

# **ANNEX L**

## **QUALITY ASSURANCE (QA) PLAN**

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**Developed By:**

**U.S. Army Corps of Engineers (USACE) Finance Center**

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# SOFTWARE QUALITY ASSURANCE (QA) PLAN

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## SECTION 1.0 INTRODUCTION

**1.1 Purpose.** The purpose of this Quality Assurance (QA) Plan is to define and formalize a quality program for the Corps of Engineers Enterprise Management Information System (CEEMIS).

**1.2 Scope.** Quality is defined as the extent to which an automation software system meets or conforms to stated objectives, goals and requirements. Quality can be further described through an examination of its components. Every activity that occurs throughout system development and maintenance affects some attribute of system quality.

This QA Plan for CEEMIS will provide a framework for managing the quality efforts of all participants and for achieving the desired balance among the quality attributes.

**1.3 Objectives.** The primary objective of this plan is to assure that, when deployed, CEEMIS will satisfy all specified functional and technical requirements in accordance with the quality goals as identified by the Program Manager (PM). Successful attainment of this objective required that the CEEMIS development effort and maintenance follow the provisions of this plan and comply with requirements of the Army Life Cycle Management described in AR 25-3 and associated technical bulletins (TBs).

**1.4 Applicable Documents.** This QA Plan is based on the guidance provided by the following documents:

<u>Document No.</u>	<u>Document Name</u>	<u>Date</u>
AR 25-3	Army Life Cycle Management Of Information Systems	June 1989
DoD Instruction 7920.4	Baselining of Automated Information Systems (AIS)	March 1988
DoD Directive 8120.1	Life Cycle Management of Automated Information Systems	January 1993
ER 25-1-2	Life Cycle Management of Information Systems	November 1992

## SECTION 2.0 QA RESPONSIBILITY

**2.1 Quality Assurance Participants.** The Quality Assurance requirements imposed on CEEMIS will be prescribed by the policies and procedures mandated in the Army Finance and Accounting Quality Assurance (QA) Program, AR 11-37. The QA Program is designed to improve Army financial operations and to detect, deter and prevent fraud and waste.

All levels (Headquarters, District and Division) of the Army Corps of Engineers will participate in the QA of CEEMIS. It is recommended that CEEMIS have a full checklist review of each fiscal year.

**2.1.1 Program Manager (PM).** The PM has overall responsibility for the quality of CEEMIS and for tasking, U.S. Army Corps of Engineers (USACE) Finance Center to implement the activities contained in this plan.

**2.1.2 Assigned Responsible Agency (ARA).** The USACE Directorate of Resource Management is the ARA and has joint responsibility along with the PM for the technical development of CEEMIS.

**2.1.3 Automation Quality Organization (AQO).** The AQO designated for CEEMIS is CERM-FQ. The AQO is responsible for the application and implementation of the Software Quality Program Plan; as such CERM-FQ will:

- Appoint a Quality Program Advisor for the system.
- Execute the quality program plan to include reporting on the results of its execution.
- Prepare management reports for the Program Manager which provide an assessment of the overall status of project development as determined from application of quality program activities/functions.
- Prepare technical reports for the other QA participants which contain detailed findings and recommendations pertaining to their particular areas of responsibility.

**2.1.4 Other Participants.** All other participants involved in project development activities not previously mentioned will support requirements of this plan as tasked by the PM.

## SECTION 3.0 QUALITY FACTORS

**3.1 Quality Factors and Definitions.** The following eleven quality factors will serve as a major basis for the evaluation of CEEMIS quality:

<u>FACTORS</u>	<u>DEFINITION</u>
1. CORRECTNESS	Extent to which a program satisfies its specifications and fulfills the user's mission objectives.
2. RELIABILITY	Extent to which a program can be expected to perform its intended function with required precision.
3. EFFICIENCY	The amount of computing resources and code required by a program to perform a function.
4. INTEGRITY	Extent to which access to software or data by unauthorized persons can be controlled.
5. USABILITY	Effort required to learn, operate, prepare input and interpret output of a program.
6. MAINTAINABILITY	Effort required to locate and correct an error in an operational program.
7. TESTABILITY	Effort required to test a program to ensure it performs its intended function.
8. FLEXIBILITY	Effort required to modify an operational program.
9. PORTABILITY	Effort required to transfer a program from one hardware configuration and/or software system environment to another.
10. REUSABILITY	Extent to which a program can be used in other applications; related to packaging and scope of the functions that programs perform.
11. INTEROPERABILITY	Effort required to couple one system with another.

