



EPA SYSTEM DESIGN & DEVELOPMENT GUIDANCE:

VOLUME A: MISSION NEEDS ANALYSIS

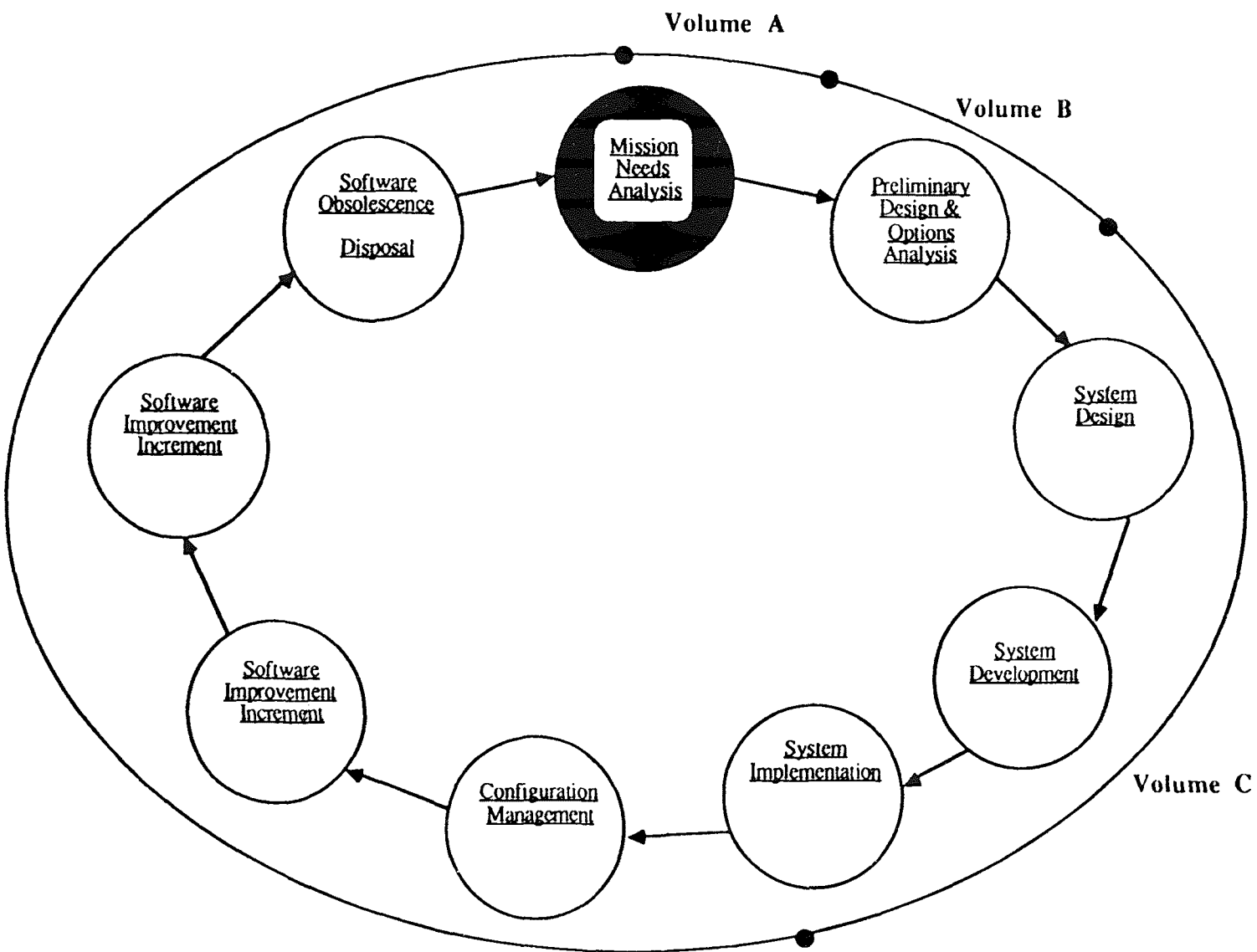
Volume A
EXECUTIVE SUMMARY

This document constructs a framework around which Agency program managers and contracting officers can document a problem and justify the need for an information processing solution. The objective of this document is to provide guidance towards satisfying requirements specified in EPA's IRM Policy Manual for the acquisition and management of information technology.

The guidelines within this document are designed to provide program managers and their staff with a suggested methodology for assessing and evaluating the need for information processing. Applying the methodology in this volume will result in two outputs: 1) a preliminary specification of a management requirement for information or information processing; and the outputs and benefits tied to the user's organization mission and operation, and 2) an "Initial System Concept" which provides an initial depiction of the inputs, outputs, and processes.

Completion of the steps outlined in this document will provide management with the information required to make a decision whether or not to proceed to the Preliminary Design and Options Analysis task defined in Volume B. The following exhibit describes the complete software life cycle. Each process in the software life cycle is represented by a circle with its corresponding title on the inside of the circle. Inputs to the Mission Needs Analysis or factors that influence the process are shown surrounding the circle. As indicated, influencing factors are: new legislation, changes to regulations, program growth and the preceding process Software Obsolescence.

COMPLETE SOFTWARE LIFE CYCLE



Operations and Maintenance Manual

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Chapter One INTRODUCTION

Pursuant to the Environmental Protection Agency's IRM Policy Manual, this volume is the first of three volumes which provide guidance for Agency system design and development efforts. This volume provides guidance for the first phase of the EPA system development process --- The Mission Needs Analysis.

Volume A is intended for use by Agency Program and Management Officials and responsible staff when making a determination regarding an information or information processing need and whether to commit resources to identify, develop, and implement an appropriate solution to satisfy that need. Exhibit 1-1 on the next page identifies the intended audience of this volume.

