



**Department of Energy**  
Office of Civilian Radioactive Waste Management  
Yucca Mountain Site Characterization Office  
P.O. Box 98608  
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AUG 02 1996

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Site Characterization Project  
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Bank of America Center, Suite P-110  
101 Convention Center Drive  
Las Vegas, NV 89109

**VERIFICATION OF CORRECTIVE ACTION AND CLOSURE OF DEFICIENCY REPORT  
(DR) YM-96-D-024 RESULTING FROM YUCCA MOUNTAIN QUALITY ASSURANCE  
DIVISION'S (YMQAD) AUDIT YM-ARC-96-03 OF KIEWIT/PARSONS BRINCKERHOFF**

The YMQAD staff has verified the corrective action to DR YMQAD-96-D-024 and determined the results to be satisfactory. As a result, the DR is considered closed.

If you have any questions, please contact either Robert B. Constable at (702) 794-5580 or John S. Martin at (702) 794-5591.

Richard E. Spence, Director  
Yucca Mountain Quality Assurance Division

YMQAD:RBC-2329

Enclosure:  
DR YM-96-D-024

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Recip: J. Spraul

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

8  Performance Report  
 Deficiency Report  
NO. YMQAD-96-D024  
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**PERFORMANCE/DEFICIENCY REPORT**

1 Controlling Document: MCP-11.0, "Test Control" & MCP-12.0, "Control of Measuring and Test Equipment" 2 Related Report No. YM-ARC-96-03

3 Responsible Organization: Kiewit/Parsons Brinckerhoff 4 Discussed With: Jon Christensen

5 Requirement/Measurement Criteria:  
MCP-11.0, "Test Control," Rev. 3, states in Section 3.1.H that test procedures shall include, "Selection and identification of the measuring and test equipment to be used to perform the test to ensure that the equipment is the proper type, range, accuracy, and tolerance to accomplish the intended function."  
  
MCP-12.0 states, "The basis for calibration acceptance shall be documented in the applicable equipment's data package ..."

6 Description of Condition:  
For Swellex bolt installation, the gauge supplied by the vendor was used. There is no documentation of the tolerance required for this gauge, so the Physical Standards and Calibration Facility has assumed that the minor division on the gauge face is the tolerance to be used for calibration. For example, for gauge Y11497 the calibration tolerance used was plus or minus 20 BAR. The data package documents the tolerance used on the calibration report, but there is no documentation of the tolerance required by the project.  
  
TCP-2.20, Permanent Function Rockbolt Installation, Rev. 2, Section 3.7.5 requires that "The inflation pressure for Super Swellex Rock Bolts shall be 300 BAR plus or minus 10 BAR. The pump units shall be periodically monitored and adjusted to ensure that the pump delivers water within the pressure range stated above." The gauge is read as a verification of the proper pressure being achieved. No gauge or gauge accuracy is specified. Therefore, if the inspector sees the gauge reading 290 BAR, he may assume that the specification is met even though the actual pressure may be only 270 BAR.

7 Initiator Alan W. Rabe Date 12/21/95 9 QA Review Alan W. Rabe Date 12/21/95  
Alan W. Rabe QAR

10 Response Due Date 20 Working Days from Issuance 11 QA Assistance/Approval [Signature] Date 12-21-95  
QAR (PRI/AOQAM (DR))

12 Remedial Actions:  
SEE PAGE 3 FOR ITEM 1  
SEE PAGE 4 FOR ITEM 2

13 Remedial Action Response By: [Signature] Date 1/23/96 14 Remedial Action Due Date Item 1: FEB 2 Date 1996

15 Remedial Action Response Acceptance Alan W. Rabe Date 2/6/96 16 PR Verification/Closure N/A Date

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**DEFICIENCY REPORT**

**17 Recommended Actions:**

1. Determine from the manufacturer the actual pressure tolerance needed.
2. Determine the tolerance to which the gauge should be read during the test.
3. Determine the capability of the gauge.
4. Using the above, document the required accuracies.
5. Revise TCP-2.20 to properly direct the readings and identify the required gauges.
6. Revise MCP-12.0 to provide for determination of required tolerances for acceptance of calibration and transmit these to the calibration lab.
7. Determine the extent of this condition with regard to other M&TE and make changes as needed.

**18 Investigative Actions:**

SEE PAGE 3 (ITEM 1)

**19 Root Cause Determination:**

SEE PAGE 3 (ITEM 1)

**20 Action to Preclude Recurrence:**

SEE PAGE 3 (ITEM 1)

**21 Response by:**

*[Signature]* Date 1/23/96

**22 Corrective Action Completion Due Date:**

FEB 2 1996

**23 Response Accepted**

QAR *[Signature]* Date 2/6/96

**24 Response Accepted**

AQOAM *[Signature]* Date 2-15-96

**25 Amended Response Accepted**

QAR N/A Date

**26 Amended Response Accepted**

AQOAM N/A Date

**27 Corrective Actions Verified**

QAR *[Signature]* Date 7/24/96

**28 Closure Approved by:**

AQOAM Date

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PR/DR CONTINUATION PAGE

Item 1

K/PB agrees that a deficiency exists. The tolerance of the gauge sent for calibration was not specified by the manufacturer nor is it addressed in the applicable installation requirements. The calibration lab can only determine the "accuracy" of the gauge and report their findings (the tolerance shown on the lab report is for the lab's benefit only). The results are then reviewed by Quality Control for acceptability for use as allowed by MCP-12.0, 3.2.1, next to last sentence, which states:

"If no nationally-recognized standards or physical constants exist, or the manufacturer has no established method, the basis for calibration shall be documented."

