



## DEPARTMENT OF ENERGY

Office of Civilian Radioactive Waste Management  
Office of Geologic Disposal  
Yucca Mountain Site Characterization Project Office  
P.O. Box 98608  
Las Vegas, NV 89193-8608

WBS 1.2.11  
QA

JAN 25 1994

L. Dale Foust  
Technical Project Officer  
for Yucca Mountain  
Site Characterization Project  
TRW Environmental Safety Systems, Inc.  
Bank of America Center, Suite P-110  
101 Convention Center Drive  
Las Vegas, NV 89109

ISSUANCE OF SURVEILLANCE RECORD YMP-SR-94-013 RESULTING FROM YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION (YMQAD) SURVEILLANCE OF TRW ENVIRONMENTAL SAFETY SYSTEMS/MANAGEMENT AND OPERATING (TRW/M&O) CONTRACTOR (SCP: N/A)

Enclosed is the record of Surveillance YMP-SR-94-013 conducted by the YMQAD of TRW/M&O, Las Vegas, Nevada, to evaluate activities related to Determination of Importance Evaluation Design Requirements from December 13 through 30, 1993.

The purpose of the surveillance was to verify that items are classified in accordance with approved quality assurance program implementing documents.

Four Corrective Action Requests (CAR) were generated as a result of this surveillance. Response to these CARs (which are transmitted via separate letter) is due by date indicated in Block 11 of the CAR. A response to this surveillance report and any documented recommendations is not required.

This surveillance is considered complete and closed as of the date of this letter; however, open CARs will continue to be tracked until closed to the satisfaction of the quality assurance representative and the Director of YMQAD.

If you have any questions, please contact either Robert B. Constable at 702-794-7945 or Robert L. Howard at 702-794-7820.

Richard E. Spence, Director  
Yucca Mountain Quality Assurance Division

YMQAD:RBC-1592

Enclosure:  
Surveillance Record YMP-SR-94-013

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L: Dale Foust

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cc w/encl:

D. A. Dreyfus, HQ (RW-1) FORS  
R. W. Clark, HQ (RW-3.1) FORS  
J. W. Gilray, NRC, Las Vegas, NV  
K. R. Hooks, NRC, Washington, DC  
R. R. Loux, NWPO, Carson City, NV  
Cyril Schank, Churchill County Commission, Fallon, NV  
D. A. Bechtel, Clark County Comprehensive, Las Vegas, NV  
J. D. Hoffman, Esmeralda County, Goldfield, NV  
Eureka County Board of Commissioners,  
Yucca Mountain Information Office, Eureka, NV  
Lander County Board of Commissioner, Battle Mountain, NV  
Jason Pitts, Lincoln County, Pioche, NV  
V. E. Poe, Mineral County, Hawthorne, NV  
P. A. Niedzielski-Eichner, Nye County, Chantilly, VA  
L. W. Bradshaw, Nye County, Tonopah, NV  
William Offutt, Nye County, Tonopah, NV  
Florindo Mariani, White Pine County, Ely, NV  
B. R. Mettam, County of Inyo, Independence, CA  
Mifflin and Associates, Las Vegas, NV  
L. L. Bolivar, LANL, Los Alamos, NM  
R. E. Monks, LLNL, Livermore, CA  
R. P. Ruth, M&O/Duke, Las Vegas, NV  
W. J. Glasser, PSDO/REEC, Las Vegas, NV  
K. J. Tunney, RSN, Las Vegas, NV  
R. R. Richards, SNL, 6319, Albuquerque, NM  
T. H. Chaney, USGS, Denver, CO  
J. B. Harper, SAIC, Las Vegas, NV  
C. K. Van House, YMQAD/QATSS, Las Vegas, NV  
R. L. Maudlin, YMQAD/QATSS, Las Vegas, NV  
C. J. Henkel, EEI, Las Vegas, NV  
R. M. Nelson, Jr., YMP, NV

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

QUALITY ASSURANCE SURVEILLANCE RECORD

SURVEILLANCE DATA

<sup>1</sup>ORGANIZATION/LOCATION:  
M&O Design/Las Vegas

<sup>2</sup>SUBJECT:  
Determination of Importance  
Evaluation/Design Requirements

<sup>3</sup>DATE: 12/13/94

SURVEILLANCE OBJECTIVE: 1. Verify items are classified in accordance with approved quality assurance program implementing documents. 2. Verify requirements identified in Determination of Importance Evaluations and the Design Acceptability Analysis are translated in appropriate design documents.

