

**SUMMARY OF THE
U.S. NUCLEAR REGULATORY COMMISSION/U.S. DEPARTMENT OF ENERGY
TECHNICAL EXCHANGE ON TOPICS RELATED TO PHYSICAL PROTECTION,
MATERIAL CONTROL AND ACCOUNTING AND EMERGENCY PLANNING
ROCKVILLE, MD
JUNE 28, 2007**

INTRODUCTION

On June 28, 2007, the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE) held a public Technical Exchange (TE) to discuss topics related to physical protection (PP), material control and accounting (MC&A) and emergency planning (EP). This meeting was held at the NRC headquarters in Rockville, MD. The agenda for this meeting is provided in Enclosure (2).

To support staff and stakeholder interactions, the TE included video connections to the Atomic Safety Licensing Board hearing facility in Las Vegas, Nevada, and the Center for Nuclear Waste Regulatory Analyses in San Antonio, Texas. Tele-conference connections were also made available for interested stakeholders. Participants included representatives of the NRC, DOE, State of Nevada, Affected Units of Local Government, Nuclear Energy Institute, and members of the public. A list of attendees is provided in Enclosure (3).

OPENING REMARKS

In their opening remarks, the NRC noted the importance of public interactions to facilitate communication and timely review of any potential license application (LA). In a letter dated May 29, 2007, (NRC ADAMS ML071370723), and in its opening remarks, the NRC stated that it would like to learn more regarding: (1) concept of operations for the geologic operations repository operations area (GROA); (2) the types of waste forms to be shipped to the GROA, which includes the composition of the high-level waste (HLW) [i.e., special nuclear material (SNM)] shape, form and size; (3) a broad overview of how DOE has integrated PP for the GROA with the design of systems and features important to safety; (4) an update on the possible types of accidents that may occur at the GROA (i.e., both radioactive and chemical), how DOE will mitigate the consequences from these accidents, name of off-site response organizations, types of equipment and facilities to be used to mitigate any accidents and training of on-site and off-site responders; (5) an update on how DOE will ensure the validity and integrity of SNM content values assigned to HLW received at the GROA from shippers; and (6) a broad overview of how DOE will implement different protective strategies based on material to be received at the GROA. The NRC reminded everyone that the topics to be discussed at this TE will be at the unclassified and non-sensitive level.

In their opening remarks, DOE reiterated its plans to submit the potential LA for a high-level waste repository at Yucca Mountain (YM), Nevada, no later than June 2008. DOE stated its EP will include coordination with potential off-site responders on matters involving public safety and use of services. In addition, DOE stated that the PP objectives for the GROA are to prevent the loss of control of the facility, the loss of HLW, to prevent theft and diversion of HLW, as well as radiological sabotage. The material

control and accounting objectives include controlling and accounting for HLW within the GROA and confirming receipt of HLW from shippers.

PRESENTATIONS

Several presentations were made by DOE to address topics requested in the NRC's key topics letter dated May 29, 2007. Copies of all presentations are provided in Enclosure (4).

DOE presented information on the concept of operations for the GROA, PP, MC&A and EP. The following discussion provides highlights for each topic presented by DOE in this meeting.

1. Concept of Operations

DOE presented updated information on the types of waste forms to be received at the GROA including commercial SNF, DOE SNF, HLW (in a vitrified glass form) and Naval SNF. DOE expects approximately 90% of the commercial SNF (approximately 200,000 pressurized and boiling water reactor assemblies), to be shipped in transportation, aging and disposal (TAD) canisters (approximately 7,800). Close to 10% of the commercial SNF (approximately 30,000 pressurized and boiling water reactor assemblies) will be received at the GROA in transportation casks (certified under 10 CFR Part 71) and loaded into TAD canisters, utilizing the spent fuel pool. The other waste forms will be shipped in a canister suitable for loading into a waste package at the GROA and will not involve bare handling operations. This includes DOE and commercial HLW (approximately 9,300 canisters of vitrified glass), DOE SNF (approximately 5,000 canisters) and Naval SNF (approximately 400 canisters). DOE elaborated on the sizes and weights of the different canisters used to ship the different waste forms to the GROA, as well as the different waste package configurations for emplacement in YM.