Each factor will be evaluated in relation to how CEEMIS technically and/or functionally performs these efforts throughout its life cycle.

**3.1.1 Correctness.** CEEMIS satisfies its specifications and fulfills its mission objectives in the following manner as it relates to correctness:

<u>Mission Objective</u>	<u>Method of Fulfillment</u>
Output from all mathematical calculations	Precise to four decimals
Accuracy and validity of accounting data	100% valid with accuracy level of 98%
Accuracy of data transmissions between levels	90-95% accurate
Capability to detect errors and/or invalid input and alert operator by retransmitting error messages	Automatically reject until completed message is sent

**3.1.2 Reliability.** CERM-FQ will review the functional performance of CEEMIS to ensure that it performs as intended.

**3.1.3 Efficiency.** CEEMIS has self-imposed performance requirements to include:

- Capability to achieve standard acceptable response time
- Capability to accommodate concurrent users

If at some point these performance requirements are not met, the efficiency of the computing resources, coding structure and processing procedures will be evaluated to improve performance.

**3.1.4 Integrity.** To restrict unauthorized modification of cost-sensitive information and to help preserve the integrity of the data, the following internal system controls have been established:

- Each prospective user must have a valid USERID/PASSWORD which is obtained from the local terminal area security officer (TASO), Information Systems Security Officer (ISSO), or the UPASS Administrator
- Users must be approved by the activity responsible employee as a valid CEEMIS user after the user logs on CEEMIS and establishes the user ID information and requests access
- Users have restricted use of CEEMIS menu options.

**3.1.5 Usability.** CEEMIS functional users will require minimal training due to the functional system design and user documentation that will be available.

**3.1.6 Maintainability.** CEEMIS must provide for technical, functional and cosmetic enhancements without major interruptions to the production system. These requirements (Reliability, Availability and Maintainability (RAM)) allow qualified users access to the system with the assurance of data accuracy and validity. The system must also have provisions for continuity of operations which are formally addressed in the Continuity of Operation Plan (COOP) provided as Annex O to the System Decision Plan (SDP).

Maintenance of the CEEMIS hardware will be the responsibility of the individual Corps activities (e.g., FOA, Lab) where CEEMIS is operational. The CEAP-IA platform and local hardware support multiple applications including CEEMIS. In this regard, CEEMIS is hardware independent.

**3.1.7 Testability.** Any deficiencies will be documented and corrected prior to live production.

**3.1.8 Flexibility.** TBD

**3.1.9 Portability.** TBD

**3.1.10 Reusability.** TBD

**3.1.11 Interoperability.** CEEMIS is capable of transmitting and receiving information from one system to another without the loss of data to demonstrate interoperability. The current interface requirements must interoperate with other Corps, Army and Department of Defense (DoD) automated systems. These interfaces include the following:

- Corps of Engineers Financial Management System (CEFMS)
- Project and Resource Information System (PRISM)
- Defense Finance and Accounting System (DFAS)
- Program Budget Accounting System (PBAS)
- ELECTRA
- Government On-line Accounting Link System (GOALS)

This system requirement will likewise be evaluated during the quality review process.

## SECTION 4.0 QUALITY REVIEWS, ASSISTANCE VISITS AND REPORTS

The following procedures reiterate the procedures and policies imposed by CERM-FQ in accordance with AR 11-37, Army Finance and Accounting Quality Assurance Program.

**4.1 QA Reviews.** The Quality Assurance requirements imposed on CEEMIS will be prescribed by the policies and procedures mandated in AR 11-37. The QA Program is designed to improve Army financial operations and to detect, deter and prevent fraud and waste.

All levels (Headquarters, District and Division) of the Army Corps of Engineers will participate in the QA of CEEMIS. It is recommended that CEEMIS have a full checklist review of each fiscal year.

Reviews are conducted to ensure continuing efforts are made to improve the quality of finance and accounting services. Review teams will evaluate all phases of financial activities to include:

- Travel and Transportation Allowances
- Civilian Pay and Allowances
- Accounts Payable
- Disbursing
- Appropriated Fund Accounting
- Quality Assurance
- Overall Management of Financial Operations Both Internal and External to the FAO
- Internal Controls
- Technical and Skill Training
- Data Input Sources Which Affect Pay and Entitlements.

Reviews will include an evaluation of each functional area sufficient in length to ensure QA Program objectives are met.