<sup>5</sup>SURVEILLANCE SCOPE:

1. Preparation, review, and approval of the M&O Plan for Determination of Importance Evaluations.
2. Preparation, review, approval, and revision of various Determination of Importance Evaluations.
3. Translation of requirements from various Determination of Importance Evaluations into design output documents.
4. Translation of Design Acceptability Analysis requirements in design documents.

<sup>6</sup>SURVEILLANCE TEAM:  
Team Leader:

Robert L. Howard  
Additional Team Members:

Kenneth O. Gilkerson  
James Blaylock

<sup>7</sup>PREPARED BY:

Robert L. Howard 12-9-93  
Surveillance Team Leader Date

<sup>8</sup>CONCURRENCE:

Robert L. Howard 12-9-93  
QA Division Director Date

SURVEILLANCE RESULTS

<sup>9</sup>BASIS OF EVALUATION/DESCRIPTION OF OBSERVATIONS:

See page 2.

<sup>10</sup>SURVEILLANCE CONCLUSIONS:

See page 6.

<sup>11</sup>COMPLETED BY:

Robert L. Howard 1/18/94  
Surveillance Team Leader Date

<sup>12</sup>APPROVED BY:

Robert L. Howard 1/24/94  
QA Division Director Date

Block<sup>9</sup>

A surveillance was performed from December 13 through 30, 1993 of the TRW Environmental Safety Systems(TRW)/Management and Operating (M&O) Contractor to evaluate activities related to Determination of Importance Evaluation (DIE)/Design Requirements.

The following personnel were contacted during the surveillance:

Gary M. Teraoka, M&O/TRW, Engineer  
Milton S. Rindskopf, M&O/TRW, Requirements Manager  
Peter S. Hastings, M&O/Duke, DIE Manager  
Robert W. Kirk, M&O/Duke, Engineer  
James E. Houseworth, M&O/INTERA, Performance Assessment  
Larry G. Engwall, M&O/Fluor Daniel (FD), Surface Engineering Manager  
Jerry L. Naaf, M&O/Morrison Knudson (MK), Engineering Manager  
Jerry Heaney, M&O/MK, Engineer  
David Parker, M&O/FD, Engineer  
Bharat Majmudar, M&O/FD, Engineer  
William R. Kennedy, M&O/MK, Engineer  
Ronald P. Ruth, M&O/Duke, Quality Assurance (QA) Manager  
Fred C. Arth, M&O/TRW, QA  
Richard P. Morissette, Science Applications International Corporation, Scientist

#### **Preparation of DIE**

The surveillance team reviewed the M&O Plan for Evaluating Items and Activities in the MGDS Program for Importance to Safety and Waste Isolation. The Plan specifies the minimum questions that must be answered to adequately perform the Determination of Importance Evaluation. The Plan is a quality assurance record; however, the Plan is not handled as a controlled document as required by M&O QAP-6-1. This deficiency is documented in Corrective Action Request (CAR) YM-94-013.

