



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



# Transportation, Aging and Disposal (TAD) Canister System Status

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# Transportation, Aging, & Disposal (TAD) System Development Summary

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- **Summary**



# TAD Background

- **DOE announced incorporation of a Transportation, Aging and Disposal (TAD) canistered system approach in October, 2005**
- **TAD system benefits include :**
  - **Supporting the standardization of SNF storage, transport, aging and disposal packaging, allowing integration of SNF handling operations**
  - **Utilizing utility fuel handling experience in loading SNF**
  - **Simplifying DOE operations and minimizing redundant handling of bare SNF assemblies at the repository**
  - **Reducing low-level waste production and worker radiation exposure at DOE facilities**
  - **Reducing complexity and cost of DOE facilities**



# TAD Background

- **TAD canisters will be the key interface component that facilitates system functions for temporary storage of SNF at utility sites, transport to the repository, aging at the repository and ultimate disposal**
- **TAD canister system will comply with regulatory requirements of 10 CFR 71 – Transport, 10 CFR 72 – Storage, and 10 CFR 63 - Disposal**



# TAD Implementation Strategy

- **Development philosophy of the TAD approach is to use proven industry practices, guidance and experience**
- **The Nuclear Waste Policy Act directs the DOE to use private industry to the fullest extent possible for transportation related activities**
- **Based on prior experience with a canister-based approach DOE decided to utilize industry expertise for TAD component design through the use of a performance specification**
- **Development of the TAD specification received substantial input from the industry and the transportation and repository components of the program**



# TAD Implementation Strategy

- **DOE issued the TAD system performance specification on the OCRWM web site (link below) on November 29, 2006**
  - [http://www.ocrwm.doe.gov/receiving/pdf/TAD\\_Performance\\_Specification\\_Rev\\_B.pdf](http://www.ocrwm.doe.gov/receiving/pdf/TAD_Performance_Specification_Rev_B.pdf)
- **Qualified vendors have recently completed TAD proof-of-concept designs:**
  - **Energy Solutions**
  - **Holtec International**
  - **NAC International**
  - **Transnuclear (TN)**
- **DOE review of submitted TAD proof-of-concept designs is currently underway**



# TAD Implementation Strategy

- **After the proof-of-concept design phase, DOE will initiate the procurement, with successful vendors, for the development of complete TAD system designs and safety analysis reports (SARs) for NRC certification under 10 CFR 71 and 10 CFR 72**
- **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 for 10 CFR Parts 71 and 72**
  - **In such an event, DOE will evaluate any proposed changes to ensure continued compliance with DOE performance specification**



# TAD Implementation Process - DOE Oversight of TAD Development

- **DOE will review NRC-certified (Part 71 and 72) TAD systems to affirm compliance with DOE performance specification**
- **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**





# TAD Implementation Process – DOE Oversight of TAD Fabrication

- **After NRC certification, cask vendors will fabricate and utilities will 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**



# TAD Implementation Process – 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**



# TAD Performance Specification

- **The TAD specification delineates 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 specification includes other requirements that are expected to improve the efficiency of TAD system operations at the repository**



# TAD Specification Highlights

- **Capacity – 21 PWR's or 44 BWR's**
- **Length (including lifting feature) 212.0 inches**
- **Diameter 66.5 inches**
- **Maximum weight – 54.25 tons**
- **Maximum average dose rate from top – 800 mr/hr**
- **Borated stainless steel is the required neutron absorber for disposal**
- **TAD canisters to be seal welded**
- **TAD canisters, transportation overpack lid and aging overpack lid will have a common lifting fixture**
- **Handling and aging at repository in vertical orientation**
- **Organic, pyrophoric, and RCRA materials prohibited**



# Summary

- **TAD canister design development is underway**
- **TAD proof-of-concept vendor designs currently under DOE review**
- **TAD canister concept is being incorporated into the license application**

