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Title/Desc:

SYSTEM PROGRAM MGMT PLAN FOR THE TMAD CODE

SEP 05 1995

Page 1 of 1

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Distribution

3. From: (Originating Organization)

Nuclear Analysis and Characterization

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6. Cog. Engr.: SH Finfrock

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Approval / Release

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1, 2, 3, or 4 (see MRP 5.43)	1. Approval	4. Review	1. Approved	4. Reviewed no/comment
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	3. Information	6. Dist. (Receipt Acknow. Required)	3. Disapproved w/comment	6. Receipt acknowledged

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Reason	Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
1	1	Cog. Eng. SH Finfrock	<i>[Signature]</i>	8/28/95	H0-38						
		Cog. Mgr. H. Toffen	<i>[Signature]</i>	8/28/95	H0-38						
		QA PJ Edwards	<i>[Signature]</i>		A4-79						
		Safety									
		Env.									
		Ind. Rev: RD Crowe	<i>[Signature]</i>	8/28/95	H0-38						

18. SH Finfrock

Signature of EDT Scott F. [Signature] Date 8/23/95
Originator

19.

Authorized Representative _____ Date _____
for Receiving Organization _____

20.	H. Toffer
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Harri Toffen 8/28/95
Cognizant Manager Date

21. DOE APPROVAL (if required)	
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Ltr No. _____

☐ Approved

☐ Approved w/comments

☐ Disapproved w/comments

RELEASE AUTHORIZATION

Document Number: WHC-SD-WM-CSRS-027, Rev. 0

Document Title: System Requirements Specification for the TMAD Code

Release Date: 9/1/95

**This document was reviewed following the
procedures described in WHC-CM-3-4 and is:**

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

C. WILLINGHAM

9/1/95

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SUPPORTING DOCUMENT		1. Total Pages <i>21</i>
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5. Key Words Neutron probe TMAD	6. Author Name: Scott H. Finfrock <i>Scott H. Finfrock</i> 8/29/95 Signature Organization/Charge Code 8M720 / N2546	
7. Abstract <p>This document is intended to meet, in part, the quality assurance documentation requirements for the development of software as outlined in WHC-CM-3-10, "Software Practices." Specifically, this document will serve as the System Project Management Plan and the System Configuration Management Plan.</p>		
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PROJECT MANAGEMENT PLAN FOR THE TMAD CODE

1.0 INTRODUCTION

This document is intended to meet, in part, the quality assurance documentation requirements for the development of software as outlined in WHC-CM-3-10, *Software Practices*. Specifically, this document will serve as the System Project Management Plan (SPMP) and the System Configuration Management Plan (SCMP).

1.1 PURPOSE

The TMAD code (named for tank moisture and anomaly determination) will be used to evaluate data from probe (typically neutron) scans of waste tanks. These scans consist of a series of data points, each measured at a different vertical position in the waste. The measured data will be compared to benchmark data from computer models of the response of the probes to tank waste. The benchmark data will represent a range of moisture contents and anomalies (such as air- or water-filled annuli around the probes) as well as different detector types. The code will determine which benchmark model provides the closest match to the scan data at each point and will make estimates, based on these comparisons, of the moisture content of the waste in the vicinity of the probe location and of any anomalies that might be present.

The results of this code will be used to evaluate the moisture concentration in the tank waste against minimum moisture requirements established for the safe storage of ferrocyanide and organic watch list tanks. While the code will not be used to directly control any activity involving the tanks (engineers will review both the raw data and the code results), the potential exists for its use to become ingrained to the point that a serious flaw in the code could result in an erroneous decision regarding tank maintenance or operations. As a result, the code is deemed "quality affecting" and will be subject to the higher quality assurance requirements associated with that designation.

1.2 SCOPE

The end results of this project will include the TMAD code, one or more benchmark data libraries, and all associated quality assurance documentation. The code will accept two (or more) scans of a tank and produce a moisture content profile consisting of the best estimate at each point in the scans. The code will be applicable to all of the Hanford Site waste tanks as well as to other media for which scans and benchmark data exist.

