



## Department of Energy

Nevada Operations Office  
P. O. Box 98518  
Las Vegas, NV 89193-8518

WBS 1.2.9.3  
QA

FEB 26 1990

John H. Nelson  
Technical Project Officer for Yucca Mountain Project  
Science Applications International Corporation  
The Valley Bank Center, Suite 407  
101 Convention Center Drive  
Las Vegas, NV 89109

ACCEPTANCE OF AMENDED RESPONSE AND CLOSURE OF STANDARD DEFICIENCY REPORT (SDR) 043 RESULTING FROM YUCCA MOUNTAIN PROJECT OFFICE (PROJECT OFFICE) QUALITY ASSURANCE (QA) AUDIT 87-04 OF SCIENCE APPLICATIONS INTERNATIONAL CORPORATION (SAIC)

The Project Office QA staff has evaluated and accepted your amended response to SDR 043. Acceptance is based on agreement that the deficiency identified in SDR 043 was written against requirements that no longer exist and that SDR 449 is current, more appropriate, and encompasses the scope of SDR 043.

SDR 043 is also closed based on confirmation of statements from BLOCK 16 of the amended response, specifically:

4. The software has not been used, and is not being used, to generate data published in technical documents to support site characterization or repository design studies.
5. The software use has been suspended until further study commitments are authorized by the Yucca Mountain Project.
6. The software will be requalified for use in accordance with the Yucca Mountain Project QA requirements in effect at the time, if future calculations are required.

A copy of SDR 043 is enclosed for your records. When the corrective actions for SDR 449 are verified, the verification will determine that specific corrective actions have been instituted to preclude repetition of the type of deficiency identified in SDR 043.

9003120795 900226  
PIR WASTE  
WM-11 PDC

FULL TEXT ASCII SCAN

ADD: Kennedy

Ltr. Encl  
1 1

WM-11  
102.7  
NH03

FEB 26 1990

John H. Nelson

-2-

If you have any questions, please contact Robert E. Constable of my staff at 794-7945, or Catherine M. Thompson of SAIC at 794-7738.



Donald G. Horton, Director  
Quality Assurance Division  
Yucca Mountain Project Office

YMP:RBC-2139

Enclosure:  
SDR 043

cc w/encl:

Ralph Stein, HQ (RW-30) FORS  
D. E. Shelor, HQ (RW-3) FORS  
J. E. Clark, SAIC, Las Vegas, NV, 517/T-06  
W. V. Macnabb, SAIC, Las Vegas, NV, 517/T-04  
C. M. Thompson, SAIC, Las Vegas, NV, 517/T-08  
S. W. Zimmerman, NWPO, Carson City, NV  
J. E. Kennedy, NRC, Washington, DC ←

cc w/o encl:

N. J. Brogan, SAIC, Las Vegas, NV, 517/T-08  
J. W. Gilray, NRC, Las Vegas, NV

# WALDO STANDARD DEFICIENCY REPORT

N-QA-038  
3/87

8/27/87 - L 87-QA-RAK-017  
 Completed by Originating QA Organization  
 Completed by Organization in Block 5  
 Comp. by Orig. QA Org.