The surveillance team reviewed the Determination of Importance Evaluation (DIE) for the Exploratory Studies Facility (ESF) Starter Tunnel Drill and Blast Section, Revision 6. The team was unable to verify that the selection of the design configuration for DIE analysis is governed or controlled by procedures. For example, Revision 6 of the ESF Starter Tunnel Drill and Blast Section includes an evaluation of the North Ramp Testing Alcove that was not included in previous revisions of the DIE. Additionally, the ESF Starter Tunnel Drill and Blast Section DIE references specific drawings and specifications (including revision number) and specifies controls based details in the design documents, such as requiring holds on the use of resin based grouts and specifying a design change to Drawing YMP-025-1-MING-MG147. No controls are in place to ensure that all structures, systems, and components (SSCs) and related activities are adequately evaluated as the design proceeds. This deficiency is documented in CAR YM-94-014.

The surveillance team investigated how Field Changes factor in the DIE. The M&O currently uses NLP-3-10 "Preparation of Field Change Requests" against Engineering

Drawings and Specifications" to control Field Change Request evaluations. NLP-3-10 requires the engineer to determine if the change violates any requirement from a DIE. However, DIEs identify requirements based on specific design features and construction methods and materials. There is a potential to introduce a new design feature or new construction methods and materials through the change process that have not been evaluated in the DIE, and the change not violate an existing DIE requirement. There are no procedural requirements for the engineer to determine if a change represents an unreviewed waste isolation issue. This deficiency is documented in CAR YM-94-014.

DIE, Revision 6, for the ESF Starter Tunnel Drill and Blast Section includes three Waste Isolation Evaluations (WIE). The DIE relies heavily on the WIEs to determine the necessary controls placed on the design. However, with the exception of M&O QAP-3-12 which governs the transmittal of WIEs from the Performance Assessment organization to the MGDS Requirements organization, the surveillance team was unable to determine what procedural controls govern the use of WIEs in DIEs. For example, Section *i* of the DIE for the ESF Starter Tunnel Drill and Blast Section states that the use of resin for rockbolting will be evaluated in a subsequent WIE; procedures do not describe how such an evaluation can be initiated by the MGDS Requirements organization and then completed by the Performance Assessment organization. Additionally, since DIEs are based on a design configuration; it is not clear how that design information is systematically controlled as input to the WIE. This deficiency is documented in CAR YM-94-014.

The surveillance team reviewed the WIEs that were included in appendices to the DIE, Revision 6, for the ESF Starter Tunnel Drill and Blast Section. The WIEs contain the following statement in the QA section: "Some of the referenced data may not have been approved for quality affecting activities, and the referenced analyses may not have been performed as quality affecting activities or under the software QA requirements. The extent and possible effects of non-qualified data and analyses on the evaluations, conclusions, and recommendations of this report have not been specifically determined." WIE and DIE preparers could not identify the qualification status of specific data or analyses in the waste isolation evaluation. Additionally, the procedure the M&O has implemented to develop WIE, NLP-3-17, states "Qualification of data and computer codes are not required because the WIE, as a Scientific Planning Document, is not intended to be used as final documentation for license application. All significant effects of site characterization with respect to waste isolation shall be revisited through a Total System Performance Assessment (TSPA)." The Office of Civilian Radioactive Waste Management/Quality Assurance Requirements and Description Document (OCRWM/QARD), DOE/RW-0333P, requires that the validation status of data be identified and tracked throughout its lifetime. This deficiency is noted in CAR YM-94-015.

NLP-3-17 requires the WIE preparer to develop a WIE Preparation Plan and then develop the WIE in accordance with the Plan. The surveillance team reviewed the WIE Preparation Plan dated October 22, 1993. The plan specifies the requirements necessary to adequately perform the WIE. Although the plan is considered a QA record, it is inappropriately identified as a non quality affecting document and is not being handled accordingly. This deficiency is noted in CAR YM-94-013.

As a result of the ESF Starter Tunnel Drill and Blast Section DIE, the M&O recommended changing the Yucca Mountain Project(YMP) Q-List to include the ground support system as an item important to safety. Administrative Procedure (AP) -6.17Q "Classification of Items Important to Safety and Waste Isolation", controls changes to the YMP Q-List. The ground support system was added to the Q-List and the DIE was referenced as the basis for the addition. However, there is no objective evidence that the procedural requirements in AP-6.17Q for performing event tree analyses to support documentation for the addition of items important to safety have been met. This deficiency is documented in CAR YM-94-012.

