

U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

**NUCLEAR WASTE TECHNICAL REVIEW BOARD
FULL BOARD MEETING**

**SUBJECT: OCRWM PLANNING AND COORDINATION
FOR DEFENSE WASTE ACCEPTANCE
AND DISPOSAL**

DIANE Harrison
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Purpose

- **Describe potential waste forms requiring geologic disposal and provide status of current treatment and management activities**
- **Identify areas of integration between OCRWM and Environmental Management (EM)**
- **Summarize key SNF and HLW considerations**
- **Update NWTRB on plans and activities to facilitate OCRWM acceptance, transportation, and disposal of SNF and HLW**

CRWMS Waste Forms

- **Current system baselined for disposal of commercial SNF and canistered HLW glass in the first repository**
 - 63,000 MTHM of commercial SNF and 7,000 MT HLW glass
 - Significant data exists for these waste forms
- **Plan to incorporate DOE-owned SNF into Program baseline**
 - March 1994 General Counsel determination that there is statutory authority to dispose of DOE SNF in a repository, contingent upon payment of fees
 - DOE SNF would displace some of the HLW allocation
- **Evaluating applicability of other waste forms for potential disposal in a geologic repository**

SNF Requiring Geologic Disposal

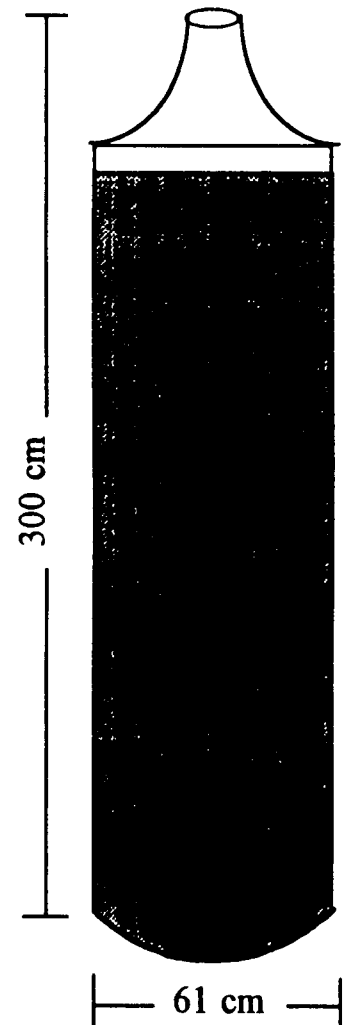
- **Spent Nuclear Fuel (estimates at year 2030)**
 - About 85,700 MTHM commercial SNF in pools or dry casks at nuclear utility storage facilities
 - About 2,750 MTHM DOE-owned SNF generated from weapons production, naval propulsion, R&D, and other activities stored throughout DOE complex, primarily at Hanford, INEL, and Savannah River
 - N-reactor SNF at Hanford (2100 MTHM)
 - Naval propulsion reactor SNF (65 MTHMU)
 - Foreign Research Reactor SNF (22 MTHM)
 - Special Commercial SNF (159 MTHM)
 - Production reactor SNF at SRS (190 MTHM)
 - Experimental SNF (180 MTHM)
 - Graphite SNF (28 MTHM)

Status of DOE SNF

- **Programmatic SNF Management and INEL Programs Record of Decision issued June 1995**
 - Provide safe, interim storage and management of SNF at specified locations until ultimate disposition
 - All DOE-owned SNF will be stabilized, characterized, and prepared for ultimate disposition
 - Planning basis is to dispose of some or all DOE SNF in a geologic repository, although ultimate disposition is outside of the PEIS scope
- **Nuclear Weapons Non-Proliferation Policy Concerning Foreign Research Reactor SNF**
 - Draft EIS assesses both direct disposal and chemical separation options

HLW Requiring Geologic Disposal

- **HLW from nuclear weapons production**
 - Up to 6,000 canisters at the Defense Waste Processing Facility in South Carolina
 - Up to 9,000 canisters at Hanford Washington
 - Up to 800 canisters at Idaho National Engineering Laboratory
- **HLW from commercial reprocessing**
 - Up to 310 canisters at the West Valley Demonstration Project in New York



