SUMMARY OF
THE U.S. NUCLEAR REGULATORY COMMISSION/U.S. DEPARTMENT OF ENERGY
TECHNICAL EXCHANGE ON PRECLOSURE FACILITY LAYOUT AND OPERATIONS
LAS VEGAS, NEVADA
MAY 30, 2007

INTRODUCTION

On May 30, 2007, the U.S. Nuclear Regulatory Commission (NRC) staff and the U.S. Department of Energy (DOE) held a public Technical Exchange (TE) to further NRC's understanding of the status of DOE's preclosure facility design, layout, and operations. This meeting was held at the Las Vegas Hearing facility in Las Vegas, Nevada. The agenda for this meeting can be found in Enclosure 2.

To facilitate staff and stakeholder interactions, the NRC Headquarters, in Rockville, Maryland, and the Center for Nuclear Waste Regulatory Analyses, in San Antonio, Texas, participated in the TE via video links. Teleconference connections were also made available for interested stakeholders. Participants included representatives of NRC, DOE, State of Nevada, Affected Units of Local Government, Nuclear Energy Institute, and other members of the public. A list of attendees is provided in Enclosure 3.

The meeting agenda, list of attendees, and NRC/DOE presentations are available on the NRC High-Level Waste Disposal Meeting Archive web site: http://www.nrc.gov/waste/hlw-disposal/public-involvement/mtg-archive.html#KTI (NRC ADAMS ML071370663).

PURPOSE OF TECHNICAL EXCHANGE

In a letter dated May 2, 2007, NRC identified topics (see below) that the staff was interested in discussing at the May 30, 2007, technical exchange (ML071170593). Therefore, the purposes of this TE meeting were: (1) to advance NRC's understanding of the status of DOE's preclosure facility design, layout, and operations, and (2) to improve DOE's understanding of NRC expectations regarding the design of DOE's preclosure facilities, via discussion of these topics. The topics to be discussed were:

- An update on DOE's facility design and operations, focusing on the Canister Receipt and Closure Facility (CRCF) and Wet Handling Facility (WHF), including: (1) facility layout and operations, (2) mechanical handling, and (3) waste handling operations (across facilities and within buildings).

- An update on the status of incorporating the new facility design and operations into the preclosure safety analysis (PCSA); specifically, impact of the new design and operations on the identification of hazards and initiating events. Staff also requested an update of the status of DOE's efforts on identification and frequencies of event sequences, and important-to-safety (ITS) structures, systems, and components (SSCs). In particular, staff was interested in: (1) analysis and design methods used to evaluate facilities for the identified hazards, including technical bases for assumptions; (2) acceptance criteria (including codes and standards); and (3) results of the performance evaluations,

including SSCs ITS reliability values, frequencies, and categorization of event sequences.

TOPICS OF DISCUSSION

NRC staff presented its perspectives on DOE's facility layout and operations, identified in NRC's letter to DOE, dated May 2, 2007. NRC discussed topics addressed at the March 28-29, 2007, Appendix 7 meeting, including: CRCF facility layout and operations, as well as CRCF seismic analysis and design. NRC also delineated regulatory requirements and related staff guidance. DOE made presentations in the following areas: (1) "DOE Introduction to Revised Program Approach"; (2) "Site Layout and Waste Handling Overview"; (3) "CRCF and WHF Layout and Waste Handling Operations"; (4) "Waste Handling Control Philosophy"; and (5) "Seismic Design Considerations." NRC and DOE presentations are provided in Enclosure 4. The following discussion provides highlights for each of the topics addressed in this meeting.

DOE Introduction to Revised Program Approach

DOE discussed the current site layout and an overview of waste handling processing for the surface waste-handling facilities. Additionally, DOE outlined the schedules for the design and PCSA of the surface facilities.

Site Layout and Waste Handling Overview

DOE discussed the current layout of surface facilities and their waste-form handling capabilities and features, based on the Critical Decision-1 (CD-1) decisions made last year. The presentation addressed the general layout and waste-handling processes of the surface-waste handling facilities (i.e., Initial Handling Facility, WHF, CRCF, and Receipt Facility). The presentation also addressed the design similarity of mechanical-handling equipment used for waste handling at these facilities, with existing equipment in use at nuclear power plants or other industrial facilities.

