DOE Spent Nuclear Fuel Transportation: Lessons Learned from Security Planning and Execution

OCRWM has reviewed lessons learned from past high visibility Spent Nuclear Fuel (SNF) and other radioactive material shipping campaigns. The objective was to identify trends and commonalities from past DOE shipping campaigns, which could be considered when planning for the development and operation of a national transportation system to fulfill requirements of the Nuclear Waste Policy Act (NWPA).

The study examined specific planning, business, institutional and operating practices that have been identified by DOE, its transportation contractors, and stakeholders as important issues that arise repeatedly. In addition, lessons learned or activities/actions which were found not to be productive to the planning and conduct of DOE shipments (i.e., negative impacts) were noted. Data for this study were obtained from a variety of written documents, including shipping campaign transportation plans. Listed below is a summary of the security-related lessons learned.

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Security-Related General Lessons Learned:

- Balance information sharing with information protection, and ensure all involved parties understand requirements for protecting information appropriately.
- Ensure there are consistent security communications policies for disseminating sensitive information effectively.
- Do not leave sensitive information on recording devices.
- Where State escorts are used, the shipper, NRC and local law enforcement need to work together to establish safe parking areas for shipment hand-offs.
- The Security Plan should consider possible security threats from assessments performed by DOE and external organizations.
- Consider use of Federal Marshals as shipment escorts.

Security Related – Transportation Planning:

- Ensure frequent, consistent, communication and coordination between all parties involved and share information with all agencies helping to plan and execute the shipments.
- Develop a system-wide process for providing notifications to points-of-contact in the States, Tribes, railroads and other organizations, and maintain a web-based system to allow updating of contact information.
- Factor in advances in physical and tracking technologies.

Throughout the lessons learned review process it was evident that some documents contained opinions or suggestions by the contributors which, while useful, were of a general nature and not derived from a discrete shipment. This paper summarizes security related lessons learned common across multiple transportation campaigns. This paper is for analytical and discussion purposes only, and is not an endorsement or commitment by OCRWM to abide by any of the findings. Such commitments, if made, will be documented in appropriate planning documents when they are developed.
• Consider using locomotive engines common to the area where the origin site is located to minimize additional interest from locals (i.e., railfans) created by unfamiliar locomotives being in the area.

Security Related – Plans & Documents:

• Transportation Plans should incorporate elements of successful plans from recent campaigns and ensure that Security Plans will be coordinated among necessary parties.
• Equipment inspections (where, who, what) should be outlined in the Transportation Plans.
• DOE needs to resolve how to handle sensitive information in Transportation Plans, while still allowing them to be useful.

Security Related - Routing

• Protect shipment routing information.

Security Related – Inspections - Rail:

• Use pre-shipment inspections as the cornerstone for subsequent confirmatory inspections and eliminate the need to plan specific en route locations for radiological inspections by State and Tribal agencies.
• DOE should establish a method to address current State and Tribal requirements for monitoring [the shipment and conducting inspections] en route.

Security Related – Stakeholder/Public Expectations:

• Keep extra notifications to States and Tribes to a minimum.
• Work with the state regional groups.
• Develop and provide resource guides and media packets that focus on material specific information not campaign specific information.
• Freely share non-sensitive information with other agencies, States, Tribes and organizations that are helping to plan shipments.

Security Related – Emergency Planning:

• Develop a comprehensive operational contingency plan which includes how States and Tribes will be involved.
• Establish a clear chain of responsibilities and have a back-up plan in the event the Homeland Security threat level changes.
• Monitor the Internet to maintain cognizance of information being viewed by rail fans and other members of the public.

Appendix A identifies the lessons learned documents which were reviewed during the lessons learned study. Appendix B contains the text of the security related lessons learned.
Appendix A

SECURITY RELATED LESSONS LEARNED
DOCUMENTS REVIEWED REFERENCE KEY

- **(SNF) Best Practices and Findings for DOE Programs Transporting Spent Nuclear Fuel;** Final January 2003; prepared by Science Applications International Corporation Energy Solutions Group for the U. S. DOE National Transportation Program. This paper benchmarks the *Radioactive Material Transportation Practices Manual* (2002) against recent transportation plans and guides for rail and highway shipping campaigns in terms of specific planning and programmatic activities for the shipping of radioactive waste. Twelve overall planning processes and transportation plans were reviewed and compared against the protocols.

