U.S. NUCLEAR REGULATORY COMMISSION

ON-SITE LICENSING REPRESENTATIVES' REPORT

NUMBER OR-04-02

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ACRONYMS AND ABBREVIATIONS

ACRO	TITLE
AECL	Atomic Energy of Canada, Limited
AMR	Analysis Modeling Report
AP	Administrative Procedure
BSC	Bechtel SAIC Company, LLC
BSC ECP	Bechtel SAIC Company, LLC Employee Concerns Program
C	Centrigrade
CAP	Corrective Action Program
CAR	Corrective Action Report
CNWRA	Center for Nuclear Waste Regulatory Analyses
CR	Condition Report
CST	Condition Screening Team
CT	Confirmation Team
DOE	U.S. Department Of Energy
DR	Deficiency Report
ECP	Employee Concerns Program
ECRB	Enhanced Characterization of the Repository Block
ESF	Exploratory Studies Facility
EWDP	Early Warning Drilling Program
IV&V	Independent Verification and Validation
km	Kilometers
KTI	Key Technical Issue
LA	License Application
M	Meter
Mi	Miles
MII	Management Improvement Initiative
MOR	Monthly Operating Review
NRC	U.S. Nuclear Regulatory Commission

ACRONYMS AND ABBREVIATIONS - continued -

ACRO	TITLE
OCRWM	Office of Civilian Radioactive Waste Management
OR	On-Site Representative
OQA	Office of Quality Assurance
PA	Performance Assessment
"Q"	Quality-affecting
QA	Quality Assurance
QARD	Quality Assurance Requirements Description
SA	Self-Assessment
SCWE	Safety Conscious Work Environment
SS	Stainless Steel
SSC	Structure, System, or Component
TSA	Technical Services Agreement
TSPA-LA	Total System Performance Assessment - License Application
TWP	Technical Work Plan
UCCSN	University and Community College System of Nevada
VoEE	Verification of Educational Experience
YMP	Yucca Mountain Project
°	Degree

EXECUTIVE SUMMARY

GENERAL SITE ISSUES

During this reporting period, the Yucca Mountain Project (YMP) established two new seismic stations in the underground, and experienced an off-site power supply surge that temporarily took one of the underground ventilation fans out of service. Tour access continues to be limited.

EXPLORATORY STUDIES FACILITY TESTING

The Project began monitoring of the 301X areas, and the drift-scale thermal test in the ESF continued its cool-down phase. Monitoring of the thermal test alcove, boreholes in the access observation drift, and moisture monitoring in Alcove 7 continues. Current plans call for an Alcove 7 re-entry, equipment maintenance, observation, and possible sample collection, in the August or September 2004 time frame.

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK TESTING

The YMP has completed all near-term entries beyond the Enhanced Characterization of the Repository Block Testing (ECRB) bulkheads at Stations 17+63, 22+01, 25+03, and 25+99. These bulkheads have been sealed and monitoring of test equipment has begun. Current plans call for a re-entry, for equipment maintenance, observation, and possible sample collection, in the August or September 2004 time frame. Also, during this reporting period, tracer studies began in the large plot test in Alcove 8.

SURFACE-BASED FIELD TESTING

The YMP began an aeromagnetic survey around the Yucca Mountain area the week of February 16, 2004. The work was stopped on February 21, 2004, when the fuselage of the aeromagnetic survey instrument package was damaged after hitting a rock outcrop. The work has remained stopped during this reporting period as the incident is being investigated and corrective actions taken. The locations of magnetic anomalies, to be drilled and sampled as part of the investigation of igneous intrusion probability, are being re-evaluated pending completion of the aeromagnetic survey. Continued water well drilling in Inyo County, California, has been put on hold until late summer 2004. During this reporting period, geophysical logging was done on Nye County Early Warning Drilling Program (EWDP) Phase IV and V wells.

LABORATORY STUDIES

Preliminary corrosion testing has identified potential corrosion concerns with the borated stainless steel absorber plate material used in the lattice assembly for the waste package. These new data may lead the Project to change some aspects of the waste package lattice assembly design.

BECHTEL SAIC COMPANY, LLC QUALITY ASSURANCE (QA) SURVEILLANCE OF MODEL DEVELOPMENT AND VALIDATION

During this reporting period the ORs evaluated the results of Bechtel SAIC Company, LLC (BSC) Quality Assurance (QA) Surveillance BQA-SI-04-048. The purpose of this surveillance was to verify implementation of the model development and validation activities associated with Supplement III, "Scientific Investigations," of the Quality Assurance Requirements and Description (QARD). Additionally, this surveillance was performed to address the corrective

actions identified in Condition Report (CR)-099 (formerly Corrective Action Report (CAR) BSC-01-C-001) concerning model development and validation deficiencies.