Status of HLW Production

- **West Valley Demonstration Project**
 - Operational Readiness Review completed November 1995
 - Radioactive tie-ins to facility scheduled April 1996
 - Borosilicate glass production to begin June 1996
- **Defense Waste Processing Facility**
 - Proficiency Runs planned for completion January 1996
 - Operational Readiness Review on-going
 - Secretarial approval needed before start of glass production
- **Hanford Tank Waste Remediation System**
 - Draft EIS addresses tank cleanup and Cs/Sr disposition
 - Draft RFP issued for privatization of tank treatment
- **INEL High-Level Waste**

DOE-Owned SNF Integration

- **Coordination among Programs facilitated by DOE SNF Steering Group**
 - Established July 29, 1994
 - Jointly authorized by Director, Office Of Civilian Radioactive Waste Management (RW) and Assistant Secretary For Environmental Management (EM)
- **Responsible for:**
 - Identifying issues regarding waste acceptance through emplacement of DOE SNF in a geological repository
 - Recommending tasks and activities for resolution of DOE SNF disposal issues

Evaluating DOE SNF Disposition

- **Evaluate DOE SNF for repository disposal**
 - Identify key issues affecting the ability to accept, transport, and dispose of DOE SNF
 - Recommend data needs and activities to allow integration of DOE SNF into CRWMS
- **Provide early guidance to EM on acceptability of waste forms for disposal**
 - Direct disposal
 - Conditioning or treatment
 - Processing

HLW Producer Integration

- **Quarterly Meetings on HLW Status & Issues**
- **Participate in EM QA Audits/Surveillances**
- **Observe Operational Readiness Reviews**
- **Concur in Waste Form Compliance Planning**
- **Participate in Waste Acceptance Technical Review Group**
- **OCRWM Director concurrence on DWPF and WVDP start of radioactive operations**

Key Waste Form Considerations

- **Waste Form Requirements**
 - Waste form must meet criteria defined in 10 CFR 60.135
 - Solidification/Consolidation/Noncombustible
 - Waste form must remain subcritical for long timeframes
 - Plan to exclude RCRA mixed wastes from first repository
- **Waste Package Design**
 - Specific package design criteria must be met
 - No explosive/pyrophoric/chemically reactive materials
 - No free liquids
 - Safe Handling
 - Unique Identification
 - Waste interactions must be evaluated
 - Solubility/redox/hydrating/radiolysis/corrosion/...
- **Safeguards/Security and MC&A**

Waste Form Performance

- **Waste Form is key physical interface**
 - Characteristics help define design of waste, transportation, and repository surface/subsurface facilities and equipment
- **Waste Form Performance as part of EBS and Total System Performance Objectives**
 - Substantially complete containment of Waste Packages
 - Not less than 300 years nor more than 1,000 years
 - Release rate after the containment period
 - Can not exceed one part in 100,000 per year of the radionuclide inventory present at 1,000 years after closure
 - Remanded standard sets allowable radionuclide releases to accessible environment for each radionuclide for 10,000 years
- **Long-term criticality control must be maintained**

Planning for Defense Waste

- **Preliminary Requirements for Disposal of DOE-owned SNF in a Geologic Repository completed January 1996**
- **Revision to baseline planned for Spring 1996 to incorporate DOE SNF**
 - **Some work in-progress may not reflect change**
 - **Subsequent planning, design, and procurement activities within DOE will reflect change**
 - **Planning basis for first repository capacity will allow for**
 - **63,000 MT capacity for commercial SNF**
 - **4,667 MT capacity for vitrified HLW**
 - **2,333 MT capacity for DOE-owned SNF**

Preconditions for Acceptance

- **Fees must be paid in accordance with an Interagency Agreement (MOA)**
- **Total DOE capacity limited to 10 percent (7,000 metric tons, which includes WVDP HLW)**
- **All repository waste acceptance criteria must be met**
- **SNF characterization and other activities to be conducted under OCRWM QARD**
- **All appropriate NEPA reviews must be performed**

Key Near-term Activities

- **Requirements and criteria for DOE SNF**
- **Identification of OCRWM data needs and reporting requirements**
- **Development of a Memorandum of Agreement**
- **Define plans for long-lead hardware and equipment items**
- **Characterization and assessment of key categories of DOE SNF**
- **Addressing NRC/IAEA safeguards and MC&A**

Other Wastes Under Evaluation

- **Other waste forms may require geologic disposal, although they have not been incorporated into OCRWM planning base**
 - **Immobilized weapons-usable fissile material**
 - **Mixed-oxide spent nuclear fuel**
 - **Cesium and Strontium capsules**
 - **Greater-than-Class C low-level waste**
 - **RCRA mixed waste**