification should contain such elements as:

- What is being done?
- When will this change occur?
- Why is this change occurring?
- How should I prepare for the change?
- What should I do after the update?
- How will I be affected by the change?
- Who can I call for additional assistance?

The notification is attached to the plan as an appendix.

6.6 Activities

List the activities that need to be accomplished to place the system/system change into operation. Specify the criteria that will be used to determine whether the activity has been successfully completed.

These activities should be presented on the Implementation Schedule (paragraph 2.2) under the heading "Installation".

7.0 ACCEPTANCE TESTING

7.1 Purpose

State the purpose of acceptance testing[4]. *For example, the purpose of acceptance testing is to objectively ensure the delivered software and/or hardware perform in accordance with the requirements stated in the Functional Description.*

7.2 Functional Testing

The test scenarios documented in the Functional Test Plan are used during acceptance testing to determine whether the proposed system/system change performs the functions required by the users to accomplish their work. The objective of the testing is to demonstrate the reliability and functionality of the software. Describe the extent of the testing to be performed. The Functional Test Plan is attached to the Implementation Plan as an appendix.

7.3 Backup and Recovery Testing

Prepare the test scenarios that will be used to test all backup and recovery procedures. These procedures are attached to the plan as an appendix.

7.4 Functional Problem/Change Log

Prepare a *Functional Problem/Change Log*. The purpose of the log is to record problems experienced during acceptance testing and changes made to resolve these problems. At a minimum, the log should contain the following elements:

- System Title/System Change Identification
- Installation Site
- Test Scenario Used
- Problem encountered
- Change(s) made

The Functional Problem/Change Log is attached to the Implementation Plan as an appendix.

---

[4] The acceptance test is run in the live environment after the technical staff declare that the system/system change is "ready-for-use" Acceptance testing is also referred to as "beta testing".

7.5 Activities

List the activities that need to be accomplished to perform acceptance testing. Specify the criteria that will be used to determine whether the activity has been successfully completed.

These activities should be presented on the Implementation Schedule (paragraph 2.2) under the heading "Acceptance Testing".

8.0 SYSTEM TURNOVER

8.1 Purpose

State the purpose of system turnover. *For example, the purpose of system turnover is to record the successful completion of the acceptance test and to formally acknowledge the system is fully operational.*

8.2 Site Certification

Prepare a *Site Certification Form*. The form contains the following elements:

- Acknowledgement.
  For example, *"The undersign certifies that the [insert system title/system change identification] was installed and that the Acceptance Testing has been completed. Any unresolved issues or problems are listed. The undersign also received the documentation suite as specified in this certification."*

- Documentation.
  List the documentation that will be given to the site. For example:
  - — *User Guide*
  - — *Known Issues*
  - — *Operations Guide*
  - — *Acceptance Test Plan*
  - — *Help Desk*

- Outstanding Issues
  List and describe each of the outstanding issues. Outstanding issues are those which have a solution but have not be implemented at installation time. The system can be used by the staff during the interim.

- Signature Line
  A signature line should be provide for the site representative (include position title).

- Date

The *Site Certification Form* is attached to this Implementation Plan as an appendix.

8.3 System Change Process

Describe the procedures that will be used to report problems and recommend enhancements to the system. These procedures are attached to the Implementation Plan as an appendix.

8.4 Activities

List the activities that need to be accomplished to perform system turnover. Specify the criteria that will be used to determine whether the activity has been successfully completed.

These activities should be presented on the Implementation Schedule (paragraph 2.2) under the heading "System Turnover".

APPENDICES

A - Implementation Schedule

B - Installation Instructions

C- Backup and Recovery Procedures

D- System Problem/Change Log

E- QA Checklist

F- Functional Test Plan

G- Functional Problem/Change Log

H- Backup and Recovery Test Scenarios

I- Site Certification Form

J- System Change Procedures

K- Administrator's Notification

L- User's Notification

Training Plan

Table of Contents

Training Plan

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the training. For example, *the purpose of this training is to enable the user and/or technical staff to maximize their effectiveness in using the system's capabilities in the performance of their job.*

1.2 IT Methodology Relationship

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the training plan. The assumptions should focus on the key factors, processes, and variables affecting the training. The identification of these assumptions permits the decision maker to understand and question the training strategy and the bounds within which they were considered.

