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December 13, 2002
Contract No. NRC–02–02–012
Account No. 20.06002.01.041

U.S. Nuclear Regulatory Commission
ATTN: Mr. Ted Carter
Two White Flint North
11545 Rockville Pike
Mail Stop 7 F3
Washington, DC 20555

Subject: Predecisional Observation Report Provided for the U.S. Nuclear Regulatory Commission (NRC) of the Unsaturated Zone Flow and Transport at the Lawrence Berkeley National Laboratories—Berkeley, California and at the Bechtel SAIC (BSC) Facility—Las Vegas, Nevada (Intermediate Milestone 20.06002.01.041.301)

Dear Mr. Carter:

Enclosed is the predecisional NRC Observation Audit Report on the BSC activities for the Unsaturated Zone Flow and Transport at Lawrence Berkeley National Laboratories (LBNL) and the BSC facility in Las Vegas, Nevada, BQAP-BSC-03-02, performed on November 11–20, 2002. An electronic version of this predecisional input is included and can be used in developing the final NRC Observation Audit Report. This submittal fulfills Intermediate Milestone 20.06002.01.041.301. Prior to the NRC sending out the final Observation Audit Report, it is our understanding the team members will be afforded an opportunity to review the final version of the report and will sign the Observation Audit Report indicating their acceptance.

These NRC observations of DOE audits are to ensure that the DOE audits and surveillances are accomplished in an effective and adequate manner, and the DOE quality assurance program has been satisfactorily implemented in the areas being evaluated.

If you have questions regarding this description of the activity, please contact me at 210-522-5149. Your cooperation in this matter is appreciated.

Sincerely,

Bruce Mabrito
Director of Quality Assurance

BM:re
Enclosure
cc: J. Linehan, E. Whitt, B. Meehan, D. DeMarco, J. Greeves, R. Latta, W. Reamer, K. Stablein, T. Matula, S. Wastler, J. Schlueter, W. Patrick, CNWRA Directors (letter only), CNWRA Element Managers (letter only), P. Maldonado, M. Ehnstrom (SwRI), R. Fedors, T. Nagy (SwRI Contracts), R. Weber (SwRI), T. Trbovich (SwRI)
D:\GLGP Group\letters\misc\Cy-2002\ObsAuditUZFlow.wpd

Washington Office • Twinbrook Metro Plaza #210
12300 Twinbrook Parkway • Rockville, Maryland 20852-1606

PREDECISIONAL

Mr. Ronald A. Milner, Chief Operating Officer
Office of Civilian Radioactive Waste Management
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION'S OBSERVATION AUDIT REPORT NO. OAR-03-01, "OBSERVATION AUDIT OF BECHTEL SAIC (BSC) ACTIVITIES FOR THE UNSATURATED ZONE FLOW AND TRANSPORT AT THE LAWRENCE BERKELEY NATIONAL LABORATORIES IN BERKELEY, CALIFORNIA, AND AT THE BSC FACILITY IN LAS VEGAS, NEVADA, AUDIT NO. BQAP-BSC-03-02"

Dear Mr. Milner:

I am transmitting the U.S. Nuclear Regulatory Commission's (NRC's) Observation Audit Report No. OAR-03-01. The audit was conducted by Bechtel SAIC Company (BSC) on November 11–20, 2002, regarding the Lawrence Berkeley National Laboratory (LBNL) and BSC.

The SAIC audit team (hereafter, audit team) performed a limited scope performance-based audit to evaluate BSC's and LBNL's implementation of the Office of Civilian Radioactive Waste Management (OCRWM) Quality Assurance Requirements and Description Document, DOE/RW-0333P, Revision 12, and associated implementing procedures pertaining to BSC's development of the Unsaturated Zone Flow and Transport Analysis/Model Reports.

The NRC observers (hereafter, observers) determined that BSC's audit of LBNL and BSC was effective in identifying potential deficiencies and recommending improvements for the reviewed BSC activities. During the audit, both the audit team and the observers independently reviewed applicable quality assurance procedures, and activities within the audit's scope.

