



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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MEMORANDUM FOR: Ronald Ballard, Chief
HLGE

THRU: Mysore Nataraja, Section Leader *R for MSN*
HLGE/GTE *8/11/93*

FROM: Banad Jagannath *BJ*
HLGE/GTE *6/13/93*

SUBJECT: TRIP REPORT

Attached is the trip report on my visit to Las Vegas, NV, in connection with observing DOE's 50% design review of ESF Design Package 2, and trip to San Antonio, TX, for RDCO element program review.

Enclosure: as stated

CC: B. J. Youngblood, HLWM
J. J. Linehan, HLWM
J. Holonich, HLPD
M. Federline, HLHP
C. Abrams, HLPD
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TRIP REPORT

- SUBJECT:**
- (1) NRC's observations of DOE's review of Exploratory Studies Facility (ESF) Title II 50% Design - Package 2; North Ramp (from North Portal to Topopah Spring level)
 - (2) Visit of Yucca Mountain site
 - (3) Visit to CNWRA for RDCO program review

DATE/PLACE OF TRIP: April 19-21, 1993, Las Vegas, Nevada,
April 22-23, 1993, San Antonio, Texas

PERSONS PRESENT: B. Jagannath (NRC), J. Gilray (NRC), S. M. Hsiung (CNWRA), and reviewers from DOE and its contractors, and observers from the Nuclear Waste Technical Review Board (NWTRB) and the State of Nevada - Las Vegas, NV. trip.

B. Jagannath and A. Chowdhury and RDCO staff at CNWRA - San Antonio, TX. trip.

BACKGROUND AND PURPOSE OF THE TRIP:

The Yucca Mountain Site Characterization Project Office (YMPO) of the DOE performed a 50 % design review of the Exploratory Studies Facility (ESF) Title II Design: Package 2. Package 2 of ESF design consists of North Ramp covering the portion between the North Portal to Topopah Spring level. The NRC and CNWRA staff observed the technical review process and had an opportunity to briefly review the drawings and relevant design documents being reviewed by DOE and its contractors. The purpose of this observation and brief review was to identify and discuss with DOE potential regulatory and technical concerns, if any associated with this design package, which may have adverse effects on the site characterization program and on repository performance if the site is determined to be suitable.

The purpose of the site visit was to get familiar with the site and to observe the construction of the starter tunnel at the North Portal.

The visit to CNWRA was for RDCO element program review, and to discuss ongoing work with the RDCO element personnel at the Center.

SUMMARY OF VISITS:

50% Design Review of ESF Design Package 2: North Ramp - Observation Visit

The management and technical review of Package 2 was scheduled from April 19, 1993, to April 30, 1993. A comment resolution session was scheduled from May 3, 1993 to May 7, 1993. The NRC/CNWRA observers attended this review on April 19 and 20, 1993. An introductory meeting was held on the morning of April 19, 1993, to brief the reviewers and the observers on the review process and procedure. The agenda of this introductory meeting is Attachment A to this report. The 50% design review of this Package 2 consisted of 42 drawings, 10 sets of calculations and analyses, and 14 sets of design specifications.

The NRC/CNWRA observers attended the introductory meeting and briefly conducted an independent review of Package 2. The NRC/CNWRA observers also attended the daily observers' meeting to discuss, with the DOE and M&O contractor, any concerns and/or questions they might have regarding the design process and the design being reviewed.

The 50% design review of Package 2 included surface and subsurface conveyor systems, north ramp, ventilation system, subsurface electrical distribution system, and instrumentation. Design of water distribution system, waste water collection system, fire suppression system, transportation system, excavation and supports, and test alcoves were excluded from this review and will be reviewed at the 90 % design review of the package.

The ESF Title II 50% Design Package 2 was based on ESF Title I Design. The ESF Title I Design Baseline provided for construction of access ramps from both north and south portals. This approach has been changed, and as per the current plan construction will begin only from the north portal. Once the north access ramp reaches the repository block, a horizontal drift will be constructed from this ramp and across the designated repository block. The south ramp will then be constructed starting from the end of this drift until it daylight at the south portal. This approach may slow down the work and is believed to be driven by the funding constraints for acquiring a second tunnel boring machine needed if the south ramp were to be excavated starting from the south portal. As a result of this change, the designs of utility feed, ventilation, and excavated rock handling were modified accordingly.

