



Department of Energy

Washington, DC 20585

FEB 14 2002

QA: QA

J. A. McNeish
Bechtel SAIC Company, LLC
1180 Town Center Drive, M/S 423
Las Vegas, NV 89144

EVALUATION OF COMPLETE RESPONSE TO, VERIFICATION OF CORRECTIVE ACTION AND CLOSURE OF DEFICIENCY REPORT (DR) BSC-02-D-022 RESULTING FROM THE OFFICE OF QUALITY ASSURANCE (OQA) SURVEILLANCE BSC-SR-02-03

The OQA staff has evaluated the complete response to, verified the corrective action of DR BSC-02-D-022 and determined the result to be satisfactory. As a result, the DR is considered closed.

If you have any questions, please contact either James Blaylock at (702) 794-1420 or Samuel E. Archuleta at (702) 794-1476.

James Blaylock
Ram Murthy, Acting Director
Office of Quality Assurance

OQA:JB-0632

Enclosure:
DR BSC-02-D-022



*Wm-11
NMSSD7*

cc w/encl:

N. K. Stablein, NRC, Rockville, MD
Robert Latta, NRC, Las Vegas, NV
S. W. Lynch, State of Nevada, Carson City, NV
Engelbrecht von Tiesenhausen, Clark County, Las Vegas, NV
R. W. Andrews, BSC, Las Vegas, NV
G. K. Beall, BSC, Las Vegas, NV
J. E. Gebhart, BSC, Las Vegas, NV
Norman Graves, BSC, Las Vegas, NV
S. H. Horton, BSC, Las Vegas, NV
R. P. Keele, BSC, Las Vegas, NV, M/S 280
D. T. Krisha, BSC, Las Vegas, NV
D. M. Kunihiro, BSC, Las Vegas, NV
T. J. Wall, BSC, Las Vegas, NV
N. H. Williams, BSC, Las Vegas, NV
S. E. Archuleta, NQS, Las Vegas, NV
W. J. Glasser, NQS, Las Vegas, NV
K. A. Hodges, NQS, Las Vegas, NV
D. G. Opielowski, NQS, Las Vegas, NV
J. R. Dyer, DOE/YMSCO, Las Vegas, NV
C. E. Hampton, DOE/YMSCO, Las Vegas, NV
D. G. Horton, DOE/YMSCO, Las Vegas, NV
J. M. Replogle, DOE/YMSCO, Las Vegas, NV
B. M. Terrell, DOE/YMSCO, Las Vegas, NV
R. N. Wells, DOE/YMSCO, Las Vegas, NV

**OFFICE OF CIVILIAN
RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.**

ORIGINAL
DEFICIENCY REPORT
 DEFICIENCY
 CORRECTIVE ACTION
-REPORT

NO. BSC-02-D-022

PAGE 1 OF
QA: QA

DEFICIENCY/CORRECTIVE ACTION REPORT

1. Controlling Document: AP-SI.1Q, Rev 3, ICN 1, ECN 1	2. Related Report No.: BSC-SR-02-03
3. Responsible Organization: BSC	4. Discussed With: Jerry McNeish, Stephen Splawn, William Watson, Judy Gebhart

5. Requirement:
- AP-SI.1Q, Section 5.10 establishes controls for the interim use of unqualified software.
 - AP-SI.1Q, Section 5.10.1c) refers users of the procedure to Sections 5.4 or 5.5 for the preparation and processing of a Software Activity Plan (SAP), Section 5.10.1c) also includes a requirement that the SAP shall include "special consideration and discussion on how the unqualified software will be used, a schedule for qualification, and comparison confirmation methodologies, including acceptance criteria to be used to determine the extent of impact evaluations that may be applicable once the software is qualified." Sections 5.4.1.2.1 or 5.5.1.2.1 further refer users of the procedure to Section 5.2.1 for requirements for developing the SAP.
 - AP-SI.1Q, Section 5.2.1 establishes the requirements for documentation of software activity planning.
 - AP-SI.1Q, Section 5.4.1.2.2 or 5.5.1.2.2 require that the Responsible Manager's Supervisor review the SAP and concur or resolve issues with the Responsible Manager.
 - Technical Work Plan (TWP) TWP-MGR-MD-000014, Rev 01, Section 13.0 states in part: "...Unqualified software, or software that has been modified as a result of executing work contained in this TWP, will be submitted to Software Configuration Management in accordance with AP-SI.1Q, Section 5.10, Interim Use...."