As a result of these reviews, the surveillance team concluded that the procedural controls defined in Administrative Procedure (AP)-SIII.10Q, "Models," represented an effective process for model development and use. However, the team determined that despite improvements in the technical adequacy of the model reports, procedural compliance issues remained an area of concern. Specifically, the surveillance team identified that 16 of the 36 model reports evaluated were unsatisfactory with regard to model validation. As a result of these findings, the surveillance team concluded that the implementation aspects of AP-SIII.10Q, Revision 2, ICN 001, and preceding revisions were inadequate.

The ORs determined that the surveillance team effectively evaluated the model development and validation process related to Supplement III of the QARD. The surveillance team's subject matter experts were technically competent and their evaluation methodology was thorough. The ORs concur with the surveillance team's findings presented at the management debrief on March 11, 2004. These findings were consistent with the recent "U.S. Nuclear Regulatory Commission Staff Evaluation of U.S. Department of Energy Analysis Model Reports, Process Controls, and Corrective Actions," issued April 10, 2004.

BSC SURVEILLANCE OF INDEPENDENT VERIFICATION AND VALIDATION OF LEGACY CODE

The ORs reviewed the results of BSC QA's Surveillance, BQA-SI-04-014. The purpose of this surveillance was to verify implementation of the software controls contained in AP-SI.4Q, "Independent Verification and Validation (IV&V) of Legacy Code." AP-SI.4Q was developed to address the corrective actions identified in CR-102 (formerly CAR BSC-01-C-002) concerning software development and control. The corrective actions associated with CR-102 included evaluation of the functionality of all software used in quality-affecting activities in support of a License Application (LA).

Based on the results of the surveillance team's evaluations of a representative sample of legacy codes, it was concluded that the procedural controls contained in AP-SI.4Q were adequate. However, the surveillance team determined that the implementation and effectiveness in meeting procedure requirements were unsatisfactory. This conclusion was predicated on the surveillance team's identification of a number of inconsistencies between the reports produced by different IV&V personnel. As noted by the surveillance team, the inconsistencies primarily involved the level of detail and/or completeness with which individuals described the materials available to them for testing, the characterization of test results, and the proposed disposition for the code. Additionally, internal inconsistencies were identified, in some reports, that rendered the results indeterminate.

The ORs reviewed the documentation associated with BSC QA's Surveillance BQA-SI-04-014, of the IV&V process for legacy code. Based on the results of this review and discussions with the team leader, the ORs determined that this surveillance activity was well-planned and effectively performed. The timing and scope of the surveillance were appropriate and the surveillance team members were technically competent. The OR also verified that the conditions identified by the surveillance team were accurately characterized and documented on CRs. These findings were consistent with the recent "U.S. Nuclear Regulatory Commission Staff Evaluation of U.S. Department of Energy Analysis Model Reports, Process Controls, and Corrective Actions," issued April 10, 2004.

OFFICE OF QUALITY ASSURANCE STAFF AUGMENTATION SURVEILLANCE

U.S. Department of Energy (DOE) Office of Quality Assurance (OQA) performed a surveillance of BSC direct support personnel used as staff augmentation. The purpose of this surveillance was to evaluate BSC's compliance with the applicable QA requirements related to the training and qualification of personnel performing quality affecting activities. The surveillance scope included a review of subcontractors, Technical Service Agreements, training, and Verification of Education and Experience.

Based on the results of this evaluation, OQA's surveillance team concluded that BSC's program for the control of direct-support contractors used for staff augmentation was adequately implemented. One CR was identified regarding the lack of documentation for subcontract personnel training. However, this CR did not impact the technical content of any products supporting LA. The ORs concurred with the OQA surveillance team's findings and conclusions. No audit observation inquiries were initiated and the ORs determined that this oversight activity was effectively performed.

REVIEW OF CONDITION SCREENING TEAM ACTIVITIES

Subsequent to the development of the new AP-16.1Q, "Condition Reporting and Resolution," process in the Fall of 2003, the Condition Screening Team (CST) was established to facilitate the administration of the Corrective Action Program (CAP). Based on the results of ORs' reviews within this area, it was determined that the CST manager was effectively administering the CR screening process and that the CST was performing thorough evaluations of CRs in a well-structured manner. Although the AP-16.1Q condition reporting process is experiencing operational challenges, improvements in the implementation of the CAP resolution process have been noted. These improvements are the result of increased Project management attention and enhancements in the timeliness of corrective action plan completion activities.

REVIEW OF OR OPEN ITEMS

During this reporting period the ORs reviewed the pertinent information associated with previously identified OR Open Items. Based on the results of these reviews, it was determined that appropriate actions had been implemented to address the identified issues. Therefore, the following OR Open Items are closed:

- OR Open Item 02-06, "Development of an unqualified data impact assessment."
- OR Open Item 03-01, "Resolution of issues identified during the procedure development process."
- OR Open Item 03-02, "Administration of changes to the Management Improvement Initiative."