**4.2 Follow-up Reviews.** A follow-up review is required within six months if serious deficiencies are noted. Serious deficiencies may exist in one or more functional areas within the FAO or in command financial management outside the FAO.

A deficiency is serious if the following circumstances exist:

- Dollar amounts involved are significant or have the potential to be significant.
- Nonexistent or erroneous systems or procedures have caused, or have the potential to cause, erroneous reports, significant monetary budgetary discrepancies or great hardship to serviced personnel and activities.
- The timeliness, accuracy or quality of service is affected by late or inaccurate financial reporting; late or uncontrolled document processing; or high error or reject rates.

- It causes or creates the potential for fraud, waste, loss of funds or misappropriation of funds. For example, the mismanagement of fund resources, improper segregation of authorized and computation duties may create the potential for such abuse.
- It is the result of major organizational or procedural deviations that jeopardize the integrity of a standardized system.
- It has existed for an extended period of time; is a repeat finding or deficiency from a prior QA review; or is chronic rather than the result of cyclical or seasonal fluctuations in work load or operational requirements.

The CERM-FQ will conduct follow-up reviews when the need is determined during MACOM reviews.

**4.3 Assistance Visits.** This is an on-site aid provided by CERM-FQ to resolve field FAO problems. This aid may take the form of training, recommendations for policy or procedural improvements or hands-on assistance. Reports on assistance provided will not be written unless fraud, waste or abuse is found to exist or incompetence is determined to be a contributing factor.

CERM-FQ may schedule assistance visits to fulfill the biennial review requirement, on the basis of an FAO request, or upon MACOM determination of the need for assistance. Assistance visits may be made in one or as many functional areas as deemed appropriate by the MACOM or the FAO.

Review teams will schedule an exit conference with the installation or activity commander at the conclusion of each QA review. The commander will receive an overview of the review results, to include both positive and negative aspects of the FAO operation. Only serious deficiencies, uncorrected deficiencies (repeat findings) and those beyond the control of the Finance/Accounting Officer (FAO(R)) (problems not resolved despite prior coordination with the local command) will be brought to the attention of the commander. Review teams will not schedule an exit conference or an assistance visit except to meet the requirements of protocol.

**4.4 QA Reports.** Both QA Review and Assistance Visits Reports will be generated.

**4.4.1 QA Review Reports.** QA review teams will prepare and send two reports, in memorandum format, within 60 days of the completion of each review.

- A memorandum providing a general overview will be addressed to the commander. A copy of the commander's memorandum will be furnished as an enclosure to the FAO(R)'s memorandum. This memorandum will be limited to a nontechnical discussion of any serious deficiencies noted during the review and their effect on finance and accounting services. Positive aspects will also be highlighted. The commander's memorandum will include a discussion of any deficiency caused by activities outside the control of the FAO(R). In these cases, command attention will be requested.

- The second memorandum will be addressed directly to the FAO(R). This memorandum will provide a comprehensive discussion of significant deficiencies noted during the review, the effect on the deficiency if not self-evident, and recommendations for corrective action. When MACOMs perform a review, a copy of the FAO(R)'s memorandum, together with copies of all QA Functional Review Guides, will be forwarded to the Commander General.

**4.4.2 Assistance Visit Report.** A Memorandum Report is required for assistance visits only when fraud, waste, abuse, or incompetence is indicated. Under these circumstances, the reviewing team will send reports through command channels and furnish a copy to the Commander General. This does not preclude providing a written report directly to the FAO(R) when a report is not otherwise required.

**APPENDIX A**  
**LIST OF ACRONYMS & ABBREVIATIONS**

AQO	Automation Quality Organization
ARA	Assigned Responsible Agency
CE	Corps of Engineers
CEAP	Corps of Engineers Automation Plan
CEEMIS	Corps of Engineers Enterprise Management Information System
CEFMS	Corps of Engineers Financial Management System
COOP	Continuity of Operation Plan
DFAS	Defense Finance and Accounting System
DoD	Department of Defense
FAO	Finance and Accounting Office
GOALS	Government On-line Accounting Link System
HQUSACE	Headquarters, U.S. Army Corps of Engineers
ISSO	Information Systems Security Officer
PBAS	Program Budget Accounting System
PM	Program Manager
PRISM	Project and Resource Information System
QA	Quality Assurance
RAM	Reliability, Availability and Maintainability
SDP	System Decision Plan
TASO	Terminal Area Security Officer
TB	Technical Bulletin