



**Department of Energy**  
**Yucca Mountain Site Characterization**  
**Project Office**  
**P. O. Box 98608**  
**Las Vegas, NV 89193-8608**

WBS 1.2.11  
 QA: N/A

AUG 18 1993

Robert F. Pritchett  
 Technical Project Officer  
 for Yucca Mountain  
 Site Characterization Project  
 Reynolds Electrical & Engineering Co., Inc.  
 P.O. Box 98521  
 Las Vegas, NV 89193-8521

EVALUATION OF RESPONSES TO CORRECTIVE ACTION REQUEST (CAR) YM-93-057, YM-93-059, YM-93-060, AND YM-93-061 RESULTING FROM YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION (YMQAD) AUDIT YMP-93-12 OF REYNOLDS ELECTRICAL & ENGINEERING CO., INC. (SCP: N/A)

The YMQAD staff has evaluated the responses to CARs YM-93-057, YM-93-059, YM-93-060, and YM-93-061. The responses have been determined to be satisfactory. Verification of completion of the corrective actions will be performed after the effective dates provided. Any extension to these dates must be requested in writing, with appropriate justification, prior to the date. Please send a copy of extension requests to Nita J. Brogan, YMQAD/QATSS, 101 Convention Center Drive, Suite 640, Las Vegas, Nevada 89109.

If you have any questions, please contact either Robert B. Constable at 794-7945 or Gerard Heaney at 794-7826.

Richard E. Spence, Director  
 Yucca Mountain Quality Assurance Division

YMQAD:RBC-5625

Enclosures:

1. CAR YM-93-057
2. CAR YM-93-059
3. CAR YM-93-060
4. CAR YM-93-061

cc w/encls:

- K. R. Hooks, NRC, Washington, DC
- S. W. Zimmerman, NWPO, Carson City, NV
- W. J. Glasser, REECo, Las Vegas, NV

cc w/o encls:

- J. W. Gilray, NRC, Las Vegas, NV
- N. J. Brogan, YMQAD/QATSS, Las Vegas, NV
- Gerard Heaney, YMQAD/QATSS, Las Vegas, NV

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*WM-11*  
*NH03*

*W. J. Glasser*

*ADD: Ken Hooks*

*1 1*

YMP-5

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PDR



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

8 CAR NO.: YM-93-057  
DATE: 7/2/93  
SHEET: 1 OF 1  
QA

CORRECTIVE ACTION REQUEST

1 Controlling Document QARD, DOE/RW-0333P, Revision 0	2 Related Report No. YMP-93-12
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3 Responsible Organization REECO Construction	4 Discussed With J. Hedlund/T. Leonard
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5 Requirement:  
QARD DOE/RW-0333P, Section 12.0, "Control of Measuring and Test Equipment," Revision 0, Paragraph 12.2.2 states, "The use of M&TE shall be documented" and Paragraph 12.2.6.A states, "M&TE calibration documentation shall include identification of the M&TE calibrated."

6 Adverse Condition:  
Contrary to the above, Shotcrete Placement Logs do not identify M&TE used to measure temperatures of placed shotcrete as required by specifications.

9 Does a significant condition adverse to quality exist? Yes ___ No <u>X</u> If Yes, Circle One: A B C	10 Does a stop work condition exist? Yes ___ No <u>X</u> ; if Yes - Attach copy of SWO If Yes, Circle One: A B C D	11 Response Due Date: 20 Working Days from Issuance
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12 Required Actions:  Remedial  Extent of Deficiency  Preclude Recurrence  Root Cause Determination

13 Recommended Actions:  
1) Revise Shotcrete Placement Logs to require M&TE serial numbers to be annotated when recording required temperature measurements.

