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MAY 09 1990

Mr. Ralph Stein, Associate Director  
for Systems Integration and Regulations  
Office of Civilian Radioactive Waste Management  
U.S. Department of Energy, RW-30  
Washington, D.C. 20585

Dear Mr. Stein:

On April 7, 1990, the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE) conducted a technical exchange on the status of DOE's Exploratory Shaft Facility (ESF) Alternatives Study. DOE explained how 10 CFR Part 60 requirements are being considered in the ongoing study to evaluate alternative repository access configurations and ESF configurations and construction methods.

Subsequent to that technical exchange, the NRC staff reviewed the information presented at the technical exchange and identified concerns with DOE's approach to the ESF Alternatives Study. In order to ensure that these concerns were provided to DOE in time to be factored into the ongoing study, NRC communicated them during a teleconference call among NRC, DOE, and the State of Nevada on May 7, 1990. These concerns, which were telefaxed to participants prior to the teleconference call, are enclosed.

If you have any questions about this letter or the enclosure, please contact King Stablein (FTS 492-0446) of my staff.

Sincerely,

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John J. Linehan, Director  
Repository Licensing and Quality  
Assurance Project Directorate  
Division of High-Level Waste Management  
Office of Nuclear Material Safety  
and Safeguards

Enclosure: As stated

cc: R. Loux, State of Nevada  
C. Gertz, DOE/NV  
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## COMMENTS ON DOE'S APPROACH FOR REPOSITORY/ESF ALTERNATIVES STUDY

1. NRC regulation 60.21(c)(1)(ii)(D) requires that the DOE perform a comparative evaluation of alternatives to the major design features important to waste isolation, with particular attention to alternatives that would provide longer radionuclide containment and isolation. Major design features would include those features, such as, excavation methods, number of openings etc., that were contained in the matrix chart of the 17 alternatives presented during the technical exchange on April 7, 1990.
2. NRC staff is pleased with the commitment stated by DOE to conduct a study of alternative repository/ESF designs. DOE has stated its commitment to apply all applicable regulatory requirements to this study. NRC staff has agreed that DOE has identified the major regulatory requirements that would pertain to design. The list of 17 alternatives contains a number of major design features which the NRC staff believes are appropriate for a comparative analysis (such as the excavation methods, number of openings, shafts vs. ramps for the repository, size of openings, repository layout, location, etc.).
3. However, NRC staff has a concern with the logic of the DOE study approach presented in that the design features have been combined into the 17 alternatives prior to conducting the 60.21 comparative analysis.
4. NRC staff believes this process is inconsistent with the intent of 60.21. There is no explicit step in the DOE process for a comparative analysis of specific design features for the purpose of identifying those that provide for longer radionuclide containment and isolation.

5. Furthermore, since DOE does not know whether the alternatives submitted to the formal decision analysis process could contain both favorable and unfavorable design features, the validity of the process is undermined. Since there is no structure to assure that the alternatives considered are combinations of acceptable design features only, or that the relative merits of the design features are considered explicitly, the process could result in the selection of an alternative which has unacceptable design features or the alternative with the combination of the least number of unfavorable design features.
6. The process being used by DOE has a very high potential to result in a situation similar to that which necessitated the preparation of the Design Acceptability Analysis (DAA) in order to demonstrate that there was adequate consideration of 60.21 requirements. We have agreed in the past, that we should avoid in the future situations which lead to the necessity to conduct that kind of activity.
7. DOE can resolve these concerns by performing the 60.21 comparative analysis of major design features prior to combining design features into the alternatives. This process would include comparing shafts vs. ramps for the ESF; single vs. multi-level layout for the repository; excavation method; number of access openings, ESF locations, etc. DOE could then combine the acceptable design features into alternatives to optimize its various objectives (e.g., limit interference; adequately characterize the Ghost Dance fault and other site features; assure representative site data are obtainable). In this way, the intent of 60.21, comparison of alternatives to the major design features, will have been met.
8. The alternatives that are considered by the formal decision analysis process should be those alternatives that emphasize more favorable design features relative to less favorable design features, thereby enhancing the validity of the outcome of the process.

9. It is not clear how DOE will integrate the ESF Alternatives Study with other relevant parallel studies, e.g., Calico Hills Characterization, and Surface-Based Studies Prioritization in considering the relative merits of alternative design features.