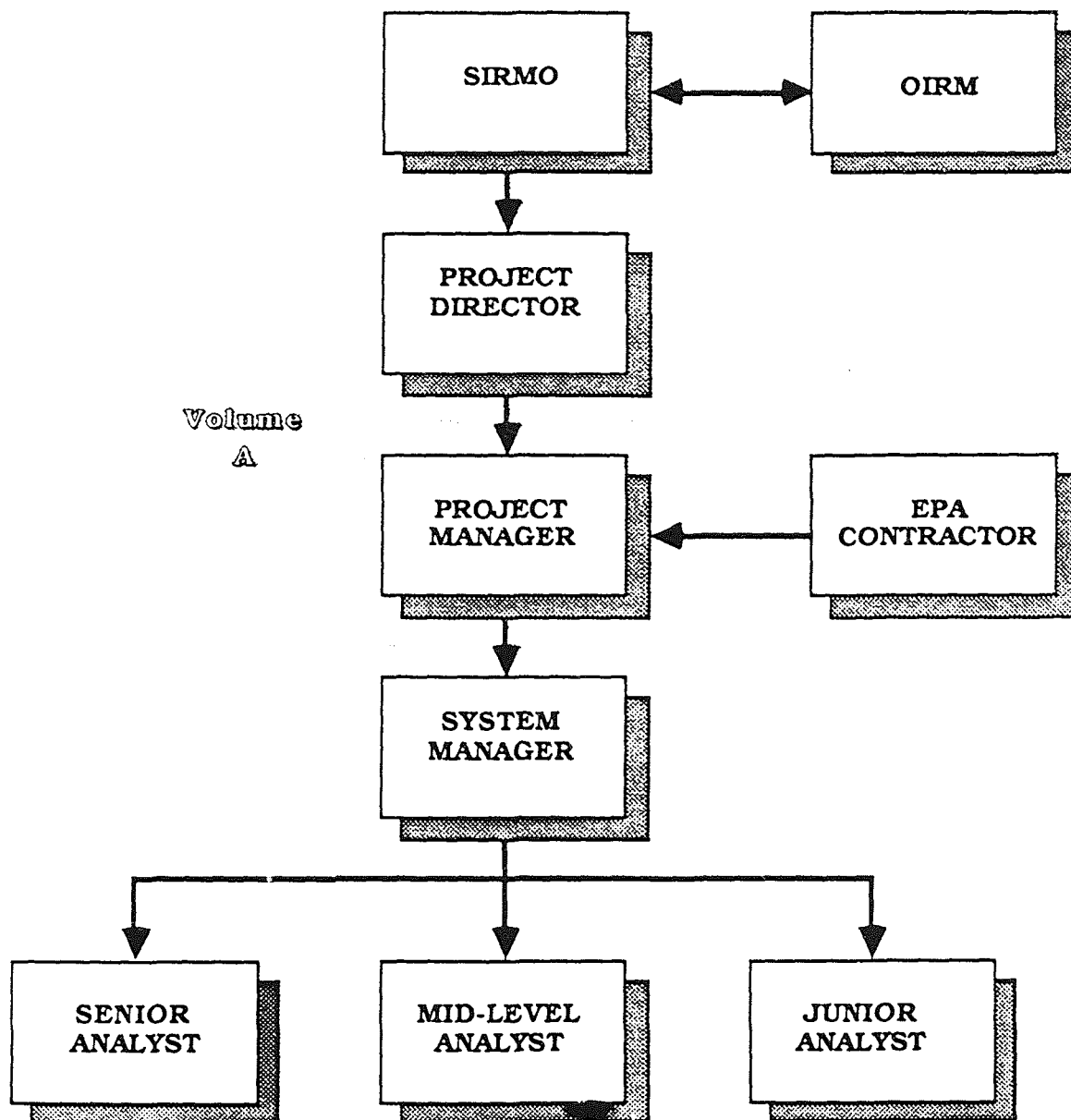
1.1 BACKGROUND

The Environmental Protection Agency expends millions of dollars each year on the design, development, implementation and maintenance of major environmental and administrative systems vital to EPA's programs and administrative functioning. Management of these resources is becoming increasingly complex, since the rapid development of information technology in recent years has dramatically increased computer capacity and user accessibility. The result has been two-fold:

- An increasing number of system development efforts by managers and staff at all organizational levels who, because of access to their own equipment, develop their own systems independently of Agency system's staff
- A wide range of hardware/software options for implementation of any specific system concept or design.

Therefore, there has been a proliferation of system development efforts by a broad range of users with varying levels of sophistication in making development decisions and conducting development efforts.

EXHIBIT 1-1
GUIDANCE AUDIENCE



1.2 OBJECTIVES OF THE SYSTEM DESIGN AND DEVELOPMENT GUIDANCE

Within EPA's Office of Administration and Resources Management (OARM), the Office of Information Resources Management (OIRM) is responsible for ensuring the effective and efficient use of EPA's information resources including automated system design, development and maintenance. OIRM's objective in this endeavor is to provide guidance, assistance, and only when necessary, controls, to assure that the Agency's considerable information resources are utilized cost-effectively for the overall benefit of the Agency. To this end, OIRM has developed umbrella policies guiding information system development and acquisition (see Information Resources Management Policy Manual). This three-volume set of guidelines and standards for system design and development is a part of OIRM's Software Management Series which is intended to assist EPA in efforts to develop and manage software effectively. This series will also include future guidance documents related to software management.

This document is the first of the three-volume set. The volumes cover the following:

Volume A - Mission Needs Analysis -- is designed to provide program managers and staff with a suggested methodology for assessing and evaluating the need (requirement) for an information system. Applying the methodology in this volume will result in: 1) confirmation that a need (requirement) exists and, 2) provide a preliminary operational specification of the requirement.

Volume B - Preliminary Design and Options Analysis -- is directed towards program managers and staff. It provides guidance and a methodology for structuring design options for meeting the requirement defined in Volume A and provides guidance for selecting the most cost-effective option.

Volume C - System Design, Development and Implementation is intended for use primarily by system developers and provides specific guidance and standards which must be adhered to when undertaking automated system design and development efforts.

Together these three volumes provide comprehensive guidance and standards for the orderly and cost-effective development of automated systems. Exhibit 1-2 depicts the flow of the development life cycle and decision process for the three volumes.

In addition to the System Design and Development Guidance, OIRM is currently drafting the EPA Information Security Manual. As security issues are raised and addressed throughout the system development life cycle, the security manual should be consulted for proper Agency policy and guidance.

1.3 AUTHORITY

The EPA System Design and Development Guidance derives its authority from Chapter 4 of the IRM Policy Manual, entitled "Software Management," which establishes the Agency Software Management Program. The guidance serves as the primary guidance for Agency system design and development efforts.

