



AGENCY FOR NUCLEAR PROJECTS  
NUCLEAR WASTE PROJECT OFFICE

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May 31, 1988

Mr. Carl P. Gertz, Project Manager  
Waste Management Project Office  
U.S. Department of Energy  
Nevada Operations Office  
Phase 2, Suite 200  
101 Convention Center Drive  
Las Vegas, NV 89109

Dear Mr. Gertz:

The State of Nevada has been involved for a number of years in review and participated in meetings on the proposed Exploratory Shaft Facility at Yucca Mountain. As a result of the recent Title I 50% Design Review presentation, and in light of other ongoing concerns, we feel it is appropriate at this time to present our concerns which you will find attached.

Please contact my office if any item therein requires clarification.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert R. Loux".

Robert R. Loux  
Executive Director

RRL/jrg

Enclosure

cc: Robert E. Browning, NRC ✓  
Paul Prestholt, NRC

CONCERNS OF THE STATE OF NEVADA  
AS RELATED TO  
EXPLORATORY SHAFT FACILITY TITLE I 50 & DESIGN

Based on recent meetings, workshops, handouts, and presentations by DOE contractors, the Nevada Nuclear Waste Project Office has identified the following areas of concern regarding the design of the proposed the Exploratory Shaft Facility at Yucca Mountain. Acknowledging that the design is still conceptual and in a preliminary form, we nevertheless find flaws in the basic concepts of the siting, construction and utility features of the design to date.

ESF PURPOSE

The basic purpose of ESF development is to facilitate site characterization. The design must insure that both the surface and underground facilities provide safe environment with ample space to carry out physical testing and data collection in order to determine if Yucca Mountain is suitable as a repository. Access, layout dimensions, drift separations, ventilation, etc. must be carefully matched to accommodate the variety of tests that will be conducted underground. Much of this testing will be conducted simultaneously with neighboring tests and continued development of the facility itself.

It would seem imperative to start the design of such an interdependent facility by a thorough review of the testing program that will ultimately utilize the facility. However, the Study Plans that describe the test procedures and thus the space and utility requirements of each test have not yet been completed. We therefore doubt that the design and planning to date can accurately serve the intended and as yet undefined testing programs. Therefore, until the Study Plans are complete and approved, design efforts are premature.

The design seems to reflect an attitude that the ESF is an exercise in shaft sinking and underground drift development as an end in itself. The State cautions that the following must be kept in mind:

1. Accommodating scientific testing is primary; scheduling and ease of construction should not compromise the gathering of sound, adequate data.

2. If in fact Yucca Mountain is subsequently developed as a repository, and if the ESF becomes an integral part of the facility, the ESF will be required to meet the same stringent license requirements imposed on the repository. The ESF use thus becomes two-fold; first as a test area and later as part of the repository. Or, in the alternative, the ESF must be designed and constructed in such a manner as to permit acceptable sealing as part of the controlled area if it is not to be incorporated into the repository. This has QA and licensing significance in either case.

3. Contingencies for design changes required by unanticipated factors encountered during development of the facility must be part of the basic design.

#### SITE LOCATION

Selection of a site in a narrow valley just downstream from the convergence of two washes only serves to needlessly increase the risk of flood damage to the ESF. Pad elevations a few feet above the PMF crest offer minimal insurance at best. Auxiliary components of the ESF facility such as roads, power lines, leach fields etc. still lie in the path of the PMF. In view of the 100 year life required for the shafts, it seems prudent to locate their collars at an elevation high above any flood danger and not in a narrow wash. Surely the size of the "repository block" and the varied surface topography permit the choice of numerous better sites.

#### DESIGN BASIS

We note the absence of meaningful near-field analysis of the rock properties in the pillars that will host the proposed shafts. This exercise, to determine and predict structural and possible hydraulic pressures on the shaft walls must be conducted before shaft features such as liners and furnishing can be designed. This becomes even more important in light of licensing requirements and the competence of future seals with a design life of 10,000 years. The stability of the shaft pillar may be weakened during the planned removal of the liner prior to decommissioning.

We see no indications of plans for restoration of the site in the event that Yucca Mountain is abandoned as a possible repository location.

We are not convinced that the design of the shaft and shaft collar is based on conservative parameters in regard to seismic ground motion. The ESF shafts are located within a few hundred feet of the Ghost Dance Fault. Possible faulting along this fault and resulting seismic motion must be carefully considered in the ESF design.

## LAYOUT

The design to date fails to incorporate into the underground layout the following essential items:

1. Testing areas to accommodate contractors that may perform independent tests for NRC, the State of Nevada, or other independent parties.
2. Supervisory offices, first aid station, and meeting or training room.
3. A refuge chamber, commonly required by MSHA to be developed and equipped soon after the first shaft station is completed. This underground room, located close to the shaft, is equipped to sustain workers for several days in the event that the single shaft becomes inoperable. It is not usually required once the connection is made to the second shaft and there are thus two routes of escape.

## CONSTRUCTION LOGISTICS

We note that bottle-necks are likely to be common as the design fails to provide the following features required for smooth operations during the underground development:

1. Space to park idle equipment to insure unobstructed haulage ways. Also, disabled equipment can be parked in such an area while awaiting parts preceding repair, thus opening up valuable shop area.
2. Space reserved for parts and materials storage such as drill steel, cable, hose, pipe, rock bolts, steel, etc. If space is not provided these items will be piled along the ribs creating a hazard or they will be stored in the shop area using valuable shop space.
3. Space allocated for a temporary muck storage bay. The muck hoisting system will normally experience down time for a variety of reasons; during these periods space should be available underground to temporarily store muck from headings so that advancement can continue.
4. Adequate separation of development activities and test areas. Some tests will no doubt require commencement early in the program while ESF development is still in progress. Test areas should not be

immediately adjacent to haulage and hoisting areas to avoid environmental problems with dust and vibration.

### HOISTHOUSE

The fundamental purpose for requiring two shafts at the ESF is to provide a second means of egress in the event that one shaft or its hoisting equipment is disabled. The current design places hoisting facilities for both shafts in a common building with electrical switch gear for both hoists in close proximity.

Perhaps the most common cause of hoisting plant failure is a damaging fire in the hoist house electrical switchgear area. If the ESF design to date is executed, an electrical fire in the common hoisthouse will likely render both hoists inoperable, thus defeating the safety purpose of two shafts.

We therefore recommend strongly that the hoisting facilities for each shaft are located in separate buildings so that a disabling event in one will not affect the operation of the other.