1.4 Constraints

Present any known or anticipated constraints to the training plan. They may be physical, financial, resource-related, or institutional.

1.5 Definitions

Provide any terms and their definitions which are unique to this document and need to be explained to enable the reader to understand the standard.

1.6 Abbreviations

Provide the standard abbreviations that are used in this document.

1.7 References

Identify existing references which would provide further understanding of the activities involved in implementing this training plan.

2.0 TRAINING APPROACH

Describe the methodology or approach that will be used. Which of the following or combination of the following will be used to provide instruction:

- In-House Training

  Will the Training Institute be tasked to train system users to use the new system? What documentation will be prepared? Who will be involved in preparing and reviewing the training materials? Who will be the instructor(s)?

- Vendor Training

  Will the vendor be tasked to train users to use the new system? What documentation will be prepared? Who will be involved preparing and reviewing the training materials? Who will the instructor(s) be?

- Outside Training

  Will outside training services be used such as the professional training institute (i.e., Learning Tree) or training seminars (i.e., SkillPath) to provide the required hands-on training. Does the course/seminar outline meet the training objectives established for the system? What documentation will be provided? How will this training be transferred to other users?

- On the Job Training

  What documentation will be used to train the user in the work environment? Who will provide training support to the users during the initial system learning period?

3.0 AUDIENCE

Describe who will be trained. Usually, there are two groups, namely:

- the user who directly interests with the system to perform their job
- the technical staff who will be responsible for the operation and maintenance of the system.

State the specific training objectives to be achieved by the training program for each group.

4.0 ACTIVITIES

List the activities that need to be accomplished to provide the user and/or staff training. Specify the criteria that will be used to determine whether the activity has been successfully completed.

These activities should be presented in the project schedule.

Project Decision Briefing
[Approval to Advance to Implementation Phase]

The Project Decision Briefing Guidelines:

- **Standard Format**

  The GAO standard format for briefing charts must be used.

- **Briefing Charts**

  As a minimum, the Project Decision briefing must contain the following elements:

  ✓ Purpose
  ✓ GAO IT Life Cycle Overview
  ✓ Activities Performed
  ✓ Review the System Test Results
  ✓ Review Functional Test Plan
  ✓ Review the User's Guide
  ✓ Review the Implementation Plan
  ✓ Product Review
  ✓ Configuration Management Action
  ✓ Project Budget and Status
  ✓ Project Schedule and Status
  ✓ Project Risk Analysis
  ✓ Decision to Advance to Implementation Means
  ✓ Issues (if any)

- **Publication**

  The briefing charts should be printed using the audience notes format. The number of copies depends upon the participants. A copy of the briefing charts, handouts, and any speaker notes should be filed in an Annex of the Project Management Plan.

Operations Guide

Table of Contents

APPENDICES

Operations Guide

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the purpose of the Operations Guide is to provide the technical staff with a description of the software and of the operational environment to ensure smooth system operation.*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to system operations. An assumption is a statement that may or may not be true, but must be accepted as at least part of the basis for your presentation.

1.4 Constraints

Present any known or anticipated constraints to system operations.

1.5 Terms and Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.6 References

Identify existing references which would provide further understanding of operating the system in the business environment.

2.0 SYSTEM MANAGEMENT

2.1 System Application

Provide a brief description of the system. The description should include its purpose and capabilities

2.2 Organizations Involved

2.2.1 System Sponsor

Identify the system sponsor.

2.2.2 System Developer

Identify the system developer.

2.2.3 User Organization

Identify the user organization(s).

3.0 SYSTEM OPERATION

3.1 Description

Describe the operation of the system by use of a chart showing the general flow of the processing operations. The interrelationships among the system tasks with respect to the system tables and database files are of primary importance.

3.2 Network Environment

Describe the operation of the system within the network architecture by use of a chart showing the operational site and the rest of the network. The description should include the interrelationships among the system data retrieval tasks with respect to tables and database files on the network.

