U.S. Marine Corps

System Development Methodology OVERVIEW

DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380-0001

IN REPLY REFER TO
5231/01A
MCCTA

26 NOV 1990

From: Commandant of the Marine Corps

Subj: INFORMATION RESOURCES MANAGEMENT (IRM) SYSTEM DEVELOPMENT METHODOLOGY - OVERVIEW

Ref: (a) MCO P5231.1B
(b) MCO 5271.1
(c) MCO P5600.31

Encl: (1) IRM-5231-01A

1. PURPOSE. To provide an overview of the System Development Methodology (SDM) procedures and documentation standards which are required by reference (a).

2. CANCELLATION. IRM-5231-01

3. SUMMARY OF REVISION. This revision adds a glossary of terms and incorporates the following major changes, which were made to reference (a).

a. Separates the deployment and operations phase of the life cycle into a deployment phase and an operations phase to emphasize the transition of Automated Information System (AIS) management from the project manager to the post-deployment operations manager.

b. Emphasizes requirements for security.

4. AUTHORITY. This publication is published under the auspices of reference (b).

5. APPLICABILITY. The guidance contained in this publication is applicable to all contractors and Marine Corps personnel responsible for system development. The standards are applicable to the Marine Corps Reserve.

6. DISTRIBUTION. This technical publication will be distributed as indicated. Appropriate activities will receive updated individual activity Table of Allowances for Publications. Requests for changes in allowance should be submitted in accordance with reference (c).

5231/01A
CCIS-45

Subj: INFORMATION RESOURCES MANAGEMENT (IRM) SYSTEM DEVELOPMENT METHODOLOGY - OVERVIEW

7. SCOPE

a. Compliance. Compliance with the provisions of the standards provided under this program is required unless a specific waiver is authorized.

b. Waivers. Request for waivers to the provisions of this program will be forwarded to the MCCTA for action, as indicated in reference (b).

8. RECOMMENDATIONS. Recommendations concerning the contents of this technical publication should be forwarded to MCCTA via the appropriate chain of command. All recommended changes will be reviewed upon receipt and implemented as appropriate.

9. SPONSOR. The sponsor of the technical publication is CMC MCCTA

G. L. McKAY
By direction

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DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
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IN REPLY REFER TO:
5231/01A Ch 1
CTAS-20
27 MAY 1992

From: Commandant of the Marine Corps

Subj: INFORMATION RESOURCES MANAGEMENT (IRM) SYSTEM DEVELOPMENT METHODOLOGY - OVERVIEW

Encl: (1) New page inserts to IRM-5231-01A

1. PURPOSE. To transmit new page inserts and direct pen changes to the basic technical publication of 26 November 1990.

2. ACTION

a. Remove present page 2-7 and the COMMENTS/REVISIONS page and replace with new page 2-7 and the new COMMENTS/REVISIONS page.

b. Change the CMC Code in the basic letter of promulgation from "CCI" to "MCCTA" in paragraphs 7.b., 8 and 9.

3. SUMMARY OF REVISION. This Change provides reference to guidelines for modernization (maintenance and modification) of existing systems.

4. FILING INSTRUCTIONS. This change transmittal will be filed immediately following the signature page of the basic technical publication.

5. CERTIFICATION. Reviewed and approved this date.

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UNITED STATES MARINE CORPS

Information Resources Management (IRM)
Standards and Guidelines Program

System Development Methodology - Overview

IRM-5231-01A

Enclosure (1)

RECORD OF CHANGES

Log completed change action as indicated.

Change Number	Date of Change	Date Received	Date Entered	Signature of Person Entering Change

PUBLICATION TABLE OF CONTENTS

		Paragraph	Page
	Chapter 1		
	GENERAL		
Section 1.	INTRODUCTION	1.1.	1-3
Section 2.	SCOPE	1.2.	1-3
Section 3.	OBJECTIVE	1.3.	1-3
Section 4.	DEFINITION OF THE METHODOLOGY	1.4.	1-3
Section 5.	DEFINITIONS	1.5.	1-6
	Chapter 2		
	CONTENT AND FORMAT		
Section 1.	SYSTEM DEVELOPMENT PROCESS	2.1.	2-3
Section 2.	AIS PROGRAMS AND AIS PROJECTS	2.2.	2-3
Section 3.	AIS PROJECT DELIVERABLES	2.3.	2-3
Section 4.	DOCUMENTATION STANDARDS	2.4.	2-7
Section 5.	REVIEWS	2.5.	2-15
	Chapter 3		
	DOCUMENTATION CRITERIA		
Section 1.	OVERVIEW	3.1.	3-3
Section 2.	DECISION GUIDES	3.2.	3-3
Section 3.	RECOMMENDED MINIMUMS	3.3.	3-4
	APPENDICES		
A.	GLOSSARY		A-1

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LIST OF FIGURES

Figure		Page
1-01	IRM Technical Publications	1-4
1-02	Life Cycle Management Phases	1-5
1-03	Applicability of the Standards	1-7
1-04	System Documentation Requirements	1-8
2-01	SDM Documentation Requirements	2-4
2-02	AIS Program and Project Relationship	2-5
2-03	Outline of a Standard	2-8
2-04	Specification Standards	2-9
2-05	Management Plan Standards	2-11
2-06	Convention Standards	2-14
2-07	Review Mechanisms	2-16
3-01	Medium System Documentation	3-6
3-02	Small System Documentation	3-7

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Chapter Table of Contents

Chapter 1

GENERAL

		Paragraph	Page
Section 1.	INTRODUCTION	1.1.	1-3
Section 2.	SCOPE	1.2.	1-3
Section 3.	OBJECTIVE	1.3.	1-3
Section 4.	DEFINITION OF THE METHODOLOGY	1.4.	1-3
Section 5.	DEFINITIONS	1.5.	1-6

Chapter 1

GENERAL

1.1. INTRODUCTION. The System Development Methodology (SDM) is a collection of methods, procedures, and activities associated with developing an Automated Information System (AIS), in support of MCO P5231.1B, "Life Cycle Management for Automated Information Systems Projects (LCM-AIS Projects)." SDM guidelines, as well as precise descriptions of the format and content required for specific deliverables, can be found in the Information Resources Management technical publications issued under the authority of MCO 5271.1, "Information Resources Management (IRM) Standards and Guidelines Program." The SDM technical publications are listed in Figure 1-01. This publication and the SDM-Developer Perspective, IRM-5231-02A, provide an introduction to the SDM and a detailed explanation of its relationship to life cycle management for use by project management personnel.

1.2. SCOPE. This technical publication describes the AIS project development process and provides a broad view of how the SDM components are interrelated. The documentation standards for the products created during systems development are described, and the control mechanisms used to ensure adherence to the SDM and its standards are also included.

1.3. OBJECTIVE. The objectives of this publication are to provide a framework and comprehensive approach to develop AIS projects. It integrates the development process, structured techniques, documentation standards, and control mechanisms.

1.4. DEFINITION OF THE METHODOLOGY. The SDM is the formal specification for building a system. It defines the activities to build a system, the interfaces between them, and the products created as a result of those activities. It uses modeling, partitioning, parallel activities execution, and iterative processing. The intent of the SDM is to provide a methodology consistent with the Department of Defense (DoD) and Department of the Navy (DON) directives, but enhanced to accommodate the technologies, constraints, and concerns specific to Marine Corps AIS developments. Figure 1-02, "Life Cycle Management Phases," shows a comparison of the Marine Corps LCM/SDM phases with those of the DoD and DON LCM programs.

a. Integrated Methodology. The SDM is an integrated methodology that provides direction to development personnel consistent with LCM. The SDM provides features and documentation requirements suitable for an experienced development staff, and for application of structured methods for use in an on-the-job training environment.