1 Date <u>6/22/87</u>		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2	
3 Discovered During <u>WMPO Audit 87-4</u>		3a Identified By <u>C. Thompson P. Colpo</u>		3b Branch Chief Concurrence Date <u>N/A</u>	
4 SDR No. <u>043</u>		Rev. <u>0</u>			
5 Organization <u>SAIC/T&amp;MSS</u>		6 Person(s) Contacted <u>B. Andrews</u>		7 Response Due Date is 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference, if Applicable) <u>T&amp;MSS Quality Assurance Procedure QP 3.2, "Use and Control of Computer Programs", Rev. 2, Para. 5.5 states in part that "Only SES (cont'd)"</u>					
9 Deficiency <u>During an interview with T&amp;MSS personnel assigned to the Transportation Planning and Analysis Task No. 1.2.3.6.2, it was determined that (cont'd)</u>					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective 1) Characterize the software by identifying the programs. 2) Develop the necessary documentation to describe the code (cont'd)					
11 QAE/Lead Auditor Date <u>C. Thompson 7/6/87</u>		12 Branch Manager Date <u>P. Colpo 7/7/87</u>		13 Project Quality Mgr. Date <u>James Blaylock 7/15/87</u>	
14 Remedial/Investigative Action(s) <u>See attached.</u>				15 Effective Date <u>N/A</u>	
16 Cause of the Condition & Corrective Action to Prevent Recurrence <u>See attached.</u>				17 Effective Date <u>October 23, 1987</u>	
18 Signature/Date <u>W Macraef 8/28/87</u> <u>John E. Thorne 8/28/87</u>					
19 Response <input checked="" type="checkbox"/> Accept <input type="checkbox"/> Amended Response		QAE/Lead Auditor/Date <u>C. Thompson 10/20/87</u>		Branch Manager/Date <u>P. Colpo 10/24/87</u>	
20 Amended Response <input checked="" type="checkbox"/> Accept <input type="checkbox"/> Reject		QAE/Lead Auditor/Date <u>C. Thompson 2/14/90</u>		Branch Manager/Date <u>J. Clark 2/14/90</u>	
21 Verification <input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date <u>C. Thompson 2/14/90</u>		Branch Manager/Date <u>J. Clark 2/14/90</u>	
22 Remarks <u>Unrequested Amended Response dated 1/19/90 (290-004)</u> <u>NOTE: SDR 043 closed on basis of SDR 449 - more current definition of problem. Verification of 449 will ensure corrective actions have been instituted to preclude repetition of similar problem.</u>					
23 QA CLOSURE		QAE/Lead Auditor/Date <u>C. Thompson 2/14/90</u>		Branch Manager/Date <u>J. Clark 2/14/90</u>	

Block 8 REQUIREMENT (cont'd)

and Auxiliary Software that has been documented and controlled in accordance with the procedure shall be used for T&MSS Project activities in support of the WMPD for Quality Assurance Level I, II, or III activities, as appropriate."

Section 5.4 of QP 3.2 further defines requirements for the responsibility for preparation of software documentation, for the extent of documentation development, and for software control.

In addition, the Administrative Procedure 1.24, "T&MSS Software Development and Maintenance", Rev. 0, 1/27/87, establishes the requirements for the development and control of software within T&MSS.

Block 9 DEFICIENCY (cont'd)

computer software (unnamed) is currently being used to perform risk analysis, a QA Level II activity. It was also determined that except for the source code, there is no documentation to support the development, existence, control, and use of the software. (Refer to Audit Checklist Item No. 3.0-8B-1)

Block 10 RECOMMENDED ACTIONS

capabilities, method and models used to describe code usage, and to describe the testing performed to verify and validate the software.

- 3) Send to the Configuration Management Branch Manager a copy of the approved computer software documentation package and computer code to establish appropriate baselines and place the software under the change control procedure.
- 4) Determine the cause of this deficiency and identify the steps that will be taken to prevent recurrence.
- 5) Investigate all other Level I and II activities for the possibility of a similar deficiency and taken appropriate remedial and corrective action.

## Response to SDR-043

### Remedial/Investigative Actions

The deficiency statement makes the following claims:

1. "computer software (unnamed) is currently being used to perform risk analysis, a QA level II activity."
2. "except for the source code, there is no documentation to support the development, existence, control or use of the software."

The first point is correct. Software is being used to perform a risk assessment. The role of this software is that of an electronic calculation. The effort is single purpose, several hundred executable statements in length and straightforward in scope.

The second point is only true to the extent that all current documentation was not available during the audit. Completed documentation is consistent with the intended use and role of the software. Documentation available during the audit included a report on model development and interim calculational results. This documentation has been the subject of two Independent Reviews. Further documentation on the development of the calculational aid is located at the Albuquerque SAIC office. Calculational aid documentation consists of a master disk in the possession of the author and a printout of the current version of the code verified and signed by the Albuquerque principal investigator and the software author. A sample problem is also available that was verified by a hand calculation. The current version of the calculational aid is also available in compiled form at the SAIC Las Vegas office.

Effective Date: N/A

### Cause of the Condition and Corrective Action to Prevent Recurrence

The current procedure covering the development of software (AP 1.24) is inadequate in that it does not allow for a reasonable level of documentation on software that is limited in scope, size and use. This is recognized in a draft revision to the procedure (OMP-03-04, 7-Aug-1987). The draft procedure would allow the use of software cited in the deficiency report under rules for calculational aides. A review of the draft procedure indicated that the following items would need to be completed over and above the documentation cited above:

1. Approval of the draft OMP-03-04. Approval is expected by mid October.
2. Prepare justification for classification of the risk analysis software as a calculational aid. Current documentation meets all other requirements for this class of software.