MONTHLY OPERATING REVIEW

During this reporting period, the ORs attended the DOE Monthly Operating Review (MOR) meetings. These meetings included discussions concerning YMP activities, management initiatives, QA program issues, licensing, environmental safety and health, site operations, public affairs, and business administration issues for the DOE and BSC managers. Additional topics discussed in the MOR meetings for this reporting period involve a summary of major issues, major accomplishments, performance indicators for work execution, YMP support, and YMP management. The increased focus on improving performance and enhanced management processes represent an overall improvement in YMP controls. The metrics for each indicator were stabilized this reporting period, but many, in their current forms, are only 2 or 3 months old, and useful trends may not yet be apparent. Therefore, effectiveness for indicating performance is not yet fully known at this time.

REPORT DETAILS

INTRODUCTION

The principal purpose of the On-Site Representatives' (ORs') report is to inform U.S. Nuclear Regulatory Commission (NRC) managers, staff, and contractors of information on the U.S. Department of Energy (DOE) programs in repository design, performance assessment, performance confirmation, and environmental studies that may be useful in fulfilling NRC's role during prelicensing consultation. The primary focus of this and future OR reports will be on DOE's programs for subsurface and surface-based testing, performance assessment, data management systems, environmental studies, and quality assurance (QA). Relevant information includes new technical data, DOE's plans and schedules, and the status of activities to support preparation of the License Application (LA). The ORs also take part in activities associated with resolving NRC Key Technical Issues (KTIs). This report covers the period of March 1, 2004, through April 31, 2004.

OBJECTIVES

The OR's mission is to serve principally as a point of prompt information exchange and to identify preliminary concerns with site investigations and potential licensing issues. The ORs carry out this role by gathering and evaluating information, identifying concerns, and bringing more significant issues to NRC management's attention. Communication with DOE is accomplished by exchanging information on data, plans, schedules, documents, activities and pending actions, and resolution of issues. The ORs interact with DOE scientists, engineers, and managers, with input from NRC Headquarters management, regarding the implementation of NRC policies, programs, and regulations. The ORs also focus on such issues as design controls, data management systems, performance assessment (PA), and KTI resolution. A primary OR role is to identify areas in site studies, activities, or procedures that may be of interest or concern to the NRC staff.

1 FIELD AND LABORATORY TESTING

1.1 General Issues

Tour Access

Access for tours is still limited to Alcoves 1 and 2 in the Exploratory Studies Facility (ESF). Underground access past Alcove 2 is currently restricted to those who have underground access training, and respirator qualification and fit test. This restriction may be lifted in the future after further collection and analysis of air quality data.

Establishment of New Seismic Stations

During this reporting period, the Yucca Mountain Project (YMP), in conjunction with the University of Nevada-Reno, established two new seismic stations in the underground. These new locations are in Niche 5, and near Station 69+46 in the south ramp. With completion of this work, there are now three seismic stations in the subsurface at Yucca Mountain (the two mentioned above and an existing seismic station at Alcove 5).

Surge in Off-site Power Supply

During this reporting period, the Yucca Mountain Site experienced a surge in the power supplied to the site from the Nevada Test Site. Consequently, one of the ventilation fans for the underground was inoperable for 3 days.

1.2 Scientific Investigations

DOE continues to conduct scientific and engineering investigations, or tests, to understand Yucca Mountain's geology, chemistry, hydrology, and other physical aspects and processes that could affect a potential repository's safety, and to provide input to a potential repository's design. DOE uses the results of this work to help form a safety and licensing basis for a potential repository. Most of DOE's active scientific and engineering investigations are being done through its contracts with the national laboratories and the U.S. Geological Survey.

Table 1 provides a list of these currently active, or recently completed tests. Included in the list is the reference number of the plan for, and status of each test, at the end of the reporting period. Also, DOE supports some scientific investigations through funding of YMP oversight to Nye County, Nevada and Inyo County, California. Under this program, these counties conduct independent scientific investigation programs. These are described under Section 1.6, "Surface-Based Field Testing."

In addition, the University and Community College System of Nevada (UCCSN) has a cooperative agreement with DOE's Office of Repository Development to participate in scientific and engineering studies of the Yucca Mountain repository site. A list of all current and closed UCCSN scientific investigations can be found at: http://hrcweb.nevada.edu/qa/sip.htm

Furthermore, DOE contracts with Atomic Energy of Canada, Limited (AECL) for scientific investigation of potential repository issues. AECL is currently working on two studies under the DOE QA program. They are: (1) crevice corrosion in titanium, Alloy 22, and stainless steel (ss); and (2) neutron diffraction-based measurements of strain in Alloy 22 test specimens.

The status of selected YMP tests is described below.

1.3 ESF Testing

The excavation of the ESF main drift, completed in 1997, allows for the collection of scientific and engineering data at Yucca Mountain. DOE continues testing in the ESF main drift to supply data to support DOE's ongoing scientific studies. Figure 1 shows the ESF test locations. On-going ESF issues and testing activities are summarized below.

301X Areas

Because of degradation of the rock in the crown of the tunnel at the time of excavation, the original specifications for the ground support system in some areas of the ESF could not be met. These areas are designated as 301X areas. The degraded rock mass in these areas is supported by specified ground support and out-of-specification shoring, with lumber and other materials. During this reporting period, the Project has begun regular monitoring, of all these areas, with strain gages on the steel sets. To date, no unusual strain has been observed.

