Transportation in Environmental Cleanup

Ellen E. Edge
Michael E. Wangler
Office of Packaging and Transportation
Office of Environmental Management

Joint Meeting of the Radioactive Materials Transportation Committee and the Transuranic Waste Transportation Working Group
December 10-11, 2014
Discussion Topics

• Environmental Management Cleanup and Transportation Activities
  • EM Waste Disposition Updates by Site
  • LLW/MLLW Disposal Update
• Office of Packaging and Transportation Activities
• National Transportation Stakeholders Forum (NTSF)
• Discussion
Environmental Management Cleanup and Transportation Activities
The primary purpose of the Office of Environmental Management is to complete the safe cleanup of the former nuclear weapons sites.

EM’s work supports DOE Strategic Goal #3: “Enhance nuclear security through defense, nonproliferation, and environmental efforts.”
Waste Disposition Updates by Site
Waste Management Activities Compose Half the EM Budget

- Radioactive Tank Waste: $2,042M / 36%
- Special Nuclear Materials and Used Nuclear Fuel: $971M / 17%
- Soil and Groundwater: $466M / 8%
- Facility D&D: $992M / 18%
- Transuranic & Solid Waste: $758M / 13%
- Site Services: $392M / 7%

EM’s FY 2015 Budget Request - $5.622 Billion Total
EM’s FY 2015 Budget Request:
Funding by Site

- Savannah River: $1,209M
- Richland: $993M
- Paducah: $322M
- Idaho: $370M
- Oak Ridge: $413M
- Portsmouth: $152M
- Los Alamos National Laboratory: $220M
- Program Direction: $281M
- West Valley Demonstration Project: $66M
- Nevada: $62M
- Other: $56M
- Moab: $36M
- SPRU: $24M

Total Request: $5.622B
• Continued soil and groundwater remediation.
• Nevada National Security Site will be used as a regional disposal facility for DOE LLW/MLLW.
  • FY2013 Disposal: 1,099,000 cubic feet
  • FY2014 Forecast: 1,441,000 cubic feet
  • FY2014 actual: 76 percent of forecast (1,091,025 cubic feet)
• K-25 final phase demolition and waste disposal completed.
• Demolition initiated for K-31 building (4 of 5 GDP Buildings).
• Increased focus on mercury cleanup at Y-12.
• CH TRU processing activities continue at TRU Waste Processing Center.

Start of K-31 demolition  Water tower demolition
Portsmouth/Paducah

Paducah
C-410 Feed Plant building demolition

Portsmouth
Cut & Cap at X-326 Process Building

Both Plants
DUF6 processing
• Reduced legacy CH TRU stored down to 600 cubic meters.
• Planning for transfer of equipment for use of TRUPACT-III at other sites.
• E-Area Waste Management Facilities continue safe operation.
• Continuing production of HLW canisters at the Defense Waste Processing Facility.
• Continuing construction of the Salt Waste Processing Facility.
Completed processing of potentially vulnerable fuel (Sodium Reactor Experiment fuel) in H-Canyon – August 2014

As per March 2013 Record of Decision, initiated processing of aluminum-clad fuel in H-Canyon – September 2014
Savannah River - Salt Waste Processing Facility

• SWPF construction is 76% complete
• New baseline approved by Deputy Secretary in August 2014:
  • Total Project Cost: $2.3 billion
  • Construction complete: December 2016
  • Start of operations:
    • November 2018 (Early)
    • January 2021 (Late)
Savannah River – Graphite Spheres

• Objective: conversion of German pebble bed research reactor fuel containing US-origin HEU fuel spheres.

• Disposition options:
  • Down-blending the HEU and vitrifying high level waste in DWPF; or
  • Separating the uranium, down blending to LEU, solidifying and sending the uranium as waste to an appropriate uranium disposal site
Low-Level Waste/Mixed Low-Level Waste Update
<table>
<thead>
<tr>
<th>Generator Site</th>
<th>FY 2014 Actual</th>
<th>FY 2015 Preliminary Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portsmouth GDP (OH)</td>
<td>551,130</td>
<td>592,250</td>
</tr>
<tr>
<td>Oak Ridge Reservation (TN)</td>
<td>178,870</td>
<td>318,300</td>
</tr>
<tr>
<td>Oak Ridge NNSA/Y-12 (TN)</td>
<td>197,420</td>
<td>125,400</td>
</tr>
<tr>
<td>Los Alamos National Lab (NM)</td>
<td>7,800</td>
<td>193,800</td>
</tr>
<tr>
<td>Idaho Site (ID)</td>
<td>93,920</td>
<td>149,400</td>
</tr>
<tr>
<td>Livermore Nat'l Lab (CA)</td>
<td>41,870</td>
<td>26,600</td>
</tr>
<tr>
<td>Paducah GDP (KY)</td>
<td>20,120</td>
<td>11,100</td>
</tr>
<tr>
<td>NNSA/Nuclear Fuel Services (TN)</td>
<td>82,140</td>
<td>7,400</td>
</tr>
<tr>
<td>Onsite NNSS (NV)</td>
<td>4,130</td>
<td>19,000</td>
</tr>
<tr>
<td>Savannah River (SC)</td>
<td>4,180</td>
<td>9,200</td>
</tr>
<tr>
<td>Berkeley</td>
<td></td>
<td>177,930</td>
</tr>
<tr>
<td>West Valley (NY)</td>
<td>5,210</td>
<td>20,100</td>
</tr>
<tr>
<td>All other sites</td>
<td>82,530</td>
<td>60,900</td>
</tr>
<tr>
<td>Total</td>
<td>1,269,320</td>
<td>1,711,350</td>
</tr>
</tbody>
</table>