IRM NUMBER	ACRONYM	STANDARD TITLE
5230-02	SM	PROJECT DELIVERABLE STYLE MANUAL
5231-01A		SDM - OVERVIEW
5231-02A		SDM - DEVELOPER PERSPECTIVE
5231-04	FRD	FUNCTIONAL REQUIREMENTS DEFINITION
5231-05	GDS	GENERAL DESIGN SPECIFICATION
5231-06	DDS	DETAILED DESIGN SPECIFICATION
5231-07	UM	USERS MANUAL
5231-08	COM	COMPUTER OPERATIONS MANUAL
5231-09	CM	APPLICATION CONFIGURATION MANAGEMENT PLAN
5231-10	QA	QUALITY ASSURANCE PLAN
5231-11	DBP	DATA BASE PLAN
5231-12	ADP	ADPE SUPPORT PLAN
5231-13	DBC	DATA BASE CONVERSION PLAN
5231-14	TP	TEST PLAN
5231-15	TRP	TRAINING SUPPORT PLAN
5231-16	IP	IMPLEMENTATION PLAN
5231-17	IA	INSPECTION AND ACCEPTANCE
5231-18	PRS	PROTOTYPING STANDARD
5231-19	PMP	PROJECT MANAGEMENT PLAN
5231-20	RS	REQUIREMENTS STATEMENT
5231-21	BL	AIS PROJECT BASELINING
5233-06	LMS	LIBRARY MANAGEMENT SYSTEM
5234-01	PS	PROGRAMMING STANDARD
5234-02	MDS	MAN-MACHINE DIALOGUE
5234-04	TNS	NAMING CONVENTIONS
5235-01	DD	DATA DICTIONARY
5236-03	EA	ECONOMIC ANALYSIS
5239-01	NPM	NETWORK PROCEDURES MANUAL
5239-05	TSP	TELECOMMUNICATIONS SUPPORT PLAN
5239-12		PROJECT MANAGER'S SECURITY HANDBOOK
5239-13	SSP	SYSTEM SECURITY PLAN

FIGURE 1-01
IRM Technical Publications

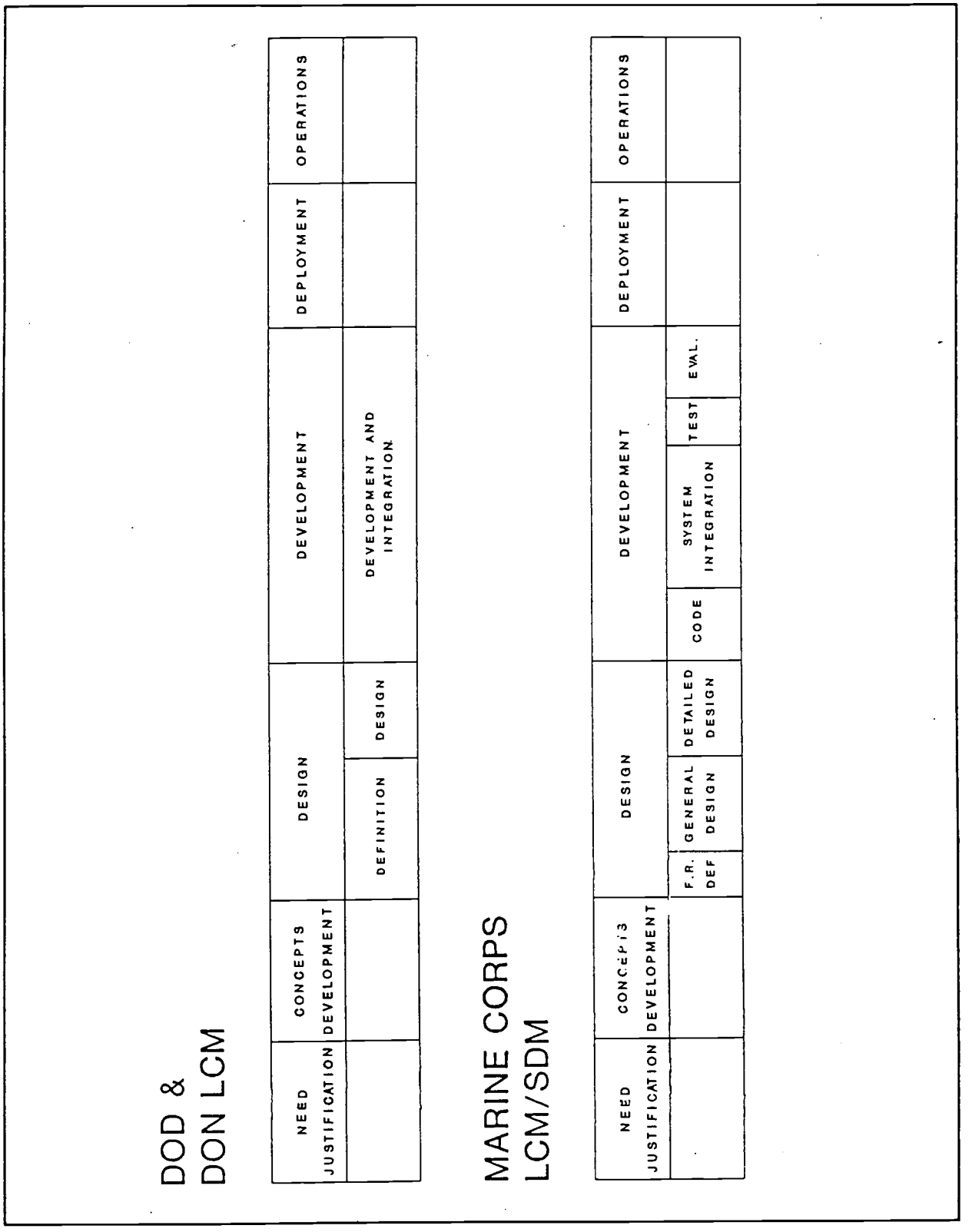

FIGURE 1-02
Life Cycle Management Phases

b. Phases. The SDM phases are the same as the LCM phases, but with emphasis placed on the Concepts Development, Design, and Development Phases. Within the Design and Development phases, the SDM adds additional divisions. As shown in Figure 1-03, "Applicability of the Standards," the major SDM emphasis is on the development activities.

c. Documentation. Each SDM phase requires some documentation. Figure 1-04, "System Documentation Requirements," outlines the SDM and LCM documentation requirements and relates the Marine Corps requirements to the requirements of the DoD/DON. Each document is labeled (1), (2), (3), or (4) depending on the deliverable type. SDM documentation follows a set format and content. The publications, listed in Figure 1-01 and in IRM-5271-01 "IRM Standards and Guidelines Program INDEX," provide the individual guidelines and standards for LCM/SDM documentation. These standards ensure that each issue pertinent to AIS development is addressed and that each issue is addressed adequately.

1.5 DEFINITIONS. Appendix A is a glossary of terms and abbreviations, and their associated definitions, which has been provided as a quick reference for the reader.