3.3 Software Environment

Identify each software package that is used by the system. The inventory is presented in tabular form. Each entry should contain such information as:

- Title of software package
- Version number
- Function performed (i.e. communication, graphics, payroll)
- Operating System required
- Storage Path (provide drive, volume, and directory)

3.4 Hardware Environment

List the equipment (i.e. servers, workstations, etc.) being used to support the system. Provide the equipment specifications (i.e. RAM size, type of internal cards, etc.)

3.5 Data Environment

Identify each table that is referenced, created, or updated by the system, indicating where the files are stored. Also indicate where user data is stored (drive, volume and directory).

3.6 Routine Operation Procedures

Provide the procedures required to be performed by the system administrator to support the operation of the system. These procedures may address such topics as:

- Dump and backup transaction logs and database
- Create new user accounts
- Purge inactive user accounts
- Data refresh procedures

The routine procedures are included as an appendix.

3.7 Non-Routine Operation Procedures

Provide system administrator procedures to cover emergency or non-routine operations. These procedures address such topics as:

- Recovery[1] from an unexpected shutdown[2].
- Orderly shutdown[3] of a server
- Recovery from an orderly shutdown of a server.
- Troubleshooting

The non-routine procedures are included as an appendix.

3.8 Security Procedures

Provide the security procedures that are used to deny unauthorized access or use of sensitive data electronically generated/stored by the system. The security procedures are included as an appendix.

3.9 Known Issues

Indicate those problems that could not be resolved, the reason why and the impact on the user environment if a user's capability is affected.

4.0 SYSTEM MAINTENANCE

4.1 Responsibility

Describe who has the responsibility to maintain the system. The areas to be

---

1 Recovery procedures are a type of planned process which must be implemented by a system administrator.

2 Unexpected shutdown, or crash can occur for two reasons: as a result of an internal error (abnormally end processing or ABEND), or an external condition (loss of power, physical disk crash, etc.)

3 An orderly shutdown is an *intentional* shutdown by a system administrator.

addressed are the system's software, hardware, and documentation.

4.2 Modification Process

Describe the configuration management process that will be used to modify the system during the maintenance phase. The configuration management procedures are included as an appendix.

APPENDICES

A - Routine Operation Procedures

B - Non-Routine Operation Procedures

C - Security Procedures

D - Configuration Management Procedures

Program Maintenance Guide

Table of Contents

APPENDICES

A - **Configuration Management Procedures**
(Appendix to this document)

B - **Verification Procedures**
(Appendix to this document)

C **Error Correction Procedures**
(Appendix to this document)

D - **Special Maintenance Procedures**
(Appendix to this document)

Program Maintenance Guide

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the purpose of the program maintenance guide is to provide the maintenance programmer with information necessary to understand the system's programs, their operating environment, and their maintenance procedures.*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Assumptions

List the assumptions pertaining to the study. An assumption is a statement that may or may not be true, but must be accepted as at least part of the basis for your reasoning.

1.4 Constraints

Present any known or anticipated constraints to maintaining the system's programs.

1.5 Definitions

Define any terms used in the document that are unique to the technical community.

1.6 Abbreviations

Provide the terms and abbreviations that are unique to this document.

1.7 References

Identify existing references which would provide further understanding on how to maintain the system's programs. At this stage of the IE Process this section may include, but not limited to, the following references (date and PMP Annex number should be included):

- Needs Statement
- Functional Description
- System Specifications
- Database Specifications
- Source Code/Script Development
- Operation Guide

2.0 INTRODUCTION

2.1 Purpose

Explain the purpose of the Program Maintenance Guide. Describe the underlying purpose of the production system.

2.2 Background

Summarize the general nature of the software to be maintained. Identify the project sponsor, developer, user, and the network where the software is implemented.

2.3 System Personnel Involved

Briefly describe the technical personnel required to effectively maintain the system. This list may include any one or all the following:

- Local Area Network Administrator
- Database Administrator
- Senior Programmer Analyst
- Senior Hardware and Software Integrator
- Data Modeling Specialist

Provide a brief description of the duties performed by these individuals[1]. Examples of such job descriptions are provided below.

