



DEPARTMENT OF ENERGY
Office of Civilian Radioactive Waste Management
Office of Geologic Disposal
Yucca Mountain Site Characterization Project Office
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WBS 1.2.11
QA

APR 15 1994

Robert M. Nelson, Jr., Acting Project Manager, YMSCO, NV
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ISSUANCE OF SURVEILLANCE RECORD YMP-SR-94-033 RESULTING FROM
YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION (YMQAD) SURVEILLANCE OF
THE YUCCA MOUNTAIN SITE CHARACTERIZATION OFFICE (YMSCO) AND THE
CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM MANAGEMENT AND
OPERATING CONTRACTOR'S (CRWMS M&O) TECHNICAL DATA BASE
(SCP: N/A)

Enclosed is the record of Surveillance YMP-SR-94-033 conducted by
the YMQAD at the YMSCO and CRWMS M&O facilities in Las Vegas,
Nevada, March 7-18, 1994.

The purpose of this surveillance was to track data from
acquisition and development through submission to the Technical
Data Base to its use in design and construction.

No corrective action requests were issued as a result of this
surveillance. This surveillance is considered completed and
closed as of the date of this letter. A response to this
surveillance record and any documented recommendation is not
required.

If you have any question, please contact either Robert B.
Constable at 794-7945 or Kenneth T. McFall at 794-7280.

Robert B. Constable for.

YMQAD:RBC-3072

Richard E. Spence, Director
Yucca Mountain Quality Assurance Division

Enclosure:
Surveillance Record YMP-SR-94-033

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PDR WASTE
WM-11 PDR

ADD: Ken Hooks
Ltr. Encl.

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APR 15 1994

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

QUALITY ASSURANCE SURVEILLANCE RECORD

SURVEILLANCE DATA

¹ORGANIZATION/LOCATION:
TRW/Management & Operating
(M&O) Contractor, Las Vegas,
NV

²SUBJECT:
Technical Data and Design Process

³DATE: 3/7-16/94

⁴SURVEILLANCE OBJECTIVE:
Track data from acquisition to construction.

⁵SURVEILLANCE SCOPE:
Verify that data, both qualified and unqualified, are acquired, developed,
submitted, tracked and used as design input according to the QA program

⁶SURVEILLANCE TEAM:
Team Leader:

K. McFall
Additional Team Members:

J. Matras
R. Weeks
W. Sublette
J. Blaylock

⁷PREPARED BY:
Kenneth McFall 3/7/94
Surveillance Team Leader Date

⁸CONCURRENCE:
R. J. Prince 3-7-94
QA Division Director Date

SURVEILLANCE RESULTS

⁹BASIS OF EVALUATION/DESCRIPTION OF OBSERVATIONS:

SEE PAGE 2

¹⁰SURVEILLANCE CONCLUSIONS:

SEE PAGE 4

¹¹COMPLETED BY:
Kenneth McFall 3/29/94
Surveillance Team Leader Date

¹²APPROVED BY:
Robert B. Bostick 4-14-94
QA Division Director Date

Block² BASIS OF EVALUATION/DESCRIPTION OF OBSERVATIONS:

During the time from March 7 through March 18, 1994, a surveillance was conducted of several Participants' activities concerning the technical data process. The surveillance began with an overview of the technical data system and process presented by the Technical Data Manager and an explanation of how the various data repositories fit together and their relation to each other. It was pointed out that the Technical Data Base (TDB) actually consists of three parts, the Geographic Nodal Information Study and Evaluation System known as GENISES, the Geologic and Engineering Materials Bibliography of Chemical Species known as GEMBOCHS, and the Reference Information Base (RIB). The Participant Data Archives (PDA), the Central Records Facility (CRF), Technical Data Parameter Dictionary, and the Technical Data Catalog use and responsibilities were also discussed.