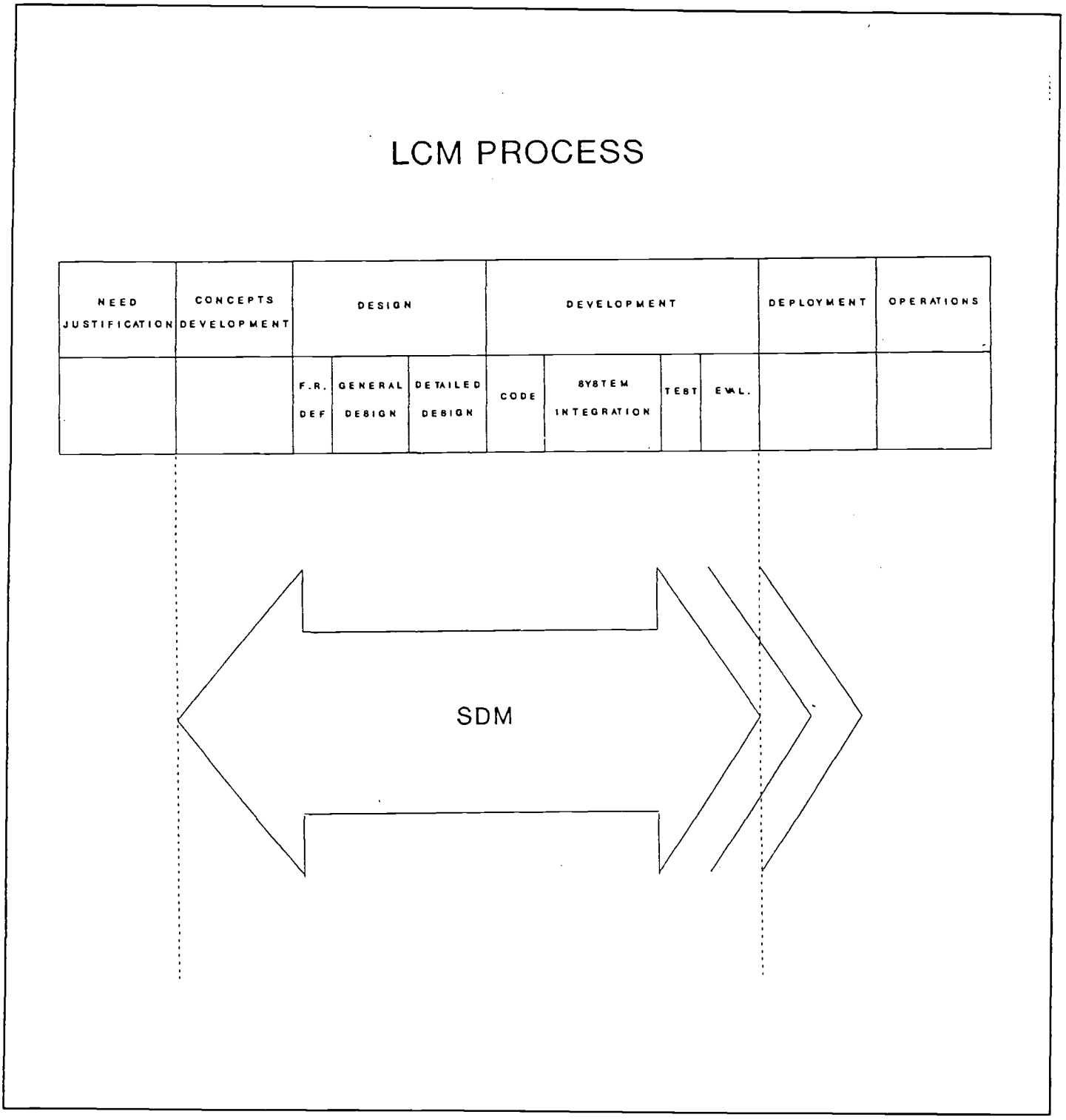

FIGURE 1-03
Applicability of the Standards

DOD/DON LCM		USMC LCM/SDM	
NEED JUSTIFICATION PHASE			
Mission Need Statement (MNS)	(3)	Mission Need Statement (MNS)	(1)
MILESTONE 0			
CONCEPTS DEVELOPMENT PHASE			
		Steering Group Charter (SGC)	(1)
Project Manager Charter (PMC)	(4)	Project Manager Charter (PMC)	(2)
Project Management Plan (PMP)	(4)	Project Management Plan (PMP)	(2)
Statement of User Req.	(4)	Requirements Statement (RS)	(2)
Economic Analysis (EA)	(4)	Economic Analysis (EA)	(2)
Update PMC (Revision 1)	(3)		
Update PMP (Revision 1)	(4)	Update PMP (Revision 1)	(2)
Configuration Mgmt Plan (CM)	(4)	Configuration Mgmt Plan (CM)	(2)
		Quality Assurance Plan (QA)	(2)
		Test Plan (TP)	(2)
		Automated Data Processing Equip. Support Plan (ADP)	(2)
		Telecommunications Support Plan (TSP)	(2)
		Implementation Plan (IP)	(2)
		Training Support Plan (TRP)	(2)
		System Security Plan (SSP)	(2)
		Project Baseline Plan (BP)	(2)
System Decision Paper 1	(3)	System Decision Paper I	(1)
MILESTONE 1			
DESIGN PHASE			
Functional Description	(3)	Functional Requirements Definition (FRD)	(2)
Data Requirements Document	(3)	General Design Specification (GDS)	(2)
System Specification	(3)	General Design Specification (GDS)	(2)
Data Base Specification	(3)	Data Base Plan (DBP)	(2)
Program Specification	(3)	Detailed Design Specification (DDS)	(2)
Update EA (Revision 1)	(4)	Update EA (Revision 1)	(2)
Update PMC (Revision 2)	(4)		
Update PMP (Revision 2)	(4)	Update PMP (Revision 2)	(2)
		Update CM (Revision 1)	(2)
		Update QA (Revision 1)	(2)
Test Plan (TP)	(3)	Update TP (Revision 1)	(2)
Implementation Plan (IP)	(3)	Update ADP (Revision 1)	(2)
		Update TSP (Revision 1)	(2)
		Update IP (Revision 1)	(2)
		Update TRP (Revision 1)	(2)
		Update SSP (Revision 1)	(2)
		Project Baseline Document	(2)
System Decision Paper II	(3)	System Decision Paper II	(1)
MILESTONE 2			

FIGURE 1-04
System Documentation Requirements (Page 1 of 2)

DEVELOPMENT PHASE

Users Manual (UM)	(3)	Users Manual (UM)	(2)
Computer Operations Manual (COM)	(3)	Computer Operations Manual (COM)	(2)
Maintenance Manual	(3)	(handled by GDS and DDS)	
		Data Base Conversion Plan (DBC)	(2)
Update EA (Revision 2)	(3)	Update EA (Revision 2)	(2)
Update PMC (Revision 3)	(4)	Update PMC (Revision 3)	(2)
Update PMP (Revision 3)	(4)	Update PMP (Revision 3)	(2)
		Update CM (Revision 2)	(2)
		Update QA (Revision 2)	(2)
Test Analysis Report	(3)	Update TP (Revision 2)	(2)
		Update ADP (Revision 2)	(2)
Logistical Support Plan	(4)	Update TSP (Revision 2)	(2)
		Update IP (Revision 2)	(2)
Training Plan	(4)	Update TRP (Revision 2)	(2)
		Update SSP (Revision 2)	(2)
		Update Project Baseline Document (Revision 1)	(2)
System Decision Paper III	(3)	System Decision Paper III	(1)

MILESTONE 3

DEPLOYMENT PHASE

Update Documents as Necessary	(4)	Update PMP (Revision 4)	(2)

OPERATIONS PHASE

Update Documents as Necessary	(4)		
System Decision Paper IV	(4)	System Decision Paper IV	(1)

MILESTONE 4

System Decision Paper V	(4)	System Decision Paper V	(1)

MILESTONE 5

-- LEGEND --

(1) USMC LCM-AIS Deliverable
(2) USMC SDM Deliverable
(3) DOD STD 7935 Deliverable
(4) DON LCM-AIS Deliverable

FIGURE 1-04
System Documentation Requirements (Page 2 of 2)

Chapter Table of Contents

Chapter 2

CONTENT AND FORMAT

	Paragraph	Page
Section 1. SYSTEM DEVELOPMENT PROCESS	2.1.	2-3
Documentation Requirements	2.1.1.	2-3
Section 2. AIS PROGRAMS AND AIS PROJECTS	2.2.	2-3
Section 3. AIS PROJECT DELIVERABLES	2.3.	2-3
Need Justification Phase	2.3.1.	2-3
Concepts Development Phase	2.3.2.	2-3
Design Phase	2.3.3.	2-6
Development Phase	2.3.4.	2-6
Deployment Phase	2.3.5.	2-7
Operations Phase	2.3.6.	2-7
Section 4. DOCUMENTATION STANDARDS	2.4.	2-7
Definition	2.4.1.	2-7
Specification Standards	2.4.2.	2-7
Management Plan Standards	2.4.3.	2-10
Convention Standards	2.4.4.	2-13
Section 5. REVIEWS	2.5.	2-15
Quality Assurance	2.5.1.	2-15
Configuration Management	2.5.2.	2-15

Chapter 2

CONTENT AND FORMAT

2.1. SYSTEM DEVELOPMENT PROCESS. The SDM is a process that is readily adaptable to any development effort, from a full project to a single application within a project. It contains the detailed descriptions of what is to be done and how it is to be accomplished. The SDM is based on structured analysis and design concepts. Structured methods and techniques such as context diagrams, structure charts, data flow diagrams, process descriptions, structured English, mini-specs, walk-throughs, and data element dictionaries have been selected for use in the SDM design specification standards. These techniques are particularly applicable to the software design activities, and also define the entire development process. By applying the SDM techniques, a project manager can carefully consider and clearly document an AIS development project.

2.1.1. Documentation Requirements. Documentation requirements exist in the development process as shown in Figure 2-01, "SDM Documentation Requirements." This figure illustrates the relative times at which documents should be prepared during a projects development.

2.2. AIS PROGRAMS AND AIS PROJECTS. During the Concepts Development phase of the AIS project, it may be determined that the functional requirements will best be fulfilled by dividing requirements into distinct, but functionally related, AIS projects. Each AIS project begins its own project life cycle using the original MNS as its starting point. Figure 2-02 depicts how AIS programs and projects are related. Once AIS projects are defined, the life cycle of the individual project must be managed.