This forecast supports operational planning.

Some of the volume included within this forecasts may be disposed at other facilities.
Commercial Disposal Options

• DOE policy supports commercial disposition options.
• EnergySolutions (Clive, Utah)
  • Accepts Class A LLW and MLLW; 11e(2); NORM
  • Offers rail access, onsite treatment, and favorable bulk waste handling and disposal
• Waste Control Specialists LLC (Andrews County, Texas)
  • Multiple disposal facilities/licenses
    • Hazardous/exempt; 11e(2); NORM
    • Texas Compact Class A, B and C LLW – non-DOE waste
    • Federal Waste Facility Class A, B, and C LLW/MLLW – DOE waste
  • Offers onsite rail access, onsite treatment and storage capabilities
Waste Control Specialists

- 8/28/14 – TCEQ gave final approval for a major amendment to the WCS radioactive waste disposal license
- Expands the licensed disposal capacity at the WCS facility to nine million cubic feet (from 2.39 million)
- Authorizes the disposal of depleted uranium in both the Federal and Compact Waste Facilities
Total number of Shipments = 7642
Historical EM Shipments

22931
24393
17393
7802
8604
6687
18774
18231
9586
7642

West Valley Melter Shipment Routing

- New York – Shipment Origin: Heavy haul from WVDP to Transload Facility (located in Western NY) then loaded onto rail cars.
- Pennsylvania*
- Ohio*
- Indiana*
- Illinois*
- Missouri*
- Arkansas*
- Texas*
- New Mexico*
- Texas* - Shipment Destination

*Via rail only.

Note: The list of states is subject-to-change since the Transportation Plan for the shipment has not be completed.
Observations

- Most LLW/MLLW disposal will continue to be handled on site.
- Small amounts will be transported to NNSS.
- Even smaller amounts will be shipped to the commercial sites.
- By 2015 the amounts of disposal on site will have been reduced to about 3.5 million cubic feet.
- The amount of LLW/MLLW transported offsite to a commercial site or to the NNSS will remain small and about the same as preceding years.
Other Future Waste Disposition Planning

• Greater than Class C Low Level Waste
• Review and selection of disposal sites for DOE depleted uranium hexafluoride
• Evaluation and planning of additional DOE on site disposal facilities at Oak Ridge, Portsmouth and Paducah
• DOE continues to closely monitor ongoing regulatory changes by the NRC – including the 10 CFR Part 61 LLW Site Specific Analysis Rulemaking
Office of Packaging and Transportation Activities
OPT Programs and Activities

Packaging Certification
• Certificates of Compliance
• DOE Exemptions
• DOT Special Permits
• Quality Assurance
• RAMPAC

Emergency Preparedness & Outreach
• TEPP
• NTSF
• State Regional Groups
• Tribes
• Prospective Shipment Report
• Fact Sheets

Regulations & Standards Support
• Domestic Federal Agencies
• International Community
• Nongovernmental Organizations
• DOE Orders, Policy, Guidance

Transportation Risk Reduction
• Motor Carrier Evaluations
• Physical Protection
• Transportation Compliance Reviews
• Safety Metrics

Program & Site Support
• DOE/Contractor Interfaces
• TMC
• PMC
• EFCOG
• Tender Negotiations
• Automated Systems
Transport security training

• Target Audience – Individuals responsible for security of nuclear and other radioactive material during transport.

• Objectives
  • Development and implementation of security plans,
  • Assessment of readiness of a transport system,
  • Actionable security measures

• Content
  • Information on US-specific requirements for transport,
  • Insight into international requirements
  • Activities – presentations, discussions, hands-on exercises,
  • ARG-US system training.