7 Initiator Gerard Heaney <i>Gerard Heaney</i> Date <u>7-6-93</u>	14 Issuance Approved by: QADD <i>[Signature]</i> for Date <u>07.07.93</u>
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15 Response Accepted QAR <i>Gerard Heaney</i> Date <u>8-10-93</u>	16 Response Accepted QADD <i>[Signature]</i> Date <u>8/17/93</u>
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17 Amended Response Accepted QAR _____ Date _____	18 Amended Response Accepted QADD _____ Date _____
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19 Corrective Actions Verified QAR _____ Date _____	20 Closure Approved by: QADD _____ Date _____
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U.S. DEPARTMENT OF ENERGY  
WASHINGTON, D.C.

CAR NO. YM-93-057  
DATE: 08/04/93  
PAGE: \_\_\_\_\_ OF \_\_\_\_\_  
QA

**CORRECTIVE ACTION REQUEST (Continuation Page)**

**CORRECTIVE ACTION RESPONSE for CAR # YM-93-057**

**A. Remedial Action:**

A Project Nonconformance Report (NCR) will be generated by August 15, 1993, to address the indeterminate accuracy of shotcrete wet mix temperature measurements. The disposition of this NCR will determine the technical bases for acceptance of the placed shotcrete. REECo YMP Quality Control (QC) Section has been given responsibility for taking shotcrete temperature measurements using calibrated thermometers. The temperature of the wet mix and the M&TE Calibration Identification Number is currently recorded on the revised Shotcrete Placement Log.

Responsible Individual: T. M. Leonard  
Estimated completion date: August 15, 1993

**B. Investigative Action:**

Extent of Deficiency: M&TE Identification Numbers were not indicated on Shotcrete Placement Log sheets completed prior to July 2, 1993. Temperature measurements indicated on completed log sheets were taken by the REECo YMP Construction Department (CND) using uncalibrated thermometers. REECo YMP QC has taken shotcrete temperature measurements using calibrated thermometers since July 2, 1993.

Responsible Individual: T. M. Leonard  
Estimated completion date: Completed

**C. Root Cause Determination:**

REECo YMP CND personnel were unaware of the requirements to use calibrated thermometers for measuring shotcrete temperatures.

**D. Corrective Action to Preclude Recurrence:**

REECo procedure TC-581-SP-0007 has been revised (to Revision 1) with an effective date of July 28, 1993, to reflect the documentation of M&TE Identification Numbers on Shotcrete Placement Log sheets. Personnel are now aware that calibration requirements apply to thermometers used to measure shotcrete wet mix temperatures.

Responsible Individual: T. M. Leonard  
Estimated completion date: Completed

Response Approved: \_\_\_\_\_

*RJ Pritchett*

Date: \_\_\_\_\_

*8/4/93*

*lets dtl 8/4/93 - 580-01-587*

<b>OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT U.S. DEPARTMENT OF ENERGY WASHINGTON, D.C.</b>		8 CAR NO.: <u>YM-93-059</u> DATE: <u>7/2/93</u> SHEET: <u>1</u> OF <u>1</u> QA
CORRECTIVE ACTION REQUEST		
1 Controlling Document TC-581-SP-0007, Revision 0		2 Related Report No. YMP-93-12
3 Responsible Organization REECo Construction	4 Discussed With J. Hedlund	
5 Requirement: REECo procedure TC-581-SP-0007, Revision 0, "Starter Tunnel Shotcrete," Paragraph 6.3.1 states, "Testing of mix design will be done prior to actual placement of shotcrete in the field." Paragraph 6.3.1.2 states, "Results of samples tested at 7 days will be used for acceptance or rejection of mix design by the A/E."		
6 Adverse Condition: The test result documentation of Fibercrete samples tested at 7 days does not provide traceability that the mix design was for Fibercrete.		
9 Does a significant condition adverse to quality exist? Yes ___ No <u>X</u> If Yes, Circle One: A B C	10 Does a stop work condition exist? Yes ___ No <u>X</u> ; If Yes - Attach copy of SWO If Yes, Circle One: A B C D	11 Response Due Date: 20 Working Days from Issuance
12 Required Actions: <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Extent of Deficiency <input type="checkbox"/> Preclude Recurrence <input type="checkbox"/> Root Cause Determination		
13 Recommended Actions: 1. Provide justification for use of present mix design for "Fibercrete."		
7 Initiator Gerard Heaney <i>Gerard Heaney</i> Date <u>7-6-93</u>	14 Issuance Approved by: <i>[Signature]</i> QADD <i>[Signature]</i> for Date <u>07-07-93</u>	
15 Response Accepted QAR <i>Gerard Heaney</i> Date <u>8-10-93</u>	16 Response Accepted QADD <i>[Signature]</i> Date <u>8/17/93</u>	
17 Amended Response Accepted QAR _____ Date _____	18 Amended Response Accepted QADD _____ Date _____	
19 Corrective Actions Verified QAR _____ Date _____	20 Closure Approved by: QADD _____ Date _____	