2.3. AIS PROJECT DELIVERABLES. This section outlines the LCM phases and identifies deliverables produced in each phase.

2.3.1. Need Justification Phase. The primary purposes of this phase are: to take an identified need, to validate the need, to identify significant assumptions and constraints on solutions, and to recommend the exploration and development of alternatives to satisfy the need. During this phase, the following deliverable should be produced:

Deliverables	Applicability
Mission Need Statement (MNS)	Used by Marine Corps and project management

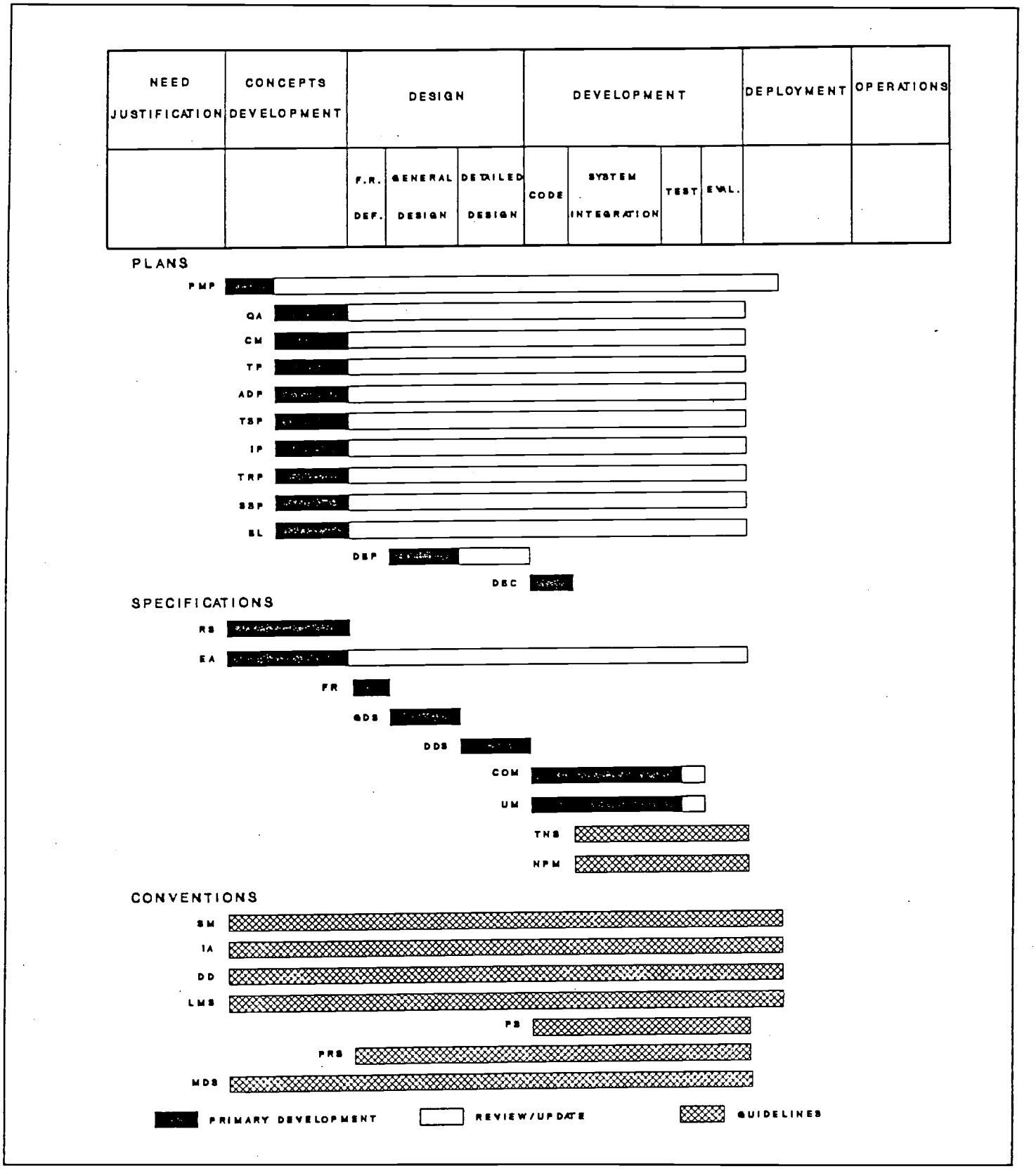

FIGURE 2-01
SDM Documentation Requirements

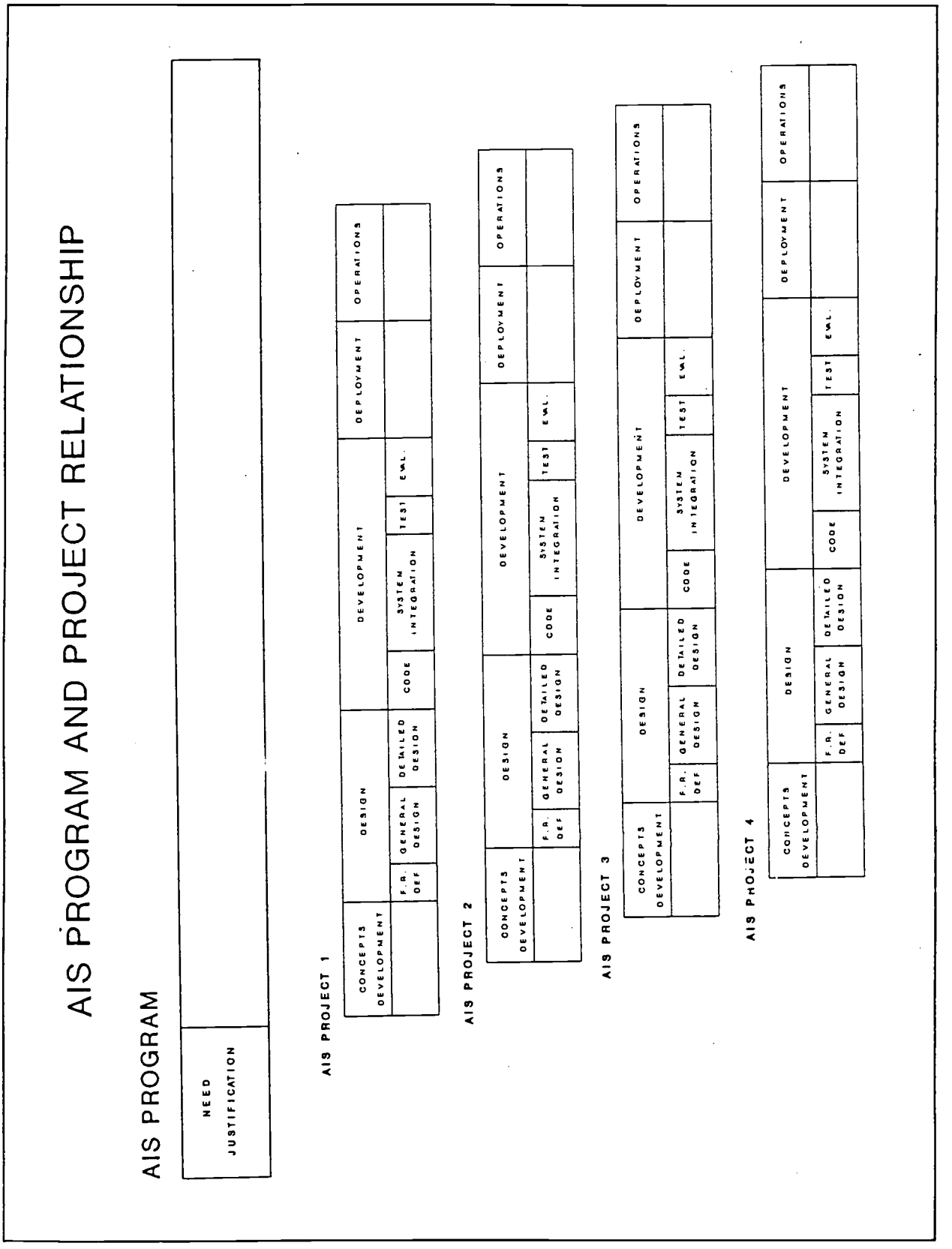

FIGURE 2-02
AIS Program and Project Relationship

2.3.2. Concepts Development Phase. The primary purposes of this phase are: to identify the functional requirements as they relate to the mission deficiencies stated in the MNS, to develop and evaluate alternative solutions to meet these requirements, and to recommend feasible concepts for further development. During this phase, the following deliverables should be produced:

Deliverables	Applicability
Project Steering Group Charter (SGC)	Used by project management
Project Manager Charter (PMC)	Used by project management
Project Management Plan (PMP)	Used by project management
Economic Analysis (EA)	Used by Marine Corps and project management
AIS Baseline Plan	Used by Marine Corps and project management
System Decision Paper (SDP) I	Used by Marine Corps
Project documentation produced under the guidance of the IRM Standards and Guidelines Program Technical Publications	See paragraph 2.4, Documentation Standards

2.3.3. Design Phase. The primary purpose of this phase is to validate and refine the functional requirements, and design the AIS. During this phase, the following deliverables should be produced:

Deliverables	Applicability
SDP II	Used by Marine Corps
AIS Project Baseline	Used by Marine Corps and project management
Project documentation produced under the guidance of the IRM Standards and Guidelines Program Technical Publications	See paragraph 2.4, Documentation Standards

2.3.4. Development Phase. The primary purpose of this phase is to develop, integrate, test, evaluate, and prepare to deploy the AIS. During this phase, the following deliverables should be produced:

Deliverables	Applicability
SDP III	Used by Marine Corps
Project documentation produced under the guidance of the IRM Standards and Guidelines Program Technical Publications to include source code where applicable	See paragraph 2.4, Documentation Standards

2.3.5. Deployment Phase. The primary purpose of this phase is to implement the system per the Implementation Plan (IP) that was developed and approved during the Concepts Development, Design, and Development phases. There are no deliverables produced in this phase.