The audit team identified five potential deficiencies, and two areas for process improvement. The observers initiated two Audit Observer Inquiries and one NRC Observation. The Audit Observer Inquiries pertain to (1) the apparent use of unverified and unqualified data as inputs for modeling and analysis purposes, and (2) the approval by a checker and a quality engineering representative of the Thermal Testing Measurement Report (U0220) apparently without reviewing all of the associated data. The audit observer inquiries are described in paragraphs 4.6.1.3 and 4.6.1.4, respectively, in the enclosed report. The observation pertains to an apparent violation of OCRWM Safety Conscious Work Environment as described in paragraph 5.3 in the enclosed report.

The observers agreed with the audit team's conclusions, findings, and recommendations presented at the audit exit meeting on November 20, 2002.

PREDECISIONAL

A written response to this letter and the enclosed report is not required. The staff will continue to interface with OCRWM and follow the action that BSC is taking to address the issues identified during this audit. If you have any questions, please contact Ted Carter of my staff at (301) 415-6684.

Sincerely,

Janet Schlueter, Chief
High-Level Waste Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure: NRC Observation Audit Report No. OAR-03-01, "Observation Audit of Bechtel SAIC (BSC) Activities for the Unsaturated Zone Flow and Transport at the Lawrence Berkeley National Laboratory in Berkeley, California, and at the BSC Facility in Las Vegas, Nevada, Audit No. BQAP-BSC-03-02"

PREDECISIONAL

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Office of Nuclear Material Safety
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cc: See attached list.

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Letter to R. Milner from J. Schlueter dated _____

cc:

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C. Meyers, Moapa Paiute Indian Tribe

V. Miller, Fort Independence Indian Tribe

A. Bacock, Big Pine Paiute Tribe of the Owens Valley

R. Quintero, Inter-Tribal Council of Nevada (Chairman, Walker River Paiute Tribe)

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S. Joya, NV Congressional Delegation

J. Pegues, City of Las Vegas, NV

R. Bahe, Benton Paiute Indian Tribe

C. Bradley, Kaibab Band of Southern Paiutes

R. Joseph, Lone Pine Paiute-Shoshone Tribe

L. Tom, Paiute Indian Tribes of Utah

E. Smith, Chemehuevi Indian Tribe

J. Charles, Ely Shoshone Tribe

D. Crawford, Inter-Tribal Council of Nevada

H. Blackeye, Jr., Duckwater Shoshone Tribe

D. Eddy, Jr., Colorado River Indian Tribes

J. Leeds, Las Vegas Indian Center

PREDECISIONAL

U.S. NUCLEAR REGULATORY COMMISSION

OBSERVATION AUDIT REPORT NO. OAR-03-01

"OBSERVATION AUDIT OF BECHTEL SAIC (BSC) ACTIVITIES FOR THE

UNSATURATED ZONE FLOW AND TRANSPORT

AT THE LAWRENCE BERKELEY NATIONAL LABORATORIES IN BERKELEY, CALIFORNIA

AND AT THE BSC FACILITY IN LAS VEGAS, NEVADA, AUDIT NO. BQAP-BSC-O3-02"

12/ /02
Ted Carter
Projects and Engineering Section
High-Level Waste Branch
Division of Waste Management

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Tom Matula
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Reviewed and Approved by:

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N. King Stablein, Chief
Projects and Engineering Section
High-Level Waste Branch
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PREDECISIONAL

1.0 INTRODUCTION

Staff from the U.S. Nuclear Regulatory Commission (NRC) Division of Waste Management, and the Center for Nuclear Waste Regulatory Analyses (CNWRA), observed the Bechtel SAIC (BSC) audit of BSC's and Lawrence Berkeley National Laboratory's (LBNL) implementation of the Office of Civilian Radioactive Waste Management (OCRWM) quality assurance (QA) program regarding development of Unsaturated Zone (UZ) Flow and Transport Analysis/Model Reports (AMRs). The audit was conducted on November 11–20, 2002, at LBNL in Berkeley, California and continued at the BSC facility in Las Vegas, Nevada.