#### **Flowdown of quality requirements from DIEs to specifications and drawings.**

The surveillance team examined the requirements sections of the referenced DIEs to determine that they have been appropriately translated into specifications and drawings. In all cases but one it was determined that the DIE requirements have been incorporated either into specifications or drawings. Some of the specifications are undergoing review and approval and have not yet been issued (e.g. Design Package 1B). The one DIE requirement not incorporated (B0000000-AA-09-00005, Section 6, Requirement 10) deals with water usage in the ESF Starter Tunnel during drilling and blasting. Since the first 200 feet of tunnel was already drilled and blasted prior to this requirement and no further tunnel excavation is underway, this DIE requirement is being evaluated against work already performed; the next Design Package continuing tunneling will address this requirement.

The surveillance team noted that a formal tracking system showing these DIE requirements are incorporated does not exist. The unincorporated DIE requirement cited above is a prime example of the value of such a system. The M&O procedures require the DIE requirements to be incorporated into specifications and drawings but do not provide a time frame. Experience has shown that it normally takes about six weeks. When a requirement is not incorporated into specifications or drawings it should be flagged and tracked.

The surveillance team found that the requirements identified in the DIEs clearly indicate what is to be documented as a QA record. The specifications identify submittal and record requirements, but do not clearly identify which records are considered QA records. A list of typical QA records is found in Section 01400 of each specification, but this does not clearly identify all QA records. An example is that the DIE for the ESF Starter Tunnel Drill and Blast Section specifically requires that water usage in the tunnel be reported and documented as a QA record. The specification, on the other hand, states that water usage shall be reported and requires that a water usage report be submitted. It is not clear that this record is to be treated as a QA record. The specifications do not differentiate "Q" from "non Q" records.

#### **Design Acceptability Analysis (DAA)**

The Nuclear Regulatory Commission (NRC) had three objections to the Yucca Mountain Site Characterization Plan published during January 1988. As a result, the Project Office generated the ESF Title I Design Acceptability Analysis (DAA) to address those objections. In Volume 2, dated February 3, 1989, the Department of Energy resolved the NRC objections by agreeing to implement 10 CFR Part 60 requirements on the ESF; these commitments are shown in Table I-4 of the DAA Volume 2. This table matrixes the 10

CFR Part 60 requirements in the current Exploratory Studies Facility Design Requirements (ESFDR) Volume I, YMP/CC-0013, dated May,13 1991. These commitments appear in Appendix K of the ESFDR.

The above referenced ESFDR was updated on July 2, 1992; Appendix K of the ESFDR date May 13, 1992 was also included as part of the new document. With this version, certain DAA commitments were either deemed to be not applicable, were combined with other requirements, or that implementation was more appropriate in another document, i.e, test planning. Examples of DAA commitments that were not applicable to the July 2, 1992 ESFDR or were combined with other documents are: 1.7.6.1, 1.7.7.1, 1.8.6.1, 1.8.7.1, 1.9.6.1, 1.9.7.1, 1.14.1.2, 1.14.4.4, 1.14.7.3, 1.17.4.1, 1.17.5.1, 1.17.6.1, 1.17.6.2, 2.5.4.3, 2.8.4.3, 2.8.5.3, 2.8.6.2, 3.1.4.1, 3.1.4.2.

The ESFDR was again revised as of July 14, 1993. A cross reference was prepared to trace requirements from the July 2, 1992 version to the July 14, 1993 version. In this matrix two DAA commitments (2.2.6.1 and 1.10.5.7) could not be traced to the July 14, 1993 version of the ESFDR. There were also several other commitments that were footnoted as being implemented through test plans, etc, that do not appear to be under any type of formal control. Some examples (not an exhaustive list) are DAA commitments 1.1.8.1, 1.6.8.1, 1.7.8.1, 2.1.8.3, and 3.1.6.1.

