



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

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MEMORANDUM

DATE: July 19, 1989

FOR: John J. Linehan, Director, Repository Licensing Project
Directorate, Division of High-Level Waste Management,
M/S 4-H-3

FROM: John W. Gilray, Sr. OR - YMP

SUBJECT: YMP Site Report for the month of June, 1989

The following report pertains to the QA, waste package and surface facility activities associated with the Yucca Mountain Project for the above-referenced time period.

I. QUALITY ASSURANCE

The Acting Quality Assurance Director for the YMPD with assistance from experienced QA personnel from SAIC and MACTEC is developing plans for improving the overall effectiveness of the YMP QA program. These improvements are necessary in order for the YMP QA Program to successfully pass a QA audit of YMP's overall QA program. The improvement plan involves strengthening

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the QA organization with the addition of experienced QA staff personnel, resolving outstanding deficiency reports, and upgrading QA program procedures as necessary to assure they are meaningful and truly responsive to 10 CFR 50 Appendix B requirements. The overall improvement plan will be presented to C. Gertz, Project Manager, YMPD, the week of July 24, 1989 for his review and comment.

MISCELLANEOUS

- ◆ QA Level Assignments. A QA draft procedure for classifying items and activities relative to the extent the YMP-88-9 QA program applies is under final review by the YMPD and DOE Headquarters. This procedure, which should be released by August 1, simplifies the overall QA classification and grading process and does away with the 3 Quality level system.
- ◆ QA Software Programs. The YMP QA organization is finalizing their review of LLNL's, SAIC's, F&S's and H&N's QA software program procedures. While these procedures appear to be in good shape the YMP is experiencing problems with the USGS and SNL QA software procedures.
- ◆ Audit of Participant's QA Programs. The audit of USGS QA program is still scheduled for 8/14/89. Due to the additional time needed to complete the necessary improvements in LANL's, SNL's, REECo's and YMP's QA Program procedures the scheduled audit dates for these programs are indefinite.
- ◆ SDRD. The SDRD Rev. 1 which includes the resolution of the comments by the participants and DOE Headquarters is expected to be released in August.

- ♦ System Requirements Document (SRD). The YMP has completed a draft of the SRD which is at DOE Headquarters for review. This input requirement document is derived from the DOE Headquarters General Requirements Document. Since the General Requirements Document represents the DOE upper tier baseline document NRC may want to consider conducting an audit or evaluation of the preparation, review, approval and control of this document to assure it has been properly prepared, reviewed and controlled.

- ♦ Allegation. The YMP QA organization was informed that the NRC was interested in the timely resolution of the Singer allegation. The Acting QA Director agreed to investigate and report on the status of resolving this issue.

II. SURFACE FACILITIES

H&N has developed their Basis for Design Document and Engineering Plan for ESF Title II using the YMP SDRD Rev. 0 as the source for input requirements. These 2 documents are awaiting review and approval by YMP which is expected in August. In addition, a Design Input Control Document is being developed by H&N which will be used by H&N personnel to assure consistency in the use of design input requirements. This document is expected to be issued by August 15. H&N is presently (1) preparing a conceptual design package which will provide a key map and overall site plan of the surface facilities and (2) performing preliminary design studies for 3 of the proposed 7 design/construction packages addressed in their Engineering Plan. These 3 packages include the design for the top soil storage area and the borrow pit and construction plans for the Drill Hole Wash Road (Package #1), the design for the main pad (Package #2) and the design for auxiliary pads and roads (Package #3). A description of the H&N proposed design packages is provided in Enclosure #1 of this report. When the YMP SDRD Rev. 1 (which will include changes to resolve the approximately 1300 comments

of the participants and others) is released YMP and H&N have allocated in their schedule time to revisit the Basis for Design, the Engineering Plan, Design Input Control documents and those existing designs analysis, drawings and specification and make the necessary controlled changes to assure consistency with the SDRD Rev. 1 changes.