1.3 OVERVIEW

The safe maintenance, and eventual decommissioning, of the single-shell waste tanks is at the core of the Hanford Site mission. It has long been recognized that some of the tanks have leaked and that there is the potential for more tanks to develop leaks. It is desirable to identify leaking tanks promptly so that efforts can be taken to minimize the impacts of those leaks. A variety of approaches have been tried in order to determine whether a tank was leaking, including gamma scans of the waste and neutron probe measurements in the soil underlying the tanks. These techniques have been considered adequate but less than ideal. Recently, concerns have been raised that the waste, if allowed to dry out, could be capable of exothermic reactions. In order to ensure that adequate moisture levels would be maintained in the tanks, it has been necessary to develop techniques that could more accurately measure those moisture levels. This has been a complicated and challenging proposal and many approaches were evaluated. Ultimately the neutron probe was selected as one of the methods for further development.

The neutron probe determines tank moisture levels by continuously emitting neutrons into the surrounding waste and then recording how many of them are thermalized and reflected back to the probe. The measured response is then compared to computer models of the waste (benchmark data) to determine the moisture level that would produce the measured response. Unfortunately, because of uncertainties (anomalies) in the structure and chemical makeup of the waste, this method will not identify a unique solution but rather a family of possible solutions. In order to obtain a precise estimate of the moisture content, two or more scans produced by detectors with different moisture responses must be used and the results cross-referenced. These different detector types are created by varying the distance between the detector and emitter and by filtering out some or all of the low-energy neutrons that return to the detector (thereby emphasizing the high-energy neutrons).

Because there are a wide range of possible moisture contents, anomalies, and detector types, the problem of cross-referencing and determining the best estimate of the moisture content becomes very involved. It is possible to solve this problem using calculators or spreadsheet software but the process is very tedious and could not be completed in a timely manner. It was decided, therefore, to develop a computer program to automate the process.

Work on this project was initiated in the fall of 1984 with all work scheduled to be completed by September 30, 1995. Estimated resource requirements are 0.5 staff years.

1.4 DELIVERABLES

The primary deliverables for this project are the TMAD code itself, the subsidiary code LIBMAKR, the data library to be used by TMAD, a report describing the results of a preliminary application of the code, and the required quality assurance documentation. Specifically, the quality assurance documentation shall include a Project Management Plan, a Design Requirements and Description document, a Testing and Validation document, and a User's Guide.

The major milestones and deliverables are shown in Figure 1.

Figure 1. Milestones.

1.5 DEFINITIONS

The following definitions will help to understand the neutron probe measurement process and the TMAD code.

TMAD - The name of the code being developed is TMAD. The name was derived from the phrase "tank moisture and anomaly detection."

Neutron probe - The neutron probe is a device consisting of a neutron emitter and a neutron detector. The device is lowered to the bottom of a liquid observation well and then slowly raised. While it is being raised, it is continuously emitting neutrons. At predetermined intervals the number of neutrons per second reaching the detector are measured.

Scan - A scan is the raw data recorded by the neutron (or other type) probe. It typically consists of a series of pairs of data points, with each pair consisting of a depth and a detector response.

Liquid observation well - A liquid observation well is a pipe, closed at the bottom and open at the top, that has been inserted into the waste. It allows probes to be lowered into the tank without coming into direct contact with the waste. This avoids the need to decontaminate the probe after every scan.

MCNP - MCNP is the name of the code that will be used to model the detector response in the waste tank, thereby producing the benchmark data. The name is derived from the phrase "Monte Carlo N-Particle."

2.0 PROJECT ORGANIZATION

This section outlines the project organization for the development of the TMAD code.

2.1 PROCESS MODEL

This Project Management Plan was developed following the guidelines of WHC-CM-3-10 and the Project Management Plan checklist (see Appendix A).

2.2 ORGANIZATIONAL STRUCTURE

This project will be carried out by the Nuclear Analysis and Characterization (NAC) group. The manager of NAC (Hans Toffer) will be the Cognizant Manager for the project and will be responsible for assigning staffing and approving completed work before it is released to the customer. Scott Finrock will be the System Developer and the Code Custodian for the completed code.