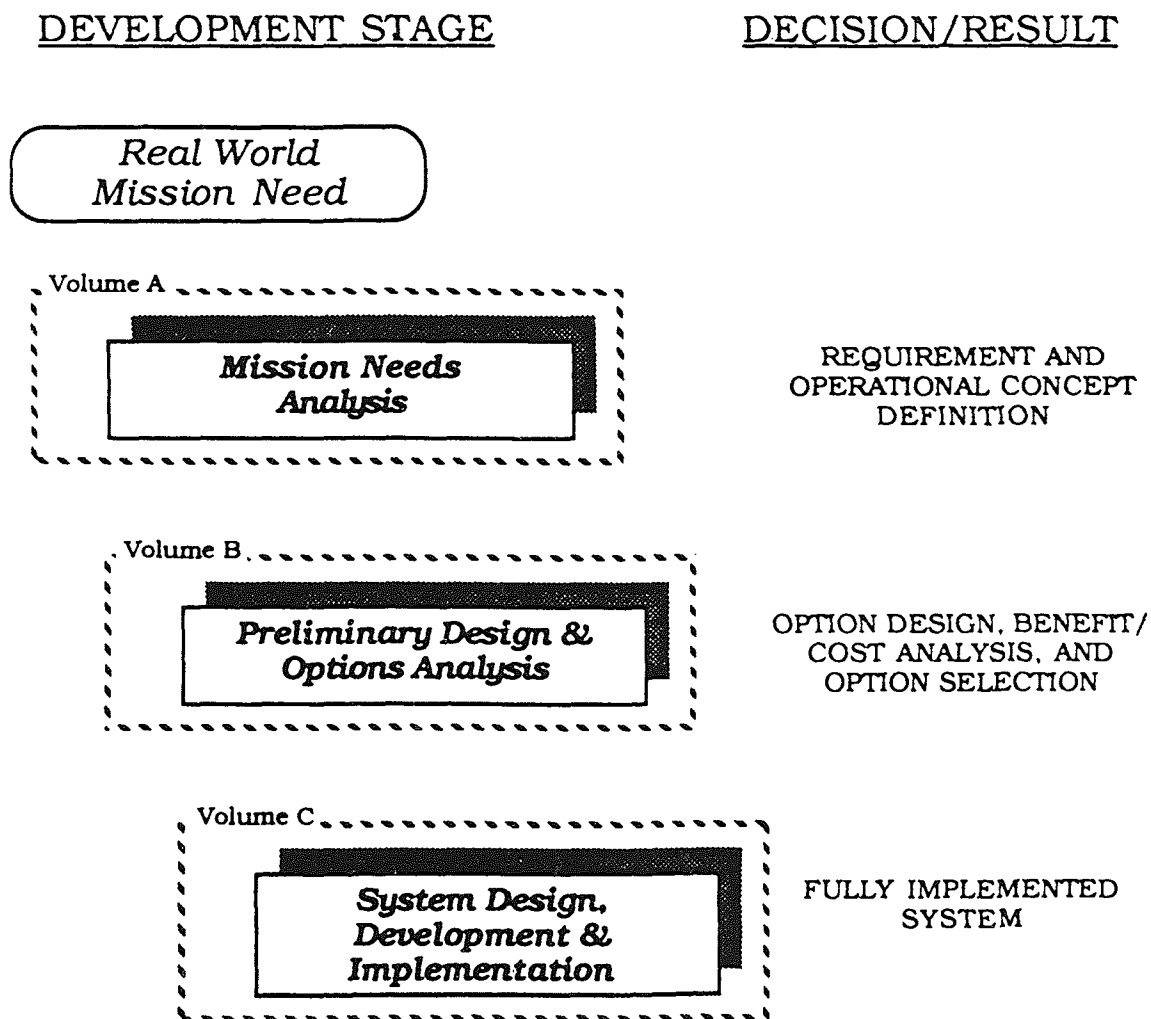
1.4 APPLICABILITY OF THE GUIDANCE

Senior Agency managers and responsible staff should read the guidance and become familiar with the decision-making process involved with system design and development efforts. They are responsible for ensuring adequate analysis and documentation to support all critical decision points. The full documentation requirements for automated system development efforts, which must be followed to conform to OARM policy, are fully discussed in Volume C.

In general, Volumes A and B are intended to assist program offices and/or users in conducting their own initial studies of system requirements, needs, option feasibility and cost-effectiveness. In this context, the term "system" in Volumes A and B refers to a systematic set of processes and/or procedures which can be used to meet the information needs of a user. It does not imply that the "system" will be an automated system.

Volume C, however, presumes that an automated or partially automated solution has been selected as a result of the Volume B options analysis. Volume C provides guidance and standards for automated system development efforts. If the automated system is a relatively small application on a microcomputer targeted for use within a single office (a "user owned information system"), Volume C provides simplified requirements for system design, development and implementation. If the proposed system is a larger application (mainframe or minicomputer), which is mission-critical or involves multiple offices and organizations, Volume C provides the full set of guidance and standards which must be followed by system developers. This will assure uniform, cost-effective system development in accordance with EPA policies, guidelines and standards.

EXHIBIT 1-2
**EPA SYSTEM DEVELOPMENT LIFE CYCLE
AND DECISION PROCESS**



1.5 DOCUMENTATION REQUIREMENTS

In general, the intent of the three volume System Design and Development Guidance is to provide a consistent focus for system development efforts which will allow both EPA program managers and OARM managers to cost-effectively develop and maintain the Agency's systems. To achieve this goal, certain documentation requirements termed "Essential Elements of Information" (EEI) documents, must be met. Observance of this guidance in preparing EEI's should result in proper documentation for audits. The EEI's will also serve as a helpful reference for conducting post-evaluations of the system decision making process. Each volume contains an appendix which outlines the required EEI documentation.

For certain system development efforts OIRM and office Senior Information Resources Management Officials (SIRMOs) must be involved in a review capacity to fulfill EPA's IRM Policy Manual requirements. Systems falling into one or more of the following categories must have OIRM/SIRMO review involvement:

- EPA mission critical
- States, local governments or other Federal agencies involved
- Interorganizational involvement (e.g., between Assistant Administratorships or including Regional Office involvement)
- Costs for system development/enhancement are projected to exceed \$250,000 (excluding costs associated with long-term system operation and maintenance)
- Information security issues involving the three general security areas: applications security, installation security and personnel security. In total, information security involves the precautions taken to protect the confidentiality, integrity and availability of information
- Privacy Act or confidential business information involved.