The presentation continued with a site description and boundaries for the GROA. DOE further clarified that all waste handling operations will be conducted within the GROA. DOE's design for surface facilities within the GROA include construction of 5 major types of facilities for receiving, handling, packaging, aging and preparing waste for emplacement in YM. These facilities are the Initial Handling Facility (IHF), the Canister Receipt and Closure Facility (CRCF), the Receipt Facility (RF), the Wet Handling Facility (WHF) and the Aging Facility (AF) that includes the Aging Pads (AP). The IHF will prepare and process Naval SNF and HLW canisters to be placed into a waste package for emplacement. The CRCF will prepare and process DOE SNF, HLW and commercial SNF canisters to be placed into a waste package for emplacement in YM. The RF will prepare and process commercial SNF for placement on to the AP, to allow SNF to cool to a certain temperature, subsequently will be sent to the CRCF or WHF for further processing. The WHF operations include transferring non-TAD canister commercial SNF to a TAD canister, subsequently the canister is sent to the RF or CRCF facilities for further processing. More details regarding each of the 5 major facilities for handling and processing of HLW are in Enclosure (4).

The presentation continued with a description of the support facilities to be constructed at the GROA and a description of phased construction for the GROA. The GROA will be constructed in 4 different phases. The first phase includes construction of 5 major facilities to process HLW waste forms at the GROA. The next 3 phases include adding

some of the major facilities to increase the GROA processing capabilities of HLW for emplacement in YM.

The presentation continued with a description of the sub-surface facility within YM. The sub-surface facility consists of approximately 108 emplacement drifts located between 215 m and 450 m below the surface and 215 m and 365 m above the water table. In addition, DOE described sub-surface operations, which included emplacement of HLW within the drifts.

Finally, DOE discussed retrieval of waste. The repository design will preserve the option to retrieve any or all of the emplaced waste.

2. Emergency Planning

DOE's presentation was an overall approach to EP that discussed the requirements associated with EP, guidance documents to be used for constructing the emergency plan and lessons learned from plans developed at other DOE nuclear facilities. DOE discussed in general the types and classifications of accidents, mitigation of consequences from postulated accidents, the Emergency Response Organization, off-site notifications, emergency response facilities, and training of both on-site workers and off-site responders. Additionally, DOE discussed the memoranda of understanding it is in the process of seeking with counties that are adjacent to YM. DOE anticipates submitting the emergency plan approximately 6 months prior to submittal of the updated LA to receive and possess source, special nuclear, or by-product material at the GROA.

3. Physical Protection

DOE's presentation presented an overview of PP operations, GROA security facilities, communications, equipment operability and compensatory measures. DOE began the presentations by reiterating the general performance objectives and guidance found in 10 CFR 73.51 and NUREG-1804. DOE anticipates submitting the PP plan to the NRC no later than 180 days after issuance of the construction authorization. Submitting the plans at this time will allow DOE to provide a mature plan to the NRC. DOE stated that the objectives of the PP are to: (1) prevent the loss of control of the GROA consistent with 10 CFR 72.106; (2) satisfy the performance objectives of 10 CFR 73.51; (3) protect against radiological sabotage and theft and diversion of material; and (4) protect classified material. The PP operations consist of a protective force, physical barriers, detection, surveillance and alarm systems, access control system and a communication system. DOE discussed in general the security organization, training of the protective force and contingency planning. Next DOE gave general descriptions of its primary security facilities for the GROA, their role in receiving shipments of material at the GROA, how the facilities are involved with monitoring movements of material within the GROA and the communication links between facilities, protective forces and off-site response organizations.

4. Material Control and Accounting

DOE's presentation presented an overview of MC&A which included its approach, general objectives and system capabilities, the organization, shipper receiver validation, item control, inventory, anomaly resolution, record keeping and reporting. DOE anticipates submitting the MC&A plan to the NRC no later than 180 days after issuance

of the construction authorization. DOE's general performance objectives include controlling and protecting HLW from the period it takes possession of the material at the GROA through emplacement. This is accomplished by detecting and responding to any losses of HLW after DOE takes possession of the material, reporting any losses of SNM or accidental criticality to the NRC, establishing an inventory, tracking and reporting system, as well as an anomaly reporting system, performing physical inventories on an annual basis and by establishing a collusion protection program to thwart attempts at diverting SNM. Furthermore, DOE is establishing a management structure that separates MC&A responsibilities and functions from its management, an independent organization to perform assessment of MC&A activities and establish a program to validate shipper values. With regards to resolving anomalies, DOE is establishing a program that includes procedures for investigating, resolving and reporting anomalies per 10 CFR 72.74 to the NRC.