North Ramp is designed to be 25 ft. in diameter and about 5,084 ft. long with a downgrade of 6.85%. At the end of this portion, a 1,000 ft. curved ramp section will follow until it intersects the potential repository block. Although detailed ground support system design will not be ready until the 90% design review, the system may consist of a combination of rockbolts, wire mesh, shotcrete, steel sets, linings, and other ground support materials as site conditions require. Six surface-based vertical boreholes have been planned along the North Ramp to collect geological information. Drilling of some of the boreholes has been completed. Performance of the ground support system installed in the ramp and ESF will be assessed during site characterization for developing more rigorous ground support systems, if necessary.

The M&O Contractor has conducted a preliminary Determination of Importance Evaluations (DIEs) on specific item or activity of Package 2 design to provide an indication of its potential impact on radiological safety and/or waste isolation. This evaluation utilized a qualitative approach (essentially an expert judgement). No quantitative evaluation is provided. The primary objective of the evaluation is to facilitate the application of the appropriate level of QA controls to the design, construction, and operations of an item. Only items or activities that would have a permanent impact on the site's contribution to the radiological safety and waste isolation aspects of the design were considered in this evaluation. Any engineered item that could be designed/constructed again, if this site were to be selected for the repository, were not considered in this evaluation. A number of items and activities (e.g., North Portal starter tunnel, North Ramp, and ground support) have been identified as important to safety and/or important to waste isolation a result of this evaluation. This document further concluded that common engineering practices will be sufficient for these items even though they are considered to be important to safety and/or waste isolation. However, no rationale is provided in the document to support this statement. As a prudent practice, it would be more appropriate to follow relatively more stringent requirements and criteria for the design, construction, and operation of these important items unless evidence is available to demonstrate that common engineering practices are indeed adequate. As the ground support design was not presented in this package, the NRC staff could only convey their general concern on the need for conservatism in the design without providing any specific example. The issue of taking a more conservative approach than the industry standard design, for the items important to safety and/or waste isolation was discussed with E.H. Petrie, Acting Deputy Division Director for Engineering & Development Division of DOE, at an observer's meeting. He appeared to be receptive to this idea and indicated that he will discuss this with his technical staff.

Yucca Mountain Site Visit

Mr. John Gilray of NRC Field Office accompanied us to visit the site. The primary purpose of the site visit was to see the North Portal starter tunnel excavation using drill and blast method. At the time of our visit (April 21, 1993), the pilot drive had advanced about 30 ft. The construction work was on hold at the time of our visit due to the inability of installing rockbolts in to the freshly exposed tunnel roof area. We were told that the excavation was in a relatively weak rock zone. The problems were believed to be related to (1) existence of fractured rock fragments in some rockbolt boreholes, and (2) loss of resin into the fracture zones surrounding the boreholes, and thereby hamper rockbolt installation. The high wall of the tunnel portal consisted of two vertical benches that were supported by 12 ft. long rockbolts and wire meshes. A concrete retaining wall will be built after the starter tunnel is excavated to its full size. We also visited the LM3000 rig in operation, G-14 trench, core storage facility, and DOE Field Office.

CNWRA Visit

I met with Asad Chowdhury, RDCO Program Manager at the Center in connection with planning for FY 94 OPS plan for the Center. Also met with the RDCO element personnel and discussed progress on ROC-RFA Cross Walk and TMHC Code Selection tasks.

CONCLUSIONS:

A conservative approach should be adopted in the design, construction, and operations of the items that are identified to be important to safety and/or waste isolation in addition to applying appropriate levels of QA controls.

PROBLEMS ENCOUNTERED:

None

PENDING ACTIONS:

None

RECOMMENDATIONS:

The design of North Ramp ground support should be reviewed to assess the conservatism in the design.

Banad Jagannath

Banad Jagannath
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