

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

AUDIT REPORT BSC-ARC-01-06

OF THE

BECHTEL SAIC COMPANY, LLC

AT

LAS VEGAS, NEVADA

AND

YUCCA MOUNTAIN PROJECT SITE

APRIL 23-27, 2001

Prepared by: _____ **Date:** _____

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Audit Team Leader
**Office of Quality Assurance/
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Approved by: _____ **Date:** _____

Robert W. Clark
Director
Office of Quality Assurance

1.0 EXECUTIVE SUMMARY

As a result of quality assurance (QA) limited scope compliance-based audit, BSC-ARC-01-06, the audit team determined that, with the exception of the one condition adverse to quality (CAQ) identified, the Bechtel SAIC Company, LLC (BSC) is satisfactorily and effectively implementing the examined portions of the U.S. Department of Energy (DOE), Office of Civilian Radioactive Waste Management (OCRWM), DOE/RW-0333P, Revision 10, *Quality Assurance Requirements and Description (QARD)*, and applicable implementing procedures.

QA Program Sections 3.0, 8.0, 9.0, 10.0, 12.0, 13.0, 14.0, 15.0, and Appendix C were determined to be effectively implemented based on activities evaluated during the audit. QA Program Section 11.0 and Appendix B were determined to be not currently applicable to BSC.

The audit team identified CAQ that resulted in the issuance of one deficiency report (DR), YMSCO-01-D-064. This DR identified that BSC failed to assure that action steps required to implement procedural requirements were not included in procedural notes. The audit team identified that procedures contain action steps in procedural explanatory/clarification notes that are not addressed elsewhere in the procedure.

The audit team evaluated the effectiveness of corrective actions for 12 previously issued BSC deficiencies. With the exception of DR LVMO-00-D-046, for which no activity was evaluated during the audit, and LVMO-00-D-130 that had no implementation to evaluate, the audit team determined the corrective actions to be effective. The evaluation results are documented in Section 5.5.3 of this report.

In addition, there was one recommendation resulting from the audit as documented in Section 6.0 of this report for the BSC management's consideration.

2.0 SCOPE

Auditors representing the DOE's Office of Quality Assurance (OQA) conducted a limited scope compliance-based audit to evaluate the BSC implementation of the OCRWM QA Program, as described in the QARD and implementing procedures. The audit team, through interviews of cognizant personnel, reviews of documentation, and evaluation of procedures, assessed implementation, adequacy, and effectiveness of BSC implementation of the QA Program.

The audit team reviewed the status of OCRWM deficiency documents generated during previous OQA audits and surveillances associated with the scope of this audit to determine the effectiveness of in-process and completed corrective actions by BSC.

In accordance with the approved audit plan, the following QA Program Sections were evaluated:

3.0	Design Control
8.0	Identification and Control of Items
9.0	Control of Special Processes
10.0	Inspection
11.0	Test Control
12.0	Control of Measuring and Test Equipment
13.0	Handling, Storage, and Shipping
14.0	Inspection, Test and Operating Status
15.0	Nonconformances
Appendix B	Storage and Transportation
Appendix C	Monitored Geologic Repository

During audit preparation activities, the audit team determined that BSC currently has no required QARD Section 11.0 or Appendix B activities.

The audit was conducted at the BSC offices in Las Vegas, Nevada and at the Yucca Mountain Project (YMP) Site, Area 25.

3.0 AUDIT TEAM MEMBERS

The following is a list of audit team members and assigned areas of responsibility.

<u>Name/Title/Organization</u>	<u>QA Program Sections</u>
V. J. Barish, Jr., Audit Team Leader, OQA/Quality Assurance Technical Support Services (QATSS)	3.0, 11.0, Appendix B
S. E. Archuleta, Auditor, OQA/QATSS	9.0, 10.0, 12.0
G. T. Harper, Jr., Auditor, OQA/QATSS	3.0
C. A. Smirolfo, Jr., Auditor, OQA/QATSS	8.0, 9.0, 12.0, 13.0, 14.0, 15.0 Appendix C
C. D. Wright, Auditor, OQA/QATSS	10.0, 12.0, Appendix C

4.0 AUDIT MEETINGS AND PERSONNEL CONTACTED

A pre-audit meeting was held at the BSC offices in Las Vegas, Nevada with YMP Site personnel on conference call, on April 23, 2001. Daily debriefings, as required, were conducted to apprise BSC management and staff of the audit progress and any CAQ. A post-audit meeting was held at the BSC offices in Las Vegas, Nevada, on April 27, 2001. Personnel contacted during the audit, including those who attended the pre-audit and post-audit meetings, are listed in Attachment 1, "Personnel Contacted During the Audit."

