IRM-5231-10A

U.S. Marine Corps

QUALITY ASSURANCE PLAN

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

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From: Commandant of the Marine Corps

Subj: INFORMATION RESOURCES MANAGEMENT (IRM) QUALITY ASSURANCE PLAN

Ref: (a) MCO P5231.1B
(b) SECNAVINST 5232.1
(c) MCO 5271.1

Encl: (1) IRM-5231-10A

1. PURPOSE. To provide guidance on the preparation of Quality Assurance (QA) Plans to be developed for automated information system (AIS) development projects as required by references (a) and (b). This technical publication provides documentation formats and specifications for these plans.

2. CANCELLATION. IRM-5231-10.

3. SUMMARY OF REVISION. This revision adds an appendix for Quality Factors and incorporates the following changes resulting from the revisions to AIS development procedures and policies published in reference (a).

a. Separates the deployment and operations phase of the life cycle process into a deployment phase and an operations phase to emphasize the transition of 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 (c).

5. APPLICABILITY. The guidance contained in this publication is applicable to all Marine Corps personnel and contractors responsible for the preparation of QA Plans for AIS development projects. This standard is applicable to the Marine Corps Reserve.

6. DISTRIBUTION. This technical publication will be distributed as indicated.

7. SCOPE

a. Compliance. Compliance with the provisions of this document is required unless a specific waiver is authorized.

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b. Waivers. Waivers to the provisions of this publication will be authorized only by the appropriate approval authority, as defined by reference (a), on a case by case basis.

8. RECOMMENDATIONS. Recommendations concerning the contents of this technical publication should be forwarded to CMC (CCI) 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 (CCI).

G. L. McKAY
By direction

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UNITED STATES MARINE CORPS

Information Resources Management (IRM) Standards
and Guidelines Program

Quality Assurance Plan
IRM-5231-10A

Enclosure (1)

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RECORD OF CHANGES

Log completed change action as indicated.

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

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PUBLICATION TABLE OF CONTENTS

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LIST OF FIGURES

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Chapter Table of Contents

Chapter 1

GENERAL

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Chapter 1

GENERAL

1.1. INTRODUCTION. The purpose of this standard is to define the format and content of all Quality Assurance (QA) Plans to be developed for an Automated Information System (AIS) project. By adhering to this standard, the developer will be assured of producing a uniform, applicable plan which provides required and necessary QA functions.

1.1.1. Objectives. The primary objective of the QA Plan is to minimize the system life cycle costs through the early detection and correction of errors and deficiencies. Other objectives are ensuring that the user requirements are satisfied, that established development standards and procedures are adhered to, that the project quality specifications, procedures and responsibilities are defined and that usability and effectiveness of the developed product is maximized.

1.2. SCOPE. This standard is applicable to all applications development activities, both contractor and government in-house. Every software development effort requires a QA program. This program should be planned and implemented through a formal QA Plan. Regardless of the size or complexity of the application, a QA Plan is required. A large development program with multiple projects can develop a single QA Plan for the program with QA Plan Addendums (QAPA) for each project. The QAPA will supplement the QA Plan with project unique requirements. All QA Plans will be developed in a standard, uniform manner following the format and content requirements described in Chapter 2, "Documentation Standard."

1.2.1. Considerations. In developing the QA Plan, the author should consider the total scope of QA for the effort to which it applies. For example, some projects may only require a Functional Requirements Definition (FRD) leading to an off-the-shelf software procurement. In this case there is no need to discuss the reviews, inspections, and evaluations that relate to design specifications. On the other hand, the effort might cover the total development from the FRD through implementation. This case would require discussion of reviews, inspections, and evaluations throughout all life cycle phases.

1.2.2. Relationships. When planning the QA program, the relationships with configuration management (CM) functions and those of all elements of the development must be identified. Specifically addressed will be the responsibility for reviews, inspections, evaluations and the configuration baselines.