• Next Course: December 8-12, 2014, at Argonne National Laboratory
  • [http://rampac.energy.gov/education/training/default.aspx](http://rampac.energy.gov/education/training/default.aspx)
Integrated security tools

• Tools
  • WebTRAGIS – route planning,
  • ARG-US – package/conveyance tracking,
  • RADTRAN – risk analysis

• Integration of the tools
  • Enhanced tracking of shipments and contents
  • Prompt rerouting based on developing threats
  • Near real-time evaluation of the consequences of a threat.

• Outcomes
  • Enhanced security of DOE shipments
  • Improved supply chain security during transport
National Transportation Stakeholders Forum (NTSF)
NTSF Charter

• **Purpose:**
  - Engage at a national level with States, Tribes, Federal agencies.
  - Work through existing agreements and networks to ensure Federal, state, and tribal government participation.

• **Goals and Objectives**
  - Information exchange
  - Input from States and Tribes about concerns, needs, or logistics
  - Emerging issues for DOE and its transportation stakeholders
The DOE chairperson leads the NTSF.

The Planning Committee assists the chairperson with developing the agenda for annual meetings and webinars.

Ad hoc working groups work on tasks to address specific developing needs.

Membership is open only to state, tribal, and federal officials.

Other stakeholders may include, but are not limited to, organizations such as science and academic institutions, labor, industry, and citizen groups.
Communication with External Stakeholders

- NTSF
  - NTSF Annual Meeting
  - Working groups
  - NTSF newsletter
  - NTSF wiki/Public web site: http://ntsf.wikidot.com/
  - Webinars
- Other External Communication Mechanisms
  - State Regional Groups and Tribes
  - ASKPAT/Public Web Site
  - Waste Information Management System (WIMS)
  - Prospective Shipment Report

NTSF Annual Meeting 2012 – Oak Ridge tour

NTSF Annual Meeting 2010 – Chicago
WRAP UP
Summary of Principles

• From cradle to grave, the manufacturing, use and disposition of nuclear and other radioactive material and sources ultimately requires safe, secure and compliant packaging and transport operations.

• DOE has and excellent performance record for safely, securely and efficiently transporting our materials.

• Plan to continue our support for international safety and security efforts.
Closing

• EM activities
• Office of Packaging and Transportation activities
• Collaborate with NE and NNSA to ensure and consistent, compliant approach to moving DOE materials, substances and wastes safely and securely
• Commit to working with State Regional Groups and Tribes related to packaging and transportation issues.
• EM has made considerable progress, but significant programmatic challenges and scope remain.
• Safe and urgent recovery of the WIPP facility is a significant priority for DOE.
• Experience has proven that an optimized waste management system is vital to ensure environmental cleanup can continue
• Through partnership with regulators, tribes, stakeholders and industry, we have the ability to mitigate many of the impacts associated with upset conditions.
Contacts for additional information

Michael E. Wangler  
Chair  
National Transportation Stakeholders Forum  
EM-33/FORS 5B-171  
U.S. Department of Energy  
1000 Independence Avenue, S.W.  
Washington, DC  20585  
Phone: 202-586-7976  
Email: mike.wangler@em.doe.gov

Ellen E. Edge  
TEPP Program Manager  
Office of Packaging and Transportation  
EM-33/CLV 2065  
U.S. Department of Energy  
1000 Independence Avenue, S.W.  
Washington, DC  20585  
Phone: 301-903-8327  
Email: ellen.edge@em.doe.gov
BACKUP INFORMATION
Transportation Emergency Preparedness Program

- Since 2005, TEPP has trained over 20,000 responders
- TEPP has conducted over 30 full scale exercises and drills
- Translation of MERRTT curriculum into Spanish

TEPP is a national level program for providing radiological transportation emergency preparedness activities and addressing emergency response concerns of state, tribal and local officials affected by the Department’s radiological shipments.
Transportation Risk Reduction

- Motor Carrier Evaluation Program (MCEP)
- Transportation Safety and Operations Compliance Assurance Program (TCAP)
- Transport security and physical protection
- RADTRAN
Packaging Support to Field Sites

- Department-wide program that provides for the certification of fissile and Type B packagings.
  - Review and approval of packaging designs and Issuance of DOE Certificates of Compliance
  - Curtail and/or suspends the use of specific packages, when warranted
  - Review and approval of quality assurance programs for Type B and fissile radioactive material packaging activities
- Radioactive Material Packaging (RAMPAC), the all-in-one source for information on shipping containers for radioactive materials ([http://rampac.energy.gov/](http://rampac.energy.gov/))
- Initiation of security training course.
Emergency Preparedness & Outreach