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Effectiveness

The audit team concluded that, with the exception of the one CAQ, DR YMSCO-01-D-064, BSC is satisfactorily and effectively implementing the examined portions of the QARD and applicable implementing procedures.

5.2 Stop Work or Immediate Corrective Actions Taken

There were no Stop Work Orders or immediate corrective actions as a result of the audit.

5.3 QA Program Audit Activities

Attachment 2, “Summary Table of Audit Results,” provides the results for each QA Program Section audited. Details of audit activities, including objective evidence reviewed, are documented in the audit checklists. The checklists are maintained as QA records.

5.4 Technical Audit Activities

An audit of technical activities was not included in the scope of the audit.

5.5 Summary of Conditions Adverse to Quality (CAQ)

One deficiency document with CAQ was issued as a result of this audit. Details of the deficiency are detailed in Section 5.5.2 of this report.

5.5.1 Corrective Action Requests (CAR)

There were no CARs issued as a result of this audit.

5.5.2 Deficiency Report (DR)

YMSCO-01-D-064

This DR identified that YMSCO/BSC failed to assure that action steps required to implement procedural requirements were not included in procedural notes. The audit team identified that procedures contain action steps in procedural explanatory/clarification notes that are not addressed elsewhere in the procedure.

5.5.3 Follow-up of Previously Identified Conditions Adverse to Quality

LVMO-00-D-046

The DR noted the failure to properly validate a model in accordance with AP-3.10Q, *Analyses and Models*, requirements. This issue was partially deferred to DR LVMO-00-D-119 for remedial actions and ultimately to CAR BSC-01-C-001 due to failure to effectively implement corrective actions. No models were included in the sample technical products selected for this audit.

LVMO-00-D-071

The DR noted a failure to correctly status inputs in the Document Input Reference System (DIRS) database. DIRS reports for the technical products selected for review during the audit were evaluated. No additional occurrences of this condition were identified during the audit.

LVMO-00-D-097

The DR noted a failure to assign To Be Verified (TBV) tracking numbers to input references in the DIRS reports. DIRS reports for the technical products selected for review during the audit were evaluated. No additional occurrences of this condition were identified during the audit.

LVMO-00-D-106

The DR noted a failure to properly store quality-related steel set components in the lay down yard. Compliance to the storage requirements was evaluated during the audit and no additional occurrences of this condition were identified.

LVMO-00-D-129

The DR noted a failure to correctly status design input transmittals in the DIRS database. DIRS reports for the technical products selected for review during the audit were reviewed. No additional occurrences of this condition were identified during the audit.

LVMO-00-D-130

The DR noted a failure to revise an Interface Control Document to reflect current organizational interfaces. The procedure governing Interface Control Documents was not implemented during the time period covered by this audit.

LVMO-00-D-146

The DR noted a failure related to the technical accuracy of statements/information within the technical product. There were no similar issues identified during the audit.

LVMO-00-D-147

The DR noted a failure to correctly identify in a classification analysis the quality level of equipment consistently throughout the analysis. The extent of condition investigation revealed that the deficient condition was an isolated incident. No additional occurrences of this deficient condition were identified during the audit.

LVMO-00-D-148

The DR noted a failure to maintain TBV/To Be Determined (TBD) status in the metadata in the Automated Technical Data Tracking database consistent with the TBV/TBD status in the DIRS database. No additional occurrences of this deficient condition were identified during the audit.

LVMO-00-D-151

The DR noted a failure to clearly identify and document the attributes that comprise the two conceptual models developed within Analysis and Model Report (AMR) T-0070 relative to transparency. The sample technical products reviewed during the audit did not contain models or model development. Suspected Trend Investigation Report BSC-01-004 resulted in the issuance of CAR BSC-01-C-001 that addresses inadequacies with model validation and documentation.

LVMO-01-D-011

The DR noted a failure to correctly identify the TBV status of Design Input Transmittals used as inputs to technical products in the DIRS database. No additional occurrences of this deficient condition were identified during the audit.

LVMO-01-D-042

The DR noted a failure to include range of use in calibration procedures for water meters. Water meters were removed from the calibration program. Subsequently, no review of the calibration of water meters was performed during the audit. No deficient conditions related to the inclusion of range of use in calibration procedures were identified during the audit.