6. Description of Condition:
During Surveillance BSC-DR-02-03, the Configuration Control Documents for the following software codes were reviewed: (a). ANCPHMIX.BAS V1.0; (b) BATH_10 V1.0; (c) PATCH_FAIL_LAG V1.0; (d) PDFCDF V1.0; (e) SEEPAGEDLLMK2_UU V1.0; (f) SEEPAGEDLLV2UU V1.0; and (g) GoldSim V7.17-200; and (h) LAG_WPFAILURE_T1 V1.0

1. Contrary to requirement 1, the Software Activity Plans for software codes (b) through (h) referenced above were deficient in that, contrary to requirement 2, the SAPs did not effectively address the schedule for qualification, nor did they describe the confirmation methodologies and acceptance criteria.

Continued on Page 2, Continuation Page

7. Initiator: <i>Sam E. Archuleta</i> Sam E. Archuleta Date 11-5-01	9. Does a stop work condition exist? (Not required for a DR) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Check One: <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
---	---

10. Recommended Actions:
None

11. QA Review: <i>Sam E. Archuleta</i> QAR Sam E. Archuleta Date 11-5-01	12. Response Due Date: 10 Working Days From Issuance
--	---

13. DOQA Issuance Approval:

Printed Name Robert D. Davis Signature *James Blaylock for* Date 11/19/01

22. Corrective Actions Verified: QAR <i>Sam E. Archuleta</i> Date 2-3-02	23. Closure Approved by: DOQA <i>James Blaylock for</i> Date 2/14/02
---	---

OFFICE OF CIVILIAN
RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.

8. DR/CAR
 Stop Work Order

NO. BSC-02-D-022

PAGE OF
QA: QA

DEFICIENCY/CORRECTIVE ACTION REPORT/STOP WORK ORDER CONTINUATION PAGE

Block 6 - Description of Condition: Continued

2. Contrary to requirement 3, the Work Scope statements in all seven SAPs (b through h) are inaccurate in that they state that the non-qualified code will be utilized in non-quality affecting activities until final decisions on the modeling approach for LA are made, yet all seven codes (b through h) were already used in the FY01 Supplemental Science and Performance Analyses (SSPA), Vol 2, which is a "QA: QA " designated document, and therefore represents quality affecting work. In addition, this use of software conflicts with the planned course of action. that is documented in Section 13 of the TWP, requirement 5.
3. Contrary to requirement 4, the review of the SAPs by the Responsible Manager was ineffective in that it failed to detect the deficiencies cited in number 1, above.

TYPE RESPONSE:

- Initial
- Complete
- Amended

**OFFICE OF CIVILIAN
RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.**

DR/CAR NO.
BSC-02-D-022
PAGE OF
QA: QA

DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)

14a. Immediate Actions:

No software development activities were in process that required immediate action. The conditions noted do not result in the software being out of configuration management control.

14. Remedial Actions:

Condition 1

SAPs for the codes identified in Section 15, Extent of Condition, were revised to address deficiencies associated with qualification schedules and confirmation.

Condition 2

SAPs for the codes identified in Section 15, Extent of Condition, were revised to clarify utilization.

(Continued on Continuation Page)

15. Extent of Condition:

Condition 1 and 2

SAP's for the 32 codes identified in the initial response were reviewed. Of these 22 codes were identified as non-compliant with the requirements of AP-SI.1Q as noted in Conditions 1 and 2 of the DR. Condition applicability and corrective action status for these 22 codes are given in Table 1

plus 3 additional SAPs identified later 1/31/01
5 as 1/31/01
27 1/31/01

[Continued on Continuation Page]

16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)

The causes of these conditions are as specified under Section 15, Extent of Condition, Condition 3 on the continuation page.