The objectives of the audit were to access the adequacy and effectiveness of LBNL's and BSC's implementation of the QA Requirements and Description (QARD) and implementing procedures, and to verify compliance with the applicable requirements in DOE/RW-033P, Revision 12, to work performed in the development of UZ Flow and Transport AMRs for license application. The NRC observers' (hereafter, observers') objective was to assess the effectiveness of the BSC audit team (hereafter, audit team) and audit process, as well as, the LBNL and BSC implementation of the QA provisions in the QARD. This report documents the observers determination of the effectiveness of the BSC audit and LBNL/BSC implementation of the QA provisions of the QARD.

2.0 MANAGEMENT SUMMARY

The observers determined that BSC audit regarding the development of the UZ Flow and Transport AMRs (Audit BQAP-BSC-03-02) was effective in determining the level of compliance of BSC and LBNL QA with the QARD and associated implementing procedures. The observers agreed with the audit team's conclusions, findings, and process improvement issues. The observers determined that the audit team members were qualified, independent of the areas being audited, and knowledgeable of the pertinent QA requirements. Based on these observations, the BSC QA program has been effectively implemented regarding the development of UZ Flow and transport AMRs with the exception of the items noted in the three potential deficiency reports (DRs) and the two Document Input Reference Systems (DIRS). The potential DRs and DIRS were in the areas of QARD implementation, data inputs obtained from uncontrolled sources, errors documented on Technical Data Information Forms (TDIFs), personnel qualification, and scientific notebook entries.

3.0 AUDIT PARTICIPANTS

3.1 Observers

Ted Carter	Team Leader	NRC
Tom Matula	Senior QA Engineer	NRC
Mark R. Ehnstrom	QA Specialist	CNWRA
Randy Fedors	Technical Specialist	CNWRA

3.2 Audit Team

The audit team consisted of members from BSC, Integrated Science Solutions Inc. (ISSI), and from Los Alamos National Laboratory (LANL). The audit team was also evaluated by members from the Office of QA (OQA), Office of Civilian Radioactive Waste Management (OCRWM) and from Navarro Quality Services. The following individuals comprised the audit and observation teams:

Kenneth O. Gilkerson	Audit Team Leader	BSC QA
Paul H. Lowe	Auditor	BSC QA
James B. Harper	Auditor	BSC QA
Gary M. Grant	Auditor	BSC QA
Charles C. Warren	Lead Auditor	BSC QA
Jefferson R. McCleary	Technical Specialist	BSC/ISSI
Hari Viswanathan	Technical Specialist	BSC/LANL
Jim Blaylock	Observer	OCRWM Office of QA
Harvey Dove	Observer	OQA/Navarro Quality Services

4.0 REVIEW OF THE AUDIT AND AUDITED ORGANIZATION

The audit of LBNL and BSC regarding the development of UZ Flow and Transport AMRs was conducted in accordance with Administrative Procedure AP-18.3Q, Internal Audit Program and AP-16.1Q, Management of Conditions Adverse to Quality. The NRC staff's observation of this audit and development of this report was based on NRC Manual Chapter 2410, "Conduct of Observation Audits," dated July 12, 2000.

4.1 Scope of the Audit

The audit team conducted a performance based audit of activities and processes supporting UZ Flow and Transport scientific analyses activities. The QARD, DOE/RW-0333P, Revision 12, Scientific Process Guidelines Manual, TDR-WIS-MD-000001 R-01, and applicable implementing procedures were used to generate the performance based audit checklist. This audit was to have focused on four AMRs at different stages of development. The four AMRs reviewed during the audit were:

- U0000 Development of Numerical Grids for UZ Flow & Transport Modeling, ANL-NBS-HS-000015 R-01B, (U0000)
- U0090 Analysis of Hydrologic Properties Data, (U0090)
- U0110 Drift Scale Coupled Process MDL, (U0110)
- U0220 Thermal Testing Measurement Report, ANL-NBS-HS-000041R-0, (U0220)

Specifically, the audit concentrated on two AMRs, the Thermal Testing Measurements Report and the Development of Numerical Grids for UZ Flow and Transport Modeling. Although documentation on the other two AMRs was reviewed, they were too early in development for

any substantial evaluation to be performed. Delaying this audit until the two in-process AMR reports were further along in development would have provided additional information to be evaluated during the audit.