6.0 RECOMMENDATIONS

The following recommendation is presented for consideration by appropriate BSC management:

Revise technical product ANL-WES-ME-000006, Rev. 00, "Retrieval Equipment and Strategy for WP on Pallet," to incorporate those portions of superseded document BCAF000000-01717-0200-00008, Rev. 00, "Retrieval Equipment and Strategy for WP on Pallet," in order to provide a complete presentation of the analysis within ANL-WES-ME-000006. Some examples of sections that reference text in the superseded document can be found in Sections 6.1, 6.1.2, 6.1.2.4, 6.2.1, and 6.2.4. Entered into Condition/ Issue Identification and Reporting Resolution System (CIRS) as CIRS-1614.

7.0 LIST OF ATTACHMENTS

Attachment 1 – Personnel Contacted During the Audit
Attachment 2 – Summary Table of Audit Results

ATTACHMENT 1
BSC-ARC-01-06
Personnel Contacted During the Audit

Name	Organization	Pre-Audit Meeting	Contacted During Audit	Post-Audit Meeting
Abernathy, Larry	BSC/Quality Engineering Support	X	X	X
Anderson, Michael	BSC/Waste Package Design		X	
Armstrong, Jan	BSC/Material		X	
Bartley, Charles F.	BSC/Methods & Procedures	X		
Beall, George K.	BSC/Corrective Action Coordination (Projects Audit Coordination)	X	X	X
Belanger, Mark	BSC/Records Management and Document Control		X	
Blaylock, James	DOE/Office of Quality Assurance			X
Boldt, G. K.	BSC/Methods & Procedures	X	X	
Boutin, Robert	BSC/Subsurface Facilities	X		X
Clark, James E.	BSC/Quality Engineering Support	X		
Clark, John J.	BSC/Methods & Procedures	X	X	
Clark, Laure	BSC/Regional Data Analysis		X	
Cogar, Jerry	BSC/Waste Package Fabrication			X
Cox, Howard	BSC/NCR Coordinator		X	
Cozzolino, Daniel	BSC/Field Construction Engineers		X	
Croft, Larry	BSC/ES&H Information Analysis and Management	X	X	
Dana, Stephen	BSC/Quality Engineering	X		X
Davis, Jayne	BSC/Environmental Safety & Health - Deputy			X
Doering, Thomas	BSC/Waste Package	X		
Donaldson, George	BSC/Regional Data Analysis		X	
Doyle, John	QATSS/QA Verification			X
Fitch, Edward	BSC/Project Field Engineer - Staff		X	
Gilkerson, Kenneth O.	BSC/Quality Engineering Support			X
Goodin, Steve	BSC/Subsurface Design		X	

Name	Organization	Pre-Audit Meeting	Contacted During Audit	Post-Audit Meeting
Greene, Henry	BSC/Quality Engineering Support	X		X
Gwyn, Dealis	BSC/Integrated Safety Analysis - PMR	X		X
Hartstern, Robert	BSC/Quality Assessment	X		
Hasson, Robert	QATSS/QA Verification			X
Higgins, Thomas	BSC/Subsurface Facilities – Senior Staff	X	X	X
Horton, Sam	BSC/QA Special Assignments	X		
Iyer, Muthu	BSC/Surface Facilities	X		X
Jaeger, Michael	BSC/Integration		X	
Keele, Robert	BSC/Quality Engineering	X		X
Keifer, Jerry	BSC/Subsurface		X	
Kimble, Robert L.	BSC/Regional Data Analysis	X		X
Krishna, Donald T.	BSC/Quality Assurance	X		
Latta, Robert M.	U. S. Nuclear Regulatory Commission	X		X
Law, Robert (Telephone conference - Pre-audit)	BSC/Contracts and Coordination	X	X	
Leigtner, Marty	BSC/Requirements and Integration West		X	
Lewis, Chris (Telephone conference - Pre-audit)	BSC/Sample Management Facility	X	X	
Loros, Eric F.	BSC/Ground Control		X	
Martin, John	BSC/Quality Control	X		
McDaniel, Mary	BSC/Product Assurance Department	X	X	
Morrison, Larry	BSC/Test Facilities		X	
Osborne, C. D. (Telephone conference – Pre-audit)	BSC/Quality Control	X	X	
Pernisi, Robert	BSC/Facilities Design		X	
Peters, John W.	BSC/Product Checking	X		
Pettit, N. E.	BSC/Systems Engineering and Requirements Team		X	
Pointer, Ken	BSC/Regulatory Programs	X		X

