



U.S. Department of Energy
Office of Civilian Radioactive Waste Management


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DOE/NRC Quarterly Management Meeting



December 07, 2006
Pahrump, Nevada



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Office of Civilian Radioactive Waste Management

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Licensing Update

Presented to:
DOE/NRC Quarterly Management Meeting

Presented by:
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Office of Civilian Radioactive Waste Management
U.S. Department of Energy

December 07, 2006
Pahrump, NV

Topics for Discussion

- **Interactions**
- **Recent DOE Correspondence**
- **Key Technical Issues**
- **License Application Status**



Recent Interactions

- **Total System Performance Assessment (TSPA) Technical Exchange (10/24-25/06)**
 - Demonstration of barrier capability
 - Scenario analysis
 - Treatment of uncertainty
 - Quality assurance and model support
 - Design and use of TSPA analyses
- **Preclosure Safety Analysis Topics 11/7-9/06**
 - Aircraft Hazards
 - Preclosure Source Term and Consequences
 - Reliability Analysis, Technical Specifications, and Training
 - Preclosure Criticality and License Application Mapping Requirements



Future Interactions

- **DOE is prepared to support interactions on:**
 - Transportation, Aging, and Disposal (TAD) Approach
 - Lawrence Livermore Corrosion Testing Audit Issues
 - Science and Technology Program
 - Infiltration Modeling
 - Waste Package Corrosion
- **NRC has requested additional interactions on:**
 - Postclosure Peak Seismic Ground Velocity
 - Drift Degradation
 - Near-Field Environment
 - Unsaturated-Zone Testing
 - Saturated-Zone Testing
 - Drip Shield Materials, Fabrication, and Performance
 - Pre- and Postclosure Criticality
 - Colloids
 - Safeguards and Security



Recent DOE Correspondence

- **Transmittal of Frequency Analysis of Aircraft Hazards Report on 11/3/2006**
- **Review of NRC's Interim Staff Guidance on Preclosure Safety Analysis-Level of Information and Reliability Estimation**
 - **Comments due 12/13/2006**
- **Transmittal of Quality Assurance Requirements and Description, Revision 18 on 11/1/06**
- **TAD Specification issued 11/29/06 on OCWRM website (www.doe.ocrwm.gov)**



Key Technical Issues

- **DOE's ongoing evaluation of closed agreements provided on 9/12/06 has not changed**
 - TAD's could impact 11 agreements
 - Infiltration work could impact 1 agreement
 - DOE will continue to evaluate the potential impacts of programmatic changes on closed KTI agreements and will keep NRC informed of the results
- **DOE submitted 3 AIN responses in September 2006 and expects to submit 3 more by the end of CY 2006**
 - RT 3.05, AIN-1 and SDS 3.01, AIN 2 – Documentation of Alcove 8 and Niche 3 tests
 - TSPAI 2.02, Comment 59 – Transmittal of two Analysis and Model Reports: *In-Drift Natural Convection and Condensation*, and *Multiscale Thermohydrologic Model*



License Application Status

- **Submit a quality LA not later than Monday, June 30, 2008 to the NRC**
- **LA Project progress includes:**
 - **Technical teams formed and approved**
 - **Performance baseline established**
 - ♦ **Resource-loaded schedule**
 - ♦ **Product and milestone baseline**





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Transportation, Aging and Disposal (TAD) Cask System Development and Implementation

Presented to:
NRC Management Meeting

Presented by:
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December 07, 2006
Pahrump, Nevada

TAD System Development

- **TAD Integration with Yucca Mountain Repository**
- **TAD Licensing Approach**
- **DOE Oversight of TAD Development**
- **Loading by Utilities**
- **Conclusion**