2.3.6. Operations Phase. The primary purposes of this phase are to operate and maintain the AIS, evaluate the AIS effectiveness, and develop and implement plans for AIS modernization. Chapter seven of reference (a) provides guidance in system modernization (maintenance and modification). Maintenance is required because an AIS fails to execute correctly. Modifications will be made only if the system is not meeting a mission requirement and a modification is more cost-effective than the development of a new system, or when a cost savings can be shown, or when a new requirement has been imposed by higher authority. During this phase the SDP IV and SDP V should be produced. Both documents are for use by the Marine Corps.

2.4. DOCUMENTATION STANDARDS

2.4.1. Definition. An SDM standard defines the format and content of an AIS project deliverable. The format is characterized by a required structure. The content is characterized by a description of the material to be presented. There are three types of SDM standards: Specification Standards, Management Plan Standards, and Convention Standards. The SDM Standards are organized as shown in Figure 2-03, "Outline of a Standard." Note that standards governing the preparation of AIS plans and specifications contain specific requirements defining the documentation structure. Standards governing the preparation of system specifications also contain some procedural information in the definition of the approach.

2.4.2. Specification Standards. The Specification Standards govern the primary work of any system developer (contractor or in-house). These define the documentation requirements of specific steps within the SDM phases as shown in Figure 2-04, "Specification Standards." The documents produced according to these standards form the core description of the system design. The following technical publications provide the guidelines for the Specification Standards:

SECTION	SPECIFICATION STANDARDS	MANAGEMENT PLAN STANDARDS	CONVENTION STANDARDS
Chapter 1: GENERAL			
1. Objective	X	X	X
2. Scope	X	X	X
3. Approach	X	X	X
3.1 Definition	X		
3.2 Procedures	X		
Chapter 2: CONTENT AND FORMAT			
1. General Description	X	X	X
2. Documentation Dependencies	X	X	X
3. Evaluation Criteria	X	X	
APPENDICES CONTENT DESCRIPTION	X	X	X

FIGURE 2-03
Outline of a Standard

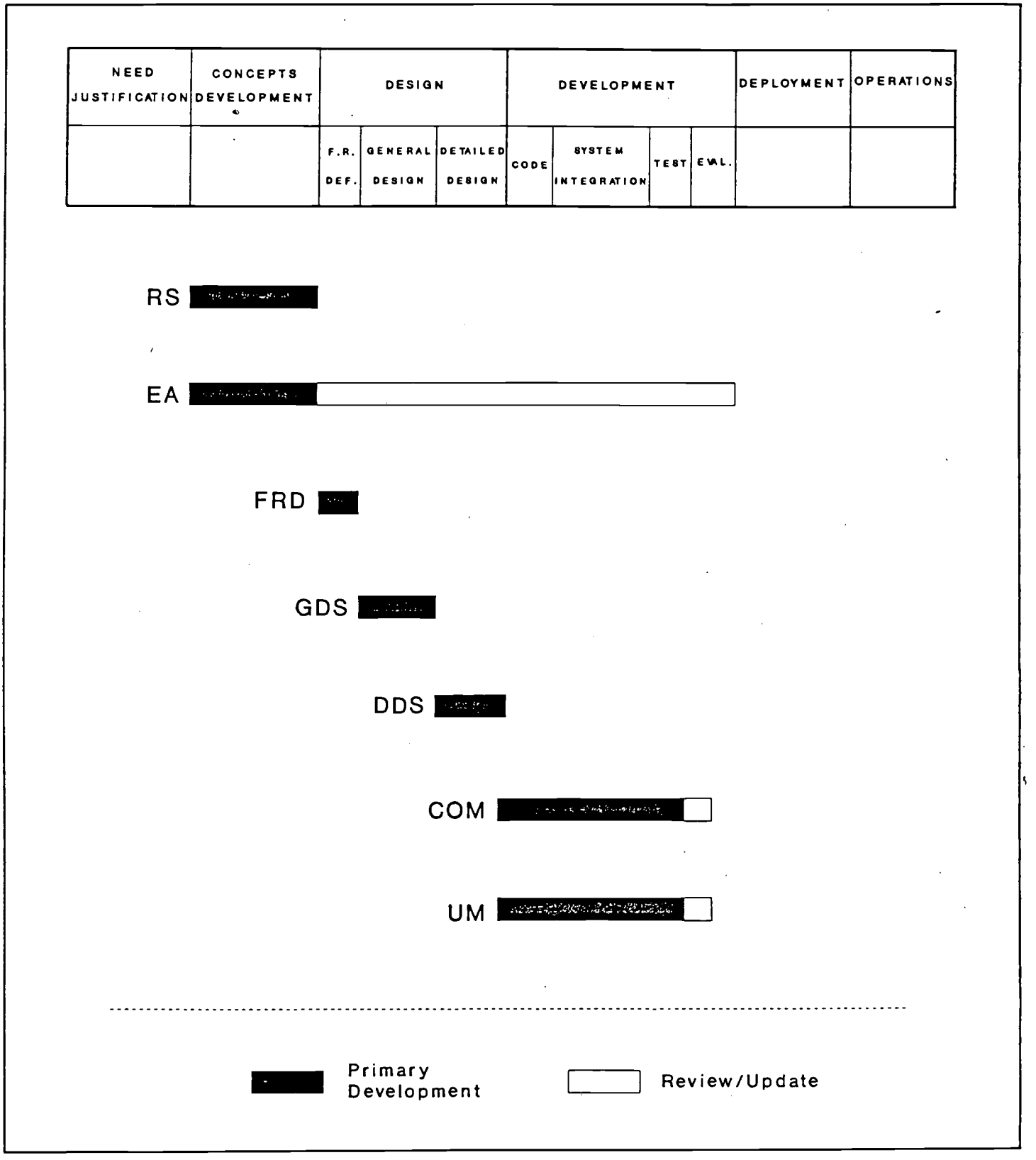

FIGURE 2-04
Specification Standards

a. Requirements Statement (RS) (IRM-5231-20). This publication provides the guidelines to produce a Requirements Statement. The statement developed will specify the functional requirements necessary to satisfy the identified needs.

b. Economic Analysis (EA) (IRM-5236-03). This publication provides the guidelines to produce an analysis of feasible development alternatives on a cost and benefit basis.

c. Functional Requirements Definition (FRD) (IRM-5231-04). This publication provides the guidelines to produce a Functional Requirements Definition. Procedures for developing the current physical, current logical, and new logical models are provided.

d. General Design Specification (GDS) (IRM-5231-05). This publication provides the guidelines to produce the General Design Specifications. Procedures for developing the new physical model of the AIS project are provided.

e. Detailed Design Specification (DDS) (IRM-5231-06). This publication provides the guidelines to produce a Detailed Design Specification. Procedures for developing the detailed design model of the AIS project are provided.

f. Computer Operations Manual (COM) (IRM-5231-08). This publication provides the guidelines to produce a Computer Operations Manual. The manual developed will provide reliable, accessible, and understandable information for operations personnel to effectively run the system.

g. Users Manual (UM) (IRM-5231-07). This publication provides the guidelines to produce a Users Manual. The manual developed will provide reliable, accessible, and understandable information for non-Automated Data Processing personnel to effectively use the system developed.

2.4.3. Management Plan Standards. These planning standards guide the project through its life cycle. The documents produced in accordance with these standards will provide the core information of a project plan. These standards define the documentation requirements within the SDM phases as shown in Figure 2-05, "Management Plan Standards."

a. Project Management Plan (PMP) (IRM-5231-19). This publication provides the guidelines to produce a Project Management Plan. The plan developed will be used to define, monitor, control, plan, and implement the AIS project.

b. Quality Assurance Plan (QA) (IRM-5231-10). This publication provides the verification and validation guidelines to produce a Quality Assurance Plan. The plan developed will detail the auditing of all deliverables from the review of project documentation to certification testing.

