October 8, 2004

Mr. W. John Arthur, Deputy Director
U.S. Department of Energy
Office of Repository Development
P.O. Box 3644629 M/S 523
North Las Vegas, NV 89036-8629

SUBJECT: THE DESIGN OF THE PROPOSED SURFACE AND SUBSURFACE FACILITIES AT YUCCA MOUNTAIN, NEVADA

Dear Mr. Arthur:

The purpose of this letter is to address several specific items relating to the amount of design information that the U.S. Department of Energy (DOE) would provide in a potential license application (LA) to describe the surface and subsurface facilities for the geologic repository operations area (GROA) at Yucca Mountain, Nevada. The amount of design detail that would be supplied in the potential LA has long been a subject of discussion between the DOE and the U.S. Nuclear Regulatory Commission (NRC) staffs. As such, by letter dated December 11, 2003, the NRC provided DOE guidance on the level of detail that would be expected for a heating, ventilation, and air conditioning (HVAC) system. Since that time, three technical exchanges have been held to discuss the level of design detail in the LA.

At the most recent technical exchange the staff noted that: (1) DOE would not provide in the LA a design for site-specific casks that it planned to use at the proposed Aging Facility; (2) DOE had unresolved design issues regarding the proposed important to safety (ITS) portion of the GROA electrical system; (3) in some cases DOE would provide target reliability values for equipment and systems; (4) DOE may not be fully evaluating the effect of preclosure operations on post closure performance objectives; and (5) other broader design issues have not been fully addressed (e.g., aircraft crash hazards and seismic design methodologies).

The staff is providing the following guidance on the type and amount of design detail that DOE should provide to enable the staff to perform its technical review in accordance with NUREG-1804, “Yucca Mountain Review Plan”, and make a determination whether the requirements of 10 CFR 63.31 have been met. Regarding site-specific cask design, the staff considers either of the following options appropriate:

1. Based on the concept of operations discussed at the technical exchanges, it appears that the site-specific cask proposed for use at the Aging Facility is similar in function to casks certified by NRC under 10 CFR Part 72. As such, the staff believes that it would be appropriate to use applicable guidance from NUREG-1567, “Standard Review Plan for Spent Fuel Storage Facilities,” and NUREG-1536, “Standard Review Plan for Dry Cask Storage Systems,” as appropriate to demonstrate compliance with the 10 CFR Part 63 performance objectives. The analysis should include, but not be restricted to, criticality, structural, shielding, confinement, and thermal performance evaluations. Operational and

required testing and maintenance activities should be described. The potential LA should include a description of proposed technical specifications and license conditions for the site-specific casks.

2. Another method would be to select a cask system previously certified by NRC and perform a bounding analysis of the proposed GROA to demonstrate compliance with the 10 CFR Part 63 performance objectives. The analysis should include a review of the certificate of compliance and safety analysis report which demonstrates compliance.

The above options may be used by DOE to demonstrate that the use of site-specific casks at an Aging Facility meet the performance objectives of 10 CFR Part 63. However, this letter does not preclude DOE from using alternate methods, as it believes appropriate, to demonstrate compliance.

With regard to the electrical distribution system, DOE has stated that it has not determined whether it will rely on emergency diesel generators as an emergency power source or if the reliability of the off-site grid will be sufficient to exclude the need for an emergency power source. In addition, it appeared to the staff during the September meeting that DOE has not yet identified the entire scope of the portions of the electrical system that are ITS. For example, if emergency diesel generators are used to supply emergency power, to what extent would electrical and, instrument and control equipment (e.g., manual sequencing of power to the appropriate systems and equipment ITS) operated within the Central Control Center be classified as ITS. In order for DOE to demonstrate compliance with 10 CFR 63.31, it will need to describe the extent of the portions of the electrical distribution system that are ITS.

The DOE has stated that in some cases the LA will only contain target reliability data for SSCs that are ITS (e.g., if DOE decides to rely on the reliability of an off-site power supply that has not yet been constructed for emergency power). The staff acknowledges that SSCs of the GROA may require research and development to confirm the adequacy of the design and DOE is allowed to do so in accordance with the requirements of 10 CFR Part 63. However, if target reliability data is provided in the LA, it is important that the data be accompanied by a detailed description of the programs designed to confirm the validity of the data and a schedule on when this confirmation would be completed.

During the technical exchanges that have taken place in 2004 regarding the GROA, the NRC has identified areas in which SSCs, that DOE does not consider ITS, may affect the performance of SSCs that are important to waste isolation. The DOE should clearly address how it evaluated any of these potential effects in the LA.

The staff also noted that the evaluations of the aircraft crash hazards and the seismic design methodology have not yet been completed. The results of these evaluations may have impacts on the design of SSCs in the GROA and may also affect the consequence analysis.

If you or your staff have questions or comments, please contact Tim Kobetz at 301-415-5170.

Sincerely,

/RA/

C. William Reamer, Director
Division of High-Level Waste Repository Safety
Office of Nuclear Material Safety
and Safeguards

cc: See attached list

Letter to W.J. Arthur from C.W. Reamer, dated: October 8, 2004
cc:

A. Kalt, Churchill County, NV
R. Massey, Churchill/Lander County, NV
I. Navis, Clark County, NV
E. von Tiesenhausen, Clark County, NV
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J. Ray, NV Congressional Delegation
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M. Murphy, Nye County, NV
S. Joya, NV Congressional Delegation
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R. Anderson, NEI

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J. Treichel, Nuclear Waste Task Force
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R. Boland, Timbisha Shoshone Tribe
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S. Kraft, NEI
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R. Craig, USGS
W. Booth, Engineering Svcs, LTD
S. Echols, Esq.
C. Marden, BNFL, Inc.
J. Bacoch, Big Pine Paiute Tribe of the Owens Valley
P. Thompson, Duckwater Shoshone Tribe
T. Kingham, GAO

D. Feehan , GAO
E. Hiruo, Platts Nuclear Publications
G. Hernandez, Las Vegas Paiute Tribe

K. Finfrock, NV Congressional Delegation
P. Johnson, Citizen Alert

A. Capoferri, DOE/ Washington, DC
J. Williams, DOE/Washington, DC
A. Robinson, Robinson-Seidler
M. Dayton, City of Las Vegas
D. Wilson, Sen. Reid's Office

C. Meyers, Moapa Paiute Indian Tribe
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D. Vega, Bishop Paiute Indian Tribe
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J. C. Saulque, Benton Paiute Indian Tribe
C. Bradley, Kaibab Band of Southern Paiutes
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M. Henderson, Cong. J. Gibbon's Office
D. Duquette, NWTRB

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Sincerely,

/RA/

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and Safeguards

cc: See attached list

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