1.2.3. Definitions. Appendix A provides definitions that will be used in the preparation of the QA Plan.

1.3. LCM PROCESS. A QA program permeates the entire Life Cycle Management (LCM) process. Every document, plan, code or testing procedure must be evaluated based on quality principles (e.g.- Is the Users Manual prepared during the Design Phase a quality document?). The QA Plan must outline procedures to encourage and ensure that quality principles are used not only in the preparation of deliverables but also every product generated during the life cycle of an AIS. The content of the QA Plan can be found in Appendix D. Figure 2-01 graphically depicts specific deliverables and their sequence in the LCM process. In addition, a QA Phase Analysis is undertaken to evaluate the status of quality throughout each LCM phase of an AIS development effort.

1.3.1. Concept Development Phase. The QA Plan is developed, approved and implemented during the Concept Development Phase of an AIS development. Establishment of a QA plan must be accomplished by an organization separate from that developing the AIS. This group will use quality factors (see appendix E) to establish quality requirements. As these requirements are AIS unique, they must be developed for each AIS by the functional and technical managers. These quality requirements form the basis of the QA Plan.

1.3.2. Design Phase

a. Systems Requirements Review (SRR). The SRR is a review of the system requirements specifications and preliminary support plans to determine if the functional requirements are complete, feasible, verifiable, and testable. Successful completion of this review results in the establishment of the Functional Baseline. Preliminary versions of the Users Manual, the Implementation Plan, the Test Plan, and the Training Support Plan are also reviewed against quality factors.

b. Preliminary Design Review (PDR). The PDR is conducted upon completion of the general design to evaluate the progress, technical adequacy, quality, and testability of the selected design approach. In addition, the PDR establishes the existence and compatibility of the physical and functional interfaces between equipment, facilities, computer software, and personnel.

c. Critical Design Review (CDR). The CDR is performed at the end of the Design Phase to determine the acceptability of the detailed design, performance and test characteristics of the design solution and the adequacy of the operation and support documentation. Successful completion of this review results in the establishment of the Allocated Baseline. The Detailed Design Specifications (DDS), Economic Analysis, the Data Base Conversion Plan, the ADPE Support Plan, the Telecommunications Support Plan and the Project Management Plan are reviewed against quality factors.

1.3.3. Development Phase

a. Physical Configuration Audit (PCA). The PCA determines whether the support documentation accurately reflects the AIS and is adequate for AIS maintenance. Computer program listings (source code) are reviewed for conformance to programming standards.

b. Functional Configuration Audit (FCA). The FCA verifies that the AIS has achieved the performance and functional characteristics specified and complies with operational support documentation.

c. Testing. A variety of test procedures are completed during this phase. Program, subsystem, system, and operational code is checked for validity against programming specifications and conformance to programming standards. The entire AIS is tested to ensure instructions are complete and provide for error free recovery.

d. Systems Integration Review (SIR). The SIR is performed during the Development Phase to determine if the AIS is ready for acceptance testing. Successful completion of this review results in the establishment of the Product Baseline. Previously tested code is combined with executive software, hardware, and data communications facilities to determine if all parts of the AIS work effectively together and with other AISs, prior to the System Acceptance Review (SAR). In addition, the final form of the Computer Operator's Manual, Training Support Plan, Users Manual, Implementation Plan, and Data Base Conversion Plan are reviewed against appropriate quality factors.

e. System Acceptance Review (SAR). The SAR is performed at the end of the Development Phase to determine if the AIS functions properly, satisfies the requirements, has complete and accurate documentation, and is ready for implementation. Successful completion of this review results in the establishment of the Product Baseline.

1.3.4. Deployment Phase. During this phase a final review of all documents and manuals should be conducted prior to the Implementation Phase to ensure accuracy, compliance with documentation standards, and compatibility with other AIS development documents.

1.3.5. Operations Phase. Reviews should be conducted at regular intervals during this phase to determine the effectiveness and benefits of the AIS.

Chapter Table of Contents

Chapter 2

CONTENT AND FORMAT

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Chapter 2

CONTENT AND FORMAT

2.1. DOCUMENTATION STANDARDS. The QA Plan will be prepared in accordance with these standards. All sections and paragraphs which are described in this standard will be included in a QA Plan. If a particular section is not applicable, the title of the section will be included followed by a statement with supporting justification why the section is not applicable. Additional levels of text are permitted, provided the text is pertinent and consistent with this standard.