The accuracy of gauge Y11497 was found to be 98.4% and greater at the pressure used in the field. This accuracy was determined to be within an acceptable range based on experience that a tolerance of +- 2%, with the accompanying accuracy of 98%, is generally accepted for gauges in the construction industry when no other accuracy is specified. K/PB QC, however, failed to appropriately document this basis of acceptability in the applicable data package.

Remedial Actions:

The basis for acceptance of the accuracy of gauges supplied by Atlas Copco for use in installing Super Swellex rockbolts will be inserted in the appropriate data packages.

Remedial Action Due Date:

See "Corrective Action Due Date"

Investigative Actions:

All M&TE will be reviewed for appropriate documentation of acceptance where the manufacturer has no established method.

Root Cause Determination:

Human error. The K/PB Quality Control Manager considered this equipment to be normal commercial equipment, and required accuracy checks only to assure reasonable controls. He failed to apply all of the requirements of MCP-12.0 to gauges that had no specified tolerance or accuracy.

Action to Preclude Recurrence:

Responding to this Deficiency Report has retrained the K/PB Quality Control Manager in the Projects expectations regarding calibration of measuring equipment. Additional action in this area is not required.

Corrective Action Completion Due Date:

Feb. 2, 1996

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Item 2

As stated previously, in the response to Item 1, since no tolerances were specified, an industry standard of plus/minus 2% was selected. Also, as previously stated, the selection of this tolerance was not documented, but will be as part of the corrective action for item 1. Gauges falling outside this acceptable range have been documented on NCR's totally unrelated to this Deficiency Report. Discussions with the supplier indicate that an accuracy of plus/minus 3% for these gauges would be acceptable. No further action is required.

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Review of Response

K/PB has correctly reviewed the problem and identified a proper resolution. The key is Par. 3.2.3 of MCP-12.0 which states that, "The basis for calibration acceptance shall be documented in the applicable equipment's data package with authorization indicated by the Quality Control Manager's signature." Acceptance had been documented in the data packages, but not the basis.

It should also be noted that in discussion with K/PB that they indicated that the pressure requirement in TCP-2.20, Par. 3.7.5 is for the reading on the gauge face, not the absolute pressure of the fluid. I concur that although it is not specifically stated as such, that the context of the procedure does make that interpretation the proper one.

Proper documentation of the basis for acceptance will be verified.



Alan W. Rabe 2/6/96

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Verification of Corrective Action for Deficiency Report YMQAD-96-D024

Items 1 & 2

Remedial Action:

Verified at the ESF pad 0-400 BAR M&TE Data Packages "Pressure Gauge Basis for Acceptance" letter H. Cox to F. Harper QC Memo:96-60 dtd. 1/29/96 for the following Atlas Copco supplied gauges: Y-11569, Y-11568, Y-11567, Y-11497 and Y-10664.

Verified NCRs YMSCO-96-0017 and YMSCO-96-0018 that gauges that did fall out of range have been documented.

Investigative Action:

Interviews with the QC Manager and QC Supervisor reveals that an investigation had taken place consisting of a review of all M&TE utilized by K/PB and whether it was used or not used for quality affecting verifications ( See Interoffice Memo H. R. Cox to File # QC:MEM:96-072). As a result of this review, all Data Packages for M&TE utilized for quality affecting verifications, include a Calibration Acceptance Form signed off by the QC Manager. This form requires that calibration acceptance is based upon: calibration performed at an approved testing laboratory, an effective calibration period be recommended and that test results be reviewed and approved by the K/PB QC department. Verified the above documentation for the following M&TE files: Air Pressure Gauge # Y-11430 , VDO Pressure Gauge # Y-11569 and Caliper # Y-11444, Cube Mold # Y-11716, Hydraulic Ram System # Y-11330. In addition, a Master List of Used M&TE is kept on file with a cover Calibration Acceptance form signed off by the QC Manager attesting to their acceptance, verified said list dtd. 2/27/96.

Root Cause Determination:

See page 3

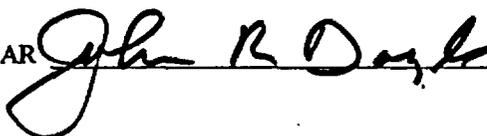
Action to Preclude Recurrent:

None Required

Verification of Corrective Action s to this DR are considered Satisfactory.

This DR is Considered Closed.

QAR



Date

7/26/96