4.2 Conduct and Timing of the Audit

The audit was performed in a professional manner and the audit team demonstrated a sound knowledge of the applicable LBNL and BSC programs and procedures. The audit team personnel were unified in approach, persistent in their interviews, challenged responses when appropriate, and followed their checklist questions, deviating when necessary to more fully understand the LBNL or BSC process or pursue discrepancies. The audit team performed a thorough and effective audit. Although the audit did not include in-process work on two of the reports, the observers conclude that these reports were too early in development to provide a meaningful evaluation on compliance to quality program requirements.

The audit team and observers caucused at the end of each day to discuss the audit status and any new and developing issues. The observers were encouraged to participate in the discussions with any comments, concerns, or questions. The audit team met with LBNL or BSC management, as appropriate, each morning, with observers present, to discuss the current audit status and potential discrepancies. The observers determined that the timing of the audit was appropriate for the team to evaluate the LBNL/BSC quality program, even though two of the AMRs could have been further along in development for a more thorough evaluation.

4.3 Audit Team Qualification and Independence

This audit team consisted of one audit team leader who is a qualified Lead Auditor, a second lead auditor, three auditors and two technical specialists who provided the technical expertise required for this type of performance based audit. The observers reviewed the qualifications for the Audit Team Leader and two of the auditors were reviewed for compliance to procedure AP-18.1Q, "Audit Personnel Qualification." The observers determined that the qualifications of these audit members met the requirements of AP-18.1Q. The observers concluded that the audit team members had the necessary expertise to perform the audit and had sufficient authority and organizational freedom to make the audit process meaningful and effective.

4.4 Examination of Quality Elements

4.4.1 Design Control

Design controls used for development of the AMRs were reviewed during the audit. The review of the Thermal Testing Measurements Report found that some Data Tracking Numbers (DTNs) referenced in Section 4 of the report as "qualified" were comprised of QL-2 data (i.e., data that have not been confirmed to be qualified, and data that have a limitation for use as only for supporting "non-principal factors"). These unconfirmed data can be incorrectly issued in output DTNs. The current process allows for data to be processed as a Technical Product Output (TPO) without meeting the requirements for qualification of unqualified data (reference paragraph 4.6.1.3, Potential Audit Finding No. 3). Changes will be required in procedures AP-

SIII.9Q, "Scientific Analyses", and AP-3.15Q, "Managing Technical Product Inputs" to be in compliance with requirements contained in the QARD addressing the control of data.

During additional review of the Thermal Testing Measurement Report the audit team found that not all inputs used in the report had been verified back to its origin. The assigned qualified checker and the Quality Engineering Representative failed to assure that inputs were appropriately verified in accordance with procedure AP-SIII.9Q (reference paragraph 4.6.1.4, Potential Audit Finding No.4).

The observers agreed with the audit team findings in this area.

4.4.2 Control of Measuring and Test Equipment and Calibration Standards

One piece of calibrated measuring and test equipment was traced back through requirements contained in procedure AP-12.1Q, "Control of Measuring and Test Equipment and Calibration Standards." This flow measurement equipment had exceeded its calibration cycle. LBNL personnel initiated an Impact Evaluation on a Measuring and Test Equipment Out-of-Calibration Report. Personnel also documented this information, in accordance with the procedure, in the appropriate scientific notebook. The audit team identified that LBNL does not currently have a positive recall system for Measuring and Test Equipment. This subject is discussed in greater detail in paragraph 4.7.1.2 as Potential Process Improvement No.2.

The observers agreed with the audit team findings in this area.