III. WASTE PACKAGE

Essentially there are 11 basic work activities associated with the development of a waste package which are being performed by LLNL. These activities are addressed in Enclosure 2. However, due to the self-imposed stop work order issued by the LLNL very little technical and scientific work is being performed. As a result of the YMP recently accepting the LLNL QA program LLNL is now engaged in conducting readiness reviews of contractors (B&W, Argonne, and Pacific Northwest) and planned activities to assure the necessary QA program requirements and technical prerequisites have been met before starting work. Such a readiness review has been completed on B&W with favorable results. As a consequence B&W has been authorized to start work on the development of the manufacturing process, design and material selection for the fabrication and closure design. (Note enclosure 2, Activity 4). Also as a result of the accepted upgraded QA program LLNL is now rereviewing the Scientific Investigation Plans and Study Plans and rewriting them as necessary to comply with program requirements.

In regard to the management and integration of the waste package (note enclosure 2, Activity 1) LLNL has developed a Waste Package Strategy Document and a Waste Package Program Plan which are under review by the YMP. These documents will describe how to carry out the program commitments in the SCP and Work Breakdown Structure.

As the LLNL self-imposed stop work activities are resumed their status will be reported in future monthly reports.

cc: With enclosures: K.Stablein, J.Kennedy, M/S 4 H3; R.Adler,
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**PROPOSED H&N
DESIGN/CONSTRUCTION PACKAGES
FOR SURFACE FACILITIES**

Package No. 1 for Top Soil & Borrow Area Pads * (WBS 1.2.6.2.1.2)
Drill Hole Wash Road (WBS 1.2.6.2.1.3)

Activity: This package provides the Title II detailed design showing the location and arrangement of the Top Soil Storage area and the Borrow Pit and construction plans for the Drill Hole Wash Road. It will also contain a Drawing Index and an Overall Site Plan showing all surface facilities. The package will contain the necessary detailed analyses and calculations required to support all designed components of this package. In addition, this package will provide specifications required for construction of these items.

Package No. 2 for Main Pad (WBS 1.2.6.2.1.1)

Activity: This package pertains to the analysis, drawings and specifications of the Main Pad including controlled blasting and water tracer installation and servicing.

Package No. 3 for Site Drainage (WBS 1.2.6.2.1.4)
Auxiliary Pads (WBS 1.2.6.2.1.2)
Roads (WBS 1.2.6.2.1.3)

Activity: This package pertains to the analysis, drawings and specifications of the remaining pads and roads not previously included and site drainage.

Package No. 4 for Water System (WBS 1.2.6.2.2.2)
Sewer System (WBS 1.2.6.2.2.3)
Mine Wastewater System (WBS 1.2.6.7.1.6)
Booster Station (WBS 1.2.6.3.1.5)
DAS Surface Enclosure
Rock Sampling Shelter (10'X10'
at ES-1)

Activity: This package pertains to the analysis, drawings and specifications of all civil utilities, chlorinated and non-chlorinated water systems, the Booster Station, the temporary DAS Surface Enclosure and the Rock Sampling Bin. Also the electrical analysis, drawings and specifications for the Booster Pump Station Building and the DAS Surface Enclosure.

* WBS: YMP Work Breakdown Structure Numbers which are keyed to specific YMP work activities.

Package No. 5 for Hoist Houses (WBS 1.2.6.3.1.2)
Shop (WBS 1.2.6.3.1.3)
Warehouse (WBS 1.2.6.3.1.4)
Surface Data Building (WBS 1.2.6.3.1.7)
Surface Power (WBS 1.2.6.2.2.1)

Activity: This package pertains to the Title II detailed analysis, drawings and specifications for construction of the Hoist Houses, Shop, Warehouse, Surface Data Building, and all Surface Power.

Package No. 6 for Change House (WBS 1.2.6.3.1.1)
Testing Support Facility (WBS 1.2.6.3.1.1)
Switchgear Building (WBS 1.2.6.2.2.1)
Subsurface Data Building (WBS 1.2.6.7.1.1)
Subsurface Power (WBS 1.2.6.7.1.1)

Activity: This package pertains to the analysis, drawings and specifications for construction of the Change House, Testing Support Facility, Switchgear Building, and Subsurface Power and Subsurface Data Building.

