

U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
OFFICE OF QUALITY ASSURANCE

SURVEILLANCE REPORT

OF

CRWMS (M&O)

Vienna, VA

SURVEILLANCE NUMBER HQ-SR-94-01

October 19-21, 1993

PRIMARY ACTIVITY EVALUATED

Preparation and Review of the Interface Specification Document

Prepared by: F. H. Lentz
F. Hugh Lentz
Surveillance Team Leader
Headquarters Quality Assurance Division

Date: 11/8/93

Approved by: R. W. Horton
Donald G. Horton
Director
Office of Quality Assurance

Date: 12/1/93

1.0 EXECUTIVE SUMMARY

Surveillance HQ-SR-94-01 was conducted to evaluate the preparation and review of the CRWMS Interface Specification (IFS). The surveillance was conducted at the M&O offices in Vienna, VA on October 19-21, 1993. The surveillance team consisted of personnel from Headquarters Office of Quality Assurance (OQA). It was determined that the preparation and review process for the IFS was effectively implemented. Four recommendations were made for management consideration. The evaluation of user acceptance and implementation was inconclusive because the IFS had not been issued.

2.0 SCOPE

Surveillance HQ-SR-94-01 was conducted to evaluate the IFS preparation and review process. The surveillance was performance-based, concentrating on nine areas:

- a) IFS end-product
- b) TDPP preparation and review
- c) IFS preparer
- d) IFS preparation
- e) Review information and criteria
- f) IFS reviewers
- g) IFS technical review
- h) Comment resolution
- i) IFS concurrence

A table of the objectives and measurement criteria for each of the areas is presented in Attachment 1. After evaluating pre-determined performance objectives and measurements for these nine areas, the surveillance team concluded that the preparation and review process was effective.

The surveillance team used checklists based upon the performance objectives and the requirements of the following documents:

CRWMS M&O Quality Administrative Procedure, QAP-3-1, *Technical Document Review*, Revision 2, P01, effective 6/18/93

CRWMS M&O Quality Administrative Procedure, QAP-3-5, *Development of Technical Document*, Revision 2, P01, effective 6/18/93

CRWMS M&O Quality Administrative Procedure, QAP-2-1, *Indoctrination and Training*, Revision 2, P01, effective 6/18/93

CRWMS M&O Quality Administrative Procedure, QAP-2-2, *Verification of Personnel Qualification*, Revision 2, P01, effective 6/18/93

CRWMS M&O Technical Document Preparation Plan (TDPP) for the CRWMS Interface Specification (IFS), Revision 1, dated 3/11/93

DOE/RW/0214, *Quality Assurance Requirements and Description (QARD)*, Revision 4, ICN 4.1, effective 9/3/91

3.0 SURVEILLANCE TEAM

The surveillance team consisted of the following personnel:

Hugh Lentz	QATSS	Surveillance Team Leader
Robert Holliday	QATSS	Surveillance Team Member
Don Champagne	Weston	Surveillance Team Member

4.0 PERSONNEL CONTACTED

The personnel contacted during the surveillance are listed in Attachment 2.

5.0 SURVEILLANCE RESULTS

The results of the surveillance are presented for each of the identified nine performance-based areas of the IFS preparation and review process.

5.1 IFS End-Product

The Interface Specification (IFS) is one of three sets of documents which address the system level interfaces of the Civilian Radioactive Waste Management System (CRWMS). The purpose of the IFS is to identify the six interfaces between the four "elements" of the CRWMS. The four system elements are Waste Acceptance (WA), Monitored Retrievable Storage (MRS), Transportation System (Trans), and the Mined Geologic Disposal System (MGDS).

The second set of documents dealing with system interfaces are the System Requirements Documents (SRDs). The SRDs (there is one for each of the four system elements) identify requirements for the interfaces, and do so in part by presenting "N-Square diagrams", which relate inputs to outputs for interfaces between functions. The third set of interface documents are the Interface Control Documents (ICDs), which are in their early stages of preparation. The purpose of the ICDs is to document how the interface requirements are to be controlled.