4.4.3 Software Management

The qualifications of individuals, who develop and manage software must be documented and verified. During the review of verification for employment and education documentation for the individual responsible for the software management area, confirmation from a previous employer could not be found. This was due to the fact that the previous employer had gone out of business. This lack of review from a previous employer had not been documented and will be handled as a DIR to the earlier initiated DR No. BSC-(0)-02-176 (reference paragraph 4.6.1.1, Potential Audit Finding No.1).

The observers agreed with the audit team findings in this area.

4.4.4 Supplement III Scientific Investigation

The assigned auditor reviewed documentation contained in scientific notebooks for compliance to procedure AP-SIII.1Q, "Scientific Notebooks." The auditor found that, although in general compliance with procedural requirements, there was some confusion when certain data is added to a scientific notebook. Initial entries on a scientific notebook page were documented days, and in some cases weeks, before other data and dates were entered on that same page creating confusion and making it difficult to track entries. This observation is being carried as a DIR to an existing DR No. BSC(B)-03-D-025 (reference paragraph 4.6.1.2, Potential Audit Finding No. 2).

The observers agreed with the audit team findings in this area.

4.5 Examination of Technical Activities

4.5.1 Development of Numerical Grids for UZ Flow and Transport Modeling, ANL-NBS-HS-000015 Rev 01B (AMR U0000)

The purpose of AMR U0000 is to document the generation of the numerical grid used for the three-dimensional site-scale unsaturated flow model. Inversions using this grid are used to develop values of hydrologic properties.

The BSC technical specialist focused on three topics contained in the UZ Flow and Transport Modeling AMR: (1) water table data; (2) adequacy of grid refinement; and (3) distinction between grid development and assignment of properties. These three topics are discussed below. Other technical questions from the auditors were sufficiently answered or clarified during the audit.

For the first topic, the technical specialists were concerned with consistency of the water table data used in this AMR with that used elsewhere in the program. With sparse data points to constrain the slope of the water table beneath the repository, particularly since there is a 45 m [148 ft] increase in the water table elevation in the northwestern portion of the main repository block, different groups within the Yucca Mountain Project have slightly different estimates of the water table position. Furthermore, these contour maps have to be interpolated to grid node locations in numerical models. Alternative interpolation methods (e.g., automatic methods or use of soft information) can lead to significantly different elevations at any particular node within the repository footprint.

The second topic, adequacy of grid refinement, affects heat and mass transfer in the repository subsurface. The technical specialists were concerned that the basis for cell sizes used in the grid was not presented. They were concerned that heterogeneous net infiltration was smoothed by averaging, concentrations of radionuclides could be reduced by artificial (numerical) dispersion, flow near faults could be inaccurately represented by the configuration of cells representing fault zones. The technical specialists decided that an iterative process between the grid generators and the downstream users (e.g., transport or thermohydrologic modelers) was not evident from this version of the AMR. The primary author of the UZ Flow and Transport Modeling AMR stated that adequacy of grid refinement was a task for the modelers and stated that an iterative process was informally in place with LBNL modelers. If the bases for adequacy of grid refinement is the responsibility of downstream model users, then this has not been the case to date. Process Improvement No.1 (see paragraph 4.7.1.1) addresses adequacy of grid refinement.

The third technical topic of interest to the technical specialists was the distinction between developing the grid and assigning properties. In particular, the technical specialists noted that the block size (based on fracture density) and zones of vitric versus zeolitic nonwelded tuff below the repository were fixed by the grid development. While the Bechtel SAIC technical specialist had extensive discussions with the report author on fixing uncertain parameters as

constant values in the grid generation, they did not recommend any process-level improvements.

The observers agreed with the audit team findings in this area.

4.5.2 U0090 Analysis of Hydrologic Properties Data

Insufficient information was provided to perform an accurate assessment of quality program compliance.

