DOE's Initial Site-Specific De-Inventory Reports

Erica Bickford, PhD

Transportation Program Manager

Office of Nuclear Energy

June 13, 2018

U.S. DEPARTMENT OF ENERGY

Disclaimer

This is a technical presentation that does not take into account the contractual limitations under the Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste (Standard Contract) (10 CFR Part 961). Under the provisions of the Standard Contract, DOE does not consider spent nuclear fuel in multi-assembly canisters to be an acceptable waste form, absent a mutually agreed to contract amendment. To the extent discussions or recommendations in this presentation conflict with the provisions of the Standard Contract, the Standard Contract provisions prevail.

Contents

- Background on De-Inventory Reports
- Snapshot of 2 reports
  - Big Rock Point
  - Humboldt Bay
- Technical Issues to be Addressed
  - Common Themes
  - Unique Challenges

Planning for spent nuclear fuel (SNF) transport

- DOE-NE has been gathering data from sites as they shut down
  - *Preliminary Evaluation of Removing Used Nuclear Fuel from Shutdown Sites*:
    - Includes input from site personnel, local Tribes/states, DOT, and other stakeholders
    - As this work matured, DOE-NE looked for the next steps in understanding the challenges with and planning for the removal of SNF and greater-than-Class-C low-level waste (GTCC)

Photo courtesy of Connecticut Yankee

Photo courtesy of Humboldt Bay

Photo courtesy of Big Rock Point

Initial site-specific de-inventory reports

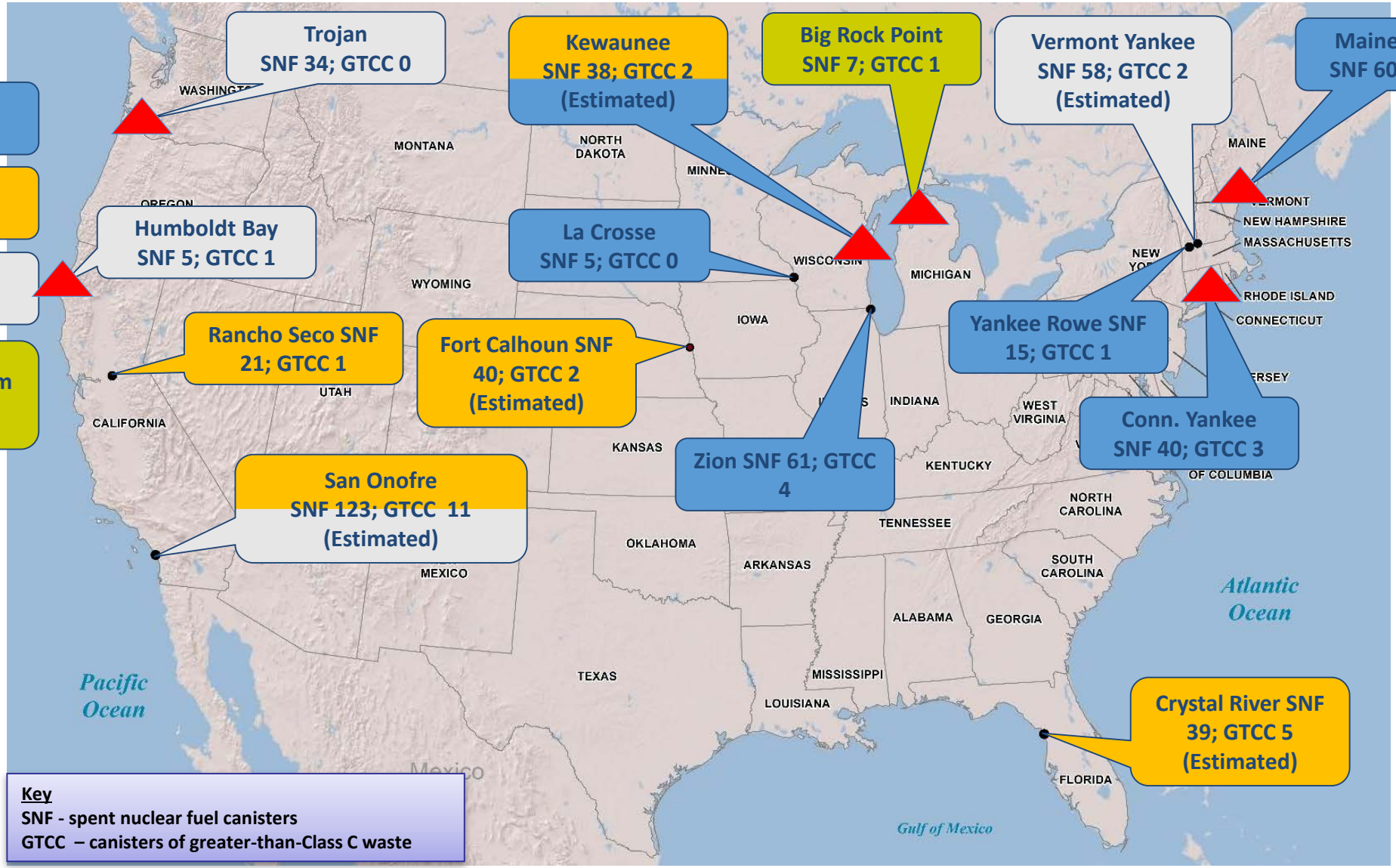
- These reports are a first look at how an integrating contractor could recommend going about removing SNF and GTCC waste from these sites
- The reports represent one contractor's perspective and do not represent DOE's plans
  - Contractor used a Multi-Attribute Utility Analysis (MUA) as a framework for future identification of preferred mode/route alternatives
  - As DOE-NE continues to develop system analysis tools (START, NGSAM, etc.), these tools can also be integrated into the decision making process