2.3 ORGANIZATIONAL BOUNDARIES AND INTERFACES

This project was authorized and funded by Gary Dukelow, Manager, Tank Waste Remediation System Safety Engineering. He is the customer for this work and will be responsible for the final acceptance of the completed work.

All work on the project will be conducted by staff of the NAC group. This group reports to Safety Analysis and Nuclear Engineering. A primary interface for the project will be with the neutron probe development team, which will provide the benchmark and scan data that the code will operate on. This project is headed by Todd Watson, an NAC scientist. The task of independent review of the code documentation will be assigned to Ralph Crowe, a member of the NAC group who is knowledgeable in both tank waste moisture measurement and code development and documentation but who is not part of the actual code development work. Quality assurance review of the code documentation will be performed by Phil Edwards.

2.4 RESPONSIBILITIES

Scott Finfrock, a member of the NAC group, will be responsible for all aspects of the code development and delivery. Todd Watson, also of NAC, will be responsible for delivery of the benchmark and scan data required for testing the code and for some of the analysis of the results of the preliminary application of the code.

3.0 MANAGERIAL PROCESS

This section describes the managerial objectives and requirements for the project.

3.1 MANAGEMENT OBJECTIVES AND PRIORITIES

The primary management goal for this project is to have a fully functioning and tested version of the code ready for field application by the end of fiscal year 1995. Progress on the project will be monitored by oral status reports at biweekly meetings (as scheduled by the customer) in conjunction with the neutron probe development project.

3.2 ASSUMPTIONS, DEPENDENCIES, AND CONSTRAINTS

The primary assumption of this project is that the different neutron probes under development, possibly in conjunction with the electro-magnetic induction (EMI) probe, will provide measurements that can be cross-referenced (by means of the TMAD code) to provide a unique interpretation of the moisture content of the waste. This assumption has been validated to a large extent using laboratory tests and computer modeling.

The completion of this project depends on the availability of a complete benchmark data set, a project that is being conducted concurrently. To a lesser extent it also depends on the availability and reliability of the actual scan data, which is necessary for validating the code.

3.3 ACCEPTANCE CRITERIA

The TMAD code will be tested for acceptability on completion. The testing criterion will be its ability to reproduce hand calculations of the waste moisture content and anomaly size to three significant digits. Deviations in excess of that are acceptable only if they can be shown to be a result of approved changes in the algorithm from what is used for the hand calculations. Some differences are anticipated as the code will use a second order curve fit while the hand calculations use linear interpolation. The acceptance criterion must be met for sample points representing 0.0, 5.0, 10.0, 20.0, and 50.0 percent moisture content. In addition, testing must be performed on one point from actual scan data.

3.4 RISK MANAGEMENT

Only one significant risk factor has been identified for this project: the completion of the necessary documentation. Because code development is scheduled to continue into July of 1995, there will be only two months at the end of the project in which to complete all necessary documentation and reviews. Considerable attention will need to be given to this task in order to avoid impacting the project's completion date.

3.4 MONITORING AND CONTROLLING MECHANISMS

The primary monitoring and reporting mechanism for this project will be the (approximately) biweekly meetings conducted by the customer for tracking progress on the neutron probe development. At these meetings oral status reports will be presented and compared to the milestones presented in this document. Adherence to this project plan will be tracked through independent reviews of the code and its associated quality assurance documentation.

3.5 STAFFING PLAN

This project requires one person, working approximately half-time, for approximately one year. The person needs to be experienced with software development and familiar with the principles of the neutron probe.

4.0 TECHNICAL PROCESS

4.1 METHODS, TOOLS, AND TECHNIQUES

The following methods, tools, and techniques have been specified for this project.

- The code will be developed using the WHC-CM-3-10 life cycle model.
- The code will be written using the Fortran computer programming language, using good programming practices.
- The target platform will be a SiliconGraphics Incorporated (SGI) workstation, however, machine dependencies will be avoided to the extent possible.