For system development efforts falling into any one of these categories, OIRM and office SIRMOs must be involved beginning with a review of EEI-1, generated at the conclusion of the Mission Needs Analysis, as described in this volume of the EPA System Design and Development

Guidance. OIRM/SIRMO review involvement will continue through the development life cycle of these systems and will include all EEI documentation requirements for such systems. For systems not falling into one of the above categories, EEI's may be forwarded to OIRM/SIRMOs for information and review as they are developed.

A review cycle should be developed to monitor each EEI preparation. The review cycle could include several stages, such as a series of status briefings for management, focus groups, and/or distribution of the EEI in draft form. Throughout the review cycle, the managers and users involved should be informed of the process and content of the EEI. When the final document is completed, a consensus among management should be reached before developing the next EEI.

It is not OIRM's intent to burden EPA managers with a host of documentation requirements for each system development effort. The EEIs simply stress typical documentation requirements and their outlines highlight major topics that need to be considered for any system development effort. Managers may use their professional judgment in substituting, combining, or down-scaling the content of the EEIs to meet the unique requirements of their project.

Criteria for determining the minimum EEI documentation for a specific process during the design, development and implementation phase is based on the nature and scope of the information process and its importance to EPA's mission. Three types of categories describing various systems with differing levels of EEI documentation requirements are identified as follows:

- TYPE I: Major Agency /Widely Accessed Information System: An information process that requires special attention because of its importance to an Agency mission; its high development, operating, or maintenance costs or its significant impact on administration of Agency programs or; is widely accessed by a combination of EPA Headquarters, Regional Offices, state and local users and/or Federal agencies.
- TYPE II: Localized Information System: An information process that is not a Major Agency Information System but significantly supports accepted program goals and missions and is accessed primarily by users in one major area, e.g., EPA Headquarters, a single Agency program, or a Region.
- TYPE III: User Owned Information System: Unique, stand-alone process developed to improve the efficiency or effectiveness of operations for a single user or a small group of users.

Documentation requirements for each of these categories are projected in Exhibit 1-3. Automated systems involving information security will be subject to one additional documentation requirement -- completion of a certification form (certification of sensitive systems is an OMB requirement). The form, which is under development and will be issued as part of the forthcoming EPA Information Security Manual, will capture basic information on system sensitivity, security requirements, security design, reviews, test scenarios, results and safeguards.

1.6 ASSISTANCE AND SUPPORT AVAILABLE

Agency Program Management officials embarking on a system development effort should be aware that there are at least two sources available to them for assistance and support during the system development life cycle:

- Within each AA/RA's office SIRMOS are available for assistance, support and guidance relative to the EPA System Design and Development Guidance and other OIRM guidance and standards
- OIRM, with its general IRM management oversight role and requirements to exercise procurement approval authority, has a staff organized to support EPA's administrative, program and research communities.

It is appropriate to involve these support sources as early as is feasible in the system development life cycle for most system development efforts.

The primary reasons for early involvement of SIRMOS and OIRM staff are:

- Fulfilling EPA's IRM policy for system development review requirements
- Providing a value-added service role involving consultation, assistance, technical standards, guidance and interpretation of requirements
- Expediting procurement for system development efforts which proceed to the system design, development and implementation phase

EXHIBIT 1-3
SYSTEM CATEGORY
EEI MATRIX

System Category EEI Requirements	Type I	Type II	Type III
EEI-1 Mission Needs Analysis	•	•	•
EEI-2 Preliminary Design and Options Analysis	•	•	
EEI-3 Project Management Plan	•	•	
EEI-4 System Implementation Plan	•	•	
EEI-5 System Detailed Requirements Doc.	•	•	•
EEI-6 Software Management Plan	•		
EEI-7 Software Test and Acceptance Plan	•		
EEI-8 Software Design Document	•	•	•
EEI-9 Software Maint. Document	•	•	•
EEI-10 Software Operations Document	•	•	•
EEI-11 Software User's Reference Guide	•	•	•
EEI-12 System Integration Test Report	•	•	

- Providing assistance in determining user needs as early as possible in the life cycle.

Achieving these objectives will strengthen EPA's system development efforts and avoid major pitfalls that have beset system development efforts in other government agencies (e.g., project stalls due to outyear funding shortages stemming from under-projected planning or project disruptions due to failure to get hardware/software acquisitions into the procurement cycle expeditiously and when required).

The remainder of Volume A provides requirements for conducting the first phase of the system development process -- the Mission Needs Analysis, including development of the Initial System Concept.

Chapter Two

CONDUCTING THE MISSION NEEDS ANALYSIS AND DEVELOPING THE INITIAL SYSTEM CONCEPT

This chapter provides guidance for the first and most critical stage in initiating any system development effort -- the Mission Needs Analysis.

The decision to initiate system development efforts should be based on a perceived or existing mission-based information or information processing need. This need may be prompted by any number of factors such as new legislation, changes in regulations, or program growth which may create needs for additional data, changes in practices or additional demands on existing functions and resources.

As a result of the Mission Needs Analysis, the manager should have a complete understanding of the problem and be able to demonstrate that the problem and solution are within the manager's organizational mission. This will provide the manager with the necessary information to justify the need for the project which is then used to obtain procurement authority for the required resources. The manager should be aware of the fact that once the definition of the needs has started, adequate in-house or contractor resources must be available to complete it.

Successful development and implementation of any process requires careful review, understanding, and documentation of the need for information and the functioning of the information processes in the context of the user organization's mission and operational framework. It is, therefore, critical that the "mission-based need" be reviewed as the first step toward establishing and defining the requirements for the system.

The use of computer-aided software engineering (CASE) tools, are becoming increasingly prevalent within the Agency. CASE tools can automate and standardize the activities within a system development effort possibly resulting in a quicker and more accurately built system. If appropriate, consideration should be given for using CASE tools early in the development life cycle.

Project managers should be aware of the types of activities involved in software development efforts and allow for slippage in schedules due to uncertainties and unknowns. Planning for these activities and making estimates is a difficult task for any manager that does not do this full time. Cost and time factors associated with implementing and managing a software

development effort are dependent on such factors as size of the project, levels of complexity and the skill level, experience and length of time the project team has been together.