Alcove 5 Drift-Scale Test

Power to the heated drift was shut down in mid-January 2002, and the 4-year cool-down of the facility is being monitored in accordance with the established DOE test plan. At shutdown, the surface temperature of Canister 1, and the temperature of the rock, were both 201.1°degree centigrade (C) [394°degree Fahrenheit (F)]. As of the end of this reporting period, the surface temperature of Canister 1 was 67.7° C (154° F), and the temperature of the rock was 68.9° C (156° F). Also, during this reporting period, DOE performed gas sampling and neutron logging on selected boreholes in Alcove 5, and conducted air hydraulic conductivity measurements.

Alcove 7 Moisture Monitoring

The bulkheads for this alcove were last opened on May 20, 2003. During this opening, drops of moisture were observed on the utility lines, and the rock in the crown of the alcove had a moist appearance. The bulkheads were closed again on June 26, 2003. Current plans call for re-entry, equipment maintenance, observation, and possible sample collection in the August or September 2004 time frame.

1.4 Enhanced Characterization of the Repository Block Testing

The excavation of the Enhanced Characterization of the Repository Block (ECRB) cross drift, completed in October 1998, allows the collection of scientific and engineering data in stratigraphic units that constitute the bulk of the potential repository horizon. DOE continues ECRB testing to supply data to support DOE's ongoing scientific studies. Figure 1 describes the ECRB test locations. ECRB issues and testing activities are summarized below.

ECRB Cross-Drift Moisture Monitoring

The last ventilated entry into the ECRB began on September 8, 2003, to install batteries for the remaining instruments and to remove unused equipment. This activity concluded in November 2003 and all bulkheads, up to the bulkhead at Station 17+63, were sealed for an indefinite period of time. All external power has been shut off past Station 17+63, and the batteries installed should last in excess of 1 year. During this reporting period, the equipment for taking gas samples behind the bulkhead at Station 17+63 remained operational. Current plans call for a re-entry, for equipment maintenance, observation, and possible sample collection, in the August or September 2004 time frame.

Alcove 8 (Large-Plot Test)

The Large-Plot Test is an infiltration test that uses a metal box, sectioned into 12 compartments, that is placed behind the bulkhead on the bare rock floor of Alcove 8. Water is placed into the compartments. This water seeps through approximately 20 meters (m) [65.6 feet (ft)] of the upper lithophysal zone and the middle nonlithophysal zone, of the Topopah Spring Tuff, and is collected in Niche 3 of the ESF.

The Large-Plot Test started on August 20, 2002, with two of the compartments. On August 28, 2003, testing was expanded from 2 to 12 compartments by filling all 12 with water to re-establish flow in each of the 12 infiltration zones. Tracer application began on March 1, 2004. Representatives from the OR Office, NRC Headquarters, and Clark County Comprehensive Planning Department observed the test on April 1, 2004. Tracer application was completed on April 8, 2004.

1.5 Surface-Based Field Testing

Investigation of Magnetic Anomalies in the Yucca Mountain Region

As part of the ongoing investigation of magnetic anomalies in the Yucca Mountain region the YMP began conducting an aeromagnetic survey around the Yucca Mountain area the week of February 16, 2004. The survey involves towing an aeromagnetic survey instrument, approximately 30 m (100 ft) off the ground by helicopter, along parallel flight paths across the survey area. The purpose of this work is to look for geomagnetic anomalies below the ground surface that could be related to past igneous activity. The area to be covered is about 893 square kilometers (km^2) [345 square miles (mi^2)] , or roughly a square-shaped area about 24 km (20 mi) on a side with the Yucca Mountain site in the north-central part of that area.

The work was proceeding with no identified issues until February 21, 2004. On that day, the fuselage of the aeromagnetic survey instrument package was damaged after hitting a rock outcrop on a ridge west of Busted Butte (about 5 miles south of the north portal of Yucca Mountain). The survey instrument was shipped out of state where it is being installed in a new fuselage. The survey had not resumed as of the end of this reporting period. Before the survey can resume, the YMP will complete an investigation on how this accident happened and will determine and initiate corrective actions to prevent recurrence.

Nye County Early Warning Drilling Program

The Early Warning Drilling Program (EWDP) was initiated as part of the Nye County, Nuclear Waste Repository YMP Office, Yucca Mountain Oversight program. The purpose of the EWDP is to establish a groundwater monitoring system, to protect the residents of Amargosa and Pahrump Valleys against potential radionuclide contamination.

The program is also intended to provide geologic and hydrologic information to DOE's Yucca Mountain program. The targeted area is located in the hydrogeologic system south of Yucca Mountain. The questions planned to be investigated are: (1) the origin of spring deposits; (2) the geology and hydraulic properties of valley-floor sediments; (3) the recharge; and (4) groundwater-flow patterns.