4.2 DOCUMENTATION

The following documents will be produced for this project:

- Project Management Plan
- Software Requirements Specification and Design Description
- Software Verification and Validation Report
- User's Guide.

These documents will be released as Supporting Documents (SD's) and each will be subject to independent review and Quality Assurance approval. Ralph Crowe of the NAC group will serve as the independent reviewer.

4.3 SYSTEM CONFIGURATION MANAGEMENT PLAN

This section provides the Code Management Procedures that will be used to maintain the TMAD code. These procedures have been developed in accordance with WHC-CM-3-10 and are intended to ensure that all users are accessing the appropriate version of the code, no unauthorized changes are made in the code, and a historical record is maintained of all versions (including superseded versions) of the code. This plan will be put in place before the release of the code for installation and operational use.

4.3.1 Configuration Identification

Configuration control is necessary to ensure that the correct version of the code is being used. It also provides traceability in the event that an error is found in the code.

The initial release of the code shall be identified as version 1.0, where the '1' is the major revision number and the '0' is the minor revision number. There shall also be a release date associated with the version number. The version number and the release date shall be clearly shown in the text of the code, in the interactive output of the code, and in any output files produced by the code.

Any change in the code, no matter how minor, must be accompanied by a new version number. The new version number shall be established in one of two ways: (1) either the minor revision number will be incremented by 1 or (2) the major revision number will be incremented by 1 and the minor revision number will be set to 0. The Code Custodian shall decide which method to use, but typically the second method is used when the modification substantially changes the functionality, theoretical foundation, or use of the code. Any other modification would use the first method.

4.3.2 Configuration Control

All aspects of configuration control will be the responsibility of the Code Custodian. The Code Custodian alone will have change control authority and will be responsible for receiving, processing, approving, and recording change requests. In the event that the change will result in the code not meeting the system requirements as specified in the System Requirements and Design Description document, the change must be approved by the Cognizant Manager and the Customer. Any user may initiate a change request or problem report. All change requests and problem reports should be made directly to the code custodian.

Every action by the Code Custodian that directly affects the code shall be recorded in the Code Logbook in the form of a letter, typically from the Code Custodian to the Cognizant Manager. Such actions include (but are not limited to) assigning a new Code Custodian, changing the location of controlled files, changing the code itself, and changing the code documentation.

If a change is made in the code or in the computer system on which it is implemented (such as an operating system upgrade) requiring the code to be recompiled, then a precursory code verification test shall be performed (as defined in the System Verification and Validation Report). The results of this test shall be documented in the logbook. If the results show a change of greater than 10% over the previous result for the same test, then it will be necessary to perform a complete revalidation of the code (as defined in the System Verification and Validation Report). This will require that the System Verification and Validation Report be reissued.

Any time a new version of the code is released the Code Custodian shall document the changes associated with it. This could be as simple as a single letter report included in the logbook, or as complicated as a complete revision of all of the code documents. Any documentation that becomes inaccurate or insufficient for regular use of the code, as a result of changes to the code, must be updated. The Code Custodian shall determine the degree and nature of documentation required to accomplish this. In any event, the users shall be informed of any changes in the usage of the code or interpretation of code results. The users shall also be informed any time there is a revision to one of the following documents:

- System Requirements Specification and Design Description
- Verification and Validation Report
- User's Manual

An electronic copy of the source code shall be maintained for each version of the code. These files shall be maintained in the same place and manner as the source code for the current version, as described in Sections 4.3.5 and 4.3.6.

4.3.3 Configuration Status Accounting

Any release of a new version of the code must be documented in the logbook. This must include the version number, the date of release, the document number (with revision number specified) of the current version of each of the Quality Assurance documents, a brief description of the changes, and a list of any Change Requests or Problem Reports that went into the new version.

4.3.4 Audits and Reviews

When it is necessary to re-release one of the quality assurance documents associated with this project, that document must again go through independent review and quality assurance approval.