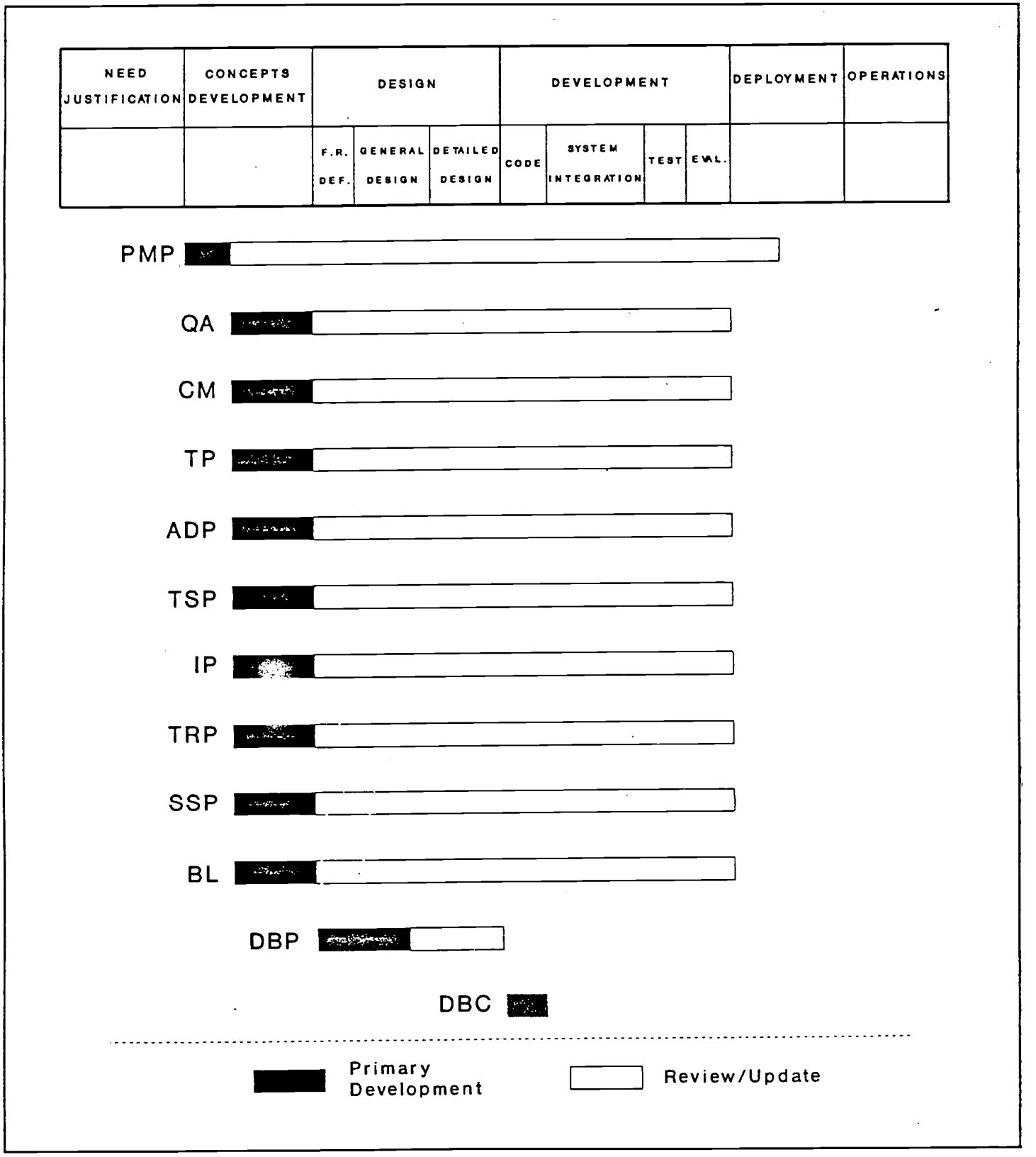

FIGURE 2-05
Management Plan Standards

c. Application Configuration Management Plan (CM) (IRM-5231-09). This publication provides guidelines to produce a Configuration Management Plan. The plan developed will be used to identify, control, account for, and audit the functional and physical characteristics of system components developed, produced, operated, and supported in the AIS project.

d. Test Plan (TP) (IRM-5231-14). This publication provides the guidelines to produce a Test Plan. The plan developed will detail a schedule of test events and activities for selected system functions and capabilities.

e. ADPE Support Plan (ADP) (IRM-5231-12). This publication provides guidelines to produce an ADPE Support Plan. The plan developed will identify and analyze the requirements for ADPE site preparation, logistics support, funding, and delegation of procurement authority.

f. Telecommunications Support Plan (TSP) (IRM-5239-05). This publication provides guidelines to produce a Telecommunications Support Plan. The plan developed will detail the system's telecommunications environment and requirements, its use of the current telecommunications environment, and any modifications to the current telecommunications environment needed to support the AIS functional requirements.

g. Implementation Plan (IP) (IRM-5231-16). This publication provides the guidelines to produce an Implementation Plan. The plan developed provides the guidance for installing the AIS and to achieving operational status at all sites.

h. Training Support Plan (TRP) (IRM-5231-15). This publication provides the guidelines to produce a Training Plan. The plan developed will detail the requirements, methods, and objectives of user education for use and operation of the AIS.

i. System Security Plan (SSP) (IRM-5239-13). This publication provides the guidelines to prepare a System Security Plan to ensure the security of each AIS containing sensitive information. This plan is mandatory under the auspices of the Computer Security Act of 1987 (P.L. 100-2351).

j. AIS Project Baselining (BL) (IRM-5231-21). This publication provides the guidelines to baseline AIS projects. The Project Baseline Document produced, provides a vehicle to express organizational commitment to support the AIS project within specified resources, schedule, and constraints.

k. Data Base Plan (DBP) (IRM-5231-11). This publication provides the guidelines to develop the Data Base Plan and define the format and content of the plan document. Adherence to this standard will assure that the Data Base Plan will adequately address all issues relative to the establishment, maintenance, and usage of the data base.

l. Data Base Conversion Plan (DBC) (IRM-5231-13). This publication provides guidelines to produce a plan to migrate data into a new data structure. The plan developed will assure a proper transition from the current environment to one employing the new software components and data.

2.4.4. Convention Standards. The Convention Standards govern the overall documentation. These define a uniform set of rules to be applied to any documentation (both technical and narrative types) produced during the SDM phases as shown in Figure 2-06, "Convention Standards." There are no specific documents produced directly from these standards.

a. Naming Conventions (IRM-5234-04). This publication provides the standards which govern the naming of Marine Corps automated resources. It establishes the naming standards and conventions which must be used by Class I AISs.

b. Network Procedures Manual (NPM) (IRM-5239-01). This publication provides the guidelines that govern the use of the Marine Corps Data Network (MCDN).

c. Project Deliverable Style Manual (IRM-5230-02). This publication provides the guidelines and instructions for the preparation of AIS documentation required by MCO P5231.1B. The documentation developed or maintained will be assembled in a standardized format to ensure uniform arrangement, style, and appearance of all documentation.

d. Inspection and Acceptance (IA) (IRM-5231-17). This publication provides guidelines for the inspection and acceptance of deliverables The process details the procedures for the receipt, inspection, evaluation, and formal acceptance of deliverables.

e. Data Dictionary (DD) (IRM-5235-01). This publication provides guidelines concerning the usage and application of the data dictionary, operation in the data dictionary environment, definition of responsibility for administrative and technical management, and conventions for use of data dictionary facilities.

f. Library Management System (LMS) (IRM-5233-06). This publication establishes uniform procedures and guidance for the development of a Library Management System. The standing operating procedures detail library functions, release and distribution procedures, record keeping procedures, and reports used daily in the operation of the libraries.

g. Programming Standard (PS) (IRM-5234-01). This publication establishes a uniform methodology for the development of project software. These guidelines will ensure readable and supportable application program listings are produced before they are distributed as a finished product.