4.5.3 U0110 AMR Drift Scale Coupled Process MDL

Drift-Scale Coupled Processes (DST and THC Seepage) Models, Rev. 02

A draft copy of AMR U0110, Drift Scale Coupled Process MDL, was provided to the auditor that included chapters 1 and 2 and a partially updated draft of chapter 4. Since chapter 6 contains the technical discussion and chapter 4 contains a description of the input data, the technical specialist had little material to review.

The observers agreed with the audit team findings in this area.

4.5.4 U0220 Thermal Testing Measurement Report, ANL-NBS-HS-000041R-0

The purpose of AMR U0220 is to assemble descriptions and references and graphically illustrate data collected during the Large Block Test (Fran Ridge), Single Heater Test (Alcove 5), and Drift-Scale Heater Test (Alcove 5). The latter two tests were located in the Exploratory Studies Facility. The Large Block Test and the Single Heater Test are complete. The Drift-Scale Heater Test Data is in its first year of cool-down after 4 years in the heating phase. Output data from this report are provided to the technical data management system. This report does not provide the basis for the data, it assumes that other reports (e.g., project milestone reports) provide the necessary details. As such, the quality assurance status and basis of measured data from field thermal tests are not in the scope of this document.

The technical specialists focused on three topics. One, methods evolved during the Drift-Scale Heater Test, are not cited in support of input data. For example, gas chemistry and Rapid Estimation of Thermal Conductivity and Thermal Diffusivity measurements have been added during the test program and are not documented. The technical lead for the thermal testing program said that the next revision of this AMR would focus more on the Drift-Scale Heater Test and would better document the methods and techniques. Two, non-qualified data was not clearly noted as such. This was data from pre-June 1999 that still needed to go through a verification checklist before it could be used as input for principal factors. This was a potential problem since all output from this scientific analysis report was noted as fully qualified data. Three, uncertainty sections were included for all data in this report, though the cited uncertainty levels would not be adequate for inclusion in performance assessment modeling. The BSC technical specialists agreed that a program-wide approach needs to be developed for this difficult task.

The observers agreed with the audit team findings in this area.

4.6 Potential Audit Findings

4.6.1 Potential Deficiency Reports

The audit team identified five conditions adverse to quality during its review. The audit team identified these conditions adverse to quality as DRs or referenced them as DIRS which are then attached to existing DRs.

4.6.1.1 Potential Audit Finding No.1

During the audit, the audit team verified employment and education records for software development personnel at LBNL. The audit team could not confirm previous employment for an applicant for a software position and no justification had been given. This finding will be entered into the DIRS and will be attached to an existing DR Number BSC-(0)-02-D-176.

4.6.1.2 Potential Audit Finding No.2

During the review of scientific notebooks, the audit team determined that entries had been placed into the book after a specific page had already been initialed and dated. The new entries contained the initials and dates of when the new entry was added into the notebook. The new entries were entered sometimes days and even weeks after that page had been first initialed and dated. Although the additions were added in accordance with current procedural requirements, these added entries can be a cause for confusion. This will be added to the DIR data base and will be attached to an existing DR Number BSC(B)-03-D-025.

4.6.1.3 Potential Audit Finding No.3

The audit team determined that LBNL used unqualified and unverified data as input data for the Thermal Testing Measurements Report. Procedure AP-3.15Q, "Managing Technical Product Inputs," is inadequate in meeting requirements contained in the QARD relative to data identification/qualification, control and usage. The audit team found that a new classification of data, qualified but unconfirmed, exists and that this classification of data is not described in the QARD. A DR will be issued to address this audit finding.

4.6.1.4 Potential Audit Finding No.4

The audit team determined that data for the Thermal Testing Measurements Report did not come from controlled sources. BSC violated-Procedure AP-SIII.9Q, "Interface Process Management," when a qualified checker and the Quality Engineering Representative did not assure that inputs were appropriately sourced in accordance with procedural requirements. A DR will be issued to address this audit finding.

4.6.1.5 Potential Audit Finding No.5

During a review of Technical Data Information Records for the Thermal Testing Measurements Report and the Development of Numerical Grids for UZ Flow & Transport Modeling, the audit team identified numerous errors and incorrect information. A DR will be issued to identify the reason for these errors appearing on these records.

