April 27, 2001

Stephan Brocoum, Assistant Manager
Office of Licensing and Regulatory Compliance
U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P.O. Box 30307
North Las Vegas, NV 89036-0307

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION/U.S. DEPARTMENT OF ENERGY TECHNICAL EXCHANGE ON PRE-CLOSURE ISSUES

Dear Mr. Brocoum:

During a telephone call on March 5, 2001, your staff proposed to have a Nuclear Regulatory Commission (NRC) / U.S. Department of Energy (DOE) Technical Exchange and Management Meeting (Technical Exchange) on the pre-closure issues the week of July 23, 2001. In a letter dated March 11, 2001, I stated that this timeframe was acceptable to the NRC. I further stated that the NRC staff is reviewing DOE's pre-closure documents and would provide a list of topics related to pre-closure safety to be discussed at the Technical Exchange.

Based on its review of DOE's Preliminary Pre-closure Safety Assessment Report, Repository Safety Strategy, and other support documents, NRC staff has preliminarily identified several areas DOE should discuss in any future license application regarding the potential high level waste repository at Yucca Mountain (Enclosure 1). The staff has also identified specific topics it would like DOE to discuss during this, and future Technical Exchanges. Although all the topics do not need to be addressed during this Technical Exchange, we are providing the list so that DOE understands the key areas the staff plans to review. The NRC plans to discuss these topics with DOE during the next three months to further clarify which areas need to be discussed and what information the NRC is looking for during the July Technical Exchange. It is also important to note that this list is subject to change and that the NRC's overall plan for reviewing any future license application will be documented in the Yucca Mountain Review Plan, which is currently under development.

If you have any questions on this letter, please contact Mr. James Andersen of my staff. He can be reached at (301) 415-5717.

Sincerely,

/RA/

C. William Reamer, Chief
High-Level Waste Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated

cc: See attached distribution list

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Letter to S. Brocoum from C.W. Reamer dated: April 27, 2001

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TOPICS FOR DISCUSSION DURING THE JULY 2001 PRE-CLOSURE TECHNICAL EXCHANGE AND MANAGEMENT MEETING

The U.S. Nuclear Regulatory Commission (NRC) staff has preliminarily identified several areas the U.S. Department of Energy (DOE) should discuss in any future license application regarding the proposed high level waste repository at Yucca Mountain. The ten general areas and associated descriptions are described below. Under each description are specific topics the NRC staff would like to discuss at future Technical Exchanges; the ones marked with a double asterisk are the topics the NRC would like to discuss at the July 2001 Technical Exchange.

1) Site Description

Discuss the site description as it pertains to the pre-closure safety analysis and geologic repository operations area design. Discussions should include: (1) site geography; (2) regional demography; (3) local meteorology and regional climatology; (4) regional and local surface and groundwater hydrology; (5) site geology and seismology including geoengineering properties that are relevant to design of surface and subsurface facilities; (6) igneous activity; (7) site geomorphology; and (8) site geochemistry.

a) geotechnical investigation for surface facilities
b) design basis ash fall

2) Description of Structures, Systems, Components, Equipment, and Operational Process Activities

Describe the structures, systems, components, equipment, and operational process activities as they relate to the design of geologic repository operations area facilities. The discussions should include: (1) descriptions of location of surface facilities and their functions, including structures, systems, components and equipment; (2) descriptions of and design details for structures, systems, components and equipment of surface facilities; (3) description of and design details for structures, systems, components and equipment of the subsurface facility; (4) characterization of high level waste; (5) description of engineered barrier system components (e.g., waste package, drip shield); and (6) description of geologic repository operations area operational process activities and procedures including interfaces and relationships between structures, systems and components.

a) high-level waste characterization/burn-up credit**

3) Identification of Hazards and Initiating Events

Discuss the identification of hazards and initiating events. Discussions should include: (1) technical basis and assumptions for methods used for identification of hazards and initiating events; (2) use of site data for identification of hazards and initiating events; (3) determination of frequency or probability of occurrence of hazards and initiating events; (4) technical basis for inclusion or exclusion of specific hazards and initiating events; and (5) list of hazards and initiating events to be considered in the pre-closure safety analysis.

a) aircraft hazards**
b) nearby military facilities hazard
c) operational hazards including human reliability
d) earthquake as an initiating event
e) tornado missile hazards**
f) fire hazards

4) Identification of Event Sequences

Discuss the identification of event sequences considered in the pre-closure safety analysis. The discussion should include: (1) technical bases for methods used and assumptions made for identification of event sequences; and (2) Category 1 and 2 event sequences.

a) events screened out by design**
b) justification of probability estimations**

5) Consequence Analyses

Discuss the consequence evaluation methodology that the design meets regulatory requirements related to radiation protection requirements for normal operations and Category 1 and 2 event sequences. Discussions should include: (1) consequence evaluations for normal operations and Category 1 and 2 event sequences; (2) onsite and offsite doses during normal operations and Category 1 and 2 event sequences, as appropriate; and (3) compliance with performance objectives.

a) dose calculation methodology for Category 1 event sequences**
b) dose calculation methodology for Category 2 event sequences

6) Identification of Structures, Systems and Components Important to Safety; Safety Controls; and Measures to Ensure Availability of the Safety Systems

Discuss the identification of structures, systems and components important to safety; safety controls; and measures to ensure availability of the safety systems. Discussions should include: (1) structures, systems and components important to safety and measures to ensure availability of safety systems; (2) administrative or engineered safety controls for structures, systems and components important to safety; and (3) risk significance categorization of structures, systems and components important to safety.

a) Q-list methodology**
b) quality level categorization**

7) Design of Structures, Systems and Components Important to Safety and Safety Controls

Discuss the design of structures, systems and components important to safety and safety controls. Discussions should include: (1) design criteria and design bases; (2) design methodologies; and (3) repository design and design analyses.

a) level of design details**
b) soil-structure interaction
c) ventilation design
d) fire protection design
e) engineered barrier system design and fabrication**
    - waste package drop analysis
    - welding flaws
    - differential thermal expansion
    - fire design criteria for waste package

8) Meeting the 10 CFR Part 20 as Low as is Reasonably Achievable Requirements for Normal Operations and Category 1 Event Sequences

Discuss meeting the 10 CFR Part 20 as low as reasonably achievable requirements for normal operations and Category 1 event sequences. Discussions should include: (1) policy considerations; (2) design considerations; and (3) operational considerations.

9) Plans for Retrieval and Alternate Storage of Radioactive Wastes

Discuss the plans for retrieval and alternate storage of radioactive wastes. Discussion should include: (1) plans for meeting performance objectives; (2) adequate alternate storage for retrieved wastes; and (3) reasonable retrieval schedule.

10) Plans for Permanent Closure and Decontamination, or Decontamination and Dismantlement of Surface Facilities

Discuss plans for permanent closure and decontamination, or decontamination and dismantlement of surface facilities. Discussions should include: (1) the description of design considerations that are intended to facilitate permanent closure and decontamination, or decontamination and dismantlement of surface facilities; and (2) plans for permanent closure and decontamination, or decontamination and dismantlement.