The IFS appears to have accomplished its purpose. The surveillance team verified that the preparers of the ICD are using the (draft) IFS to develop annotated outlines. The ICD preparers indicated that the IFS is necessary for their work, and that they would have to create the IFS themselves if it did not exist. The IFS is proving to be a very important starting point for developing the ICDs.

The surveillance team concluded, based on an evaluation of reviewer comments and the IFS itself, that the IFS is well organized for its purpose: 1) it has a major section for each of the six interfaces, with each of these sections organized identically; 2) it repeats key functional information from the SRDs, first from one side of the interface and then the other; and 3) it then develops the physical interface description. The results are summarized as physical-interface N-square diagrams; which, while efficient, are not easy to understand. Furthermore, the IFS explanation of N-square diagrams, in Figure 3-3 and the associated text, are not as strong as the explanation provided in Figure 3-6 and the associated text in the Transportation-SRD. (See Recommendation 6.1.)

The assignment of responsibility for the interfaces is not clear in the IFS nor in the Technical Document Preparation Plan (TDPP). Section 1.3.5 of the IFS assigns responsibility for defining, controlling, and managing interfaces to the Interface Control Working Group (ICWG); and refers to the ICWG charter issued by the DOE Office of Systems and Compliance (RW-30). Section 4.G of the TDPP indicates that the ICWG charter is to be approved by the Program Baseline Change Control Board (PBCCB). At the time of the surveillance, the surveillance team could find no evidence that the ICWG charter had been approved by the PBCCB. It has since been determined that the ICWG is authorized by Section 4.1.1.4.2, "Interface Management", of the Systems Engineering Management Plan (SEMP) and the assignment of responsibilities for interface control is spelled out in the "TDPP for the Interface Control Document (ICD)". (See Recommendation 6.2.)

5.2 TDPP Preparation and Review

The surveillance team verified that a TDPP was developed, reviewed, approved, and issued. The TDPP contained all required sections in accordance with the implementing procedure. The TDPP specifies the types of reviewers, the review criteria, and the training requirements. The thoroughness and insight exhibited by reviewer comments on the DRRs provided ample evidence that the list of criteria was adequate and effective.

RW-30 commented on the original version of the TDPP; resolution of comments were incorporated into revision 1. Recently, TDPP, revision 2, has been sent to RW-30 for their review. The surveillance team verified that there were no significant changes.

5.3 IFS Preparer

The surveillance team was provided with an IFS document preparation and review history package which contained a list of the CRWMS IFS task team members. The process for the selection of the IFS preparer was reviewed and determined to be effective.

The surveillance team conducted an evaluation to determine if the selected IFS preparer has the proper qualifications and training in accordance with QAP-2-1 and QAP-2-2.

The verification of experience and education of the IFS document preparer was evaluated and determined to be in accordance with his position description. A statement of qualification for the IFS preparer had been prepared and signed by his supervisor.

The training records file for the IFS document preparer was reviewed for evidence that the necessary indoctrination and training had been accomplished. The surveillance team verified that the preparer had received a copy of the TDPP and had documented the required reading and self-study training prior to preparing the CRWMS IFS document.

5.4 IFS Preparation

The surveillance team verified that the IFS was satisfactorily prepared in accordance with the TDPP. The preparer's responses to the DRR comments verified that he understood the review criteria. There were five inputs to the IFS: the CRWM System Requirements Document (CRD) and the four SRDs. Adequate Technical Document Input Control (TDIC) forms were found in the preparer's file for all five documents. The preparer indicated that no unqualified inputs were needed to prepare the IFS; the surveillance team found no evidence to the contrary.

The review of the IFS Issues List suggested improvements in the M&O contractor system for tracking outstanding issues and for indicating where the issues appear in the document hierarchy. The IFS contains two outstanding issues (TBD/TBR):

1. Will there be a cask maintenance facility (CMF) at the MGDS?
2. To what destination would waste be transported from the MGDS?