17. Action to Preclude Recurrence:

The primary action to preclude recurrence is the restriction in Section 5.10 that only allows interim use of unqualified software in products that support the SR. Thus no interim use of unqualified software will be possible for the LA. In addition, the discussions described in Block 14, Condition 3 will assure that Performance Analysis Project Department Heads obtain clarification of procedure requirements when such an interpretation of applicability (Section 5.7.4) is made and escalate cases where conflict exists.

18. Due Date: ~~January 31, 2002~~ *2/5/02* *1/31/02*

- For submittal of complete response
- For completion of corrective action ~~2/25/02~~

19. Response by: Jerry McNeish

Jerry A McNeish *Jed BSCAT*
Date: January 31, 2002 Phone: 295-6858

20. Evaluation: Accept Partially Accept Reject

QA: *David Archuleta* Date *2.3.02*

21. Concurrence:

DOQA *Jane Blaylock* for Date *2/14/02*

**OFFICE OF CIVILIAN
RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.**

8. DR/CAR
 Stop Work Order

BSC-02-D-022

PAGE OF
QA: QA

DEFICIENCY/CORRECTIVE ACTION REPORT/STOP WORK ORDER CONTINUATION PAGE

14. Remedial Action: (continued)

Condition 1

SAPs for the codes identified in Section 15, Extent of Condition, were revised to address deficiencies associated with qualification schedules and confirmation.

Condition 2

SAPs for the codes identified in Section 15, Extent of Condition, were revised to clarify utilization.

Condition 3

TSPA managers have been notified by e-mail that in cases such as this, e-mail request for clarification of procedure requirements should be made and, in cases where the clarification conflicts with planned action, the issue be immediately elevated to Project Management/QA Management for resolution.

15. Extent of Condition: (continued)

Condition 1 and 2 (continued)

Table 1 Condition Applicability and Corrective Action Status

DICTRA	Condition 1	SAP Revised
Image Pro Plus	Condition 1	SAP Revised
MSTHAC	Condition 1	SAP Revised
THERMO-CALC	Condition 1	SAP Revised
DCPT	Condition 1	Qualification SAP competed
Delba.dat	Condition 1	SMR completed
FLAC3D	Condition 1	CP1 and CP2 documents completed
Gpzones.dat	Condition 1	SMR completed
infil2grid	Condition 1	SMR completed
ITOUGH2	Condition 1	Qualification SAP completed
tin.dat	Condition 1	SMR completed
TOUGH2	Condition 1	Version number changed to V1.6 for which a qualification SAP is completed
Wingridder	Condition 1	Qualification SAP completed/
2kgrid8.for	Condition 1	SMR completed/approved.
Bath_10	Condition 1 and 2	SAP Revised
Gold Sim	Condition 1 and 2	SAP Revised
Patch_Fail_Lag	Condition 1 and 2	SAP Revised
PDFCDF	Condition 1 and 2	SAP Revised
SeepagedIIMk2_uu	Condition 1 and 2	SAP Revised
SeepagedI2uu	Condition 1 and 2	SAP Revised
Writefiles_new	Condition 1 and 2	SAP Revised
Transform_Perc_files_into_Tables	Condition 1 and 2	SAP Revised
pass_data V1.0	Condition 1 and 2	SAP Revised
statistics V1.0	Condition 1 and 2	SAP Revised
Extract_Qinf V1.0	Condition 1 and 2	SAP Revised

Condition 3

TWP-MGR-MD-000014 REV 01 stated that software used in the SSPA would be qualified only if it would be used in LA. Consequently, TSPA staff and management believed that the language of AP-SI.1Q, Section 5.10.3.b) "Continue work on the documentation and qualification aspects of the software in accordance with this procedure" did not preclude following Section 5.7.4, Canceling or Retiring Software. This understanding was further reinforced by a letter report to the NRC "Transmittal of Evaluation of the Impact of Unqualified Software and Data on Total system Performance Assessment for the Site Recommendation, (TSPA-SR), Revision 0, ICN1". As a result TSPA staff and management believed the SAP's were in compliance with AP-SI.1Q. The review of the SAPs by the Responsible Manager did not detect that there was a possible conflict between the project position on unqualified software used in the SSPA and the language in Section 5.10.