Name	Organization	Pre-Audit Meeting	Contacted During Audit	Post-Audit Meeting
Reitan, Judy	BSC/Quality Assurance –Functional Support		X	
Roach, Jeff	BSC/Busted Butte Test Management Section		X	
Roesner, Kent	BSC/Regional Data Analysis		X	
Ryan, Kathy	BSC/Technical Staff		X	
Ryan, Thomas	BSC/Methods & Procedures	X	X	
Silva, R. A.	BSC/Mechanical		X	
Smith, Steve	BSC/Work Planning and Control		X	
Sorensen, C. D.	BSC/Environmental Safety & Health			X
Sun, Yiming	BSC/Thermal Hydrology		X	
Taylor, Charles	BSC/Quality Control Engineering		X	
Taylor, M. F.	BSC/Structural		X	
Thompson, Kathleen	BSC/Customer Support		X	
Tomek, Thomas	BSC/Project Field Engineer – Technical Support		X	
Trautner, Larry	BSC/Repository Design	X	X	X
Tunney, Daniel	BSC/Quality Engineering Support	X	X	X
Wagner, Lester	QATSS/QA Verification	X		X
Weaver, Jeff	BSC/Integration Manager	X		
Weeks, Rick	BSC/Site Science Quality Assurance			X
Whitcraft, James	BSC/Engineering	X		X
White, Leslie	BSC/Material		X	
Williams, Kent	BSC/Quality Control Engineering		X	
Williams, Nancy	BSC/Manager of Projects			X
Wolverton, Kenneth	BSC/Regional Data Analysis	X	X	X
Ziegler, Jo	BSC/Integrated Safety Analysis - PMR		X	
Zinkevich, Fred	BSC/Corrective Action Coordination	X		X

ATTACHMENT 2
BSC-ARC-01-06
Summary Table of Audit Results

QARD Section	Document Reviewed	Check List Pages	Deficiencies	Recom-mendations	Program Adequacy	Procedure Compliance	Overall	
3.0	AP-3.10Q	1-5		REC-1	SAT	SAT	SAT	
	AP-3.11Q	6-8			SAT	SAT		
	AP-3.14Q	9-11			SAT	SAT		
	AP-3.17Q	12-14			SAT	SAT		
	AP-3.19Q	15-19			SAT	SAT		
	AP-3.20Q	20-23			SAT	SAT		
	AP-3.12Q	24-27			SAT	SAT		
	AP-3.4Q	28-31			SAT	SAT		
	AP-3.15Q	32-35			SAT	SAT		
	AP-2.14Q	36, 37			SAT	SAT		
	LP-3.24Q-M&O	38-41			NI	NI		
8.0	NWI-ESF-038Q	42-46			SAT	SAT	SAT	
9.0	NWI-ESF-027Q	47, 48			SAT	SAT	SAT	
	AP-9.2Q	49-55			SAT	SAT		
10.0	AP-10.1Q	56-61			SAT	SAT	SAT	
	AP-10.2Q	62-67			SAT	SAT		
	AP-10.3Q	68-72			SAT	SAT		
	AP-10.4Q	73-75			SAT	SAT		
	LP-QC-006Q	76-79			SAT	SAT		
11.0	N/A	80			N/A	N/A	N/A	
12.0	AP-12.1Q	81-87			SAT	SAT	SAT	
	LP-MM-001Q	88, 89			SAT	SAT		
	LP-MM-002Q	90-92			SAT	SAT		
	LP-MM-003Q	93			SAT	SAT		
	LP-CAL-004Q	94-96	YMSCO-01-D-064			SAT		SAT
	LP-SMF-007Q	96-1 – 96-4				SAT		SAT
13.0	NWI-ESF-047Q	97, 98			SAT	SAT	SAT	

ATTACHMENT 2
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Summary Table of Audit Results (continued)

QARD Section	Document Reviewed	Check List Pages	Deficiencies	Recom- mendations	Program Adequacy	Procedure Compliance	Overall
14.0	AP-OM-006Q	99-104			SAT	SAT	SAT
15.0	AP-15.2Q	105-108			SAT	SAT	SAT
APP B	N/A	109			N/A	N/A	N/A
APP C	Included under Sections 9.0, 10.0, & 15.0	110			SAT	SAT	SAT
Total	Pages - 110		1 DR	1 REC	SATISFACTORY		
LEGEND: REC – Recommendation SAT – Satisfactory APP - Appendix DR – Deficiency Report N/A – Not applicable NI – Not implemented							