Integration of TAD Concept with Repository Planning

- **DOE is implementing a transportation, aging and disposal (TAD) canistered system approach**
- **TAD system will :**
 - **Support the standardization of spent nuclear fuel (SNF) storage, transport, aging and disposal packaging, allowing integration of SNF handling operations**
 - **Utilize utility fuel handling experience in packaging SNF**
 - **Simplify DOE operations and minimize redundant handling of bare SNF assemblies at the repository**
 - **Reduce complexity and cost of DOE facilities**



TAD Licensing Approach

- **Cask vendors will work directly with utilities and the NRC to receive certification for transportation (10 CFR 71) and storage (10 CFR 72) utilizing TAD cask systems**
- **DOE will be responsible for reviewing TAD system designs and affirming compliance with TAD performance specifications**
 - **TAD performance specifications will be reviewed by NRC as part of DOE's license application (10 CFR 63)**
 - **Any modifications to the performance specifications arising from the NRC repository review process will be communicated to the cask vendors**



TAD Licensing Approach - Certification for Part 71 and Part 72

- **DOE issued the TAD system performance specifications on the OCRWM web site (11/29/06)**
- **Qualified vendors are now developing TAD canister conceptual designs**
- **DOE will review the vendors TAD canister conceptual designs to assess feasibility and compliance with DOE requirements**
- **Upon DOE approval of conceptual design, cask vendors will proceed with development of complete TAD system designs and safety analysis reports (SARs) to be submitted to NRC for certification under 10 CFR 71 and 72**



TAD Licensing Approach - Certification for Part 71 and Part 72 (continued)

- **Cask vendors will submit DOE-reviewed TAD system SARs to NRC for review and approval**
- **Cask vendors will notify DOE of any proposed modifications of TAD designs resulting from the NRC review**
 - **In such an event, DOE will evaluate any proposed changes to ensure continued compliance with DOE performance specifications**



DOE Oversight of TAD Development

- **DOE will review NRC-certified (Part 71 and 72) TAD systems to affirm compliance with DOE performance specifications**
 - **NRC-certified TAD systems that DOE determines meet the DOE performance requirements will be placed on a DOE-maintained list of approved TAD system cask models**
 - **The list will be updated regularly to include the latest DOE approved TAD designs that are consistent with repository licensing requirements**



DOE Oversight of TAD Fabrication

- **After NRC certification, cask vendors will fabricate and utilities deploy TAD systems for utility at-reactor storage**
- **DOE will require that utilities using TAD-based systems for at-reactor storage certify that TAD systems and components are fabricated in accordance with approved design drawings, specifications, and NRC-approved quality assurance (QA) requirements**
 - **Modifications to TAD systems or components that arise during the fabrication process will require DOE review to ensure continued compliance with DOE performance specifications**



Loading by Utilities

- Utilities that use TAD systems for at-reactor storage or for direct transfer to DOE will be required to certify to DOE that the canister has been loaded and prepared in accordance with all requirements under the provisions of an NRC approved QA program and DOE specifications
 - DOE will require utility certification prior to acceptance of each TAD canister
- DOE asserts NO regulatory authority over utility operations



Purpose of the DOE TAD Specifications

- The specifications delineate the requirements that DOE will rely upon in the repository License Application to demonstrate compliance of the TAD system with 10 CFR 63, both preclosure and postclosure
- The specifications include other requirements that are expected to improve the efficiency of TAD system operations at the repository



Conclusions

- **TAD specifications issued on November 29, 2007**
- **Vendors are initiating conceptual design process**
- **TAD performance specifications will comprise part of the repository license application to the NRC for the Yucca Mountain repository**
- **DOE will rely on commercial industry to design and engineer TAD system components**
- **TAD systems will enhance SNF management and disposal operations**



Conclusions

(continued)

- **DOE will confirm TAD system compliance with repository requirements for storage and disposal throughout the design, licensing, fabrication and operation of the systems**
- **NRC is the regulatory authority to approve the use of TAD systems for utility at-reactor storage, transportation to the repository, repository aging and disposal**
- **DOE looks forward to discussing the specifications at a future exchange**