Impact

This condition is limited to software used to support SSPA as there have not been any past conditions related to TSPA-SR documentation or supporting AMRs where a future decision to qualify has been contemplated. There is no impact due to these conditions as the software was and remains under Software Configuration Management control.

OFFICE OF CIVILIAN
RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.

8. DR/CAR
 Stop Work Order

NO BSC-02-D-022

PAGE OF
QA: QA

DEFICIENCY/CORRECTIVE ACTION REPORT/STOP WORK ORDER CONTINUATION PAGE

Completed verification of corrective actions/commitments on February 1, 2002, as follows:

1. Concur with Immediate Action statement in Block 14A of the Complete Response. No further action is required.
2. Reviewed the Software Activity Plans (SAP) for each of the seven codes that were identified as deficient in the Description of Condition. For each of the seven codes, the revised SAPs contained detailed confirmation methodologies and acceptance criteria, and each of them contained an acceptable schedule. These SAPs were well written and showed marked improvement over those reviewed in the surveillance during which the deficiencies were discovered. The revised SAPs fully address the deficiencies noted in the seven SAPs identified in this Deficiency Report (DR), and satisfy Remedial Action commitments stated in Block 14 of the Complete Response. No further action is required.
3. The Extent of Condition investigation conducted by the Responsible Individual (RI) consisted of a review of 35 codes, as listed on Attachment 1. Of the 35 codes, 25 SAPs were found to be deficient due to one or both of the conditions identified in this DR. Of the 25 codes, some SAPs were revised. In some other cases, Software Management Reports (SMR) were developed for qualification of Level 3 codes (thus obviating the need for a SAP), and in the remaining cases, SAPs for codes to be used on an interim basis were superceded by full qualification SAPs. Reviewed the documentation for all 25 codes (100% verification) to ensure that each was in compliance with the requirements of AP-SI.1Q. No other discrepancies were noted. Commitments are deemed to have been satisfied for the findings in the Extent of Condition. No further action is required.
4. Concur with the corrective actions for Condition 3 as stated in the Complete Response. A copy of the email used to inform TSPA Managers of the additional controls is provided in Attachment 2. This action satisfies remedial action for Condition 3. No further action is required.
5. Concur with the cause of these deficiencies as stated in the Complete Response. The remedial action for Condition 3 also satisfies action to preclude recurrence for all deficient conditions identified in this DR.
6. I concur with the RI's assessment of the impact of these deficiencies. No similar deficiencies due to the stated cause have been detected in other project software, therefore this is considered to be an isolated case of non-compliance.

Corrective actions to address the deficiencies identified in this DR are deemed to have been appropriate and effective. Assessments of the cause and impact are deemed to be accurate and representative. Therefore, recommend this deficiency be closed at this time.



Sam El Archuleta
QA Representative

2-3-02
Date

Attachments:
As stated.