During this reporting period, Nye County and its geophysical logging contractor conducted heat-pulse flow meter and temperature surveys in EWDP Phase IV and Phase V boreholes. Project staff monitored and documented the Nye County geophysical logging operations. Additional water sampling at the Nye County boreholes is scheduled to start in May 2004. Detailed information on all EWDP wells (when available) can be found at: http://www.nyecounty.com/ewdpmain.htm.

Inyo County Well Drilling

As part of its Yucca Mountain oversight program, Inyo County, California, began drilling the first of five deep monitoring wells in early April 2003. This undertaking is called the "Inyo County Death Valley Lower Carbonate Aquifer Monitoring Program." The county's rationale for drilling these new wells is to: (1) evaluate regional groundwater flow through the southern Funeral Mountains; (2) establish structural controls on flow paths and discharge areas; and (3) evaluate potential zones of mixing between the deep regional groundwater systems and the local shallow groundwater systems to the northeast. This first well, located south of Yucca Mountain, in Death Valley National Park, has been

completed, pump-tested, and sampled. Drilling of the next well is now expected to begin in late summer 2004 at a site near Furnace Creek, also in Death Valley National Park.

1.6 Laboratory Studies

Corrosion Testing

As described in the last OR Report, preliminary testing identified potential corrosion concerns with the borated SS absorber plate material used in the lattice assembly for some of the proposed waste packages. Based on the results of this testing, DOE is moving ahead with making changes to the lattice assembly.

2. OUTREACH ACTIVITIES

On March 5, 2004, an OR attended a Las Vegas field hearing convened by the U.S. House Subcommittee on Railroads. The hearing was used to examine and challenge aspects of DOE's preferred strategy to ship, by new rail in Nevada, and by use of existing rail in other parts of the country, nuclear waste to the potential Yucca Mountain repository. About 150 members of the public and local media attended.

On March 15, 2004, an NRC OR and about 100 members of the public and news media attended a Las Vegas field hearing convened by U.S. Senator Harry Reid of Nevada. The hearing was held to understand past site industrial safety practices for, and potential health impacts from, working in environments with high levels of silica or fibrous mineral dust during the drilling and tunneling of Yucca Mountain. DOE's knowledge of, and response to, the dust issues was also discussed. Current DOE managers, former and current workers at the Yucca Mountain site, and industrial and medical health experts provided testimony.

3 QUALITY ASSURANCE AND ENGINEERING

3.1 BSC QA Surveillance of Model Development and Validation

During this reporting period, the ORs evaluated the results of BSC QA Surveillance BQA-SI-04-048. The purpose of this surveillance was to verify implementation of the model development and validation activities associated with Supplement III, "Scientific Investigations," of the QARD. An independent team of subject matter experts conducted the surveillance to address the corrective actions identified in CR-099 (formerly CAR BSC-01-C-001) concerning model development and validation. As noted in the surveillance report, this oversight activity was a corrective action follow-up to an evaluation of 20 model reports conducted by DOE's OQA in late 2003. That evaluation determined that six of the 20 model reports were unsatisfactory. As a result of that evaluation, BSC determined it was appropriate to evaluate the remaining model reports that were developed in accordance with AP-SIII.10Q, "Models."

To validate the model development and validation process, the surveillance team evaluated 36 model reports using the criteria defined in AP-SIII.10Q, Revision 2, ICN 001, or the applicable revision of the procedure that was in effect at the time the model report was issued. The surveillance team also used detailed checklists to evaluate the acceptability of each model report versus the established criteria concerning model development and validation. Details of the surveillance activities, including a description of the objective evidence reviewed, were properly documented in the surveillance

checklists and the ORs determined that these verification activities were effectively performed.

As a result of these reviews, the surveillance team concluded that the procedural controls defined in AP-SIII.10Q, were an effective tool in translating the requirements of the QARD into specific implementing procedural controls. The team also noted that despite improvements in the technical adequacy of the model reports, procedural compliance issues remained an area of concern. Specifically, the surveillance team noted that there was a large variability in the quality of the documents with regard to compliance with the governing procedures. The surveillance team determined that 16 of the 36 model reports were unsatisfactory with regard to model validation. As a result of these findings, the surveillance team concluded that the implementation aspects of AP-SIII.10Q, Revision 2, ICN 001, and preceding revisions were inadequate.

Based on the results of the ORs' reviews within this area, it was determined that the surveillance team effectively evaluated the model development and validation process related to Supplement III, of the QARD. The surveillance team's subject matter experts were technically competent and their evaluation methodology was thorough. No audit observation inquiries were identified. The ORs generally concur with the surveillance team's findings presented at the management debrief on March 11, 2004. These findings were consistent with the recent "U.S. Nuclear Regulatory Commission Staff Evaluation of U.S. Department of Energy Analysis Model Reports, Process Controls, and Corrective Actions," issued April 10, 2004.