Finally, DOE presented the draft ANSI standard N15-8, "Special Nuclear Material Control and Accounting Systems for Nuclear Power Plants," as a basis for the proposed item accounting approach for the repository.

General NRC's Comments to DOE's Presentations

With respect to DOE's presentation regarding emergency planning, the NRC stated that it expects an emergency plan (with possible place holders for information not available at submission of the plan) to be submitted with DOE's LA as part of the Safety Analysis Report per 10 CFR 63.21(c)(21), 63.161 and 72.32(b). In addition, the NRC requests more information regarding the types of accidents (i.e., radiological and chemical) that may occur at the GROA and the measures taken to mitigate the consequences from these possible accidents.

With respect to DOE's presentation regarding physical protection, the NRC requests more information regarding physical protection attributes for the GROA, physical protection of HLW as it enters the GROA, moved and processed through the GROA and finally through emplacement of the material into YM.

With respect to DOE's presentation regarding MC&A, the NRC requests more specific information regarding the types of waste that will be received at the GROA (e.g., specifically the shape, form, size, SNM content, and so forth of non-commercial material), a more detailed description of: (1) the technical basis for assigning SNM content to HLW received at the GROA, ensuring the integrity of receipts of HLW; (2) how DOE will implement its MC&A program, which includes the control and tracking of HLW within the GROA; (3) the use of custodians; (4) the use of the "2-person rule;" and (5) the use of the item control and material balance areas. In addition, the NRC needs more information in the MC&A plan regarding anomaly resolution, including measurement capabilities to assist in resolving any anomalies, more information regarding DOE's collusion protection program and its diversion path analysis.

General Public Comments

Mr. Martin Malsch (Egan, Fitzpatrick and Malsch) asked a question regarding the size and number of the aging pads (i.e., for temporary storage and cooling of commercial SNF). Mr. Jack Bailey [Bechtel SAIC Company (BSC)] stated that increasing the size and number of aging pads at the GROA, would assist with increasing the rate of emplacement of HLW in YM based on more material being readily available for emplacement operations, after the commercial SNF has met requirements for the facility.

Ms. Shelly Walker (Clark County) asked a question regarding who will be able to comment on the emergency plan (e.g., Nye County only). Mr. Daniel Hulbert (BSC) stated that those counties that would provide off-site assistance to the YMP would be allowed to comment on the emergency plan.

Mr. Steve Frishman (State of Nevada) asked a question regarding if there are 2 emergency plans for YM. Mr. Daniel Hulbert (BSC) stated there will be 2 emergency plans; the first emergency plan will be for the GROA based on NRC requirements and the second emergency plan will be for the area outside of the GROA and would be based on DOE requirements.

Ms. Judy Treichel [Nevada Nuclear Waste Task Force (Nevada NWTF)] voiced her disagreement with a DOE comment that retrieval operations were the reverse of emplacement.

Ms. Judy Treichel commented that the counties and the public would be interested in viewing the PP and MC&A plans, but if DOE submits the plans subsequent to the NRC granting construction authorization for the GROA, that would prevent the counties and the public from forming contentions on these plans during the hearing process.

Ms. Judy Treichel commented that an emergency plan, with place holders, does not allow the affected units of local government the opportunity to view the plan in its entirety and formulate all its contentions with the plan.

Closing Remarks

In closing, Ms. Melanie Wong (NRC) thanked DOE for their presentations and those from the public for the comments and attendance. Ms. Wong stressed the importance that the NRC be made aware of any significant changes to DOE's concept of operations for the GROA. Furthermore, Ms. Wong stressed that throughout the presentations, there were several areas in which the NRC will need additional information and further discussions with DOE to outline the NRC's expectation regarding information to be submitted with any potential LA in the areas of PP, MC&A and EP. Finally, Ms. Wong cautioned DOE on the use of any non-High Level Waste Repository Safety guidance documents for use in preparing a potential LA.

Mr. Jeff Williams (DOE) thanked the NRC for hosting the TE. On the topic of what emergency planning information will be provided in the LA, DOE emphasized its intention to provide a detailed description of the emergency plan in the LA at the time of initial submittal. The description would contain the information available at the time of submittal. DOE agreed that further discussions on this topic would be necessary.

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