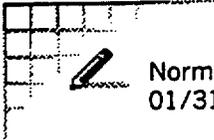
BSC-02-D-022 VERIFICATION

CODE	VERSION	ORGN	C/A STATUS	VERIF STATUS	QAR VERIF
Post10K Bins	1	TSPA	Cancelled	None Required	
WTRISE	1	TSPA	Cancelled	None Required	
PROCESSBTC	1	LANL	No deficiencies	None Required	
FEHM	2.11	LANL	No deficiencies	None Required	
FEHM	2.12	LANL	No deficiencies	None Required	
TOUGHREACT	2.3	LANL	No deficiencies	None Required	
MULTIFLUX	1	LLNL	No deficiencies	None Required	
FIDAP	8	SEA	No deficiencies	None Required	
FLUENT	5.5	SEA	No deficiencies	None Required	
SZ CONVOLUTE	2.1	LANL	No deficiencies	None Required	
DICTRA	20	LLNL	Confirmation Meth. Unsat	SAP Revised	SA
Image Pro Plus	4.1	LLNL	Confirmation Meth. Unsat	SAP Revised	SA
MSTHAC	6.4.2	LLNL	Confirmation Meth. Unsat	SAP Revised	SA
THERMO-CALC	VM	LLNL	Confirmation Meth. Unsat	SAP Revised	SA
DCPT	2	LBNL	Schedule Unsat	Qual. SAP Complete/Int.Appvd.	SA
Delba.dat	1	LBNL	Schedule Unsat	SMR Complete/Approved	SA
FLAC3D	2	LBNL	Schedule Unsat	CP1/CP2 Docs Completed	SA
Gpzones.dat	1	LBNL	Schedule Unsat	SMR Complete/Approved	SA
Infil2grid	1.7	LBNL	Schedule Unsat	SMR Complete/Approved	SA
ITOUGH2	4.4	LBNL	Schedule Unsat	Qual. SAP Complete/Int.Appvd.	SA
Tin.dat	1	LBNL	Schedule Unsat	SMR Complete/Approved	SA
Tough2	1.5	LBNL	Schedule Unsat	Section 5.10 exists: Version Nr changed to V1.5 for which a Qualification SAP is Complete and Internally Approved.	SA
Wingridder	2	LBNL	Schedule Unsat	Qual. SAP Complete/Int.Appvd.	SA
2kgrid8.for	1	LBNL	Schedule Unsat	SMR Complete/Approved	SA
Bath 10	1	TSPA	Schedule & Confirm. Meth Unsat	SAP Revised	SA
Gold Sim	7.17.200	TSPA	Schedule & Confirm. Meth Unsat	SAP Revised	SA
Patch Fail Lag	1	TSPA	Schedule & Confirm. Meth Unsat	SAP Revised	SA
PDFCDF	1	TSPA	Schedule & Confirm. Meth Unsat	SAP Revised	SA
SeepagedIIMk2 uu	1	TSPA	Schedule & Confirm. Meth Unsat	SAP Revised	SA
SeepagedI2uu	1	TSPA	Schedule & Confirm. Meth Unsat	SAP Revised	SA

01 of 10

CODE	VERSION	ORGN	C/A STATUS	VERIF. STATUS	OAR VERIF
Writefiles-new	1	TSPA	Schedule & Confirm. Meth Unsat	SAP Revised	SA
Transform_Perc_Files Into-Tables	1	TSPA	Schedule & Confirm. Meth Unsat	SAP Revised	SA
Pass_data	1.0	TSPA	Schedule & Confirm. Meth. Unsat	SAP Revised	SA
Statistics	1.0	TSPA	Schedule & Confirm. Meth. Unsat	SAP Revised	SA
Extract Qinf	1.0	TSPA	Schedule & Confirm. Meth. Unsat	SAP Revised.	SA

01 of 2



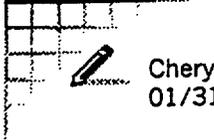
Norman Graves
01/31/2002 03:54 PM

To: Sam Archuleta/YD/RWDOE@CRWMS
cc:

Subject: BSC-02-D-022 Corrective Action

QA:N/A Exclusionary

----- Forwarded by Norman Graves/YM/RWDOE on 01/31/2002 03:55 PM -----



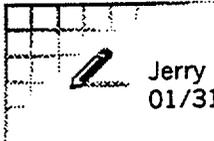
Cheryl Schneider
01/31/2002 12:12 PM

To: Norman Graves/YM/RWDOE@CRWMS
cc:

Subject: BSC-02-D-022 Corrective Action

QA:N/A Exclusionary

----- Forwarded by Cheryl Schneider/YM/RWDOE on 01/31/2002 12:14 PM -----



Jerry McNeish
01/31/2002 12:11 PM

To: Cheryl Schneider/YM/RWDOE@CRWMS
cc:

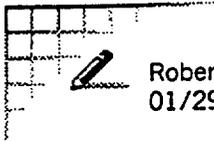
Subject: BSC-02-D-022 Corrective Action

Not A Federal Record

I have read this and understand it.