2.1.1. Deliverable. The deliverable that will be produced through the use of this standard is a single document: the QA Plan. In preparing the plan, the required table of contents described in Appendix C, "Table of Contents", should be used and the text should be developed according to the descriptions in Appendix D, "Content Description."

2.1.2. Evaluation Criteria. Criteria to evaluate the QA Plan document for completeness and accuracy are as follows:

a. All sections and paragraphs contained in Appendix C, "Table of Content", must be included.

b. The text for all sections and paragraphs must be in accordance with the descriptions in Appendix D, "Content Description."

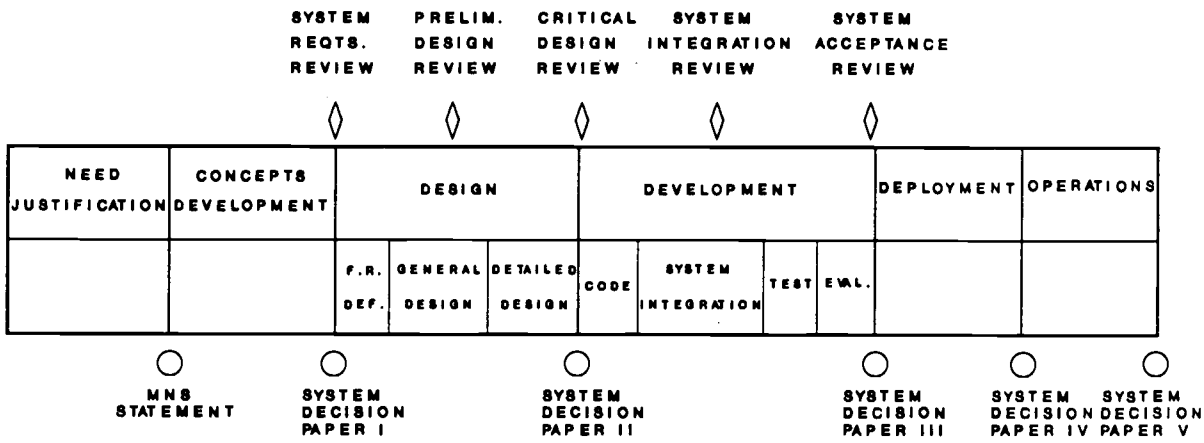
c. The document must establish measurable quality specifications and define the acceptance criteria for the deliverables and tests.

d. The QA Plan must define a QA program which is consistent with the content description contained in Appendix D.

e. Any section or paragraph deemed not applicable to the plan must appear with a statement to that effect and a justification for the exclusion.

2.2. DOCUMENTATION DEPENDENCIES. The documentation governed by this standard may also rely on the content of other project deliverables and standards. Figure 2-01, "Precedence Relationship", shows those project deliverables and standards and plans and reviews which impact the QA Plan deliverables.

2.2.1. Consultation Documents. The documents listed in Appendix B, "References", shall be consulted at the time of preparation of the QA Plan.



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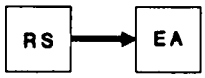

PLANS

CONVENTIONS

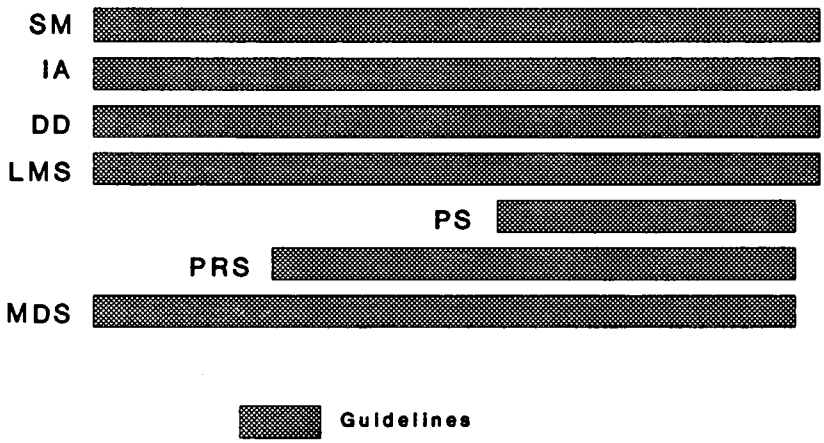

FIGURE 2-01
Precedence Relationship

2.2.2. Change Requirements. During the development of the QA Plan, new issues may arise that will require changes to preceding documents. These changes must be documented and approved in accordance with the QA and CM procedures. Externally imposed milestones that are unrealistic to accomplish will not be used as an excuse to defer or eliminate the documentation requirements.