- Local Area Network Administrator

  Responsible for the support, maintenance, and upgrading of the LAN used to support the system. The LAN Administrator is also responsible for creating new accounts, configuring microcomputers to be used as workstations, and the installation of all hardware devices and software used by the system.

- Database Administrator

  Responsible for maintaining the integrity of the system's database. All technical duties necessary to install and configure the database, develop and debug database objects, such as tables, stored procedures, triggers, etc., are performed by the Database Administrator. Troubleshooting and fine tuning of the database, as well as ensuring the use of efficient storage management techniques and perform complex database design are also part of the Database Administrator's responsibility.

- Senior Programmer Analyst

  The analyst performs systems analysis tasks required for the system including feasibility and alternatives analysis, system testing, system conversion, and implementation. System documentation, user and operating procedures are developed by the analyst, as well as handling problem recording and resolution. Familiarity with the appropriate software development tool(s) and Help suite are also necessary requirements for the analyst.

---

[1] Depending of the project's complexity, one individual may be required to perform more than one role. For example, the database administrator may also be responsible for maintaining the data models in the Computer-Assisted System Engineering tool.

- Senior Hardware and Software Integrator

  The integrator is responsible for the installation, configuration, and troubleshooting of the system's software and hardware. Familiarity with the appropriate software development tool(s) and Help suite are also necessary requirements for the integrator.

- Data Modeling Specialist

  The Data Modeling Specialist plans, supervises, and participates in developing data models, producing IT documentation to support the models, and maintains the Computer Assisted System Engineering tool(s) that support the system's design and implementation.

2.4 Configuration Management

The Program Maintenance Guide is a configuration item[2], which means that as modifications are made to the system, this guide is updated. The change process and procedures are documented in the System's Configuration Management Plan. If this is not the case, then this section should be used to document the configuration management procedures that will be used to update this document. The actual procedures would be attached to the Program Maintenance Guide as an appendix.

2.5 Document Organization

List the sections of the Program Maintenance Guide.

- Screen Record
- Report Record
- Macros and Templates
- Script
- Database
- Help

The above list is flexible and depends upon the type of system being maintained. If the system produced standard reports, a section on Reports (hardcopy) would be included (see section 4.0).

---

2 The other configuration items are: Functional Description, System Specification, Operations Guide, and the User's Guide.

3.0 SCREENS

3.1 Record

3.1.1 Purpose

Describe the purpose of the screen record[3]. The integrating factor to all system support documentation in an interactive system is the graphical user interface, the screen. The purpose of the screen record is to record the information required to maintain these screens and the supporting documentation.

3.1.2 Description

The screen record is composed of a group of related fields. An example record is shown below.

Code:	Dialog Box:	
Tab		COTS:
Function		Macro:
Option		WP Template:
Button		Screen Chart #:
List		Process:
		Help:
		Version:

[3] The term "record" is a database object, and as such, is defined to consist of a group of related fields.

- **Code**

  The purpose of the screen code is to uniquely identify the screen so it can be used as a reference in other documentation such as the script/code that generates the screen. The screen code is made up of a number of digits. Each digit should correspond to a menu selection the user makes to launch a portion of the system's functional capability.

  In the example on page 5, the interactive menu provided the user a number of selection options, namely: Tab, Function, Option, Button, List and Dialog Box. Six digits were used. The first digit addressed the *tab* selected. The second digit dealt with the *function* chosen. The third digit denoted the *option* selected. The fourth digit revealed the *button* clicked. The selection from a *list* was recorded as the fifth digit. Finally, the sixth digit revealed the *dialog box* that the selection generated.

- **Dialog Box**

  The name of the dialog box is recorded in this field.

- **COTS**[4]

  Record any commercial software package(s) launched by the menu choices. A standard list of abbreviations should be used.

- **Word Processing (WP) Macro**[5]

  Record the name of the word processing macro that is launched following a particular menu choice.

---

4 COTS is the abbreviation for *Commercial-Off-The-Shelf* software.

5 Macro is a word processing term. It is defined as a series of actions that the user records and plays back to accomplish specific tasks.

- **Word Processing (WP) Template**[6]

  Record the name of the word processing template that is launched following a particular menu choice.