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WASHINGTON, D.C.

CAR NO. YM-93-059

DATE: 08/04/93

PAGE: \_\_\_\_\_ OF \_\_\_\_\_  
QA

CORRECTIVE ACTION REQUEST (Continuation Page)

CORRECTIVE ACTION RESPONSE for CAR # YM-93-059

A. Remedial Action:

Although the test results in the original submittal were for the Fibercrete product, additional test results with the placement logs to show traceability to the Fibercrete product were submitted to the Architect/Engineer on July 30, 1993, in Submittal Number 1A-03-191CND.

Responsible Individual: Jon P. Hedlund  
Estimated completion date: Completed

Response Approved: *RJ Pittner* Date: 8/4/93

*Ltr dtd 8/4/93 - 580-01-587*

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U.S. DEPARTMENT OF ENERGY  
WASHINGTON, D.C.**

8 CAR NO.: YM-93-060  
DATE: 07/02/93  
SHEET: 1 OF 1  
QA

**CORRECTIVE ACTION REQUEST**

1 Controlling Document REECO QAPP, 568-DCO-115, Revision 8	2 Related Report No. YMP-93-12
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3 Responsible Organization REECO Construction	4 Discussed With T. Leonard/J. Hedlund
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5 Requirement:  
REECO QAPP, Section XVII, "Quality Assurance Records," Paragraph 2.1.1 states in part, "Documents that are designated to become records shall be legible, identifiable, accurate, complete...."

6 Adverse Condition:  
Contrary to the above, review of Shotcrete Placement Logs indicated the following for several records:

- a. Sample identification numbers are not accurate.
- b. The transfer of batch numbers is not accurate.
- c. Drawing numbers are not always listed.
- d. Corrections are not being lined out and initialed and dated.

9 Does a significant condition adverse to quality exist? Yes ___ No <u>X</u> If Yes, Circle One: A B C	10 Does a stop work condition exist? Yes ___ No <u>X</u> ; if Yes - Attach copy of SWO If Yes, Circle One: A B C D	11 Response Due Date: 20 Working Days From Issuance
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12 Required Actions:  Remedial  Extent of Deficiency  Preclude Recurrence  Root Cause Determination

13 Recommended Actions:  
1) Provide reinstruction to record management and procedural requirements.

7 Initiator Gerard Heaney <i>Gerard Heaney</i> Date <u>7-1-93</u>	14 Issuance Approved by: QADD <i>[Signature]</i> Date <u>07-07-93</u>
15 Response Accepted QAR <i>Gerard Heaney</i> Date <u>8-10-93</u>	16 Response Accepted QADD <i>[Signature]</i> Date <u>8/17/93</u>
17 Amended Response Accepted QAR _____ Date _____	18 Amended Response Accepted QADD _____ Date _____
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DATE: 08/04/93  
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QA

**CORRECTIVE ACTION REQUEST (Continuation Page)**

**CORRECTIVE ACTION RESPONSE for CAR # YM-93-060**

**A. Remedial Action:**

Shotcrete Placement Logs completed prior to July 28, 1993, will be checked for completeness and corrected as necessary.

Responsible Individual: Jon P. Hedlund  
Estimated completion date: September 3, 1993

**B. Investigative Action:**

Extent of Deficiency: All shotcrete Placement Logs completed prior to July 28, 1993.