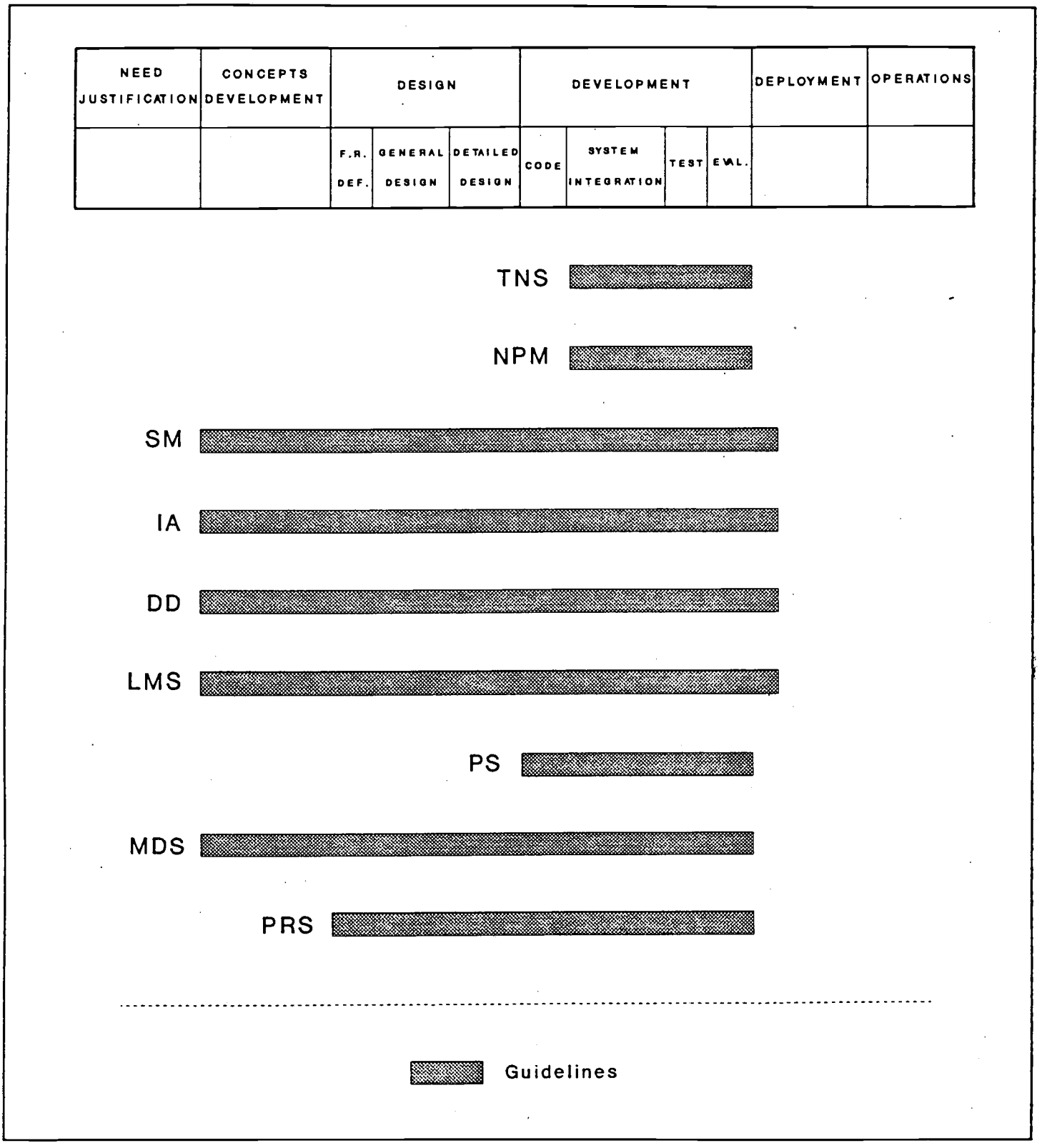

FIGURE 2-06
Convention Standards

h. Man-Machine Dialogue (MDS) (IRM-5234-02). This publication provides the guidelines for designing the man-machine dialogue (user interfaces) and to specify formatting conventions for interactive screens.

i. Prototyping Standard (PRS) (IRM-5231-18). This publication provides guidelines to prototype selected aspects of an AIS project. The prototype developed will either validate that the system meets its requirements and verifies its accuracy or it will identify aspects of the project that need redesign.

j. Project Managers Security Handbook (IRM-5239-12). This publication provides guidelines to ensure that security requirements are satisfied throughout the life cycle of an AIS project.

2.5. REVIEWS. All project deliverables, but particularly those governed by the SDM Standards, are subject to a formal review process. This process is shown in Figure 2-07, "Review Mechanisms." This figure defines the type and occurrence of required reviews during the life cycle of any AIS project. There are two types of reviews: a formal review of documents; and a project status review that results in a decision paper. The review of documents is used in the preparation of the decision papers. The primary information obtained from the review of documents supports quality assurance and configuration management.

2.5.1. Quality Assurance. The primary objective of quality assurance (QA) is to minimize the system costs through the early detection and correction of errors and deficiencies. The role of QA ranges from the review of project documentation to the certification testing of completed products. QA ensures that standardized methodologies are used to produce standardized results.

2.5.2. Configuration Management. Configuration Management (CM) is a discipline which applies technical and administrative direction and surveillance to identify and document the functional and physical characteristics of Configuration Items (CI) and Computer Program Configuration Items (CPCI), control changes to those characteristics, and record and report change processing and implementation status.

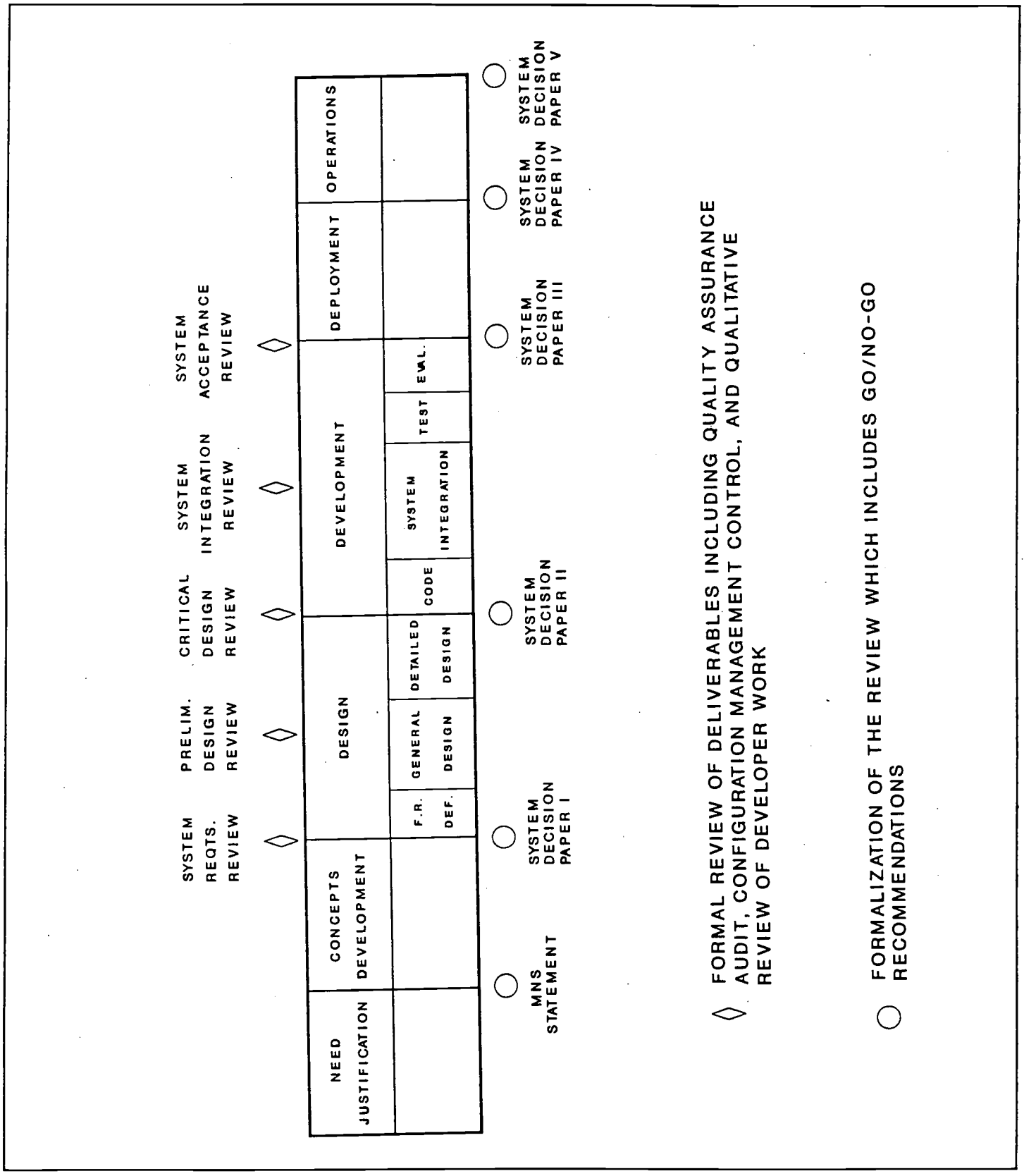

FIGURE 2-07
Review Mechanisms

Chapter Table of Contents

Chapter 3

DOCUMENTATION CRITERIA

	Paragraph	Page
Section 1. OVERVIEW	3.1.	3-3
Section 2. DECISION GUIDES	3.2.	3-3
Medium Systems	3.2.1.	3-3
Small Systems	3.2.2.	3-4
Section 3. RECOMMENDED MINIMUMS	3.3.	3-4
Medium Systems	3.3.1.	3-5
Small Systems	3.3.2.	3-5

Chapter 3

DOCUMENTATION CRITERIA

3.1. OVERVIEW. The SDM was developed to provide guidance and control for the development of large systems. The validity of the SDM is not limited to just large systems. By modifying the list of required documents and reducing the scope of the documents for those cases where the effort does not fit the large system definition, the SDM can still be used. The following sections attempt to provide guidance on how to reduce the SDM documentation requirements to fit smaller system development.