Appendix A

GLOSSARY

ADPE - Automated Data Processing Equipment

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.

ALLOCATED BASELINE - The initial approved allocated configuration identification.

BASELINE - A configuration identification document or a set of such documents formally designated and fixed at a specific time during a configuration item's life cycle.

BL - AIS Project Baselining.

CONFIGURATION IDENTIFICATION - Selection of the documents which identify and define the configuration baseline characteristics of a configuration item.

CONFIGURATION ITEM - An aggregation of hardware and software, or any of its discrete portions, which satisfy an end use function and is designated by the government for configuration management.

CDR - Critical Design Review. A review to determine the acceptability of the detailed design, performance, and test characteristics of the design solution and the adequacy of the operation and support documentation.

CM - Configuration Management. The process of:

a. Identifying and defining the configuration items in a system.

b. Controlling the release and change of these items throughout the AIS life cycle.

c. Recording and reporting the status of configuration items and change requests.

d. Verifying the completeness and correctness of configuration items.

e. Identification and documentation of functional and physical characteristics of a product item.

f. Controlling changes to AIS characteristics.

g. Recording and reporting change processing and implementation status.

CMRB - Configuration Management Review Board. The authority responsible for evaluating and approving or disapproving proposed change, waiver and deviation requests and ensuring implementation of the approved request.

CODE INSPECTION - An independent review of source code by a person, team, or tool to detect faults, verify compliance with software design and programming standards, and other problems. Correctness and efficiency may also be evaluated.

DD - Data Dictionary.

DDS - Detail Design Specifications. The refinement and expansion of the general design to contain more detailed descriptions of the processing logic, data structures, and data definitions to the extent that the design is sufficiently complete to be programmed.

EA - Economic Analysis.

EVALUATIONS - An independent assessment of compliance with software requirements, specifications, baselines, standard procedures, instructions, codes, and contractual and licensing requirements. An activity to determine the adequacy of and adherence to established procedures, instructions, specifications, codes and standards, or other applicable contractual and licensing requirements and the effectiveness of implementation.

FCA - Functional Configuration Audit. A formal audit to validate that the development of the configuration item has been completed satisfactorily, has achieved the performance and functional characteristics specified in the functional or allocated configuration identification, and complies with the completed operation and support documentation.

FRD - Functional Requirements Definition

FUNCTIONAL BASELINE - The initial approved functional configuration identification.

IA - Inspection and Acceptance.

INDEPENDENT - Denotes an unbiased, objective attitude and an unrestricted access to data and information.

INSPECTION - An evaluation technique in which software requirements, design, or code is examined, observed, or measured to determine the conformity of materials, supplies, components, parts, systems, processes or structures to predetermined quality requirements.

IRM - Information Resource Management.

LMS- Library Management System.

MDS - Man-Machine Dialogue.

MNS - Mission Need Statement.

PCA - Physical Configuration Audit. A technical examination of a designated configuration item as built, conforming to the technical documentation definition.

PDR - Preliminary Design Review. Review conducted at the completion of the general design phase to:

a. Evaluate the progress, consistency, technical adequacy, quality, testability and risk resolution of the selected design approach.

b. Establish the existence and compatibility of the physical and functional interfaces among the configuration items and other items of equipment, facilities, computer software and personnel.

PMP - Project Management Plan.

PRODUCT BASELINE - The product baseline is established with the successful completion of the Systems Integration Review(SIR).

PRS - Prototyping Standard.

PS - Programming Standard.

QA - Quality Assurance. A planned and systematic pattern of all actions necessary to provide adequate confidence that the item or product conforms to established technical and quality requirements.

QA PHASE ANALYSIS - Evaluation of the status of quality throughout the LCM phases of a systems development effort through the analysis of all components and not the re-inspection of individual pieces.