- **Screen Chart #**

  A picture of the screen was created using a graphical tool. This screen picture was used to during the system design phase to interact with the user. Depending on the tool used (graphic package such as Freelance or a CASE screen generator), a unique identification was assigned. For example, when using Freelance, an item number is shown for each chart created when the *Page Sorter* is displayed. The purpose of the screen chart# is to be able to retrieve and modify the screen at a future time.

- **Process**

  Enter the number of the process being satisfied by this screen. The process refers to the process documented in the decomposition created in the Definition Phase and in the data flow diagram in the Analysis Phase. This represents the link to the information engineering models.

- **Help**

  Enter the *Help* notations. These notations refer to the entry points for the Help System on a specific screen. The notation represents the link to the Help script created to assist the user executing the system.

3.1.3 Screen Records List

Provide the list and printout of the screen records.

---

[6] Template is a word processing term. It is defined as the basic design of a document.

3.2 Screen Pictures

3.2.1 Purpose

The purpose of this section is to present the actual pictures of each screen with the screen code number denoted at the bottom. The numbering scheme which uniquely identifies each screen that was developed, as described in section 3, 3.1.2, Screen Record on page 5, 6, under the title Code.

3.2.2 Capture Process

Specify what software was used to generate and save the screens. Document the steps to be performed to generate, store and print the screens.

3.2.3 Screen Picture List

Provide the index list and printout of the screen pictures.

3.3 Menu Structure

3.3.1 Purpose

The purpose of this section is to present the menu choices for the system.

3.3.2 Menu Architecture

The menu-based system gives the user a set of choices from which the user makes the desired selection. Two types of diagramming tools can be used to design and document the user interface screens, namely: state transition diagrams and decomposition diagrams. Both can be used to depict the sequence and variation of screens as seen by the system user. The chosen technique is presented in this section. This information was initially generated during the Design Phase.

4.0 REPORTS[7]

4.1 Record

4.1.1 Purpose

The purpose of the report record is to record the information required to maintain these screens and the supporting documentation.

4.1.2 Description

The report record is composed of a group of related fields. As a minimum, the following fields should be recorded for each report used in the system:

- Identification Code
- Report Name
- Type of Report (e.g. summary, detail, exception, etc.)
- Recipient(s)
- Security Classification (e.g. none, confidential, etc.)
- Report Chart #:
- COTS Involved:
- Macro
- WP Template
- Entity Name

4.2. Reports Format

4.2.1 Purpose

The purpose of this section is to present the layout of each report with the identification code number denoted at the bottom. The numbering scheme which uniquely identifies each report that was developed.

4.2.2 Report Listing

Provide the index list and printout of the reports.

---

[7] Report refers to a printed document.

5.0 MACROS AND TEMPLATES

5.1 Purpose

The purpose of this section is to present the macros and templates used in the system. Macros are usually created to assist the user to perform a word processing task(s). Template refers to a pre-designed document, sometimes called a form. The user doesn't have to create the form. The form is provided via a template.

5.2 Description

Specify the word processing software package used. Provide the general procedures used to create a macro and template.

5.3 Listing

Provide a list of the macros and templates created. As a minimum, the following information should be included:

- Supporting Macros
  - — Menu Choice
  - — Filename
  - — File size
  - — Date created
- Associated Templates
  - — Menu Choice
  - — Filename
  - — File size
  - — Date created

Provide a hardcopy of all macros and associated templates.

6.0 SCRIPT/CODE

6.1 Purpose

The purpose of this section is to present script generated for the system.

6.2 Description

Provide a brief description of the programming effort. It should include a description of the development programming tool/language.

6.3 Structure Chart

Provide a listing of the internal and external modules used in the system. Use a structure chart to diagram the relationships between these modules.

6.4 Module Template

Describe the standard documentation template used for each module. This information was originally prepared for the Program Specifications and further described in the Source Code/Script documented

6.5 Script Modules

Include a hardcopy of the script by module.

7.0 DATABASE

7.1 Purpose

The purpose of this section is to provide a description of the database that was designed to support the newly developed system.

7.2 Description

Provide a brief description of the database design effort. Identify the database management system used. Describe the database architecture. Provide the database schema.