The IFS Issue List forms for both issues were blank. The preparer had left the form blank because both issues appear in the Issue Lists for other documents, notably the Transportation-SRD. The surveillance team verified that the two issues appear in the Transportation-SRD, respectively as issues Trans-IL-005 and Trans-IL-014.

There are six Issues Lists, one for each the CRD, the four SRDs and the IFS (the latter list form being blank). The separate lists were developed when their parent documents were developed, more or less independent of each other. Most issues appear on more than one list. (See Recommendation 6.3.)

5.5 Review Information and Criteria

The surveillance team conducted interviews with six reviewers, including at least one from each of the four CRWMS elements (i.e., TRANS, WA, MRS, AND MGDS). The evaluation was performed to determine that the review criteria was adequate and that the appropriate background information had been provided to the reviewers. Each reviewer fully understood the review criteria and had based their review on the interface element activity for which they were responsible. The IFS review criteria in the TDPP were considered to be clear, valid, and reasonable. The reviewers indicated that the IFS document is currently adequate, knowing that there will be further input and updates required as the program develops.

The surveillance team examined the reviewer kickoff-meeting package to verify that the provided review criteria included those criteria required by the TDPP. The review criteria did not conflict with the SRDs, and it referenced input documents that are current, correct, and usable.

5.6 IFS Reviewers

The surveillance team conducted an evaluation of the IFS document review team qualifications (education and experience) plus their indoctrination and training.

Personnel records, including position descriptions, provided verification of experience and education of the IFS document review team. A statements of qualification for the IFS document reviewers were prepared and signed by their supervisor. One set of reviewer records was not available at the M&O location and had to be retrieved. (See Recommendation 6.4.)

M&O training records files for each of the IFS document reviewers were evaluated. The surveillance team verified that the necessary indoctrination and training had been completed, that each reviewer had been issued a copy of the TDPP, and that the required reading and self-study training had been documented prior to performing the CRWMS IFS document review.

5.7 IFS Review

The surveillance team verified that the review comments were documented on DRR forms. The adequacy, completeness, and appropriateness of the review criteria was verified by a thorough review of the DRR comments. Four reviewers failed to mark any of their comments as "mandatory". This was not a substantive problem because the preparer resolved every comment.

5.8 Comment Resolution

The surveillance team verified, by comparison of DRR comments and responses, that the resolution was consistent with the comments. All comments were resolved and accepted before document approval.

5.9 IFS Concurrence

A sample of twenty comment resolutions were verified as being incorporated into the IFS. Each reviewer signed, indicating concurrence of the IFS final version.

6.0 RECOMMENDATIONS

6.1 Consider replacing TDPP Figure 4-1, "N-Square Chart Definition", and the associated text with Figure 3-6 and the associated text from the Transportation-SRD. The latter figure and text provide a better description of the N-square diagrams.

6.2 In Section 1.3.5 of the IFS, clarify the authority and responsibilities for the ICWG by referring to the appropriate section of the TDPP for the ICD.

6.3 Consider combining the current six Issues Lists into a single list of unresolved issues. Most issues appear on more than one list, and sometimes more than once. A single issues list would cite every occurrence of each issue in all the documents. This would facilitate revision of the documents when the issue is resolved.

6.4 Personnel files for Dave Jones were available, but not at the M&O Human Resources area; they are kept with Johnson Associates, Inc. The surveillance team recommends that the files be kept at the M&O location.

7.0 GOOD POINTS

7.1 The Draft Issue Resolution Plan is a positive step toward combining and tracking the TBDs/TBRs.

7.2 During the preparation of the IFS, the M&O noted inconsistencies among the IFS and the SRDs. The M&O plans to describe and document the inconsistencies so that they can be reconciled by revising the SRDs. This action should be helpful to the various document users and for providing future traceability of interface requirements and descriptions.