However, it is vital that managers begin making and recording their estimates early in the project life cycle so they can compare them with actual recorded program costs and hours. It is this iterative effort of comparing planned versus actual performance that allows the manager to develop more accurate estimation skills for future planning efforts.

Information collected during the Mission Needs Analysis:

- Specifies the nature of the program mission, problem, functions, processes and information flows
- Validates the need for information or information processing in the context of the organizational mission
- Provides the basis for developing and evaluating an "Initial System Concept" which will meet the need.

The five steps required to conduct a complete Mission Needs Analysis and develop an Initial System Concept are as follows:

- Step 1 - Background review of the evolution of the perceived need, a concise statement of the problem and a review of the user's mission, organizational structure and operational processes. The analysis focuses on the positions and functions of those individuals who will be the users of the completed system. The result of this review should be a preliminary list of potential users of the system.
- Step 2 - Identification and specification of the information flow, transactions and outputs the system must or potentially could produce. The result of this step is the development of a concise (perhaps one page) Initial System Concept.
- Step 3 - Testing and/or evaluation of the system concept by reviewing the concept and preliminary output "designs" with potential users to test their usefulness and identify actual or potential constraints.

- Step 4 - Final specification and documentation of the results of the previous steps through development of a Mission Needs Statement.
- Step 5 - Initiation of the Project Management Plan as a preliminary document to facilitate the planning and scheduling of resources for the activities that follow the Mission Needs Analysis.

The actual approach to conducting the Mission Needs Analysis involves conducting the first four steps, and requires continual review, revision and recycling of steps as the analysis proceeds. The suggested approaches for conducting each of these steps are presented below.

2.1 STEP 1 - REVIEW OF THE INFORMATION NEED BACKGROUND AND THE MISSION AND ORGANIZATIONAL NEEDS

The Mission Needs Analysis should begin with a careful review of the organizational and operational context from which the need evolved and the specific users which the process or systematic solution is intended to assist. The first task is to determine the genesis of the initially identified and/or defined need. Some possibilities include:

- A new program or set of mission functions have been mandated by the President, Congress or senior officials, requiring the performance of new tasks, processes and/or systems
- A manager has decided to perform a new function or an existing function using different procedures in support of the Agency's mission, goals and objectives
- The Agency has decided to upgrade and modernize existing hardware and software applications to take advantage of new technology.
- An existing process or system has been evaluated and is suspected of being inefficient, ineffective or obsolete.

In each of these cases it is important to review the evolution of the information need to determine which of these possible causes was principally responsible for the system development effort. Clearly identifying which of these causes is the basis for the system requirement is important to future development efforts since knowing the reason for the need helps:

- Define the problem in concise terms including any quantifiable facts or conditions related to the problem. For example, "The program office is unable to respond to Freedom of Information Act (FOIA) requests for data due partly to a fifty percent increase in FOIA requests and a five percent effective reduction in force."
- Define the specific set of users and uses
- Establish the likely priority accorded the effort by senior Agency officials and responsible staff
- Determine whether the problem is really one requiring a system solution or has some other underlying cause.

In conducting this background review, two primary data collection methods may be used:

- Interviews with key officials, managers and staff involved or potentially involved in the processes to be systematized and those who will be the end users of the system results. These user interviews should focus on what specific outputs are required of the process and what benefits users anticipate. Interviews should include State and Regional users to fully understand their system, data and access requirements.
- Collection and review of key documents such as relevant legislation, agency policies or operational plans, organizational mission/function statements or previous studies of the function or process.

The results of the data collection efforts should be reviewed to provide those conducting the Mission Needs Analysis with a clear picture of the operational context within which the process will operate.

Perhaps the critical output of this initial review is a preliminary identification of users and potential benefits of process outputs. A summary format for displaying this information in a matrix is provided below:

<u>Potential System User/ Organization</u>	<u>Position/ Function</u>	<u>System Output</u>	<u>User Benefit</u>
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It is important that to the extent practical, this type of matrix be completed for all major users to ensure adequate consideration of user needs and benefits.

2.2 STEP 2 - IDENTIFICATION AND PRELIMINARY SPECIFICATION OF INPUTS, PROCESSES AND OUTPUTS AND DEVELOPMENT OF THE "INITIAL SYSTEM CONCEPT"

Conducting Step 1 will result in the identification of the potential users, uses, outputs and benefits. During this second task, the "flow" of information and work processes of the potential system application are developed and documented. The purpose of this step is to develop an overall understanding and preliminary design for the flow of information and information products. At the conclusion of this step, a brief (perhaps one page) Initial System Concept is developed. In addition, the documentation of the information flow ultimately provides the basis for:

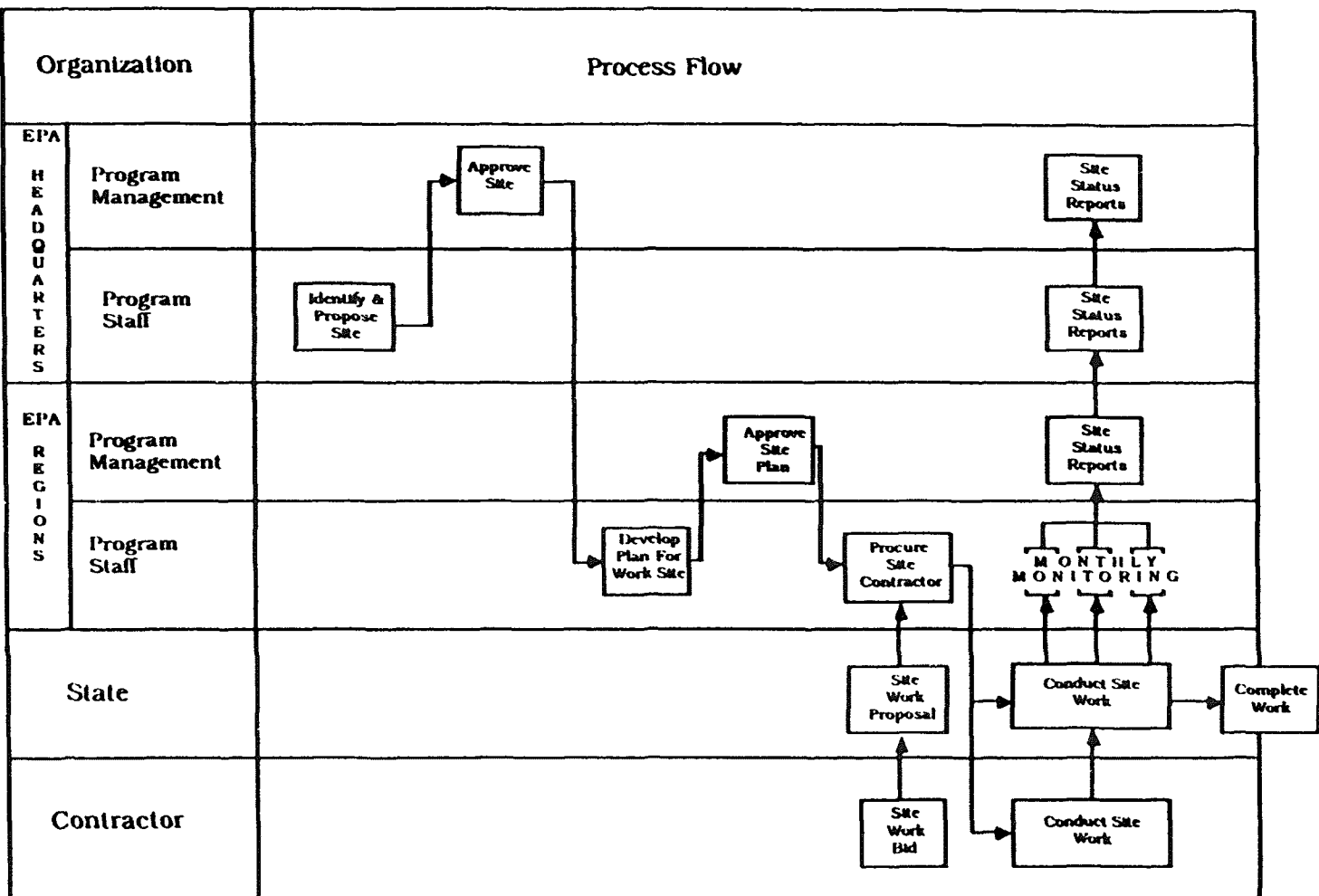
- Determining the manual processes and procedures which will become a part of the ultimate "system solution" for the need or problem (any and all automated processes have a set of manual processes and procedures which support the automated portion of the "system" and distribute its output)
- Identifying and specifying the procedures and functions which may be automated and therefore may become the "automated system" which will be designed.

The flow of information or work processes that are candidates to be systematized can be examined through flow diagrams that depict, on a macro level, the:

- Organizations and key individuals involved in the information flow and information products
- The input processes and documents which feed and support the system
- The specific output products.

Exhibit 2-1 illustrates a format for a sample process flow diagram which can usefully depict such information. As shown, the diagram contains these important elements:

EXHIBIT 2-1
PROCESS FLOW OF SITE INFORMATION



- A stub (vertical axis), containing the major organizations and/or individuals involved in the process including those involved in:
 - Input processes
 - Information process flow
 - Process operation
 - Process output and use.
- The flow and interrelationships of information among the various involved organizations including the relationships between Headquarters, States and Regions concerning shared data resources.
- Specifically identified outputs of the process.

The creation of a flow diagram similar to, and at the approximate level of detail as, that shown is highly recommended. It is a systematic methodology for identifying the specific inputs, information flow and process outputs. This flow diagram can usually be constructed from a combination of existing documentation and limited interviews with affected organizations and staff.

Based upon the data flow diagram, a higher level (ideally one page) Initial System Concept document should be developed as in Exhibit 2-2. The concept should illustrate:

- Major process input documents/sources on the left side
- A very brief description of key "processes" and/or data files in the center
- Graphic depictions of "outputs" on the right side.

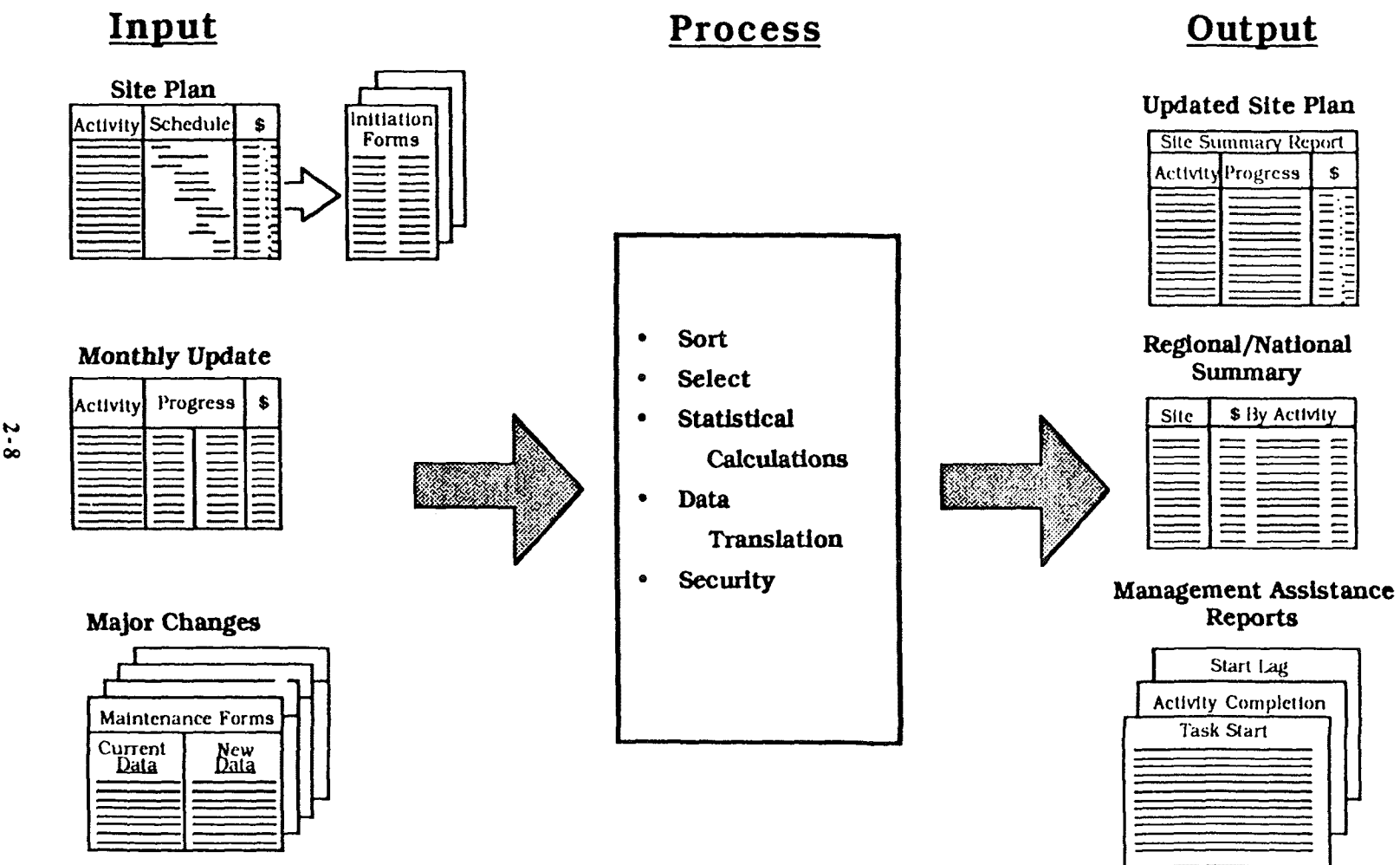
In most cases it should be possible to construct the "Initial System Concept" on one page.