- TEPP – Transportation Emergency Preparedness Program
- NTSF – National Transportation Stakeholders Forum
- State Regional Groups
- Tribes
- Prospective Shipment Report
- Fact Sheets
• Department-wide responsibility for three transportation Directives
  • DOE O 460.1C: Packaging and Transportation Safety -- under review
  • DOE O 460.2A: Departmental Materials Transportation and Packaging Management – under review
  • DOE M 460.2-1A: Radioactive Material Transportation Practices Manual – under review
• Developing a new Order, 460.3: Physical Protection of Unclassified Irradiated Fuel in Transit – under development
Program & Site Support

- **DOE/Contractor Interfaces**
  - TMC – Transportation Management Council
  - PMC – Packaging Management Council
  - EFCOG – Energy Facility Contractor Group
- **Tender Negotiations**
- **Automated Systems**
  - ATLAS
  - RADCALC
• Materials: Highly enriched uranium (HEU) in liquid form.

• Outreach:
  • Extensive outreach with the Northeast and Southern regions and the Tribes.
  • Additional training by the Transportation Emergency Preparedness Program (TEPP) on emergency response in those areas, especially among the Tribes.

• Proposed routes:
  • NRC approved.
  • Buffalo, NY -- would go through some Tribal lands in Canada and through some heavily populated areas in Canada.
  • East of Buffalo – would go through a number of Native American lands on the U.S. side and moves through more heavily populated American regions.

Last week, DOE’s Office of Nuclear Energy issued a report evaluating options for disposal of DOE's HLW and SNF. "Assessment of Disposal Options for DOE-Managed HLW and SNF”


The report examines several options for disposal of DOE's waste, including whether DOE-managed HLW and SNF should be disposed of with commercial SNF and HLW in one geologic repository or whether there are advantages to developing separate geologic disposal pathways for some DOE-managed HLW and SNF.

Assessment results indicate that multiple disposal options are technically feasible and have the potential to provide excellent long-term isolation of DOE-managed HLW and SNF.

And, there are programmatic advantages to a phased strategy that allows for flexibility in disposal pathways for some DOE-managed HLW and SNF.
• The report recommends that:
  o DOE pursue options for disposal of DOE-managed HLW from defense activities and some thermally cooler DOE-managed SNF, potentially including cooler naval SNF, separately from disposal of commercial SNF and HLW;
  o Other DOE-managed HLW and SNF, including HLW and SNF of commercial origin and naval SNF with relatively higher heat output, would be disposed of with commercial SNF and HLW.; and
  o DOE retain the flexibility to consider options for disposal of smaller DOE-managed waste forms in deep boreholes rather than in a mined geologic repository

This report has been prepared for informational and comparison purposes only and should not be construed as a determination of the legal permissibility of specific alternatives and options
- Completed targeted exhumation at Accelerated Retrieval Project (ARP) VII and III
- Completed two-year project of legacy TRU and MLLW sludge from AMWTP
- Started sodium distillation system
- Completed Readiness Assessments for Integrated Waste Treatment Unit
• Disposition at the Environmental Restoration Disposal Facility (ERDF).
• Construction activities at K-West Basin.
• Plutonium Finishing Plant glove box removal.
• Demolition of B Reactor’s 183-B Clearwell support facility.
• Removal source of chromium contamination near Hanford’s D Reactor.
• Removal of demolished buildings surrounding the Plutonium Finishing Plant.

Construction of K-West Basin Annex for sludge retrieval project

1,082-ton packaged PRTR being transported to ERDF for disposal
Office of River Protection

- FY2015 Planned work includes continuation of full construction of the Low Activity Waste Facility, Balance of Plant Facilities and Laboratory
- Resolution of technical issues

Will treat the bulk of 56 million gallons of radioactive waste
Los Alamos

- DOE made great effort to complete removal of 3706 cubic meters of TRU waste by June 30, 2014, in accord with Framework Agreement.

- April 1, shipments to Waste Control Specialists for temporary staging.

- Nearly 90% of the volume and 93% of the material at risk

- Discovery of concerns with LANL nitrate salts in May

- Program paused to allow thorough review of issues and required actions.

- EM will assume cleanup responsibilities from NNSA.
• Completed processing of tank sludge generated 28 liners of stabilized LLW and disposed at the Waste Control Specialists’ Federal Waste Facility.
• Decommissioning activities in Building H2 and Building G2 proceeding
• Process tank removal planning underway
West Valley

• Planning work underway to ship WIR wastes to disposal.
• Construction of HLW Storage Pad essentially complete.
• Sixteen vertical storage casks completed and eight Multi-Purpose Canister Overpacks are on site (eight more Overpacks arriving next summer).
• Deactivation of Main Plant continues.
• The Vitrification Melter has been removed from the Vitrification Facility.