It was decided that the best way to approach the data process was to start with the construction approved design documents and work in reverse through the process to the data acquisition stage. The specific area of construction selected was the installation of rockbolts in the Exploratory Studies Facility Starter Tunnel, to include the length of the rockbolts, their spacing, and the pattern of installation. This area was chosen because it is one of the few activities that is quality affecting and has actually been constructed. The design specification relating to rockbolts was "Rockbolts and Accessories", numbered "YMP-025-1-SP09 Section 02165". This specification directed the reader to the drawings for details on the rockbolt parameters. Drawing YMP-025-1-MING-MG143 was examined for inclusion of the rockbolt data needed for construction. The length (10 feet), spacing (5 feet), and pattern (square) were given on the drawing. When asked for the source of these numbers, the design engineers said that they were assumptions based on engineering judgement. Therefore, the numbers were not traceable to any database data acquisition other than engineering judgement on the part of Raytheon Services Nevada engineers who originally developed the drawing. The design engineers were asked to point out on the drawing where the rockbolt numbers were identified as assumptions or unqualified data, and the stamps "TBV-3" and "Unverified" were located. There was no specific identification of exactly what the stamps referred to or if they were intended as a blanket application for everything on the drawing. The surveillance team was referred to the Configuration Management (CM) organization where the To Be Verified (TBVs) were tracked.

Upon reviewing the CM TBV tracking system it was discovered the TBV-3 refers to the completion and approval of the Determination of Importance Evaluation (DIE) for the Starter Tunnel. When the DIE was located and examined it was found that the rockbolt numbers (assumptions) could not be verified due to the incomplete Waste Isolation Evaluation (WIE) on using rockbolts associated with cemented grout. The rockbolt numbers in question were not addressed. At this point the trail ended for the source of the rockbolt numbers and the trail of the verification of the numbers picked up.

"Addendum 2 to Test Interference Evaluation for Borehole USW UZ-14 Drilling, Testing and Instrumentation, to Constitute Revision 1", (TPP) T-92-16, was examined to determine the status of technical data that was utilized to complete the evaluation. Two specific data

parameters were traced to determine compliance with QARD requirements as described in Supplement III, Section III, 2.3, A. Stress values were obtained from USGS Bulletin 1790, Chapter 6, and rock fracture information was obtained from an informal report titled "Detailed Graphic Structure Log of Borehole USW UZ-14 Depth Interval 1230.0 to 1282.0" dated 8/27/93. Examination of the RIB to determine the validation status of this data revealed that the data had not been submitted to the Technical Data Base. The useability and validation status of this data is indeterminate.

Upon completion of the starter tunnel, the United States Bureau of Reclamation (USBR), working for the United States Geological Survey (USGS) began the geological mapping of the tunnel. The mapping was done in such a manner as to satisfy the needs of the USGS and released as "preliminary only". However, the needs of the designers were not taken into account when the mapping was planned. As a result the mapping data developed by the USBR did not provide the rock mass classification analysis parameters of "RMR" and "Q" which are needed by the design engineers for verification of their assumptions and provide data collected under a quality program for preparation of upcoming design output documents. The only data available for use in design verification that was collected under an approved Quality Assurance program were the results of the NRG-1 borehole investigations which were of borderline acceptability for the design engineers needs (it was not clear whether the data taken from the USBR report and used in the design verification was in fact qualified data). The design organization performed a design verification analysis using the NRG-1 data but went ahead and engaged the service of J. F. T. Agapito (under contract to Sandia National Labs) to come in and re-map the starter tunnel with the specific intent of providing the needed information for additional verification of the assumptions used in the Design Package 1A and prepare for future design specifications and drawings. It should also be noted that a design verification has not been performed using the new Starter Tunnel data.