2.3 STEP 3 - EVALUATION AND TESTING OF THE INITIAL SYSTEM CONCEPT THROUGH USER REVIEW

Documentation of processes and functions as outlined in Steps 1 and 2 will result in a high level Initial System Concept depicting inputs, processes and outputs. During this step, the system

EXHIBIT 2-2

INITIAL SYSTEM CONCEPT -
SITE MANAGEMENT SYSTEM



concept is evaluated in terms of output usefulness, input feasibility and possible constraints. A methodology which should be employed for evaluating output usefulness is to review the system concept as well as "mock-ups" of the outputs (hard copy or screens) with users or potential users. The "mock-ups" allow potential users to visualize the output of the process with three results:

- The user is able to "relate" to the output and indicate the benefit (or lack of benefit) of the output
- The discussion surrounding the reports can often identify other types of needs or report designs which can be incorporated into the Initial System Concept
- A preliminary estimate of the benefit to the user or potential user can be made by the user.

During the review of the system concept and outputs with users, an exploration of possible constraints to the process design should also be conducted. Constraints and/or implementation problems may include:

- Resistance by managers or staff to changes in operations
- Organizational impediments
- Input data compilation/collection problems
- Lack of hardware accessible to the organizational units
- Lack of staff and/or funds to develop and/or operate a system
- Lack of readily available telecommunications equipment/capability for data sharing and access requirements
- Information security needs and considerations based on the sensitivity of the system
- Limited development time.

Also, during the system concept review, the proposed output reports can be expected to be partially redesigned in response to suggestions and reactions to individual reports by the users.

Finally, it is at this point that process options or process designs for achieving similar outputs can be explored with the user. Although the options analysis is not fully conducted until a later phase of the system development life cycle (described in Volume B), it is useful to begin identifying alternatives with the user during this phase.

Two results should emerge from this step of the Mission Needs Analysis:

- A refined Initial System Concept incorporating the results of user evaluations of both the concept and proposed outputs
- An initial assessment of the needs feasibility, priorities and constraints.

These and the results from the previous step provide the basis for documenting each section in the Mission Needs Statement (EEI-1).

2.4 STEP 4 - FINAL SPECIFICATION AND DOCUMENTATION OF RESULTS IN THE MISSION NEEDS STATEMENT

The next step in conducting the Mission Needs Analysis is the formal documentation of the work performed in Steps 1 through 3 in a Mission Needs Statement. This document need not be long. An outline for this document is attached in Appendix A. As shown, primary chapters in the statement include:

- A background section, with a concise statement of the problem. It should also relate the problem and its solution to the agency organizational unit's missions and functions.
- An Information Flow/Initial System Concept section which contains the Initial System Concept and also identifies:
 - Input data source
 - Macro information flow and functions
 - Outputs including "mock up" format
- A discussion of potential system development constraints.

The actual length of the Mission Needs Analysis document is dependent on various factors such as: complexity of the problem or the organizational functions and mission, the size or scope of the Initial System Concept, the impact of any known elements of risk, and the number and effect of potential constraints to development and implementation.

2.5 STEP 5 - INITIATION OF THE PROJECT MANAGEMENT PLAN

The final step in conducting the Mission Needs Analysis is to initiate a preliminary Project Management Plan. The format of the Project Management Plan is contained in Volume B, Preliminary Design and Options Analysis. It is important to start this planning effort as early as possible in order to plan and schedule the resources required for the activities that follow. This preliminary document should include the following:

- Steps and tasks associated with Preliminary Design and Options Analysis
- Assignment of roles and responsibilities for the purpose of accountability which is particularly critical when dealing with programs that cross organizational lines into the States and Regions
- Resource allocations to accomplish the Preliminary Design and Options Analysis
- Project costs and time frames associated with Preliminary Design and Options Analysis.

At this stage of the system development process, there should also be little, if any, thought given to the specific hardware or software that is to be used to support the process. Options in these areas will be considered as part of the options analysis which is discussed in Volume B.

Chapter Three

SUMMARY

3.1 MISSION NEEDS ANALYSIS OUTPUTS

The outputs, documents and results of the Mission Needs Analysis are as follows:

- EEI-1, Mission Needs Analysis, is a concise document that describes the problem and the need to perform the process or function in support of the organization's mission.
- An "Initial System Concept" indicating the flow of information required to support the function, as well as the preliminary input documents and output reports.
- An initial Project Management Plan that outlines the tasks, resources and deliverables of the next phase of the project effort.

3.2 NEXT STEPS

Once the Mission Needs Statement is complete, it should be understood that it will continue to evolve and change as the "Initial System Concept" proceeds through the development life cycle. Formal endorsement from management of the Mission Needs Analysis and approval to proceed to the next step needs to be obtained. Since staff and management may change during the design and development phases of the project, it is important to have a record of management approval at key decision point.