7.3 Database Listing

Provide a listing of the following:

- Data types
- Database table names
- Database table descriptions
- Stored Procedures
- Default Values Used

8.0 HELP

8.1 Purpose

The purpose of this section is to provide a description of the *Help* files created to support the user in executing the capabilities of the system.

8.2 Description

Describe the *Help* software that was used. For example, if RoboHELP is the software used, the description should discuss the software's three dynamic ink libraries and two document templates.

Identify the equipment required for operation of the *Help* system

8.3 Change Process

Describe how the *Help* software is used to make a change to the *Help* system.

8.4 Script

Provide the files created by the *Help* software. There should be a brief description for each *Help* file. The screen record (as described in section 3 on page 5) links the *Help* files to the screens.

9.0 MAINTENANCE PROCEDURES

9.1 Purpose

The purpose of this section is to document for the maintenance programmer the programming conventions and procedures used to support system operation.

9.2 Programming Conventions

Identify and describe the programming conventions used.

9.3 Verification Procedures

Describe the verification procedures to check the performance of the module, either general or following modification. Include a reference to test data and test procedures.

9.4 Error Correction Procedures

Describe common error conditions, their sources, and procedures for their correction.

9.5 Special Maintenance Procedures

Describe any special procedures required for the maintenance of the modules. Include information such as periodic purges of the database, temporary modifications needed for leap years or century changes, etc.

APPENDICES

A - **Configuration Management Procedures**
(Appendix to this document)

B - **Verification Procedures**
(Appendix to this document)

C **Error Correction Procedures**
(Appendix to this document)

D - **Special Maintenance Procedures**
(Appendix to this document)

System Change Package

Table of Contents

APPENDICES

System Change Package

EXECUTIVE SUMMARY

1.0 BACKGROUND

1.1 Purpose

State the purpose of the document. *For example, the purpose of the System Change Package is to consolidate all the technical and user documentation and system resources (code, files, databases, etc.) required to install a change to an existing system baseline.*

1.2 IT Methodology Reference

Identify the phase and the step in which this document is being prepared and reviewed. Indicate when this document should be updated.

1.3 Constraints

Present any known constraints to installing the system change package.

1.4 References

Identify existing references which would provide further understanding of the system change package.

2.0 PACKAGE CONTENTS

2.1 Scope

The contents of a system change package depends on such factors as: the number and size of the change, what is being changed, and how it is being implemented. The system change package must contain enough information to install the change, to exercise the system's capability, and to maintain the new baseline. See the table below for the suggested contents of a system change package.

SYSTEM CHANGE PACKAGE					
ITEM		DISTRIBUTION			
		Install Mgr	Main-tenance	Sys Admin	User
User Notification		X	X	X	X
System Administration Notification		X	X	X	
Installation Instructions		X	X	X	
Installation Test Procedures		X	X	X	
Functional Test Procedures		X	X		
Site Acceptance Test Procedures		X	X	X	X
Known Issues and Problems		X	X	X	X
System Resources (data, files, tables, etc.)		X	X	X	
Documentation Inventory	Document Change Inventory List	X	X	X	
	Functional Description	X	X		
	System Specification	X	X		
	Database Specification	X	X		
	Operations Guide	X	X	X	
	Program Maintenance Guide	X	X		
	User's Guide	X	X	X	X

System Change Summary	X	X	X	

2.2 System Change Summary

Provide a high-level description of the changes that will be made when the system change package is installed. The summary should address the following topic areas:

- Changes Being Installed
  A brief functional description of each change being made is presented. These descriptions are documented in the related system change requests that are being address in the system change package. Identify the applications/systems being affected (include version numbers).

- System Change Requests/Trouble Tickets Being Closed
  Provide a list of the System Change Requests and/or Trouble Ticketsbeing closed by the system change package. A copy or filename of each system change request should be included in the system change package but not distributed outside the designated maintenance group.

- Installation Approach
  Describe how the system change package will be installed. The purpose is to identify to management the major tasks that will be performed in the installation process. Attention should be given to the testing and acceptance process.