3.2 BSC Surveillance of Independent Verification and Validation of Legacy Code

On March 5, 2004, BSC QA issued the results of its surveillance, BQA-SI-04-014. The purpose of this surveillance was to verify implementation of the software controls contained in AP-SI.4Q, "Independent Verification and Validation (IV&V) of Legacy Code," Revision 0, ICN 002. AP-SI.4Q was developed to address corrective actions identified in CR-102 (formerly CAR BSC-01-C-002) concerning software development and control. These corrective actions included evaluation of the functionality of all software used in quality-affecting activities in support of LA. Software codes, which had not already been qualified and baselined in accordance with AP-SI.1Q, "Software Management," (Revisions 1, 2, and /or 3) are characterized as 'legacy codes' and are subject to the AP-SI.4Q testing program.

The BSC surveillance team selected a sample of eight codes, which had completed AP-SI.4Q testing, and 10 codes that were still in the testing process. To ensure a representative sample, codes selected for inclusion in the surveillance profiled a variety of platforms and operating systems. The surveillance team evaluated the documentation associated with testing observations and findings for completeness, consistency, and compliance with the applicable procedural requirements.

Based on the results of the surveillance team's evaluations, it was concluded that the procedural controls contained in AP-SI.4Q were adequate. However, the surveillance team determined that the implementation and effectiveness in meeting procedure requirements were unsatisfactory. This conclusion was predicated on the surveillance team's identification of a number of inconsistencies between the reports produced by different IV&V personnel. As noted by the surveillance team, the inconsistencies primarily involved the level of detail and/or completeness with which individuals described the materials available to them for testing, the characterization of test results, and the proposed disposition for the code. Additionally, internal inconsistencies were identified in some reports that rendered the results indeterminate.

The ORs reviewed the documentation associated with BSC QA's "Surveillance," BQA-SI-04-014, of the IV&V process for legacy code. Based on the results of this review and discussions with the team leader, the ORs determined that this surveillance activity was well-planned and effectively performed. The timing and scope of the surveillance were appropriate and the surveillance team members were prepared and technically competent. The ORs verified that the conditions identified by the surveillance team were accurately characterized and documented on CRs. Also, these findings were consistent with the recent "U.S. Nuclear Regulatory Commission Staff Evaluation of U.S. Department of Energy Analysis Model Reports, Process Controls, and Corrective Actions," issued April 10, 2004.

3.3 OQA Staff Augmentation Surveillance

Representatives from DOE's OQA performed a surveillance, OQA-SI-04-006, of BSC direct-support personnel used as staff augmentation. The purpose of this surveillance was to evaluate BSC's compliance with the applicable QA requirements related to the training and qualification of personnel performing quality affecting-activities. The surveillance scope included a review of subcontractors, Technical Service Agreements (TSAs), training, and Verification of Education and Experience (VoEE.)

To confirm that staff augmentation personnel had completed the requisite training, the surveillance team interviewed BSC procurement personnel and evaluated the TSA and the "Statement of Work for Direct Support Technical Professional Services and Subcontracts, Memorandum Purchase Agreement." The surveillance team also reviewed the Human Resources documentation that provided VoEE for project personnel. Information from these sources were compared for a representative sample of individuals to determine if the required training for each job function had been completed in accordance with the requirements of AP-2.1Q, "Personnel Training and Qualification." Also, the team reviewed these records to confirm that VoEE had been performed in accordance with the requirements of LP-2.9Q-BSC, "Establishment and Verification of Required Education and Experience of Personnel."

Based on the results of this oversight activity, OQA's surveillance team concluded that BSC's program for the control of direct-support contractors used for staff augmentation was adequately implemented. One CR was identified regarding the lack of documentation for subcontract personnel training. However, this CR did not impact the technical content of any products supporting LA. The ORs concurred with the OQA surveillance team's findings and conclusions. No audit observation inquiries were initiated and the ORs determined that this oversight activity was performed effectively.

3.4 Review of Condition-Screening Team Activities

Subsequent to the development of the new AP-16.1Q, "Condition Reporting and Resolution," process in the Fall of 2003, the Condition-Screening Team (CST) was established to facilitate the administration of the Corrective Action Program (CAP). Although designated responsibilities for implementation of the condition reporting process are assigned to the CAP manager, the CST, which includes a multi-disciplined membership, assists in the review, evaluation, and processing of all CRs. Specifically, the CST evaluates CRs and provides information to the CAP manager, including recommendations concerning the adequacy of information provided; responsible manager assignment; significance-level determination; screening criteria; trend-code information; and feedback to the CR originators.

To determine the effectiveness of the CR Screening Team, the ORs attended several CST meetings and reviewed the information contained in current CAP trending reports. During the conduct of these meetings, the ORs observed that the CST members were cognizant of the technical and administrative aspects of each of the CRs on the agenda, and that the affected organizations provided appropriate representation. Based on the results of the ORs' observations and document reviews, it was determined that the CST manager was effectively administering the CR screening process and that the CST was performing thorough evaluations of CRs in a well-structured manner. Although the AP-16.1Q condition-reporting process is experiencing operational challenges, improvements in the implementation of the CAP resolution program have been noted. These improvements are the result of increased Project management attention and enhancements in the timeliness of corrective action plan completion activities.