- **(WVSNF) West Valley Spent Nuclear Fuel Shipment Project Lessons Learned;** April 2004 and November 2001. On July 17, 2003, the U. S. DOE completed the movement of 125 commercial SNF assemblies from the West Valley Demonstration Project to the Idaho National Engineering and Environmental Laboratory (INEEL). The assemblies were transported by rail in two dual-purpose shipping and storage casks and moved 2300 miles; it arrived ahead of schedule and without incident. Planning, preparation and conduct involved four railroads, eleven States, two Tribes and five Federal Railroad Administration regions. Input for this document was received on the shipment planning and conduct from staff in the involved railroads, States, and the Federal Railroad Administration plus DOE and contractor staff.


- **(TEC) Transportation External Coordination Working Group meeting summaries;**
  - **(TEC 1) July 2000 TEC meeting.** This meeting involved over 110 participants representing State, Tribal and local governments, regional groups, industry and professional organizations, DOE, and other Federal agencies meeting to address a variety of issues related to DOE’s radioactive materials transportation activities.
  - **(TEC 2) July 2003 TEC meeting.** The overall objective of this meeting was to explore best practices and lessons learned from business and industry and DOE shipments in order to improve DOE shipment practices in the future.
  - **(TEC 3) September 2004 TEC meeting.** The meeting involved 132 participants representing national, State, Tribal and local governments, industry, professional organizations, and other interested parties. They met to address a variety of issues related to DOE’s radioactive materials transportation activities.

- **(FRR) Foreign Research Reactor West Coast Shipment Spent Nuclear Fuel Transportation External Lessons Learned,** October 1998. In July 1998, Training, Research, Isotope, General Atomic (TRIGA) SNF was received from South Korea at the Concord Naval Weapons Station in California and shipped by rail to the INEEL. The shipment arrived without incident. This document was prepared with input from key stakeholders from State, local and Tribal agencies from the four corridor states.

- **(WIPP) Waste Isolation Pilot Plant:** Various presentations, papers and documents provided by WIPP staff.
  - **Presentations:**
    - August 2005 WIPP Compliance Recertification Application, US DOE/CBFO
August 2005, WIPP Overview, US DOE/CBFO, Lloyd Piper/Chuan-Fu Wu
August 2005, Site Management–CBFO Perspectives, US DOE/CBFO, Lloyd Piper/Chuan-Fu Wu
July 2004, Federal Perspective on Lessons Learned by the WIPP regarding Communication with Stakeholders and the Public, US DOE/CBFO, R. Paul Detwiler

- **Papers:**
  - Feb. 2001-WM’01, Opening and Operating a Nuclear Disposal Facility: Lessons Learned in Public Outreach, US DOE/CBFO, Dennis Hurtt & others
  - Feb. 2001-WM’01, Innovative Approaches to Technical-Public Affairs Collaborations, US DOE/CBFO, Dennis Hurtt & others

- **Documents:**
Appendix B

SECURITY RELATED LESSONS LEARNED

Security

- All involved parties must understand the requirements of safeguarding information. This needs to be included in the Transportation Plans and discussed during the planning calls. (WVSNF; CCTWG; WIPP)
- Security Plan should identify the federal security regulations and requirements applicable to the shipment. Balance the need to know vs. security. (WVSNF; SNF; TEC 1; TEC 2; WIPP)
- The Security Plan should take into consideration the assessments that have been performed by DOE and external organizations of possible security threats against shipments, as applicable. (SNF)
- Communication of sensitive shipment information should only be provided to designated individuals with a need to know. Sensitive information should not be left on recording devices. (WVSNF; FRR; SNF)
- Ensure there are consistent security communication policies for disseminating sensitive information effectively. Investigate use of secure telephone lines when sensitive information needs to be relayed. (WVSNF; WIPP)
- Ensure all parties receiving sensitive and/or OUO information know the definition of sensitive information and OUO, and provide guidance on how to disseminate and handle sensitive and OUO materials. (WVSNF)
- Communication and security should be evaluated differently for highly visible shipments. (TEC 2)
- The security office must work with the shipper, NRC and local law enforcement to establish safe parking areas on either side of State borders where escorts are required to hand-off or receive shipments. (CCTWG)
- Consider use of Federal Marshals as shipment escorts. (WVSNF)
- Balance security with information dissemination – provide the right information to the right people. (WVSNF; TEC 2; WIPP)