During the surveillance an attempt to extract data from the Technical Data Base was made by the surveillance team. The Sandia Report titled "Rock Mass Mechanical Property Estimations for the Yucca Mountain Site Characterization Project", print date, June 1993 was the subject of the investigation. The report's Work Breakdown Structure (WBS) number was 1.2.4.2.1.2. The Technical Data Parameter Dictionary was consulted looking under the letter "R" for rock mass. The given WBS number could not be located. Next the Technical Data Catalog was examined. However the Technical Data Catalog lists data by Site Characterization Plan (SCP) activity number and data tracking number and not the WBS number. This required going back to the Technical Data Parameter Dictionary to find the closest WBS number to the one in question and obtaining the SCP number prior to looking it up in the Catalog. The subject report could not be located in the Catalog dated September 30, 1993 even though 54 data packages on 20 pages were examined. The report was therefore not in the PDA, CRF, or the Technical Data Base.

Block¹⁰SURVEILLANCE CONCLUSIONS:

This surveillance attempted to trace the use of technical data from acquisition and development through submittal to the TDB, into the modeling and design process and design output documents, Test Interference Evaluations, to construction. There were no Corrective Action Requests issued in association with this surveillance, however, there were a number of either recognized or perceived weaknesses that should be addressed by the appropriate personnel and organizational managements.

Recommendations:

The following recommendations resulting from weaknesses identified during the surveillance are presented for the consideration of the managements of the affected organizations involved in data gathering and data use:

1. There needs to be formal classroom training, possibly to be verified by examination, for those involved in the production, transfer, and use of data. The training would cover the requirements for submitting data, the reason for and use of the TDB, and the requirements for retrieving data from the data base.
2. The TDB, in particular the Reference Information Base (RIB) needs to be updated and vastly overhauled so that they contain the information or data that is needed by the design engineers to proceed with the design process. Additionally, the design and performance assessment activities that have been completed and determined to be important to the licensing process need to be included. There is large discrepancy between the PDA, The CRF, and the TDB. The TDB, rather than being the primary source of data is the least useful of the three. The CRF and the PDA each hold many times more qualified data than can be found in the TDB. An example of this is the fact that the RIB, Revision 2, dated 4/6/93, has a total of one piece of qualified data. The TDB needs to be brought up to speed to the point where it is the data source of choice.
3. The design organization needs to become much more directly involved in what should be qualified and be placed into the data bases so that when they need a particular suite of data there is a better chance that it will be available.
4. If possible, the data submittal, transfer, and retrieval process needs to be simplified and made more user friendly. If the process is difficult to use, the natural tendency of people will be to circumvent the process and go to other sources for the needed information. In the process of going to alternate sources, the data traceability is lost and the future qualification becomes much more difficult.
5. A concerted effort needs to be made to alert the data generators on the project of the need to submit the data they have developed to the data base in a timely manner. There have been instances where needed collected data has not been submitted

because the Principal Investigator does not want the data released for public scrutiny until after he has had the data released in a publication for which he and his participant organization can take credit. The relative need of the modelers and design organization and other investigators is not taken into consideration.

6. Unqualified data used in designs and models needs to be tracked so that the designs and models can be verified when qualified data becomes available.
7. It is recommended that a series of surveillances be conducted by YMQAD, using subject matter experts or technical specialists as appropriate, covering the data development, submittal, and retrieval throughout the Yucca Mountain Project. Each organization that either produces data or uses data should be examined for compliance to the requirements concerning data. Unlike this surveillance the scope of the additional surveillances would be narrow and focus on discrete elements of the process and the responsibilities concerning data that are incumbent upon each Participant.
8. A Technical Database user tracking system needs to be developed. The purpose of the tracking system would be to provide a system by which data users could be appraised of updates, corrections, and/or revisions to data which they have utilized.
9. The condition identified in CAR YM-94-015 concerning indeterminate status of qualification of data in reference to WIEs should be extended to incorporate similar conditions encountered in the Test Interference Evaluations.
10. The design input used for ground support parameters in the Starter Tunnel were assumptions based on engineering judgement. A design verification using the new Starter Tunnel information recently developed needs to be conducted. This verification will lend additional confidence to the design process by comparing the assumptions to what was actually encountered underground.