3.5 Review of OR Open Items

During this reporting period, the ORs reviewed the pertinent information associated with previously identified OR Open Items. The results of this review are provided below.

3.5.1 As previously documented in OR Report 02-01, dated April 9, 2002, Open Item 02-06 was initiated to track the Project's development of an unqualified-data impact assessment. Specifically, the NRC staff identified that unqualified data could be replaced with qualified data for the PA. The staff noted that unqualified data had a lower degree of credibility and its use in PA, which is intended to represent known sources of uncertainty, could be problematic. Furthermore, for risk-significant components, an evaluation of unqualified data subsequently replaced with qualified data, would help determine whether efforts should be undertaken to qualify the superseded data. Also, the comparison of these data sets could provide an additional source of information (corroboration) that the uncertainty and variability assigned to the qualified data are appropriate.

In response to this issue, BSC informed the ORs that the Regulatory Integration Team (RIT) had been formed to conduct a comprehensive evaluation of the set of analysis and model reports (AMRs) identified as supporting the Total System Performance Assessment for LA (TSPA-LA). BSC stated that a discrete review of the RIT checklists would be completed to ensure that this issue is addressed as part of the RIT effort.

As described by DOE, the RIT evaluation phase has two parallel activities that address the issues raised in OR Open Item 02-06. Technical Work Plan (TWP) for Regulatory Integration Evaluation of AMRs Supporting TSPA-LA contains Analysis and Model Checklists, that are being used to ensure that an evaluation of each AMR is processed in a consistent manner. Questions related to data usage on this checklist ensure that references are clear with appropriate specificity. Additionally, the RIT TWP requires that the technical reviewer evaluate whether key uncertainties and their impacts on results are clearly discussed in the text of the AMR. The TWP also contains provisions for documenting the traceability from the Parameter Entry Forms, used to track inputs to TSPA-LA, through the AMRs to the supporting data sources. The purpose of the review by the RIT Parameter Team is to evaluate and improve the traceability of technical parameters as they are developed in the AMR and transferred among AMRs, with a priority placed on those that become direct feeds to the TSPA-LA.

Results from application of the Analysis and Model checklists, the Parameter Review Checklists, and the Data Confirmation Checklists during the evaluation phase of the RIT are being entered into an action-list data base for each AMR. During the revision phase of the RIT, action-list items will be dispositioned, either by making a correction or addition to the text of the AMR, or by other means, to ensure that the revised AMRs meet procedural requirements and provide clear and transparent technical bases for the TSPA-LA.

Based on the review of the resolution actions described above, the ORs determined that appropriate actions had been developed to address the identified issue. Therefore, **OR Open Item 02-06** is closed.

3.5.2 OR Open Item 03-01 was documented in OR Report 03-01, dated April 4, 2003, to track the resolution of issues identified as a result of OQA's surveillance of the procedure-development process. As a result of the ORs' reviews, it was noted that three significant issues identified by OQA's surveillance team were not specifically addressed within the context of CAR BSC (O)03-C-097. These issues involved: (1) the lack of procedural training as a contributing factor; (2) failure to develop an effective transition plan; and (3) an apparent Safety Conscious Work Environment (SCWE) issue related to the release of a quality-affecting document with known errors and potential procedural deficiencies.

The first two issues involving the lack of procedural training and failure to develop an effective transition plan were reviewed and closed in OR Report 03-04, dated October 20, 2003. Information related to the remaining issue, involving an apparent SCWE concern, was provided to the ORs during this reporting period. This information included the results of BSC's Employee Concerns Program (ECP) evaluation of the concerns surrounding the apparent SCWE issue. The ECP evaluation of this concern determined that no adverse action had occurred in the process of identifying the initiating conditions associated with CAR BSC (O)-C-097,or as a result of initiating the related deficiency reports (DRs).

The ORs noted that the ECP manager interacted with the responsible organization and assisted with the completion of an appropriate lessons-learned product that was distributed site-wide to project personnel. As determined by the ORs, the lessons-learned information concerning "Effective Communication Facilitates Issue Resolution," was widely distributed throughout the OCRWM program, and project supervisors were asked to read the document and share the information with their staff. As indicated by the BSC ECP manager, project personnel were receptive to the information contained in the lessons-learned and many project supervisors used the information as a basis for discussion with project employees. As a result of this effort, this particular lessons-learned document received wide distribution and continues to be available via the lessons-learned database.

Based on the ORs' review of the completed actions, and discussions with the BSC ECP manager, it was determined that appropriate actions had been implemented to address this issue. Therefore, **OR Open Item 03-01** is closed.

3.5.3 OR Open Item 03-02 was initiated to document the apparent deviation from a commitment to administer the Management Improvement Initiative (MII) in accordance with the requirements of AP-5.1Q, "Procedure Preparation, Review, and Approval." Specifically, during the review of completed MII confirmation packages, the ORs

determined that at least one of the MII action statements had been revised to eliminate the development of supplemental procedures. This change in scope, of the action statement, should have resulted in a revision to the MII in accordance with the requirements of AP-5.1Q. In response to this issue, DOE initiated CR-943, to document the condition and establish the necessary corrective actions.

