

U.S. NUCLEAR REGULATORY COMMISSION  
OBSERVATION AUDIT REPORT 94-01  
OF THE YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION  
AUDIT YMP-94-02  
OF REYNOLDS ELECTRICAL & ENGINEERING COMPANY, INC.

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## 1.0 INTRODUCTION

During December 6-9, 1993, members of the quality assurance (QA) staff of the U.S. Nuclear Regulatory Commission Division of High-Level Waste Management observed a U.S. Department of Energy (DOE), Office of Civilian Radioactive Waste Management (OCRWM), Office of Quality Assurance, Yucca Mountain Quality Assurance Division (YMQAD) audit of Reynolds Electrical & Engineering Company, Inc. (REECO). The audit, YMP-94-02, was conducted at the REECO offices in Las Vegas, Nevada, and at the Nevada Test Site (NTS). The audit evaluated the adequacy and effectiveness of the REECO QA program in two programmatic areas. The State of Nevada was invited to send a representative to observe at this audit, but chose not to do so.

This report addresses the effectiveness of the YMQAD audit and the adequacy and implementation of the QA controls in the audited areas of the REECO QA program.

## 2.0 OBJECTIVES

The objectives of the audit by YMQAD were to determine whether the REECO QA program and its implementation meet the applicable requirements and commitments of the OCRWM Quality Assurance Requirements and Description document (QARD), the REECO Quality Assurance Program Description (QAPD), and associated implementing procedures.

The NRC staff's objective was to gain confidence that YMQAD and REECO are properly implementing the requirements of their QA programs in accordance with the OCRWM QARD, the REECO QAPD, and Title 10 of the Code of Federal Regulations (10 CFR), Part 60, Subpart G (which references 10 CFR Part 50, Appendix B).

## 3.0 SUMMARY AND CONCLUSIONS

The NRC staff based its evaluation of the YMQAD audit process and the REECO QA program on direct observations of the auditors; discussions with audit team, REECO and contractor personnel; and reviews of the audit plan, the audit checklists, and other pertinent documents. The NRC staff has determined that YMQAD Audit YMP-94-02 was useful and effective in determining the adequacy and degree of implementation in the areas examined. The audit was organized and conducted in a thorough and professional manner. Audit team members were independent of the activities they audited. The audit team was well qualified in the QA disciplines, and its assignments and checklist items were adequately described in the audit plan.

The NRC staff agrees with the preliminary YMQAD audit team finding that implementation of the REECO QA program is adequate in the programmatic areas audited. No preliminary Corrective Action Requests (CARs) were identified by the YMQAD audit team.

YMQAD should continue to closely monitor implementation of the REECo QA program to ensure that future QA program implementation is effective. The NRC may conduct its own independent audits at a later date to assess implementation of the REECo QA program.

#### 4.0 AUDIT PARTICIPANTS

##### 4.1 NRC

Kenneth R. Hooks	Observer	
Bruce Mabrito	Observer	Center for Nuclear Waste Regulatory Analyses

##### 4.2 DOE

Donald J. Harris	Audit Team Leader (ATL)	YMQAD/Quality Assurance Technical Support Services (YMQAD/QATSS)
Cynthia Humphries	Auditor	YMQAD/QATSS
John S. Martin	Auditor	YMQAD/QATSS
Charles C. Warren	Auditor	YMQAD/QATSS

##### 4.3 OTHER

Ronald Berlien	Observer	Management and Operating Contractor (M&O)
William Petrie	Observer	M&O

#### 5.0 REVIEW OF THE AUDIT AND AUDITED ORGANIZATION

This YMQAD audit of REECo was conducted in accordance with OCRWM Quality Assurance Administrative Procedure (QAAP) 18.2, "Audit Program" (Revision 5 plus Interim Change Notice 1) and QAAP 16.1, "Corrective Action" (Revision 4).

The NRC observation audit of this audit was based on the NRC procedure, "Conduct of Observation Audits," issued October 6, 1989.

##### 5.1 Scope of Audit

This audit was designed to be performance-based to the maximum extent possible. The auditors were directed to focus on work products rather than programmatic requirements.

###### 5.1.1 Programmatic Elements

The audit scope included the two QA programmatic elements listed below:

- 4.0 Procurement Document Control
- 7.0 Control of Purchased Items and Services

The audit team was directed to focus on the procurement and processing of rock bolts (purchased as commercial grade items), the preparation and award of the contract (Subcontract 1-YUC-01-2) to Kiewit/Parsons-Brinkerhof (Kiewit/PB),

and the corrective actions related to the programmatic elements. The audit was organized by these specific interest areas, rather than by the general programmatic elements. No technical activities were included within the scope of the audit.