QC - Quality Control. The review discipline used throughout the development process to detect errors. Quality Control is the responsibility of the Project Manager.

REVIEW - The evaluation of software products through presentation of form and technical content for the purpose of detection and remedy of deficiencies.

RS - Requirements Statement.

SAR - Systems Acceptance Review. A review of the system using the results of the System Acceptance Test, User Test, and a QA Phase Analysis. The objective is to determine if it functions properly, fulfills the requirements, has complete and accurate

documentation, and is ready for implementation. The results of this review are integrated into the System Decision Paper III.

SIR - Systems Integration Review. The participants in the review ensure that all AIS components work together as necessary. These test results and inspection reports determine if the system is ready to proceed to the Systems Acceptance Test.

SM - Style Manual.

SRR - Systems Requirements Review. A review of the system requirements specifications and the preliminary version of the Test Plan, User's Manual and the Computer Operations Manual to determine that the functional requirements are complete, feasible, verifiable, and testable.

TESTABILITY - The extent to which the establishment of test criteria, and the evaluation of the software with respect to those criteria, can be achieved.

TESTING - The process of exercising or evaluating a system or system component, by manual or automated methods, in order to verify that it satisfies specific requirements or identifies differences between expected and actual results.

TRACEABILITY - The extent to which information exists in one software product that leads to its precedent or antecedent in another.

TRACEABILITY MATRIX - A chart prepared in matrix form used to trace the project requirements through the development of the system to assure that a requirement has not been omitted or inserted without formal approval from the Configuration Management Review Board.

UNIT TESTING - Aggregate of technical activities involved in demonstrating that:

a. A unit has been correctly coded.

b. That the code and the design of the unit are consistent.

c. That the unit design is correct.

WAIVER - A formal authorization to deviate from stated specifications, practices, or plans.

WALKTHROUGH - A review process in which a designer or programmer leads one or more other members of the development team through a segment of design or code that he or she has written, while the other members ask questions and make comments about technique, style, possible errors, violation of development standards, and other problems.

Appendix B

REFERENCES

1. SECNAVINST 5232.1, Quality Assurance Program for Information Systems

2. MCO P5231.1B, Life Cycle Management for Automated Information Systems Projects (LCM-AIS)

Appendix C

QUALITY ASSURANCE PLAN TABLE OF CONTENTS

Appendix D

QUALITY ASSURANCE PLAN CONTENT DESCRIPTION

SECTION 1. PURPOSE, SCOPE, AND OBJECTIVE

This section delineates the specific purpose, scope, and objective of the project QA Plan. It shall list the name of the project covered by the QA Plan and the intended use of the software.

1.1. Purpose

This paragraph states the name of the project and describes the purpose of the QA Plan as it applies to the project development effort. It is written from the Project Manager's point of view.

1.2. Scope

The scope of a project's QA project should be stated as well as what related activities will be carried out within that scope.

1.3. Objective

This paragraph defines the project's quality goals and objectives in terms of quality factors as listed in Appendix E. It also states the objectives and goals to be achieved through the use of the plan and briefly outlines the relationship of these to the total AIS development. Included is an overview of the intended effect QA has on the project.

SECTION 2. REFERENCE DOCUMENTS

This section provides a complete list of documents referenced in the plan.

SECTION 3. MANAGEMENT

This section describes the development and related QA organization, tasks, resource requirements, and responsibilities. When a contractor is being used for either development or QA, this section names the specific contractor(s).

3.1. Resource Requirements

This paragraph describes the resources, and personnel necessary to implement the QA Plan. Describe the number, type, and organizational placement of personnel performing QA activities. Also include the types and quantities of other resources required. This will include hardware, software, supplies and travel.

3.2. Responsibilities

This paragraph depicts the organizational structure that influences the quality of the software. This includes a description of each specific organizational element and their responsibilities. It shall define the organizational independence of the elements responsible for QA from those responsible for software development. It shall also describe the tasks associated with each element of the organization. Special emphasis shall be given to the QA and quality control activities and the sequence of the tasks.

3.3. Relationships

This paragraph clearly describes and depicts the organizational relationships, dependence or independence of the elements responsible for software development and use.