- Data Conversion Strategy
  Identify what data will be modified. Describe why the modification is required. Explain how the data will be protected prior to change, how it will change (if it does) during the conversion process, and how it will be validated after the conversion process.

- Installation Schedule
  Present a delivery schedule. At a minimum, the schedule should include the dates for the following events/activities:

  — System Testing
  — Quality Assurance Testing

— Installation
— Installation Testing
— Acceptance Testing

- Installation Team
  Identify the members of the installation team who are responsible for the installation of the system change package. Describe how management will be kept informed on the status of the installation.

2.3 User Notification

The purpose of the User's Notification is to inform the users at the site about the pending system/system installation and about any functional tasks they should perform prior to installation.
The notification should contain such elements as:

- What is being done?
- When will this change occur?
- Why is this change occur?
- How should I prepare for the change?
- What should I do after the update?
- How will I be affected by the change?
- Who can I call for additional assistance

For system projects, this information was prepared and documented in the Implementation Plan (Notification Section).

2.4 System Administrator Notification

The purpose of the Administrator's Notification is to inform the local administrator about the pending system installation and about any system tasks that must be performed prior to installation. A memo format is used. See the key elements in the User's Notification, paragraph 2.3 for the topics to address in the memo. The difference between the two notifications besides the audience is the technical content.

For system projects, this information was prepared and documented in the Implementation Plan (Notification Section).

2.5 Installation Instructions

Document the step-by-step procedures to be used: to install the system/system change, to backup the system, and to recover from abrupt power failure. For system projects, these procedures were written and included as part of the Implementation Plan.

2.6 Installation Test Procedures

Document the technical test scenarios that will be used to determine the system is ready for acceptance testing by the user. These tests are performed by the installation team after the installation has been completed.

2.7 Functional Test Procedures

The test scenarios documented in the Functional Test Plan are used during both the quality assurance testing and acceptance testing to determine whether the proposed system/system change performs the functions required by the users to accomplish their work. Once the package passes the quality assurance testing in the Operations Test Center, the system change package installation manager working closely with the user determines which functional test scenarios (all or a subset) will be used in the acceptance testing at the site. Only the test scenarios in the acceptance test are distributed to the site(s) for execution.

2.8 Site Acceptance Test Procedures

Present the test scenarios that will be executed by the user at the site to determine whether the delivered software and/or hardware performs in accordance with the requirements stated in the Functional Description (requirements document). Once the acceptance test is successfully completed, a Site Certification is signed by management. Include the Site Certification form as part of the Site Acceptance Test Procedures.

2.9 Known Issues and Problems

Indicate those problems that could not be resolved, the reason why and the impact on the user environment if a user's capability is affected. Document any tips that will assist the user to work around the problem. This information was originally documented in the Functional Test Report. Additional issues may arise during the installation process, and if so, they should be documented and distributed as part of the system change package.

2.10 System Resources

Provide an inventory list of data (code, files, tables, etc.) that will be required to install the system change package.

2.11 Documentation Inventory

The Document Change Inventory List enumerates all documents and/or change pages for existing documentation that will be distributed as part of the system change package. The suggested distribution list is presented in the table on page 2. Include all pertinent documentation contained on the list.

3.0 Post Installation

3.1 Functional Evaluation

At a predetermined time, the users at the installation site should be asked such questions as:

- What impact did you experience during the installation process?
- How well did the system change work?

3.2 Lessons Learned

Prepare a lessions learned statement following completion of an installation. If multiple sites are involved, provide an overall lessions learned at the completion of all installations.

Project Decision Briefing
[Approval for Deployment]

The Project Decision Briefing Guidelines:

- **Standard Format**

  The GAO standard format for briefing charts must be used.

- **Briefing Charts**

  As a minimum, the Project Decision briefing must contain the following elements:

  ✓ Purpose
  ✓ GAO IT Life Cycle Overview
  ✓ Activities Performed
  ✓ Project Risk Analysis
  ✓ Review Quality Assurance Results
  ✓ Review the Deployment Schedule
  ✓ Review Budget and Status
  ✓ Configuration Management Action
  ✓ Discuss Known Issues and Problems
  ✓ Decision to Deploy Means

- **Publication**

  The briefing charts should be printed using the audience notes format. The number of copies depends upon the participants. A copy of the briefing charts, handouts, and any speaker notes should be filed in an Annex of the Project Management Plan.