The next major step is to prepare the Preliminary Design and Option Analysis as described in detail in Volume B. Both of these tasks are based on information collected during the Mission Needs Analysis and embodied in the "Initial System Concept."

Appendix A

ESSENTIAL ELEMENTS OF INFORMATION

This appendix provides a representative outline of documents that will be developed during the Preliminary Design and Options Analysis phase.

A.1 INTRODUCTION

The documentation requirements contained in this appendix apply to all software development or modernization projects, regardless of size, complexity or origin. At a minimum, these standards apply to all new software development projects. Maintenance and/or enhancements to existing information systems must comply with the requirements set out in Chapter 1, section 1.4 of Volume B, Preliminary Design and Options Analysis.

Compliance with the standards and conventions provided in this appendix will ensure that adequate documentation is produced for all system development projects.

The documents defined in this appendix are:

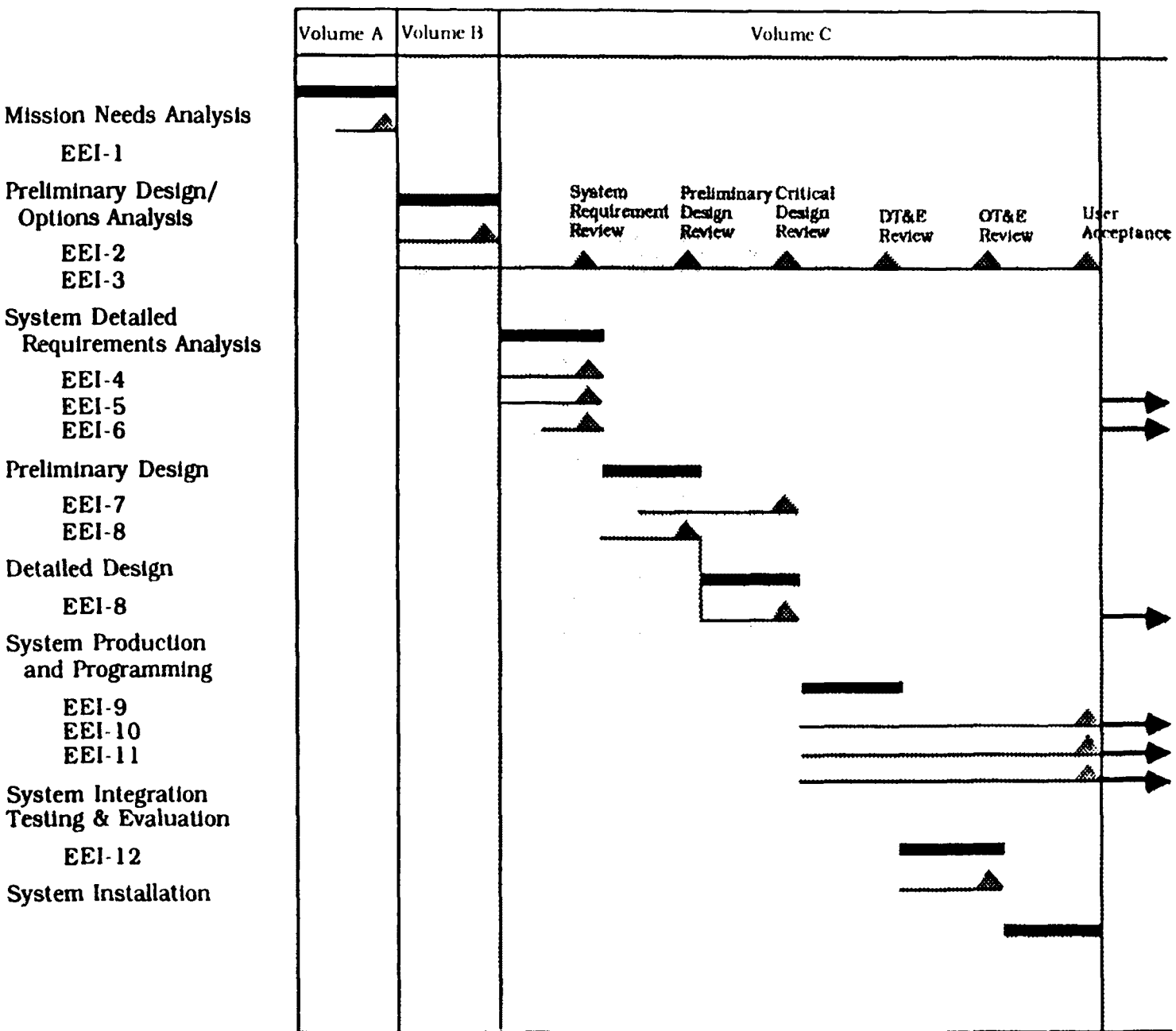
EEI-2 • • Preliminary Design And Options Analysis

EEI-3 • • Project Management Plan

When an asterisk appears within a section number in the outlines, it represents a repetition of the element as many times as necessary to define multiple iterations of the element.

The following milestone chart illustrates the relative initiation and completion of each document with respect to the software development life cycle, its major phases, and the span and scope of Volumes A, B, and C.

DOCUMENTATION VERSUS LIFE CYCLE



EEI-1
MISSION NEEDS STATEMENT

1. BACKGROUND

- Agency and organizational mission requiring system support
 - Mission/function statement(s)
 - Organizational chart with key functions/users identified
 - Operational environment
 - Current system description, including manual procedures
- Evolution of defined need
 - New program or functions
 - Enhancement/modernization of functioning system, or
 - Current performance mode and limitations/problems

2. INFORMATION FLOW AND INITIAL SYSTEM CONCEPT

- Description/documentation of information flow including:
 - Organizational data flow diagrams
 - Key input processes/documents
 - Primary data integration/data base functions and processes
 - Key output report types and distribution
- "Mock-ups" of key output reports and discussion of their benefits to users
- Initial System Concept (ideally one page) and related description

3. DEVELOPMENT/OPERATIONAL CONSTRAINTS

- User commitment, priority, discipline and budgetary limitations
- Policy or organizational constraints
- Information security needs based on system sensitivity
- Timing of need
- Interface needs
- Shared data/access constraints
- Stability/flexibility of need