Responsible Individual: Jon P. Hedlund  
Estimated completion date: Completed

**C. Root Cause Determination:**

Lack of technical coverage on the back shifts (swing and graveyard).

**D. Corrective Action to Preclude Recurrence:**

The Shotcrete Placement Log has been simplified in TC-581-SP-0007, Revision 1, effective on July 28, 1993. A technical person has been assigned on each shift to ensure that the logs are properly completed.

Responsible Individual: T. M. Leonard  
Estimated completion date: Completed

Response Approved: *RJ Ditcher* Date: 8/4/93

*Stu dtl 8/4/93-580-01-587*

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8 CAR NO.: YM-93-061  
DATE: 07/02/93  
SHEET: 1 OF 1  
QA

CORRECTIVE ACTION REQUEST

1 Controlling Document Specification YMP-025-1-SP09		2 Related Report No. YMP-93-12	
3 Responsible Organization REECO QC		4 Discussed With P. Bryant	
5 Requirement: Specification YMP-025-1-SP09, Section 03361, "Shotcrete," Revision 1, Paragraph 3.10.B.3.d states in part, "When shotcrete does not meet the specified requirements and was taken from a test panel, additional samples shall be taken from the area of work in place represented by the test panel and tested for conformance to the specifications."			
6 Adverse Condition: Contrary to the above, Field Quality Control did not notify construction to take additional samples when two test panel 28-day compressive strength tests failed.  Refer to test results for shotcrete placed on 4/23/93 and on 5/10/93.			
9 Does a significant condition adverse to quality exist? Yes ___ No <u>X</u> If Yes, Circle One: A B C		10 Does a stop work condition exist? Yes ___ No <u>X</u> ; if Yes - Attach copy of SWO If Yes, Circle One: A B C D	
		11 Response Due Date: 20 Working Days from Issuance	
12 Required Actions: <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Extent of Deficiency <input checked="" type="checkbox"/> Preclude Recurrence <input checked="" type="checkbox"/> Root Cause Determination			
13 Recommended Actions: 1) Ensure the two failed test results are appropriately documented.			
7 Initiator Gerard Heaney <i>Gerard Heaney</i> Date <u>7-1-93</u>		14 Issuance Approved by: <i>[Signature]</i> Date <u>07/07/93</u>	
15 Response Accepted QAR <i>Gerard Heaney</i> Date <u>8-10-93</u>		16 Response Accepted QADD <i>[Signature]</i> Date <u>8/17/93</u>	
17 Amended Response Accepted QAR _____ Date _____		18 Amended Response Accepted QADD _____ Date _____	
19 Corrective Actions Verified QAR _____ Date _____		20 Closure Approved by: QADD _____ Date _____	

ENCLOSURE

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CAR NO. YM-93-061  
DATE: 08/04/93  
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QA

**CORRECTIVE ACTION REQUEST (Continuation Page)**

**CORRECTIVE ACTION RESPONSE for CAR # YM-93-061**

**A. Remedial Action:**

REECO YMP Quality Control (QC) Section has investigated the two noted panel failures and has determined that the failure on April 23, 1993, is included in the area addressed by Project Nonconformance Report (NCR) Number 93-014. Further evaluation indicates that a full review of all shotcrete records with 28 day test results is needed. When this review is completed, all failing panels will be documented on a Project NCR for Architect/Engineer disposition.

Responsible Individual: E. P. Bryant  
Estimated completion date: September 15, 1993

**C. Root Cause Determination:**

Positive controls to ensure appropriate actions for test failures were not in place.

**D. Corrective Action to Preclude Recurrence:**

As a positive control, a log system has been implemented to ensure timely receipt of test data and to clearly indicate test status. The test results and any action required will be documented on the appropriate Inspection Report.

Responsible Individual: E. P. Bryant  
Estimated completion date: September 15, 1993

Response Approved: *R. F. Pritchett* Date: *8/4/93*

*Ltr dtd 8/4/93 - 580-01-587*