The surveillance team checked three current water use requirements for ESF construction for inclusion in the ESF Basis for Design (BFD) or water specification (Specification 02225). Current ESFDR requirements 3.2.2.4.5.4, 3.2.2.5.5, and 3.2.2.4.D.5 were found in either the BFD or Specification 02225, although specific numerical values in 3.2.2.4.5.5 had been replaced with to be determined (TBD).

#### **Documents Reviewed**

B00000000-AA-09-00001, R-1, DIE for North Portal Pad  
BABC00000-01717-2200-00001, R-0, DIE for Water Supply System  
B00000000-AA-09-00006, R-0, DIE for ESF Switchgear Building/Temporary Facilities  
BABBDAA000-01717-2200-00026, R-0, DIE for ESF Temporary 69kv Power Supply System  
B00000000-AA-09-00004, R-1, DIE for ESF Rock Storage Area  
B00000000-AA-09-00003, R-2, ESF Starter Tunnel Steel Arch Section  
B00000000-AA-09-00005, R-6, DIE for ESF Starter Tunnel Drill & Blast Section

BABBA0000-01717-6300, Design Package 1B, Section 16450 R-1, Section 16460 R-0,  
Section 01600 R-2

Specification YMP-025-1-SP09, R-2, Section 02225 R-2, Section 02165 R-2,  
Section 15485 R-1

Specification YMP-025-1-SP08, R-2, Section 02665 R-1

Drawing: YMP-025-1-MING-MG128, R-2, B00000000-AA-01-00002-00 M&O Plan for Evaluating Items and Activities in the MGDS Program for Importance to Safety and Waste Isolation.

Drawing: YMP-025-1-MING-MG147

Exploratory Shaft Facility Design Requirements YMP/CC- 0013, dated 5/13/91.

Exploratory Studies Facility Design Requirements YMP/CM- 0019, dated 7/2/93.

Exploratory Studies Facility Design Requirements YMP/CM- 0019, dated 7/14/93.

### **Procedures Reviewed**

M&O, QAP-3-0, Revision 1

M&O, QAP-3-5, Revision 4

M&O, QAP-3-9, Revision 3

M&O, QAP-3-12, Revision 3

M&O, NLP-3-10, Revision 0

M&O, NLP-3-17, Revision 0

M&O, QAP-6-1, Revision 2

AP-6.17Q, Revision 1

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Four CARs were issued as a result of the surveillance. Three were related to the process used to classify items and identify activities important to safety and waste isolation; therefore, this process is considered inadequate as stated in the CARs.

With the one exception noted in section 9 of this surveillance record, the requirements generated in the DIEs are being translated into the appropriate design output documents.

With the exception of DAA commitments 1.10.5.7 and 2.2.6.1, the DAA commitments were traceable to the current baseline. There was no evaluation of those commitments that were deleted, combined, or identified as being more appropriately allocated to another document.

### **Recommendations**

The surveillance team recommends that a formal tracking system showing where DIE requirements are incorporated into the design output documents be implemented. The unincorporated DIE requirement cited in section 9 is a prime example of the value of such a system. When a requirement is not incorporated into specifications or drawings it should be flagged and tracked.

The surveillance team recommends that the specifications clearly identify what documents are to become QA records as they are identified in the DIEs.

The surveillance team recommends that DAA commitments that have been consolidated, deleted or identified for inclusion into other documents be tracked and documented decisions made regarding the status of these commitments can be readily demonstrated.



The surveillance team recommends that the M&O clearly define the relationship between plans and procedures within the M&O QA program. M&O staff have tended to not regard plans as quality affecting documents because they are called "plans" rather than basing the determination on the actual use of the document.

Since the use of Test Interference Evaluations in DIEs was not covered by this surveillance, the surveillance team recommends that another surveillance be conducted to cover this aspect of DIE preparation.