4.7 Potential Audit Process Improvements

4.7.1 Potential Process Improvements

The audit team identified two areas where process improvements could be made to enhance or protect product quality. These are strictly for management consideration as a means for possible program improvement.

4.7.1.1 Potential Process Improvement No.1

The audit team found that, although the reports and supporting documentation was adequate, some consideration for downstream users may be required. For example, in the Development of Numerical Grids for UZ Flow & Transport Modeling Report, a condition exists where flow and transport scientists may incorrectly assume that the numerical grids are adequate for their specific scope of work. Additional information in the scope of reports to more accurately identify parameters used in the development of the model could prevent this from occurring.

4.7.1.2 Potential Process Improvement No.2

Currently LBNL has no positive recall system for calibrated Measuring and Test Equipment. Although there is no requirement to maintain a positive recall system, implementing such a system would be a proactive approach to better controlling Measuring and Test Equipment.

5.0 NRC STAFF FINDINGS

The NRC observers determined that the audit team for Audit BQAP-BSC-03-02 was effective in determining the level of compliance of LBNL and BSC activities associated in the development AMRs relative to requirements contained in the QARD and associated procedures with the exceptions identified as the potential deficiencies and observation.

5.1 NRC Audit Exit Summary

During the audit exit meeting, the observers expressed their appreciation for the cooperation and responsiveness given them during their observation activities. In addition, the observers stated that they agreed with the audit team's findings and recommendations, as presented at the audit exit meeting.

5.2 NRC Audit Observer Inquiries

NRC generated the following inquiries as a result of observing audit BQAP-BSC-03-02.

5.2.1 Inquiry No. 1

DOE/BSC used qualified, verification level 2 (QL-2) and unqualified data as inputs for modeling and analysis purposes, for low risk significant applications supporting site recommendation. Given that unqualified DTNs are being used in the development of Technical Output Products, how will DOE/BSC assure that only qualified and verified data and software are used for high risk significant applications supporting license application?

5.2.2 Inquiry No. 2

The audit team identified an instance where, because of time and schedule pressure, a BSC qualified checker and a BSC Quality Engineering Representative apparently approved the Thermal Testing Measurement Report (U0220) without reviewing all of the associated data. How will DOE and BSC management create an environment to assure that personnel performing checking and quality assurance assignments will be afforded adequate time to perform their assigned tasks as time and schedule become even more important leading up to license application? What metric will be developed and used to assure that quality activities are not influenced by cost and schedule?

During this audit, the observers followed up on the status of the Audit Observation Inquiry Log No. 1 from audit LLNL-ARC-02-07, dated April 15–19, 2002. This inquiry requirement reference is welded metal plates and services supplied by Framatome. The NRC has received the response and is actively evaluating this response and the inquiry remains open.

5.3 NRC Observation

DOE and BSC currently have a program in place which establishes an environment where employees are encouraged to raise concerns without fear of harassment, intimidation, retaliation, or discrimination. This program, the OCRWM Safety Conscious Work Environment, is fully endorsed by the NRC as an effective tool in establishing this type of environment. However, during the audit the NRC observers viewed a potentially intimidating environment. Specifically, the BSC audit team identified instances where QL-2 data and unqualified data was used in the development of Technical Product Outputs (Refer to Paragraph 4.6.1.3 above). During a series of meetings with BSC management and technical staff, the Audit Team Leader presented his findings regarding this issue in great detail and in an apparently defensive manner. After the Audit Team Leader presented his findings, BSC management and technical staff asked numerous questions, and in a tone that appeared to be potentially intimidating. This is contrary to the OCRWM Safety Conscious Work Environment policy established by DOE. Auditors, when presenting potential audit findings should be allowed a forum in which intimidation should not be a potential factor. Questions asked to understand the potential finding should be asked in a professional, non-accusatory manner, without the perception of harassment and intimidation. Questions should be asked to more fully understand the potential finding and determine possible implications to product quality.