PROPOSED

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
DIVISION OF HIGH-LEVEL WASTE REPOSITORY SAFETY

GUIDELINES FOR STAFF INTERACTIONS WITH THE DEPARTMENT OF ENERGY ON PRECLOSURE TOPICS

Guidelines Rev._____
Date_____

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PURPOSE

The following U.S. Nuclear Regulatory Commission (NRC) staff guidelines describe how the NRC staff will interact with U.S. Department of Energy (DOE) staff. These guidelines have been established to provide the NRC staff a methodical process to gain a better understanding of the technical and regulatory issues associated with DOE's preclosure safety analysis to be submitted as part of a License Application (LA). In the event that DOE does submit an application, the NRC staff will no longer interact with DOE in accordance with these guidelines. Specifically, these guidelines:

- Identify potential risk-significant technical topics;
- Describe the objectives and format for conducting technical exchanges (TEs) on the topics;
- Set a proposed schedule for NRC/DOE TEs on the topics; and
- Describe the process to document the results of the TEs.

TOPICS

Table 1 provides a list of preclosure topics which involve systems, structures, and components that may be required to prevent or mitigate event sequences. The table also identifies high-level objectives to focus technical exchanges on collecting additional information and data on specific technical topics.

Topics proposed in these guidelines are primarily to advance NRC staff's understanding of the type of information that DOE intends to provide, or use to support DOE's preclosure safety analysis, however, resolution of these items is not required to begin a review of a potential License Application. To develop these topics, the staff considered information in existing DOE reports, calculations, and evaluations and, in addition, information gathered during TEs. The NRC staff examined the major functional components of the geologic repository operations area based on limited information available about specific facility designs and operations. Facility conceptual designs, concepts of operations, engineering and engineering experience, and qualitative and quantitative insights were used to identify potential topics that could be safety significant. Table 1 also contains a list of relevant documents to each topic and a tentative TE schedule.

These guidelines are not meant to establish an official NRC position on any of the topics. The objectives of the topics are expected to evolve as staff gains additional understanding and information about the proposed preclosure activities and the associated DOE preclosure safety analyses.

TECHNICAL EXCHANGES

Technical exchanges will be conducted to allow the NRC staff to present its understanding of the topics listed in Table 1 and ask questions regarding the objectives, and provide an opportunity for DOE to respond to those questions.

Format of Technical Exchanges

- The NRC Presentation of Objectives

  At the beginning of each preclosure technical exchange the NRC staff will present an overview of its understanding of the technical issue and the objectives of the technical exchange which highlight additional information that may be necessary to support the LA.

- The DOE Presentations Addressing the Objectives

  The DOE will discuss the issues raised by NRC's initial presentation of the objectives. The discussion may include formal presentations and informal discussions of specific reports, analyses, calculations, etc.

- The NRC Summary of the Technical Exchange

  At the conclusion of the TE, the NRC staff will review each objective and identify whether DOE provided sufficient information to address the objectives or whether DOE may need to provide additional information in the LA to demonstrate compliance with 10 CFR Part 63.

- The NRC Summary Letter

  Within 30 days of the TE, the NRC will document in a letter to DOE whether the objectives for the meeting were met and, if not, what objectives are still outstanding and why. This information is being supplied to DOE to document potential technical issues that may need to be addressed in the LA. The DOE will not be requested to respond to the letter; however, as new information becomes available, DOE may respond to clarify information on the objectives that were not met.

- Availability of Documents

  The DOE will make all documents that will be discussed during the TE available to all stakeholders on its website no less than 14 days before the meeting. The titles and identification numbers will be listed in the meeting notice and associated meeting agenda. In the event that the documents to be discussed contain sensitive information (e.g., Official Use Only, Safeguards Information, etc), the availability of those documents will be handled on a case-by-case basis.

PRECLOSURE PRE-LICENSING TOPICS
TABLE 1

Topic #	Topic	Objective(s)	Technical Exchange Target Date	Relevant DOE Documents
1	Preclosure Safety Assessment (PCSA)	Discuss the bases for assumptions supporting DOE's preclosure safety analysis (PCSA) in identifying hazards, categorizing event sequences, and demonstrating the perfromance of systems, structures, and components (SSCs) that have been evaluated to be important to safety (ITS). This includes the treatment of data uncertainty.		
		Discuss how DOE intends to demonstrate and achieve target reliability values in the PCSA.		
		Discuss how DOE intends to address human reliability in the PCSA.		
		Discuss how DOE intends to incorporate operational experience in PCSA hazard identification.		
2	Aircraft Crash Event Sequences	Discuss the process DOE intends to use in identifying hazard sources and assessing frequency analysis.		

Topic #	Topic	Objective(s)	Technical Exchange Target Date	Relevant DOE Documents
		Discuss how DOE intends to demonstrate the structural performance of SSCs subject to an aircraft crash in the PCSA.		
3	Seismic Event Sequences	Discuss how DOE intends to perform site geotechnical characterization.		
		Discuss how DOE intends to analyze the seismic ground response.		
		Discuss DOE's analysis of the seismic design of structures to support the PCSA.		
		Discuss how DOE intends to develop seismically initiated event sequences for the PCSA.		
4	Criticality Event Sequence	Discuss the approach DOE intends to use to address preclosure criticality safety in the PCSA.		

Topic #	Topic	Objective(s)	Technical Exchange Target Date	Relevant DOE Documents
5	Performance of Surface SSCs	Discuss how DOE intends to evaluate the structural performance of the waste package in the PCSA.		
		Discuss how DOE intends to assess the performance and reliability of mechanical systems including, but not limited to, the fuel handling equipment, cranes, HVAC systems, and trolleys.		
		Discuss how DOE intends to assess the performance and reliability of electrical systems.		
		Discuss how DOE intends to assess the performance and reliability of structural systems including, but not limited to, shielding and structural walls and the aging facility		
6	Subsurface Mechanical System & Components Performance	Discuss how DOE intends to assess the performance and reliability of mechanical systems including, but not limited to, the subsurface transporter and emplacement gantry		
		Discuss how DOE intends to assess the performance and reliability of structural systems including, but not limited to, emplacement and main drifts		

Topic #	Topic	Objective(s)	Technical Exchange Target Date	Relevant DOE Documents
7	Aging Facility Performance	Discuss how DOE intends to analyze the use previously licensed casks in the PCSA.		
		Discuss how DOE intends to analyze the use of site-specific cask designs in the PCSA.		
8	Source Terms	Discuss how DOE intends to identify and use the appropriate spent nuclear fuel release fractions in the PCSA.		
		Discuss how DOE intends to identify and handle damaged fuel assemblies including the analysis of handling damaged assemblies in the PCSA.		
9	Consequences	Discuss how DOE intends to characterize radionuclide inventories for various high-level waste forms and use those inventories in the PCSA.		
		Discuss the methodology and assumptions that DOE intends to use for worker dose assessments in the PCSA.		
		Discuss the methodology and assumptions that DOE intends to use for off-site dose assessments in the PCSA.		

Topic #	Topic	Objective(s)	Technical Exchange Target Date	Relevant DOE Documents
10	Format and Content of Licensing Documents	Develop the format and content of a potential construction authorization. While the NRC has the responsibility to develop the format and content of the construction authorization, the staff believes it is prudent to allow DOE to provide input based on the design and construction of the facility.		
		Develop the format and content of a potential license to receive and possess high-level waste. While the NRC has the responsibility to develop the format and content of the license, the staff believes it is prudent to allow DOE to provide input based on the design and operation of the facility.		