Large-Scale Spent Fuel Transportation System Development

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INMM 31st Spent Fuel Seminar
Washington, DC USA
January 13, 2016
Outline

- Introduction
- Institutional Activities
- Operational Activities
- Hardware Activities
- Linking it All Together
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NFST Established in FY 2013 to Plan for Interim Storage and Transportation

**Mission**
- Lay the groundwork for interim storage, including associated transportation

**Purpose**
- Build a foundation that could be transferred to a new waste management disposal organization (WMDO)

**Activities**
- Align with Blue Ribbon Commission (BRC) recommendations
- Plan for implementation of the *Strategy for the Management and Disposal of Used Nuclear Fuel and High Level Radioactive Waste* (Strategy)
- Consistent with existing statutory authorities
- Consistent with budget direction and authorization
High-Level Objectives to Lay the Groundwork for Strategy Implementation

- Improve integration of storage as a planned part of the waste management system, including evaluating standardization of dry cask storage systems
- Develop and evaluate design options for an integrated waste management system
- Prepare for the large-scale transportation of SNF and HLW, with an initial focus on removing SNF from the shutdown reactor sites
The development of this transportation system is organized into three primary elements:

### Institutional
- Important relationships with stakeholders that will help move the transportation process forward
  - States, Tribes and Local Officials
  - First Responders
  - Industry
  - Carriers, etc.

### Operational
- Activities that will take place to operate the transportation system

### Hardware
- All physical items that must be used in order to operate the transportation system
  - Casks
  - Railcars
  - Heavy-haul trailers, etc.
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The Transportation Planning Framework (TPF) Establishes the Basis for Collaboration with Stakeholders

- **Stakeholders include states, Tribes, local governments, and other participants**
  - Collaborate to develop a safe, secure and uneventful transportation system to ship SNF from shutdown reactors

- **The TPF**
  - Identifies requirements and agreements regarding operational practices
  - Identifies technical and institutional issues that need to be addressed prior to shipment
  - Provides details about the infrastructure and fuel to be moved
  - Provides a template for site-specific transportation plans following successful transportation plan models

- **The TPF is a living document and will continue to be developed throughout the life of the transportation system**
Section 180(c) of the US Nuclear Waste Policy Act requires DOE to provide technical assistance and funds for training of local public safety officials to States and Tribes through whose jurisdictions DOE plans to transport SNF and HLW to a NWPA-authorized facility

- The 180(c) Policy Implementation Exercise simulates the 180(c) grant process using most recently proposed policy
- States and Tribes have volunteered to participate
- Process and results will provide insight into revisions to current implementation policy moving forward
- Implementation exercise began in the fall of 2014 and will proceed through June 2016
  - Working session held at the National Transportation Stakeholders’ Forum in Albuquerque, May 2015
NFST is proactively addressing development of a standardized route selection process

NFST is developing a proposed methodology for selecting routes for SNF shipments that considers:

- Applicable requirements
- Stakeholder input
- Past experience

Moving forward, NFST will work with stakeholders (States, Tribes, Railroads, Carriers) to finalize the route selection process:

- Initial routes from shutdown sites to Class I railroads can be determined
- All interested parties will understand how routes are chosen
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Planning Efforts to Remove SNF from Shutdown Reactor Sites

- **Shutdown Sites Report (SSR)** provides information on the site inventory, site conditions and infrastructure, and near-site transportation infrastructure
  - Discusses past experience at each site with moving large and sometimes contaminated components
  - Current report contains site-by-site evaluations of 13 shutdown sites

- **NFST has visited 12 of the 13 Shutdown Sites**
  - State and Regional Group, Tribal, and Federal Railroad Administration representatives have participated in 8 of the shutdown site visits
  - Information gathered during site visits is incorporated in SSR

- **Shutdown Sites Report was revised in FY2015**
  - Incorporated information from Kewaunee, Crystal River, and San Onofre site visits
  - Added Vermont Yankee to the report as the 13th shutdown site
As the Shutdown Sites Report matures, NFST is looking at what activities would be needed to remove SNF from shutdown sites

- Implementation from the perspective of an integrating contractor
- The plans cover all aspects of shutdown site de-inventory
  - Site info, organizational structure, concept of ops, mobilization, security, emergency response, budget and spend plan, readiness, operations demobilization

Order of plan development does not indicate preferred order of servicing

- Plans will be developed for all shutdown sites
  - 2 plans are complete
    - Connecticut Yankee and Big Rock Point
  - 1 plan is currently being developed
    - Humboldt Bay
  - Additional site plans will be developed as funding permits
    - Planning for two more sites in FY16 (Sites TBD)

DOE has not made a decision to take SNF from Shutdown Sites first
Development of transportation specific UNF-ST&DARDDS applications is ongoing

- UNF-ST&DARDDS database is a repository for many types of transportation related data
- Development of templates for modeling of transportation casks with assembly-specific payloads is ongoing
  - Initial work shows the dose rates from shutdown sites transportation casks are an order of magnitude below regulatory limits
  - Thermal analysis is being performed to understand fuel temperatures during operations and when packages are have cooled enough to ship
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Development of compliant railcars is a primary focus

- Developed internal documents
  - AAR S-2043: Use and History Report
  - AAR S-2043 Cask Railcar Systems Requirements Document

- FedConnect Postings
  - Request for Proposals
    - Posted 12/8/2014
    - Closed 2/23/2015
  - Contract awarded to AREVA Federal Services on 8/21/2015
    - Initial contract covers Cask and Buffer car design, analysis, and prototype fabrication for testing
Transportation cask needs are being studied from many angles

- Existing 10 CFR 71 Certification of Compliance (CoC) applicability determination

- Transportation Cask needs
  - Type and number
  - Buying or leasing

- Preliminary design of bare fuel casks

- Study of differences with international SNF transport
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Key NFST transportation linkages

Institutional
NWPA 180(c)
Routing

Transportation Planning Framework

Operational
Shutdown Sites Information
UNF ST&DARDS

START

Hardware
Cask Ancillary Equipment

Railcars
Casks

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