SECTION 4. DOCUMENTATION

4.1. Deliverables

This paragraph lists all required deliverables, reviews, inspections, phase analyses, evaluations, project reviews and milestones.

4.2. Acceptance Criteria

This paragraph states the quality criteria for each review, inspection, phase analysis, and evaluation by document or deliverable. The acceptance criteria must be specific and measurable. Also state the course of action for any document or deliverable that fails to meet the acceptance criteria.

4.3. QA-QC Activities

This paragraph specifies by document, or deliverable, the reviews, inspections and evaluations that will be performed. It states how each document is checked for compliance to the quality specification and acceptance criteria. It specifies if a checklist will be used, who will prepare the checklist, and the additional actions to be taken to supplement the checklist.

4.4. Staffing

This paragraph describes the staffing for each document and deliverable. Also include instructions for submitting documents or deliverables for inspection and the maximum length of time allowed to perform the inspection.

4.5. Testing

This paragraph lists each required level of testing, organization responsible for performance of the test, and test documentation.

It also lists the acceptance criteria for each level of testing and the course of action taken when the test is unacceptable.

4.6. Traceability Matrix

This paragraph lists the points in the life cycle where a traceability matrix is required and the traceability matrix format. At a minimum a traceability matrix will be required during the inspection of the Requirements Statement, Functional Requirements Definition, General Design Specification, Detail Design Specification, Acceptance Test Plan, and User Test Plan. A traceability matrix will be performed as a part of the PCA. Also include the acceptance criteria for each iteration of the traceability matrix and the corrective actions required for an unacceptable traceability matrix.

4.7. Request for Change

This paragraph defines how requests for changes to the QA Plan are submitted, approved, and controlled.

SECTION 5. STANDARDS, PRACTICES, AND CONVENTIONS

This section identifies the standards, practices, and conventions applicable to the project. It also states how compliance with these items are monitored and assured.

5.1. Languages

This paragraph identifies the programming language that is used for the project.

5.2. Naming

This paragraph identifies the naming standards and conventions used for the project. If this project is to interface with other projects, care should be taken to assure that the naming conventions are consistent between the projects.

5.3. Development Standards

This paragraph identifies the development standards used for the project. Per Marine Corps policy, this will include a discussion of LCM/System Development Methodology (SDM). If waivers have been approved for use of other standards those will be discussed in this paragraph.

5.4. Deviations

This paragraph defines how requests for deviations from the standards, practices, and conventions contained in this section are submitted, approved, and controlled.

SECTION 6. REVIEW, INSPECTION, AND EVALUATIONS

This section defines the reviews, inspections, and evaluations conducted during the life of the project. It also defines the frequency, schedule, and reporting requirements for the reviews, inspections, and evaluations and states how they will be accomplished.

6.1. Reviews

This paragraph defines the required management and project reviews, walkthroughs, and code walkthroughs for the project. It also defines their frequency, schedule, and the organization responsible for their performance. Multiple walkthroughs may be scheduled for each deliverable or document. At a minimum, there will be five project reviews; SRR, PDR, CDR, SIR, and SAR.

6.2. Inspections

This paragraph defines the inspections required for the project along with their frequency and schedule. Specify if a checklist will be utilized, who will prepare the checklist, and the additional actions to be taken to supplement the checklist. Each deliverable or document should have at least one inspection. The acceptance criteria for each inspection and the organization responsible for their performance should also be defined.

6.3. Evaluations

This paragraph defines the evaluations required for the project along with their frequency, schedule, and the organization responsible for their performance. At a minimum it defines the Phase Analyses, Physical Configuration Audit, and Functional Configuration Audit. Refer to Figure 2-01, "Precedence Relationships", for guidance in establishing the frequency and schedule.

Evaluations are used to analyze the following:

a. Effectiveness of the development process.

b. Effectiveness of management and control procedures being applied to the project.

c. Acceptability of project performance and productivity.

d. Technical compliance of the system to standards.

e. Acceptability of the quality of the project.