4.3.5 Access Control

The source code files shall be in electronic format and the location of the file must be documented in the code logbook. If possible, the file should have access control limited to the Code Custodian (and System Administrators of the system the file is stored on if applicable). To prevent unauthorized executables from being created, the source code shall not be distributed or released in electronic form. Exceptions to this rule may be authorized by the Cognizant Manager. Hard copies of the source code may be distributed to specific individuals, as needed, but this is discouraged. If a user needs to know details of a code, a request should be made to the Code Custodian.

The executable file shall be stored in the same manner as the source code file, except that it must have access limits allowing it to be executed by the users. Only the Code Custodian (and system administrators of the system the file is stored on if applicable) should have write access to the file (if possible). The same people should also be the only ones to have read access to the file (to prevent the propagation of copies of the executable). It may be necessary, however, because of system limitations, to give the users read access. If this is the case, the operating procedures given to the users shall state that the user shall only copy the code if necessary to execute it and the copy shall be deleted immediately after use.

The data libraries shall be stored in the same manner as the executable except that it is necessary for the users to have read access to the data libraries. The operating procedures given to the users shall state that the user shall only access the identified data library files and shall not make any copy of those files.

The Code Custodian shall establish and maintain a list of qualified users. This is necessary so that the Code Custodian will know who to contact in the event there is a change to the code. Also, access to the executable and data files should be limited to these users if possible.

On some computer systems it may not be possible to strictly limit access, but steps can be taken to prevent inadvertent unauthorized access. It is recommended that a script file be created and the users instructed to run this rather than running the executable file directly. When the script file is run it will check the user's name against the list of qualified users. If the name is found, the script file will run the executable file. Otherwise a message will be printed instructing the user on how to gain access. The minimum qualifications for users shall be approved by the Cognizant Manager and recorded in the code logbook.

4.3.6 Backup and Recovery

All of the files identified in Section 4.3.5 shall be backed up. Backup shall be accomplished by maintaining a separate copy of each file. The location of the backup copy shall be identified in the code logbook. The backup copy may not reside on the same physical computer system as the primary copy. If possible, access to the backup copy should be limited to the Code Custodian (and System Administrators of the system the file is stored on if applicable). A hard copy of the current version of the source code must be maintained and the location identified in the logbook.

In the event that one of the copies of the files identified in Section 4.3.5 is destroyed or corrupted, recovery shall be accomplished by the code custodian immediately making a duplicate of the surviving copy and storing it as specified in the preceding paragraph.

If the executable was destroyed then, after replacing the file with a copy of the backup file, the code custodian shall perform a precursory code verification test as described in Section 4.3.2. Once the test has been completed, all registered users shall be notified of the event and the recovery.

4.4 ACQUISITION

No acquisitions are planned for this project.

4.5 DATA MANAGEMENT

No sitewide data management issues or strategies have been identified as being important for this project other than configuration and access control (see Section 4.3).

5.0 WORK PACKAGES, SCHEDULE, AND BUDGET

The resource requirements for this project are described in Section 3.6.

6.0 VERIFICATION AND VALIDATION

The verification and validation tasks associated with this project are described in the Verification and Validation Report.

7.0 REFERENCES

WHC-CM-3-10, *Software Practices*, Westinghouse Hanford Company, Richland, Washington.

APPENDIX A
PROJECT PLANNING CHECKLIST

APPENDIX A - PROJECT PLANNING CHECKLIST

	PLANNED			
	YES	NO	NA	COMMENT
1.0 CONCEPT PHASE				
1.1 Tasks				
Work authorization identified	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
Capital funds requirements identified	<u> </u>	<u> </u>	<u>X</u>	<u> </u>
Data Administration Council early notification	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
Site Statement of Strategy input prepared	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
Approval requirements of documents determined	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
System concept prepared	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
Acceptance criteria obtained	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
DOE sites surveyed for suitable solution	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
V&V concept phase activities performed	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
Project file and issue log initiated	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
1.2 Reviews				
Data Administration Council concept review	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
System concept review	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
RL MIS Board review	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
1.3 Products				
System concept documentation	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
2.0 REQUIREMENTS DEFINITION				
2.1 Tasks				
Project management plan prepared	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
System requirements specification prepared	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
System verification and validation plan prepared	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
Approval requirements of documents determined	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
Business process, data, and event model prepared	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
Request for information prepared	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
2.2 Reviews				
Project management plan review	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
System requirements specification review	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
System verification and validation plan review	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
2.3 Products				
Project management plan	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
System requirements specification	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
System verification and validation plan	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
Request for information	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
Computer Security Evaluation form	<u> </u>	<u>X</u>	<u> </u>	<u> </u>