The ORs reviewed the response to CR-943 and examined the associated documentation including selected MII Confirmation-Team (CT) closure packages. As described in the impact analysis for CR-943, the MII CT noted changes in the action statements and the planned sub-activities, during its review of the Confirmation Summary Sheets. As a result of this finding, the responsible managers were requested to provided a documented basis and justification for action statements that departed from the established actions in the MII. The CT evaluated these amended responses to determine if they departed from the action plan's stated objective to reach the desired condition. The CT concluded that the changes did not adversely impact the substance of the MII action plan objectives.

Based on the review of the completed actions documented in CR-943 and examination of the MII CT results, the ORs' determined that appropriate corrective actions had been implemented to address this issue. Therefore, **OR Open Item 03-02** is closed.

4.0 GENERAL ACTIVITIES

4.1 Items of Interest

NRC Reorganization of High-Level Radioactive Waste Programs

Effective March 22, 2004, NRC established a separate Division of High-Level Waste Repository Safety in its Office of Nuclear Material Safety and Safeguards. This reorganization will enable NRC to enhance its focus on major high-level radioactive waste programs and issues, and conduct a comprehensive licensing program for the proposed high-level waste disposal facility at Yucca Mountain, Nevada. DOE anticipates submitting an application to NRC, in December of this year, for a license to construct and operate the repository.

The changes are expected to improve organizational effectiveness and efficiency and focus attention and resources on the major program areas of high-level waste, decommissioning, environmental protection, and low-level waste.

4.2 Meetings

Monthly Operating Review

During this reporting period, the ORs attended the DOE Monthly Operating Review (MOR) meetings. These meetings included discussions concerning YMP activities; management initiatives; QA program issues; licensing; environmental safety and health; site operations; public affairs; and business administration issues for DOE and BSC managers. Additional topics discussed in the MOR meetings for this reporting period involved a summary of major issues, major accomplishments, performance indicators for work execution, YMP support, and YMP management.

During these meetings, the responsible managers provided the overall status of their respective programs, using the standard industry identifiers of red, yellow, green, and blue to characterize overall performance, and white to indicate insufficient data or undeveloped metrics to support a color. These presentations typically involved evaluations of problem areas, including critical path activities, as well as critiques of performance that focused on accountability and methods for improvement. The increased focus on improving performance and enhancing management processes, represent overall improvements in YMP controls.

The metrics for each indicator were stabilized this reporting period, but many in their current form are only 2 or 3 months old, and useful trends may not yet be apparent. Therefore, effectiveness for indicating performance is not yet fully known at this time.

Eight performance indicators declined in performance at the end of this reporting period. Surface Facilities, Site Construction, Project Management, Cost Performance Index, Scope Baseline, Key Deliverables/Critical Path Float, and Internal Communications went from green to yellow. Product Quality went from yellow to red. Nine performance indicators improved at the end of this reporting period. Seven went from yellow to green. They were Licensing, Safety Analysis, Performance Confirmation, Site Operations, Site Engineering, Site Critical Systems, and Quality Systems. One went from red to yellow -- Timely Corrective Action Resolution. One went from red to green -- Site Maintenance. All other performance indicators had no color change for the month.

A summary of work execution for the YMP, as of the end of this reporting period, indicates that overall progress towards an LA is 70 percent complete. KTI agreement response remains at 70 percent complete; the LA document is 37 percent complete; Pre-closure safety assessment is 76 percent complete; TSPA-LA is 81 percent complete; and design is 81 percent complete.

4.3 Site Visits

On March 24, 2004, an NRC OR participated in an NRC and Center for Nuclear Waste Regulatory Analyses (CNWRA) field trip to Nevada Test Site Area 25 and Yucca Mountain area, to observe basaltic rock outcrops.

On March 30, 2004, an OR toured Amargosa Valley, with a new member of NRC's PA staff, to point out features of the biosphere relevant to the post-closure performance of Yucca Mountain.

On March 31, 2004, an OR visited the site with members of NRC's High-Level Waste and Repository Safety Division, Office of the Inspector General, and Region IV Office, as well as CNWRA staff, to provide a general overview.

On April 1, 2004, a representative, respectively, from the OR office, NRC Headquarters, and the Clark County Comprehensive Planning Department, visited the site to observe the Alcove 8 and Niche 3 seepage test.

On April 12, 2004, an OR visited the site for Underground Access Training. While there, the OR attended site Plan of the Day meeting and talked to the DOE site representative and BSC site manager about general site issues.

On April 28, 2004, an OR visited the Sample Management Facility to view sonic core from Nye County EWDP well 19PB, with two members of the CNWRA staff. Also, the OR visited the Nye County Department of Natural Resources and Federal Facilities Laboratory in Pahrump, NV, where sonic core samples are being tested (in conjunction with Los Alamos National Laboratory) for hydraulic properties.