## 5.2 Timing of the Audit

The NRC staff believes the timing of this audit was appropriate since there has been delivery and installation of rockbolts and Kiewit/PB were to be released for work in the near future. The last audit of Programmatic Elements 4.0 and 7.0 was in June 1993, and at that time implementation of the QA Program for Programmatic Element 4.0 was determined to be unsatisfactory.

## 5.3 Examination of QA Programmatic Elements

As identified in the audit plan, the procurement and processing of commercial grade items and the contract preparation, purchase orders, and award processes were evaluated, as well as the end products resulting from the processes noted in 5.1.1: rock bolts and the contract for Kiewit/PB. The evaluation process and product acceptability was based upon: (i) proper implementation of the critical process steps; (ii) use of trained and qualified personnel working effectively; (iii) safety, quality and cost conscious attitudes during performance; (iv) documentation that substantiates quality of the products; and (v) acceptable results and quality of the end products.

### 5.3.1 Procurement of Rock Bolts and Accessories

To begin this portion of the audit, two of the auditors interviewed the REECO QA Manager and some of his staff to ascertain which procedures were utilized in the procurement of rock bolts and to request the pertinent purchase requisitions and purchase orders. The two major rock bolt and accessory procurements had substantial documentation which was well organized and ready for review. The REECO rock bolts and accessory purchase requisitions referenced not less than nine different ASTM specifications, and they were carefully reviewed by the auditors to verify that all appropriate specifications were included in the final purchase order document. Both 7/8-inch and 1-1/8-inch rock bolts and accessories were included in the orders, and the auditors requested and received drawings of the "Cement Grouted Pattern Bolts in the ESF Starter Tunnel" which they compared to the procurement documents. The auditors also reviewed Technical Inspection Requirements generated to provide inspection guidance when the components arrive at the site and Certificates of Compliance received with the shipments of rock bolts and accessories. No discrepancies were noted.

There was an audit trip to the NTS to see rock bolts and accessories in the QA Approved Material Holding Area located relatively near the Yucca Mountain Experimental Studies Facility (ESF) Starter Tunnel and Portal. Batches of 7/8-inch and 1-1/8-inch diameter rock bolts were viewed that had been released to the Quality Materials Storage Area. Material Acceptance Tags were checked by the auditors to ensure proper identification was being maintained for components received and REECO field staff promptly retagged one 55-gallon

barrel of rock bolt accessories when the auditors could not easily read the identification.

The auditors asked for access to the Discrepant Material Area and were escorted, with the observers of the audit, to the various storage points inside the area. Hold Tags were attached to identified discrepant material in the area and all questions were answered promptly by the field personnel. Overall, the holding areas near the Yucca Mountain ESF Starter Tunnel were well maintained, with good, clear labeling and identification markings on accepted and discrepant material, and the segregated areas are separated by high fences and locked gates which provide controlled access. The field personnel were knowledgeable in their assignments and readily answered the auditors' and observers' questions. There were no nonconformances noted during the visit to the Released Quality Materials Storage Area and the Discrepant Material Area.

The auditors and observers made a scheduled stop at the NTS Yucca Mountain Site Characterization Project Quality Affecting and Non-Quality Affecting Warehouse where other received materials for the project are maintained. The warehouse was clean, orderly, and all storage areas were well marked. The auditors used the audit checklist to ask questions of the REECO personnel who had warehouse responsibilities and determined that controls were in place to ensure adequate receipt inspections, maintenance of traceability and documentation, and security over components to be utilized on the Yucca Mountain Project (YMP). During the visit to the NTS, there were no nonconformances identified.

Documentation was received by the auditors to verify that Technical Inspection Requirement minimums had been met for various sized rock bolts and accessories that had been previously ordered. Additionally, the auditors asked about the origin of the material specifications for hollow core rock bolts and after discussions with the REECO procurement staff it was determined that the purchase order specifications came from ASTM F-432 which was included with the procurement objective evidence. There were no deficiencies noted in this area of the audit.

The auditors obtained the training certifications for the REECO Senior Material Control Agent and other staff members from the REECO Training Coordinator. The forms reviewed included: (i) the position description; (ii) YMP Education and Experience Verification Record; (iii) Training Requirements Sheet and Signature Sheet forms; and (iv) the Statement of Indoctrination to Job Responsibilities and Authority. All records for the three REECO staff members were complete and found acceptable.