Quality evaluations do not result in the baselining of specific products. They are used to evaluate the status of quality of the system development process by analyzing all components and not by

re-inspecting individual pieces. All quality evaluations will perform the following activities:

a. Definition of the evaluation goals and objectives.

b. Establishment of the evaluation scope.

c. Initiation of the evaluation by formally notifying the participants of the dates, goals, objectives, and scope.

d. Collection of evaluation data.

e. Analysis of the data.

f. Reporting the results of the evaluation.

6.4. Results Reporting

This paragraph defines how the results of the reviews, inspections, and evaluations are submitted to the Project Manager. Specify the format to be used in the preparation of inspection and evaluation reports. If the results are to be verbally transmitted to the PM prior to the preparation of the written report, state this fact. This paragraph also defines the methods for tracking the reviews, inspections, and evaluations and the resolution of identified problems.

Usually the inspection and evaluation reports will contain, as a minimum:

a. A cover page.

b. An executive summary, if the report is lengthy.

c. A subject.

d. A list of the personnel performing the inspection or evaluation.

e. The purpose.

f. The scope.

g. A background paragraph.

h. A summary evaluation.

i. A discussion of each problem area and recommendations for resolution.

j. A copy of any checklists and traceability matrix.

SECTION 7. CONFIGURATION MANAGEMENT

This section documents the QA/QC methods used for verifying compliance with the provisions of the project Configuration Management Plan. Also state how the provisions contained in Sections 10 through 13 of this plan will be verified.

SECTION 8. PROBLEM REPORTING AND CORRECTIVE ACTION

This section describes the practices and procedures for reporting, tracking and resolving problems. State the specific organizations responsible for their implementation. Each topic is discussed separately and numbered as indicated in Appendix C, "Table of Contents".

SECTION 9. TOOLS, TECHNIQUES, AND METHODOLOGIES

This section identifies the specific software tools, techniques, and methodologies used to support QA/QC. State specifically when, how, and by whom they are used. Each topic is discussed separately and numbered as indicated in Appendix C, "Table of Contents".

SECTION 10. CODE CONTROL

This section defines the methods and facilities used to identify, control, maintain and store versions of software. The version control described in this section must be in compliance with the requirements of the project Configuration Management Plan (CMP). If the CMP is very specific on code and version control, then the specific paragraph from the plan can be referenced.

SECTION 11. MEDIA CONTROL

This section states the methods and facilities used to protect computer program physical media from unauthorized access or inadvertent damage or degradation.

SECTION 12. CONTRACTOR CONTROL

This section will state the provisions for assuring that vendor-provided and contractor-developed software meets established requirements. As a minimum, the supplier is required to prepare and implement internal QA procedures. The prime contractor is responsible for the quality of the work of sub-contractors.

SECTION 13. RECORDS COLLECTION, MAINTENANCE AND RETENTION

This section identifies any QA/QC documentation to be retained. It states the methods and facilities used to assemble, safeguard and maintain this documentation.

SECTION 14. POINTS OF CONTACT

This section identifies the points of contact for this project. At a minimum it identifies the project manager, the Contracting Officer's Technical Representative, and the responsible QA/QC manager.

SECTION 15. TERMS AND ABBREVIATIONS

This section includes the terms and abbreviations applicable to the project.

Appendix E

QUALITY FACTORS

Correctness - Extent to which Automated Information Systems (AIS) satisfy their functional requirements and design specifications and fulfill the user's mission objectives.

Reliability - Extent to which an AIS can be expected to perform its intended function with required precision.

Efficiency - Extent to which an AIS achieves maximum benefit at minimum cost.

Integrity - Extent to which access to an AIS or data by unauthorized personnel can be controlled.

Usability - Effort required to learn, operate, prepare input, and interpret output of an AIS.

Maintainability - Effort required to locate and fix an error in an operational AIS.

Testability - Effort required to test an AIS and its components to make sure that it performs its intended function.

Flexibility - Effort required to modify an operational AIS.

Portability - Effort required to transfer AIS software from one hardware configuration or software system environment to another.

Reusability - Extent to which an AIS or portions of it can be used in other applications or organizational areas related to the program or project.

Interoperability - Effort required to couple one AIS with another.

COMMENTS/REVISIONS

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Name/Rank: _____(optional)

Unit: _____(optional)

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