Effective Date: October 23, 1987

AMENDED RESPONSE TO SDR-043

BLOCK 14. REMEDIAL/INVESTIGATIVE ACTIONS

Investigative Actions. Pages i, iii and I-1 (Attachment A to this amended response) of the Waste Management Project Office Quality Assurance Program Plan (i.e., the WMPO QAPP, WMPO/88-1, Rev. 0, issued 2/18/88), documents the consolidation of its predecessors, NVO-196-18, Rev.2 and the T&MSS QAPP, Rev. 3. The Preface of the WMPO QAPP (Attachment A) states that "the T&MSS QAPP and procedures have been phased out and...activities performed by the T&MSS at the participant level will be conducted in accordance with the WMPO QAPP". Section 1.0 of the WMPO QAPP (Attachment A) also states that "Project quality related activities performed by all T&MSS personnel will be conducted by implementing the WMPO QAPP", [and Project Office approved procedures].\*

The SDR requirement block 8 cites the following "phased out" documents:

1. The T&MSS QAPP.
2. T&MSS procedure QP 3.2, Use and Control of Computer Programs.
3. T&MSS procedure AP 1.24, T&MSS Software Development and Maintenance.

The SDR deficiency block 10 states that computer software is being used to support a QA Level II activity for which there is no documentation except the source code. Correction of this deficiency is no longer feasible, however, because the software documentation requirements cited by this SDR have been eliminated and replaced by the following:

4. The WMPO QAPP and its revisions.
5. Project Office approved procedures.\*

Thus, meaningful corrective action cannot be taken to close this SDR using nonexistant QA requirements and procedures. YMP SDR 449 recommends appropriate corrective action to close-out this SDR consistent with current QA requirements.

Remedial Actions. Investigation reveals that the requirements of the T&MSS QAPP that formed the basis of this SDR have been superseded by the WMPO QAPP and its revisions. The following specific QA requirements supersede the SDR requirements cited:

Revision 1 to the WMPO QAPP, effective 4/20/89, page III-13, Section 4.1.9, states that "methods for determining the applicability of requirements and managing...software are contained in...the Project Office Software QA Plan..." [and Project Office approved procedures].\* Revision 1 to the WMPO QAPP, effective 4/20/89, page III-12, Section 4.1.1, also states that "the Project Office T&MSS contractor shall prepare a Project Office QA Plan containing a description of the software design, development, test, documentation and configuration management program...[that]...shall: relate the types of documentation to be prepared, reviewed and maintained..".

---

\* Revision 2 to the YMPO (formerly WMPO) QAPP, effective 1/12/90, page iii-1, replaces all references to APs, QMPs, and BTPs with the words "Project Office approved procedures".

*Ltr dtd 1/19/90 - JHN:RES. mk:m: L 90-004*

It is anticipated that the Project Office Software QA Plan will comply with Sections 4.1.1 and 4.1.9 of the YMPO QAPP by classifying certain software types (such as electronic calculations and commercial/auxiliary software) as exempt from the YMPO QAPP life cycle documentation requirements. The following justifications would apply to such exemptions:

1. Software that is not complex, not used to generate primary data, or is used only to simplify, automate, support or verify calculations should not be subject to the full life cycle controls of the YMP software QA requirements.
2. Software types that are relatively less complex and easily verified are best controlled and managed by technical procedures at the working level rather than by the Project Office Software QA Plan and its implementing procedures.

BLOCK 16. CAUSE OF THE CONDITION AND CORRECTIVE ACTION TO PREVENT RECURRENCE

This SDR should be closed and superseded by YMP SDR 449 for the following reasons:

1. The QA requirements for which it was written have been eliminated.
2. The specific documentation requirements for the software found deficient are being significantly changed subject to technical procedures prepared at the working level.
3. The SDR is no longer valid due to major changes made to the YMP QAP (NNWSI/88-9) and the Project Office QAPP (YMPO/88-1).

The specific software identified by this SDR requires no corrective action at this time due to the following reasons:

4. The software has not been used, and is not being used, to generate data published in technical documents to support site characterization or repository design studies.
5. The software use has been suspended until further study commitments are authorized by the YMP.
6. The software will be requalified for use in accordance with the YMP QA requirements in effect at the time, if future calculations are required.