Package No. 7 for Life Safety (WBS 1.2.6.2.2.4)
Communications (WBS 1.2.6.7.1.6)
IDS Cabling

Activity: This package pertains to the analysis, drawings and specifications for the Life Safety System, Communications and IDS cabling.

**WASTE PACKAGE
(ACTIVITY AND OBJECTIVE)**

- 1.0 Activity:** Waste Package Management and Integration * (WBS 1.2.2.1)
- Objective:** To manage and integrate work performed within the waste package WBS elements.
- 2.0 Activity:** Waste Package Environment (WBS 1.2.2.2)
- Objective:** To characterize the time-dependent behavior of the hydrogeologic environment in which the waste packages will reside in order to establish the envelope of conditions that define package design parameters, materials testing conditions, and boundary conditions for performance analysis.
- 3.0 Activity:** Waste Form and Materials Testing (WBS 1.2.2.3)
- Objective:** To perform the testing and evaluation necessary to identify the waste package components required by specific host rock and to select the materials for those components.
- 3.1 Activity:** Waste Form Testing Spent Fuel and Glass (WBS 1.2.2.3.1)
(WBS 1.2.3.1.1)
(WBS 1.2.3.1.2)
- Objective:** To characterize the behavior of and determine the radionuclide release rates for the various waste forms in the environment in order to establish data base to support predictions of engineered barrier system performance required for license applications in accord with the requirements of 10 CFR 60 and 40 CFR 191.
- 3.2 Activity:** Metal-Barrier Selection & Testing (WBS 1.2.2.3.2)
- Objective:** To characterize the behavior of the metal barrier and to determine corrosion rates and corrosion mechanisms, and characteristics of other degradation modes.
- 3.3 Activity:** Exterior Packaging (WBS 1.2.2.3.3)
- Objective:** To characterize the properties and behavior of other engineered barrier waste-package components that may be present in a repository in order to establish the predicted performance of exterior packaging materials, and their effects on the ability of waste forms and metals barriers to meet 10 CFR 60 performance requirements.

* WBS: YMP Work Breakdown Structure Numbers which are keyed to specific YMP work activities.

3.4 Activity: Integrated Testing (WBS 1.2.2.3.4)

Objective: To characterize the integrated behavior of the waste form, barrier materials, and surrounding environment.

4.0 Activity: Design Fabrication, and Prototype Testing (WBS 1.2.2.4)

Objective: To develop, analyze, fabricate and test waste package designs that incorporate qualified materials and that are fully compatible with the repository design in order to support license application by demonstrating conformance with requirements for safe handling, emplacement, possible retrieval, and credible accident conditions per 10 CFR 60 and 40 CFR 191, in a cost-effective manner.

5.0 Activity: Waste Package Performance Assessment (WBS 1.2.2.5)

Objective: To provide a quantitative prediction of long-term waste package performance including uncertainties, in order to 1) provide feedback to design optimization studies, 2) to demonstrate compliance with NRC performance objectives for the waste package subsystem, and 3) provide a source term for the engineered barrier system and the total system performance assessments required by 10 CFR 60 and 40 CFR 191.

5.1 Activity: Waste Package Performance Assessment Modeling (WBS 1.2.2.5.1)

Objective: To provide predictions of post-closure waste package performance in order to assess compliance with EPA and NRC regulations (40 CFR 191 and 10 CFR 60 respectively). These assessments will consist of deterministic and probabilistic analyses. A source term necessary for total system performance assessment will also be provided.

5.2 Activity: Near-field Flow and Transport (WBS 1.2.2.5.2)

Objective: To provide a detailed conceptual and quantitative understanding of the flow and transport processes active in the near-field waste package environment. Activities will provide a basis for the near-field waste package environment. Activities will provide a basis for the near-field flow and transport submodel to be included in the waste package performance.