	PLANNED			
	YES	NO	NA	COMMENT
3.0 REQUIREMENTS ANALYSIS				
3.1 Tasks				
System requirements specification analysis	X			
Additional software requirements documented	X			
Acceptance criteria prepared	X			
Conceptual design prepared	X			
ADP acquisition/implementation plan started			X	
Change control authority documented	X			
Cost and schedule estimate for remainder of project requested or prepared		X		
Project management plan update				
- Cost and schedule refined		X		
Data dictionary updated		X		
Staff members qualifications documented		X		
Staff members training needs identified		X		
V&V requirements phase activities performed			X	
Test plan prepared (system and acceptance)	X			
Project file and issue log updated			X	
3.2 Reviews				
Project management plan review	X			
System requirements specification review	X			
Conceptual design/alternatives review	X			
Data Administration Council requirements review		X		
3.3 Products				
System requirements specifications	X			
Alternatives analysis documentation		X		
Acceptance criteria		X		
Test plan (system and acceptance)	X			
User documentation	X			
Project management plan updated	X			
Data dictionary refined		X		
4.0 PRELIMINARY DESIGN				
4.1 Tasks				
Approval requirements of documents determined			X	
Logical process and logical data model prepared	X			
Available software and hardware determined		X		
ADP software and hardware acquisition plan completed and submitted for processing			X	
Preliminary design description prepared		X		
RFP prepared			X	
Request for Proposal submitted to IRM				
Acquisition Planning/Support			X	
Project management plan updated				
- Cost and schedule refined		X		
Computer Security Evaluation form updated when appropriate			X	

PLANNED		NA	COMMENT
YES	NO		

4.2 Reviews

RL MIS Board review
Preliminary design review
RFP review
Project management plan review

	X		
	X		
		X	
	X		

4.3 Products

ADP acquisition/implementation plan
Preliminary design description
Preliminary design review records
RFP
Project management plan (updated)
Computer Security Evaluation form (updated)

		X	
	X		
	X		
		X	
	X		
		X	

5.0 DETAIL DESIGN**5.1 Tasks**

Approval requirements of documents determined
Detail design description prepared
Physical process & physical data model prepared
Site data dictionary updated
System database registered with Data Standards and Administration
Test plan updated (component and integration)
Manual forms and electronic forms prepared
Operations (production) criteria established
Test design prepared (component, integration, system, and acceptance)
Conversion specifications prepared
Project management plan updated
- Cost and schedule refined
User training planning prepared
Company policies and procedures changes identified
Capital funding requirements revised
V&V design phase activities performed
Project file and issue log updated

X			
X			
X			
		X	
X			
X			
		X	
	X		
X			
		X	
	X		
		X	

5.2 Reviews

System detail design review
Detail design review
Data Administration Council design review
Test plans and test design review