End-of-Project Briefing
[Approval for Closure Advance to Maintenance Phase]

The End-of-Project Briefing Guidelines:

- **Standard Format**

  The GAO standard format for briefing charts must be used.

- **Briefing Charts**

  As a minimum, the End-of-Project briefing must contain the following elements:

  ✓ Purpose
  ✓ GAO IT Life Cycle Overview
  ✓ Activities Performed
  ✓ Project Risk Analysis
  ✓ Review the Installation Results
  ✓ Review Lessons Learned
  ✓ Review the Maintenance Responsibilities and Process
  ✓ Configuration Management Action
  ✓ Review the steps to Close Down the Project
  ✓ Present the Maintenance Budget and Status
  ✓ Decision to Advance to Maintenance Means
  ✓ Issues (if any)

- **Publication**

  The briefing charts should be printed using the audience notes format. The number of copies depends upon the participants. A copy of the briefing charts, handouts, and any speaker notes should be filed in an Annex of the Project Management Plan.

GAO

United States
General Accounting Office

Memorandum

FOR FULL IMPACT ANALYSIS

Date:

To: OIMC ACG

Thru: OIMC Director for Infrastructure Operations
OIMC Director for Standards and Emerging Technologies
OIMC Configuration Manager

From: Project Manager *(if project is active otherwise insert the OIMC Configuration Manager)*

Subject: Impact Analysis Results on *(insert the title of the proposed change)*

Briefly summarize the results of the preliminary impact analysis performed on the proposed change using the Impact Analysis Factors Checklist as a guide. Organize the summary into the following major areas: General Information, Organizational Impact, Technical Impact, and Economic Impact.

Recommendation:

Recommend the action that should be taken based on the results of the full impact analysis. State the reasoning that supports the recommendation.

Issues:

Identify any respective issues that may occur in implementing the recommendation. If known, discuss what needs to be accomplished to resolve the issue(s).

cc: Organizational Entity *(submitting the proposed change)*
Others *(as deemed appropriate)*

Attch: System Change Request
Impact Analysis Factors Checklist
Impact Analysis Write-ups

IMPACT ANALYSIS FACTORS CHECKLIST

General Information

Reason for Change	☐ Problem ☐ Enhancement ☐ Directive
Change Classification	☐ Class I - the change has one or more of the following impacts: • will affect the application's performance and/or maintainability • will change the product baseline ☐ Class II - the change is non-technical and only affects the documentation of the application, such as correction of typos or the addition of supplementary information.
Change Priority	☐ Urgent - complete within 30 days. ☐ Routine - complete beyond 30 days

Organizational Impact

Policy Affected	☐ GAO Orders ☐ General Policy and Procedures ☐ Communications Policy ☐ Other
User Affected	☐ Evaluators ☐ Support Staff ☐ Management ☐ System Administrators ☐ Other
Support Units Involved	☐ Advance Technology Group ☐ Operations Services Center ☐ Systems Services Center ☐ Telecommunications Services Center ☐ Office of Policy ☐ Personnel ☐ Training Institute ☐ Other
Scope of Change	☐ GAO Wide ☐ Division ☐ Field Office ☐ Audit Site ☐ Support Unit

Technical Impact

Design Approach	☐ COTS ☐ Development
System Interfaces	☐ Network ☐ Application(s)
Documentation Affected	☐ Functional Description ☐ System Specifications ☐ User Interface Design Specifications ☐ Database Specifications ☐ System Test Plan ☐ Functional Test Plan ☐ Users Guide ☐ Training Guide ☐ Operations Guide ☐ Program Maintenance Guide
Training Required	☐ On-site ☐ Classroom ☐ On-the-Job
Risk Involved	☐ High ☐ Medium ☐ Low

Economic Impact

Resources Required	☐ Software ☐ Hardware ☐ Storage ☐ Staff
Cost	☐ High ☐ Low
Benefit(s)	☐ Tangible ☐ Intangible
Budget	☐ Funds Available ☐ Funds Not Available