8.0 LIST OF ATTACHMENTS

Attachment 1: Table of Objectives and Measurement Criteria for the IFS Review Process

Attachment 2: List of Personnel Contacted During the Surveillance

Attachment 3: List of Objective Evidence Reviewed During the Surveillance

ATTACHMENT 1

Table of Objectives and Measurement Criteria for the IFS Review Process

OBJECTIVE: Was the preparation & review of the IFS effective?		
SURVEILLANCE HQ-SR-94-01		
Date: 10/11/93 (N/A) = Not available		
FLOWCHART ELEMENT - What are the critical steps in the process?	OBJECTIVE - Why is it important to do this?	MEASUREMENT CRITERIA - How can we know if we are meeting the objective?
End-Product CRWMS INTERFACE SPECIFICATION Rev. 0B, QAP-3-1 Concurrence Draft	Identify the 6 inter-element interfaces (both functional and physical) between the 4 CRWMS elements Support the development of the ICDs	Review QAP-3-1 comments (OK for Surveil.) OCRWM Acceptance (N/A) Interview preparers of the ICDs
Provide TDPP preparation and review (V. Christiansen) QAP-3-5	Meets preparation and review criteria Provide guidance for IFS Basis for customer agreement Practical plan	Customer agreement User/reviewer comments TDPP revisions Surveillance evaluation (N/A)
Select IFS preparers (S. Cherkofsky) QAP-3-5	Qualified & trained preparer Area of expertise covered Computer capability (tables)	Qualification & training records Position Descriptions Management certification TDPP required training

OBJECTIVE: Was the preparation & review of the IFS effective?	SURVEILLANCE HQ-SR-94-01	Date: 10/11/93 (N/A) = Not available
FLOWCHART ELEMENT - What are the critical steps in the process?	OBJECTIVE - Why is it important to do this?	MEASUREMENT CRITERIA - How can we know if we are meeting the objective?
Perform IFS preparation QAP-3-5 TDPP	Meet TDPP requirements Meets all SRD requirements Consistency across all elements Detailed description defined one level below SRD	Surveillance Evaluation (N/A) Reviewer comments
Provide IFS review information & criteria QAP-3-5 TDPP	Adequate direction for reviewers Consistency for area of expertise Conforms to present design	Training (kick-off meeting) Volume & type of reviewer comments Surveillance Evaluation (N/A)
Select IFS reviewers (M&O - 4) (RW - 7) QAP-3-5	Qualified and trained reviewers Independent reviewers Appropriate discipline reviewers Areas of expertise	Qualification & training records Position Descriptions Management certification TDPP required training
Conduct IFS technical review QAP-3-1	PBCCB acceptance Practical document Acceptance across all elements Identify problems/good technical comments	User comments/concurrence Technical problems (N/A) Surveillance Evaluation (N/A)

<p>Provide comment resolution</p> <p>QAP-3-1</p>	<p>Documented resolution of comments (traceability)</p> <p>Improve document</p> <p>User ownership</p> <p>Address/incorporate comments</p>	<p>Concurrence</p> <p>QA records (N/A)</p> <p>Reviewer acceptance of resolution (no disputes)</p>
<p>Obtain concurrence with resulting IFS document</p> <p>QAP-3-5</p>	<p>M&O approval</p> <p>Customer acceptance</p> <p>Traceable back to SRDs</p>	<p>Surveillance Evaluation (N/A)</p> <p>Concurrence Feedback</p>

ATTACHMENT 2
Personnel Contacted During The Surveillance

NAME	ORG.	TITLE
George A. Carruth	M&O/SI	Manager, Systems Integration (SI)
Scott Cherkofsky	M&O/SI	System Engineer
Von Christiansen	M&O/SI	System Engineer
Eugene T. Chulick	M&O/Training	Manager, Training
Hubert Dameron	M&O/QA	Senior Technical Specialist
Tom Geer	M&O/SE	Acting Manager, Systems Engineering (SE)
Alvin L. Jenkins	M&O/SI	System Engineer
Dave Jones	M&O/WA	Supervisor, Contract Policy and Procedures
N. Prasanna Kumar	RW-421	General Engineer
Phyllis M. Lovett	M&O/SI	System Engineer
Gary U. Rogers	M&O/SI	Manager, System Planning and Integration
Nancy Slater	RW-432	General Engineer
Bill Teer	M&O/S&T	Assistant Project Manager, Transportation
Trieu Truong	RW-321	General Engineer