When necessary, follow-up interviews were conducted with the appropriate REECO staff to clarify or obtain additional objective evidence, however little follow up work was required.

The interview method of this auditing, combined with periodic checking of objective evidence, allowed for thorough responses to the questions and permitted many additional questions beyond those on the checklist to be answered. In this criterion, no significant deficiencies were identified.

The auditors' familiarity with the ongoing YMP activities was particularly beneficial for the efficiency of the audit process. The audit and implementation of this element of the REECO QA program appeared effective.

### 5.3.2 Kiewit/PB Contract

The auditors interviewed REECO QA personnel concerning the Kiewit/PB contract. Kiewit was providing technical support to REECO in the form of advice on the infrastructure required for the tunnel boring machine, and PB was providing QA support to Kiewit. None of this "Phase 1" work was considered by REECO to be quality-affecting. REECO was in the process of reviewing and commenting on the Kiewit QA Manual.

The REECO Yucca Mountain Project Approved Suppliers List (586-ASL-1 dated November 23, 1993) was reviewed by the auditors, who also reviewed REECO personnel records to verify that training of personnel performing procurement-related work was current. The REECO qualification and training records were also reviewed by the NRC observer; the sample reviewed contained position descriptions, proficiency evaluations, training requirements, training needs, etc., and appeared adequate.

The auditors asked appropriate questions of REECO personnel, pursuing the checklist to guide the interviews. The appropriate REECO documents were also reviewed. The audit was effective in evaluating REECO implementation of QA program requirements related to the Kiewit/PB contract. The NRC staff agrees with the audit team conclusion that REECO is adequately implementing its QA program in the area audited.

### 5.3.3 Corrective Actions

The auditors reviewed REECO Audit Report REECO-001-94, dated December 3, 1993, which covered procurement and material control activities. The audit report identified four Deficiency Notices (DN) and one CAR (REECO issues DNs for non-significant deficiencies). They also reviewed the REECO quarterly Quality Program Status Report for July-September, 1993, the 1993 REECO Management Assessment Report and the 1993 Third Quarter Trend Evaluation Report. Questions concerning these, and other REECO QA documents, were resolved in interviews with REECO QA personnel. It was established that the REECO YMP QA Manager receives copies of YMQAD audit and surveillance reports for other YMP participants and reviews these reports for items applicable to REECO.

The audit of this area was effective, and the NRC staff agrees with the audit team that the REECO corrective action program for problems associated with Programmatic Elements 4.0 and 7.0 is satisfactory.

## 5.4 Conduct of Audit

The auditors utilized prepared performance-based audit checklists on REECO's approved and issued Quality Assurance program procedures applicable to selected procurement processes and performance objectives currently in use. The auditors extended their investigations beyond the checklists and the specific criteria identified in the scope of the audit on numerous occasions.

## 5.5 Qualification of Auditors

The qualifications of the ATL and auditors were found to be acceptable in that each auditor and the ATL met the requirements of QAAP 18.1, "Qualification of Audit Personnel."

## 5.6 Audit Team Preparation

The auditors were prepared in the areas they were assigned to audit and were knowledgeable of the applicable procedures. The Audit Plan for this audit included the audit scope, the audit schedule, a list of audit team personnel, a list of the activities to be audited, and audit checklist references.

## 5.7 Audit Team Independence

The audit team members did not have prior responsibility for performing the activities they audited. The audit team members had sufficient independence to carry out their assigned functions without adverse pressure or influence.

## 5.8 Review of Previous Audit Findings

Three YMQAD CARs against REECo from previous audits/surveillances were open at the time of this audit, of which one, CAR YM-93-055, was within the scope of this audit. The corrective action to YM-93-055 was verified during this audit and the CAR was subsequently closed.

## 5.9 Summary of NRC Staff Findings Subsequently

### 5.9.1 Observations

The NRC staff did not identify any Observations relating to deficiencies in either the audit process or the REECo QA program.

### 5.9.2 Good Practices

No new good practices were identified.

### 5.9.3 Weaknesses

No weaknesses were identified.

## 5.10 Summary of YMQAD Audit Findings

No preliminary CARs were identified by the YMQAD audit team; three recommendations were made by the audit team for consideration by REECo management.

Within the scope of this audit, the audit team concluded that the REECo QA procedures are adequate and that REECo's QA program implementation is adequate for Programmatic Elements 4.0 and 7.0. The NRC staff agrees with these conclusions.