X			
X			
	X		
X			

	PLANNED		
	YES	NO	NA COMMENT
5.3 Products			
System detail design description	<u>X</u>	___	___
Design review records	<u>X</u>	___	___
Physical data model and physical process model	<u>X</u>	___	___
Conversion specifications	___	___	<u>X</u>
Test plan and test design	<u>X</u>	___	___
Training plan	___	<u>X</u>	___
User documentation (updated)	<u>X</u>	___	___
6.0 IMPLEMENTATION PHASE			
6.1 Tasks			
Approval requirements of documents determined	<u>X</u>	___	___
Software programming	<u>X</u>	___	___
Software walkthroughs	___	<u>X</u>	___
Test cases prepared (component, integration, system, and acceptance)	<u>X</u>	___	___
Test procedures prepared (component, integration, and system)	<u>X</u>	___	___
Software components released to test	<u>X</u>	___	___
Test execution (component)	<u>X</u>	___	___
Conversion software coded and tested	___	___	<u>X</u>
Operation and maintenance documentation prepared	___	<u>X</u>	___
V&V implementation phase activities performed	<u>X</u>	___	___
Project file and issue log updated	___	___	<u>X</u>
6.2 Reviews			
User documentation review	<u>X</u>	___	___
Code walkthroughs	___	___	<u>X</u>
Test cases and procedures review	<u>X</u>	___	___
6.3 Products			
Software components	<u>X</u>	___	___
Conversion software	___	___	<u>X</u>
Test case and procedures documentation (component, integration, system)	<u>X</u>	___	___
User documentation (updated)	<u>X</u>	___	___
Operation and maintenance documentation	___	___	<u>X</u>
Training materials	___	___	<u>X</u>
User procedures	<u>X</u>	___	___

	PLANNED		NA	COMMENT
	YES	NO		
7.0 INTEGRATION AND SYSTEM TESTING				
7.1 Tasks				
Approval requirements of documents determined	<u>X</u>	_____	_____	_____
Issue log items resolved	_____	_____	<u>X</u>	_____
Test procedures prepared (acceptance)	_____	_____	<u>X</u>	_____
Software released for testing	<u>X</u>	_____	_____	_____
System configuration management plan prepared	_____	<u>X</u>	_____	_____
Test execution (conversion software)	_____	_____	<u>X</u>	_____
Test execution (integration)	<u>X</u>	_____	_____	_____
Test execution (system)	<u>X</u>	_____	_____	_____
Training materials verified	_____	_____	<u>X</u>	_____
Physical data and process models updated	<u>X</u>	_____	_____	_____
ADP equipment installed and tested	_____	_____	<u>X</u>	_____
7.2 Reviews				
Acceptance test procedures review	_____	_____	<u>X</u>	_____
Test readiness review	_____	_____	<u>X</u>	_____
System configuration management plan review	_____	_____	<u>X</u>	_____
7.3 Products				
Test results (integration, system)	<u>X</u>	_____	_____	_____
Test procedures documentation (acceptance)	_____	_____	<u>X</u>	_____
System configuration management plan	_____	_____	<u>X</u>	_____
8.0 ACCEPTANCE TESTING				
8.1 Tasks				
Test execution (acceptance)	<u>X</u>	_____	_____	_____
V&V test phase activities performed	<u>X</u>	_____	_____	_____
Project file and issue log updated	_____	_____	<u>X</u>	_____
8.2 Reviews				
8.3 Products				
Test results (acceptance)	<u>X</u>	_____	_____	_____
User documentation (updated)	<u>X</u>	_____	_____	_____
Test summary report	<u>X</u>	_____	_____	_____
9.0 INSTALLATION AND CHECKOUT PHASE (CERTIFICATION)				
9.1 Tasks				
System installed	<u>X</u>	_____	_____	_____
Conversion software execution	_____	_____	<u>X</u>	_____
Data conversion verified	_____	_____	<u>X</u>	_____
System installation validated	<u>X</u>	_____	_____	_____

	PLANNED			COMMENT
	YES	NO	NA	
User training performed			X	
User procedures in place	X			
Initial operation runs evaluated	X			
Service level agreement for maintenance			X	
V&V installation and checkout phase activities performed			X	
Software configuration control plan prepared	X			
Final V&V report prepared	X			
Project file and issue log updated			X	
Post-Disaster Recovery plan prepared		X		
9.2 Reviews				
Installation review		X		
Acceptance review	X			
Data Administration Council closeout		X		
9.3 Products				
System installation package		X		
Software released for operation	X			
V&V final report	X			
Customer buy-off	X			
Project file		X		
Post-Disaster Recovery plan	X			
Software configuration control plan	X			