Spent Fuel Canister Transportation

33rd INMM Spent Fuel Management Seminar
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Spent Fuel Canister Transportation

Outline
• What is it we need to do?
• How do we do it?
• What are the challenges?
• What are the risks?
• How do we achieve success?
• Timeline
• Conclusions

How do we get there from here?
What Do We Need to Do?
What Do We Need to Do?

- Rail car
- Rail Logistics
- Heavy haul
- Transfer Equipment
- Transport Casks

Plan

Project Planning
- Project Scope
- Project Schedule
- Project Budget
- Project Quality
- Project Communication

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What Do We Need to Do?

• Build
  – Infrastructure and equipment
  – Transportation Casks and associated equipment
  – Rail cars meeting AAR S-2043

• Plan
  – Logistics
  – Validate
  – Optimize

• Public Outreach
How Do We Do It?

• Funding

• Private Sector (per NWPA)
  – casks, equipment, local infrastructure

• DOE
  – Planning
  – Emergency responder training
  – Public outreach
  – Accelerate rail car procurement and testing
What Are the Challenges?

• Funding and Legislation
• Confirm no regulatory “gaps”
• Updated Transportation CoCs
  – Address canister 72.48s, as-builts, etc.

• Public confidence and acceptance!
## Spent Fuel Transport Regulations and Experience

<table>
<thead>
<tr>
<th>Spent Fuel Activity</th>
<th>Regulatory</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation packaging (casks)</td>
<td>Yes</td>
<td>50+ years</td>
</tr>
<tr>
<td>Transportation logistics (planning, security, routing)</td>
<td>Yes</td>
<td>50+ years</td>
</tr>
<tr>
<td>SNF dry storage</td>
<td>Yes</td>
<td>20+ years</td>
</tr>
<tr>
<td>SNF assembly transport</td>
<td>Yes</td>
<td>50+ years</td>
</tr>
<tr>
<td>SNF canister transport</td>
<td>Yes</td>
<td>---</td>
</tr>
<tr>
<td>SNF canister transport after extended storage</td>
<td>Yes?</td>
<td>---</td>
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</tbody>
</table>
Canister Transportation Considerations

- Licensing Considerations
  - Storage in canister under Part 72
  - Transport in canister under Part 71
  - Place back into storage under Part 72

- Storage license conditions, tech specs, aging management programs, etc. assure canister and fuel integrity in initial storage

- Transport regulations assure safety during transport

- Normal conditions of transport are benign
  - Recent Sandia full scale transport testing of ENSA ENUN-32 cask – road, sea, rail – show accelerations on fuel are extremely low

- As long as canister arrives after transport in essentially same condition as when it started, and there were no significant events during transport, then fuel and canister remain adequate to return to storage
What Are the Risks?

• Minimal
• Nonetheless, you will hear…
  – *It’s a huge undertaking!*
    **False:** only 2 rail and 4 truck shipments per week on average at full capacity
  – *It’s never been done before!*
    **False:** we do it all the time and have been doing it for close to 7 decades
  – *It’s too dangerous!*
    **False:** the used fuel transport safety record is exemplary
• A few new things
  – Bigger casks (up to 220 tons)
  – Shipment of spent fuel canisters
  but these will not increase the risks – covered by same regulations that have provided exemplary safety record to date
A Few Thoughts on Public Outreach and Acceptance

• Facts are stubborn things
  – The history of nuclear materials and spent fuel transportation demonstrates a commendable record and history of safety
  – In more than 70 years of nuclear materials transport in the US and worldwide, no member of the public has ever been harmed from a radioactive release
  – This is a testament to the effectiveness of the regulatory requirements and processes, which are adequate and well proven, and the industry’s implementation of the regulatory requirements in partnership with regional and local governments
  – Shipment of SNF from plants to a centralized location is not an overwhelming challenge; and represents only a minimal increase in the annual shipments of radioactive materials; infinitesimally so compared to hazmat shipments

• We need to get the facts out there!
How Do We Achieve Success?

• Public Engagement and Trust
  – Enviable safety record – cite it and why it exists

• Industry Role
  – Working now to document that the regulatory basis is adequate to transport canisters from dry storage to central dry storage facility and there are no “gaps”

• DOE Role
Timeline

- Rail Car Testing
- Rail Cars
- Transport Casks
- Transfer Eqt/Infrastructure
- CoC Updates
- ER Training
- Logisitics & Planning
- Public Outreach
Conclusions

• Options are evolving now for the opportunity to consolidate storage of used fuel from stranded sites to a common centralized location in the early 2020s

• In order to use these options, we need to be ready to transport the fuel canisters from utility sites, with a focus on removing spent fuel canisters from stranded sites

• Action is needed now to get the pieces in place so there are no “roadblocks” to transportation

• Industry is underway to do its part
Spent Fuel Canister Transportation

QUESTIONS?