ATTACHMENT 3

Objective Evidence Reviewed During Surveillance

CRWMS M&O QAP-3-5 Rev. 2, PO2, Development of Technical Documents, effective 5/27/93

CRWMS Interface Specification, Rev. 0B (QAP-3-1 Concurrence Draft), dated 8/30/93

Document Review Records (DRRs) for the following reviewers:

P. Bunton	Regulatory/Licensing (R&L)
H. Dameron	QA
T. Geer	MGDS
J. Imam	R&L
D. Jones	WA
D. Kane	MRS
P. Kumar	MRS
N. Slater	WA
J. Richardson	MRS
D. Stucker	MGDS
B. Teer	Transportation
T. Truong	Systems Engineering

CRWMS M&O Technical Document Preparation Plan for Interface Control Documents, revision 0, dated 6/16/93

DOE/RW-0051, OCRWM Systems Engineering Management Plan (SEMP), Revision 2, dated 1/93

CRWMS M&O Technical Document Preparation Plan for CRWMS Interface Specifications, Revision 1, dated 3/11/93

Comments on TDPP, Rev. 0A by RW-30, Mark Senderling, dated 1/6/93

M&O Human Resources Personnel Records for:

Scott D. Cherkofsky
Hubert C. Dameron
William R. Teer
Thomas C. Geer

M&O Indoctrination/Training, Reading/Self-Study Records for:

Alan Berusch, RW-22
Priscilla Bunton, RW-331
Hubert C. Dameron, M&O
Thomas C. Geer, M&O
Jafar M. Imam, RW-332
David C. Jones, M&O
Prasanna N. Kumar, RW-421
John Richardson, Weston
Nancy H. Slater, RW-432
Dan Stucker, RW-22
Bill Teer, M&O
Trieu Truong, RW-321
Scott Cherkofsky, M&O

M&O Interoffice Correspondence from S. Willis to S. Cherkofsky, Assignment as IFS Preparer, dated 1/16/93

Technical Document Input Control forms: (five), one for each of the following:

CRD, Rev. 0
MGDS-RD, Rev. 0
MRS-SRD, PBCCB Review Draft
WA-SRD, Rev. 0
Transportation-SRD, RW-30 Review Preliminary Draft, dated 3/17/93

All five forms were originated by S. Cherkofsky, dated 3/16/93 and approved by S. Willis, dated 3/16/93.

**OCRWM Interface Control Working Group Charter, Rev. 0, dated 1/29/93
Approved by John P. Roberts, RW-30**

QAP-3-7, Rev. 1, Interface Control, dated 7/17/92

Issues List for the CRWMS IFS, Predecisional Draft II-A, dated 3/4/93

Issues List for TRANS-SRD, Revision 0, dated 10/08/93

Issues Resolution Plan, Preliminary Draft, dated 5/6/93

M&O Interoffice Correspondence from G. Carruth to Distribution, QAP-3-1 Review of the CRWMS IFS, dated 3/15/92 (with attached hand-outs for IFS Kick-off Meeting)

RW Systems 80 Records Packages for:

Trieu Truong, RW-321

Record No. SY-321-92-0017
SY-321-92-0671

Alan Berusch, RW-22

Record No. SY-321-92-0017
SY-321-92-0020
SY-131-92-0478

Dean Stucker, RW-22,

Record No. SY-22-92-0005
SY-22-92-0006

Dan Kane, RW-421

Record No. SY-421-92-0007
SY-421-92-0008
SY-421-92-0009
SY-421-92-0010

Memorandum - H. Jackson Hale, Director to OCRWM Associate Directors/OCRWM Office Directors, dated 3/01/93

QAP-3-1, Technical Document Review, effective date 10/30/93, approval date 10/11/93

Memorandum - To Distribution from J. S. Wells, Draft CRWMS IFS, dated 1/18/93