-Jerry

----- Forwarded by Jerry McNeish/YM/RWDOE on 01/31/2002 12:12 PM -----



Robert Andrews
01/29/2002 11:34 AM

Sent by: Cheryl Schneider

To: William Watson/YM/RWDOE@CRWMS, Peter Swift/YM/RWDOE@CRWMS, Paul Dixon/YM/RWDOE@CRWMS, Thomas Doering/YM/RWDOE@CRWMS, Mark Peters/YM/RWDOE@CRWMS, Ernest Hardin/YM/RWDOE@CRWMS, Stanley Pedersen/YM/RWDOE@CRWMS, Rob Howard/YM/RWDOE@CRWMS, Jerry McNeish/YM/RWDOE@CRWMS, Ernest Hardin/YM/RWDOE@CRWMS, Anthony Smith/YM/RWDOE@CRWMS, Jim Houseworth/YM/RWDOE@CRWMS, Al Eddebarh/YM/RWDOE@CRWMS, Stephanie Kuzio/YM/RWDOE@CRWMS, Ardyth Simmons/YM/RWDOE@CRWMS, Kathy Gaither/YM/RWDOE@CRWMS, Greg Valentine/YM/RWDOE@CRWMS, Tammy Summers/YM/RWDOE@CRWMS, Christine Stockman/YM/RWDOE@CRWMS, Bob MacKinnon/YM/RWDOE@CRWMS, Dan Thomas/YM/RWDOE@CRWMS, Doug Brownson/YM/RWDOE@CRWMS, Joe Wang/YM/RWDOE@CRWMS, Roger Henning/YM/RWDOE@CRWMS, Cliff Howard/YM/RWDOE@CRWMS, Ron Oliver/YM/RWDOE@CRWMS, Cynthia Palmer/YM/RWDOE@CRWMS

cc: Norman Graves/YM/RWDOE@CRWMS, Jeff Weaver/YM/RWDOE@CRWMS

Subject: BSC-02-D-022 Corrective Action

QA:QA Inclusionary

Apparently, there is some confusion as to the precedence between procedures and work planning documentation and how to proceed when conflicts or questions concerning interpretation arise. The cause of the conditions leading to DR #BSC-02-D-022 are stated in the completed response which is quoted herein:

"TWP-MGR-MD-000014 REV 01 stated that software used in the SSPA would be qualified only if it would be used in LA. Consequently, TSPA staff and management believed that the language of AP-SI.1Q, Section 5.10.3.b) "Continue work on the documentation and qualification aspects of the software in accordance with this procedure" did not preclude following Section 5.7.4, Canceling or Retiring Software. This understanding was further reinforced by a letter report to the NRC "Transmittal of Evaluation of the Impact of Unqualified Software and Data on Total system Performance Assessment for the Site Recommendation, (TSPA-SR), Revision 0, ICN1". As a result TSPA staff and management believed the SAP's were in compliance with AP-SI.1Q. The review of the SAPs by the Responsible Manager did not detect that there was a possible conflict between the project position on unqualified software used in the SSPA and the language in Section 5.10."

In the future, Performance Assessment Project personnel are to obtain clarification of procedure requirements when conflicts between procedures and other controlling documents are discovered or questions of interpretation exist. Personnel should request clarification via e-mail classified QA:QA Inclusionary from the functional organization with responsibility for the procedure with cc to the PA Management Team. In cases where the clarification conflicts with planned action, the issue is to be immediately elevated to Project Management/QA Management for resolution.

This e-mail is directed to the PA Management Team. Please respond by reply to Cheryl Schneider to acknowledge receipt and understanding.

Bob