Transportation Planning

- Freely share information with other agencies and organizations that are helping to plan the shipments. (SNF; WIPP)
- Maintain enhanced, on-going, open communication prior to planning logistics. (TEC 2; WIPP)
- Advances in physical and tracking technologies need to be factored in. (TEC 2)
- Frequent and consistent communication and coordination among all parties involved. (TEC 2; WIPP)
- Multiple shipment campaigns that cover years would greatly benefit in development of a system-wide process for notifying points of contact in the States, Tribes, railroads, and FRA. A secure web-based system that allowed the organizations to update their personnel information, telephone numbers, etc., on an ongoing basis would save an enormous amount of time and effort. (WVSNF)
• Use locomotive engines that are commonly used in the area, especially for the point of origin to minimize additional interest from locals (i.e., railfans) created by unfamiliar locomotives being in the area. (WVSNF)

Plans & Documents
• DOE needs to come to resolution on how to handle sensitive information in Transportation Plans, while still allowing them to be useful. (WVSNF)
• The transportation plan should ensure that the security plan is coordinated among the necessary parties. (SNF)
• Transportation Plans should provide contact lists and describe 1) the type of information to be provided during the notification process; 2) who has the overall responsibility for making the notification; 3) the coordination between the carrier, shipper and the receiver site to ensure that necessary notifications are made. (SNF; CCTWG)
• Transportation Plan should clearly delineate what constitutes a notification; how notifications will be made and how DOE, State and Tribal authorities and other Federal agencies, if required, will be notified in the event of an emergency. (SNF) (CCTWG)
• Transportation Plan should state what pre-notifications will occur and how they will be transmitted as required by such regulations and agreements. Plan should include how DOE intends to keep up with changes of State administrations, including administration transitions and staff turnover. (SNF; TMI)
• Transportation Plans should include pre-notifications and emergency notifications. (WVSNF)
• DOE Transportation Plans should be coordinated with carrier’s notification plans. (SNF)
• A comprehensive Operational Contingency Plan that includes how States and Tribes will be involved; contingencies for weather and adverse road/track conditions and what provisions will be made in the event of unplanned detours, unscheduled delays, accidents, vehicle breakdown, and threats against the shipment; identify who is responsible for authorizing use of alternate routes and which DOE authority and others need to be notified. If the carrier develops the operational contingency plan, it should receive prior approval from DOE. (SNF; WIPP)
• The DOE Transportation Plan and the Motor Carrier Plan need to include some type of contingency actions to be taken by the motor carrier in the event of a delay by the escorts. (CCTWG)

Routing
• Routing of shipments should not be disclosed, it should be protected information. (WVSNF; SNF)
• Coordinated and integrated planning with representatives from State, Tribal and local governments, and carriers, should be conducted to identify the appropriate route early in the planning process. (SNF; WIPP)
• Identify routes early allowing sufficient time for training. (TEC 2; WIPP)

Inspections – Rail
• Eliminate the need to plan specific en route locations for radiological inspections by State and Tribal agencies. (WVSNF)
• Establish a way to address current state and tribal requirements for monitoring to more efficiently conduct radiological monitoring. (WVSNF)

Stakeholder/Public Expectations
• Keep notifications to States and Tribes to a minimum (i.e., shipment dates, shipment departure, when shipment crosses state and tribal boundaries, etc.) (WVSNF)
• Work through state regional boards and TEPP functions. Develop and provide resource guides and media packets. Focus on material specific information not campaign specific resource guides. (WVSNF; WIPP)
• Freely share information with other agencies, States, Tribes and organizations that are helping to plan shipments. (SNF; WIPP)

Emergency Planning
• Prepare a contingency plan to provide mitigation & recovery actions for each potential incident. Keep response to incident systematic. Identify who’s involved, who’s responsible. (WVSNF; SNF; WIPP)
• A comprehensive operational contingency plan includes how States and Tribes will be involved; contingencies for weather and adverse road/track conditions and what provisions will be made in the event of unplanned detours, unscheduled delays, accidents, vehicle breakdown, and threats against the shipment; identify who is responsible for authorizing use of alternate routes and which DOE authority and others need to be notified. If the carrier develops the operational contingency plan, it should receive prior approval from DOE. (SNF)
• Have a backup plan in the event the Homeland Security Threat Level changes before a shipment or during a shipment. (TEC 2)
• Monitor the Internet to maintain cognizance of the information being viewed by rail fans and other members of the public. (WVSNF)