3.2. DECISION GUIDES. The following sections contain additional amplification, designed to assist in the determination of the type and volume of documentation needed for different size systems. These are not standards, but are guidelines and should be carefully applied to each case. The following dollar thresholds are used to define large, medium, and small systems:

CATEGORY	DEVELOPMENT AND IMPLEMENTATION COST
Large	Over $5 million
Medium	$1 to $5 million
Small	Less than $1 million

3.2.1. Medium Systems. Medium systems have the widest variance in requirements for documentation. As they approach the upper limit, they may well require all of the documents. On the lower end, they may require much less. Size is not the only issue for judging the need for a document, complexity must also be considered. Interactive systems have a level of complexity far above batch systems and will require much more documentation. The following list provides some guidelines to aid in determining the documentation requirements of medium systems.

a. ADPE Support Plan. A medium system needs an ADPE Support Plan only if it is either extremely resource intensive or involves the introduction of new hardware. If the system will fit within existing resources, then this requirement could be stated in the General Design Specification (GDS) and not in a separate document.

b. Telecommunications Support Plan. A system using existing telecommunications facilities may not need a Telecommunications Support Plan, only an identification of the necessary hardware, software, and impact on existing telecommunications. This information should be limited to a paragraph in the GDS.

c. Quality Assurance (QA) Plan. A separate QA Plan may not be necessary. The necessary QA actions may be incorporated into the Test Plan, which may also be less complex (though no less

detailed) than the document required for a successful large system development.

d. Application Configuration Management (CM) Plan. An abbreviated CM Plan will generally suffice as the overhead for the relatively few Configuration Items (CI) and Computer Program Configuration Items (CPCI) needed for a medium system. Normally, these items will be managed as part of the CDPA or RASC site Configuration Management Plan. The statement of such a decision can be contained in the Implementation Plan.

e. Training Support Plan (TSP). A medium system will normally require only a modest amount of training, often with no requirement for follow-on training from the formal schools. Therefore, the TSP can be included in the Implementation Plan.

3.2.2. Small Systems

a. Small systems should require the least documentation of all. However, all areas covered by SDM documentation requirements must be reviewed and covered in the documentation actually prepared. When documentation starts to grow in size, it may very well be an early indication that the original size estimates for the effort were low. This should not be construed as an excuse to avoid documentation, but rather as an early check on a very difficult part of any development effort estimation. The scope of a small system is such that it is unlikely that even complexity will have a large impact on the need for documentation. Only the largest of small systems will require much effort in the preparation of various support plans. The following list provides some guidelines to aid in determining the documentation requirements of small systems.

b. A GDS that is larger than a one inch binder requires a separate Detailed Design Specification. Otherwise, the two documents can be combined into one, providing that an in-depth review is held after all data flow diagrams are completed and before any work on structure charts is started. A combined Data Base Conversion Plan and Data Base Plan can also be incorporated into the GDS when there is little or no conversion to be done. This can also occur when the small system can "piggyback" on the plans prepared for another system that originally set up and managed the data base.

3.3. RECOMMENDED MINIMUMS. The minimum required documentation for small and medium systems is not meant to preclude inclusion of information normally found in other documents. The "Included Document(s)" column of Figures 3-01 and 3-02 lists documents that must be considered in conjunction with the "Required Document." Parts of included documents may be inserted as appendices to the required documents as applicable.

3.3.1. Medium Systems. Figure 3-01 provides a list which outlines the minimum amount of documentation required for a medium system. The left column of the figure contains documents which must be completed, while the right column contains documents which can be incorporated into documents on the left. This is a widely varying category and the set of documentation required for any given medium system may vary widely from that shown here.

3.3.2. Small Systems. Figure 3-02 provides a list of the smallest amount of documentation expected for any system. The left column of the figure contains documents which must be completed, while the right column contains documents which can be incorporated into documents on the left.

Required Document	Included Document(s)
Mission Need Statement	
Requirements Statement	
Economic Analysis	
Functional Requirements Definition	
General Design Specification	ADPE Support Plan Telecommunications Support Plan
Data Base Plan	Data Base Conversion Plan
Detailed Design Specification	
Test Plan	Quality Assurance Plan
Implementation Plan	Configuration Management Plan Training Support Plan
Users Manual	
Computer Operations Manual	
Systems Security Plan	

FIGURE 3-01
Medium System Documentation

Required Document	Included Document(s)
Mission Need Statement	
Requirements Statement	
Economic Analysis	
Functional Requirements Definition Design Specification	General Design Specification ADPE Support Plan Telecommunications Support Plan Data Base Plan Data Base Conversion Plan Detailed Design Specification
Implementation Plan	Quality Assurance Plan Test Plan Configuration Management Plan Training Plan
Users Manual	
Computer Operations Manual	
System Security Plan	

FIGURE 3-02
Small System Documentation

Appendix A

GLOSSARY

ADP - ADPE Support Plan

ADPE - Automated Data Processing Equipment

AIS - Automated Information System. A combination of information, computer, and telecommunications resources, and other information technology and personnel resources which collects, records, processes, stores, communicates, retrieves, and displays information.

AIS Program - A set of two or more AIS projects being managed under a common baseline. These AIS projects are distinct but functionally related (i.e., fulfilling a defined set of functional requirements).

AIS Project - One or more activities being managed as a unified undertaking which contribute toward the development and implementation of a new AIS or the significant enhancement of an existing AIS.

AIS Project Baseline Document - A formal document that consists of a cover (signature) page, a change log, and an AIS project baseline.

AIS Project Baseline Plan - A planning document which consists of a cover page, an AIS project baseline, and a plan for improving the AIS project baseline.

BL - AIS Project Baselining. Description of a specific project, containing at least the following key elements: functional requirements, planned capabilities, schedule, costs, and approved funding.

CDPA - Central Design and Programming Activity

CI - Configuration Items

CM - Application Configuration Management Plan

COM - Computer Operations Manual

CPCI - Computer Program Configuration Items

DBC - Data Base Conversion Plan

DBP - Data Base Plan

DD - Data Dictionary

DDS - Detailed Design Specification
EA - Economic Analysis

FRD - Functional Requirements Definition

GDS - General Design Specification

IA - Inspection and Acceptance

IP - Implementation Plan

IRM - Information Resources Management

LCM - Life Cycle Management. A management discipline for acquiring and using AIS resources in a cost-effective manner throughout the entire life of an AIS.

LCM-AIS - Life Cycle Management for AIS Projects

LMS - Library Management System

MCDN - Marine Corps Data Network

MDS - Man-Machine Dialogue

MNS - Mission Need Statement

NPM - Network Procedures Manual

PMC - Project Manager Charter

PMP - Project Management Plan

PRS - Prototyping Standard

PS - Programming Standard

QA - Quality Assurance Plan

RASC - Regional Automated Service Center

RS - Requirements Statement

SDM - System Development Methodology - A collection of methods, procedures, and activities associated with developing an automated information system.

SDP - System Decision Paper. An SDP recaps the essential information on an AIS for decision makers. An updated SDP is submitted at each major LCM milestone and provides the necessary information for the decision making process.

SGC - Steering Group Charter

SM - Style Manual

SSP - System Security Plan

TNS - Naming Conventions

TP - Test Plan

TRP - Training Support Plan

TSP - Telecommunications Support Plan

UM - Users Manual

COMMENTS/REVISIONS

Technical publications under the Information Resources Management (IRM) Standards and Guidelines Program (MCO 5271.1) are reviewed annually. Your comments and/or recommendations are strongly encouraged.

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