The DOE overview included three-dimensional (3-D) representations of the Cask Transfer Trolley, Canister Transfer Machine, Waste Package Trolley, and the Transport and Emplacement Vehicle (TEV). DOE discussed, for this equipment, the following aspects: (1) principal design codes; (2) the design (engineering and PCSA) process for ITS SSCs; and (3) status of design and PCSA products. The presentation also included samples of a block flow diagram, a mechanical-equipment envelope, and a process-and-instrumentation diagram.

CRCF and WHF Layout and Waste-Handling Operations

DOE's presentation focused on the similarity of waste-handling operations in the various surface facilities and described CD-1 design changes implemented to reduce risk at the repository (e.g., Transportation, Aging and Disposal canisters, simplified waste movement, and fewer waste-handling operations). This presentation included figures taken from DOE's 3-D engineering model, to illustrate waste-handling operations in the CRCF and WHF. The presentation also included several short computer-generated videos that demonstrated selected mechanical-handling functions in those facilities.

Waste-Handling Control Philosophy

DOE described its waste-handling control philosophy and provided an overview of control and monitoring systems being designed for the repository. Presentations included discussion of non-ITS control systems and ITS control functions. Examples of ITS functions and their implementation were provided as well. DOE emphasized that non-ITS control systems provide operator interface and normal control and monitoring functions for repository operations. Control functions determined to be ITS will be hardwired, independent of non-ITS control systems. No non-ITS control system, or operator commands, are able to override these hardwired ITS functions. The presentation also discussed control and monitoring locations and distinguished between remote, local-remote, and local locations.

Seismic Design Considerations

DOE's presentation clarified the seismic analysis approach to be followed that will establish the safety of the repository. Tier-1 analyses results, based on lumped mass multiple-stick models, will be presented in the license application (LA), and will be the basis of the safety evaluation. The presentation included an example based on the CRCF Tier-1 analysis results. DOE also stated that it will perform Tier-2 analyses, as appropriate, based on a finite-element model, including consideration of soil-structure interaction. The Tier-2 analyses are expected to be completed by May 2008. Once completed, the Tier-2 analyses will form the basis of detailed design calculations and are expected to confirm the results of the Tier-1 analyses. However, the Tier-2 analyses will not form the basis of the safety evaluation and will not be presented in the LA.

CLOSING COMMENTS

The TE meeting provided an update on the status of DOE's design, facility layout, and operations for the CRCF and WHF. It also provided staff with information on DOE's waste-handling control philosophy and some discussion of how DOE plans to incorporate seismic design considerations into the compliance determination, using its Tier-1 analysis. NRC highlighted the importance of continuing interactions with DOE on design and PCSA. DOE responded that the design and PCSA are currently under development and information would not be available until fall 2007. Both parties recognized that interactions on additional PCSA elements were in the planning stage. Specifically, NRC indicated the need to hold an additional TE to discuss completed preclosure facility design and operations. NRC also suggested a TE to discuss DOE's compliance determination using the PCSA for license application after DOE completes the design and corresponding PCSA. DOE agreed with this proposal.

DOE stated that the TE was a productive meeting and indicated that it looks forward to additional interactions with NRC on various elements of the PCSA, pending the availability of information.

PUBLIC COMMENT

Ms. Judy Treichel, representing the Nevada Nuclear Waste Task Force (participating via teleconference), commented that DOE's repository design continuously changes to improve safety; however, it appeared to her that NRC was not concerned about consistency of the design with operations. NRC's representative responded that the Agency's primary mission is to ensure public health and safety. To effectively discharge its responsibility, the NRC staff will ensure that the operations are appropriately analyzed and reflected in DOE's design and the PCSA. During the pre-licensing stage, NRC recognized the iterative nature of DOE's facility design process, and intends to stay abreast of the current DOE design. Furthermore, NRC has regulatory processes in place to confirm that an applicant's operations have been appropriately analyzed to ensure safety, before granting a license.

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