Scope and limitations of these de-inventory reports

- Contractor Team
  - AREVA Federal Services (now Orano Federal Services)
    - Teamed with MHF
    - Teamed with NAC for Connecticut Yankee, Maine Yankee, and Kewaunee
- Ground rules for reports
  - AREVA did not talk with shutdown site personnel, state or tribal stakeholders, or rail carriers
  - AREVA used information provided in DOE materials (*Preliminary Evaluation of Removing Used Nuclear Fuel from Shutdown Sites*, etc.)
  - AREVA relied on staff/corporate experience
- These reports only focus on technical and logistical considerations

De-Inventory Reports

Report Complete

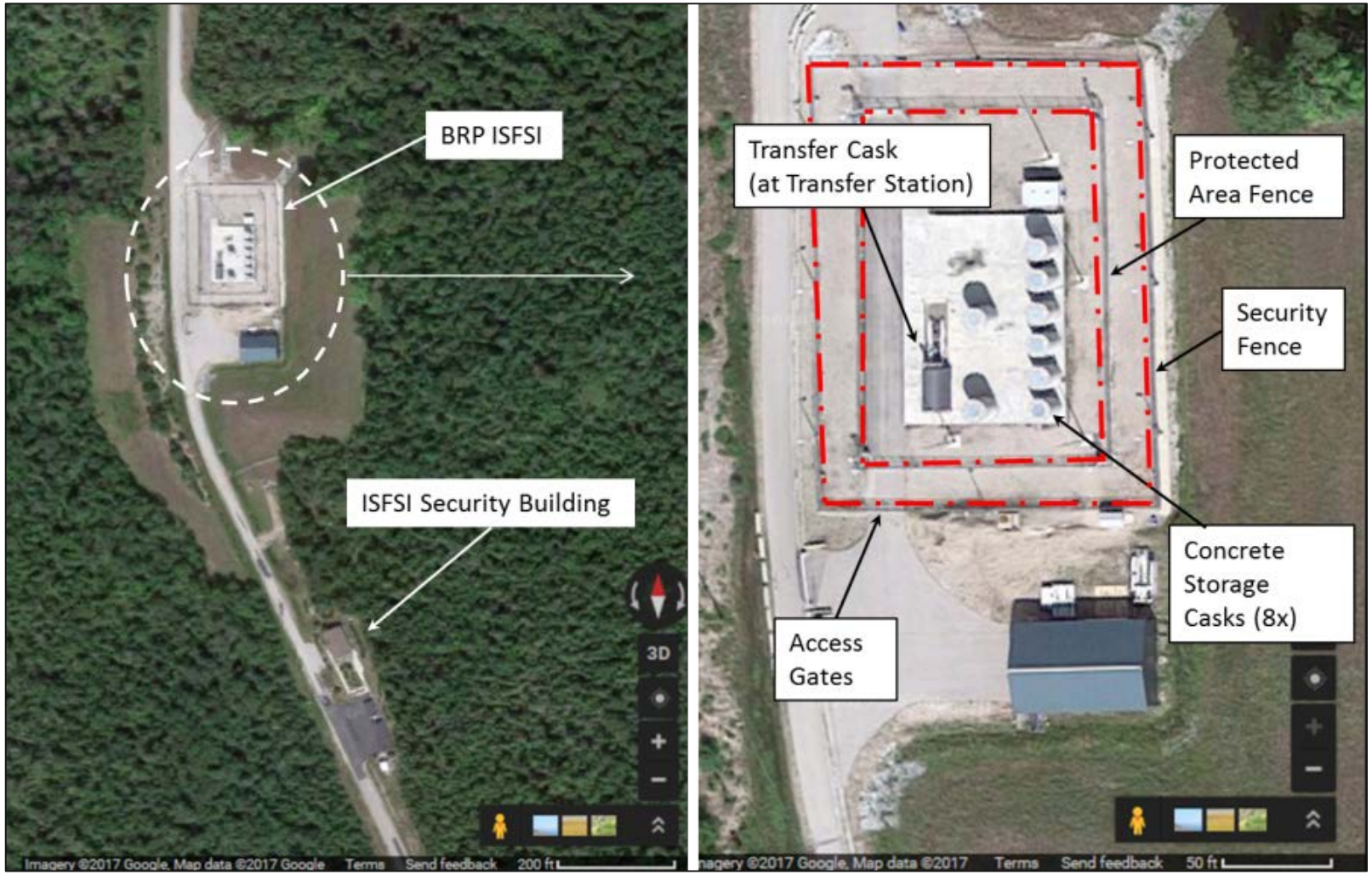


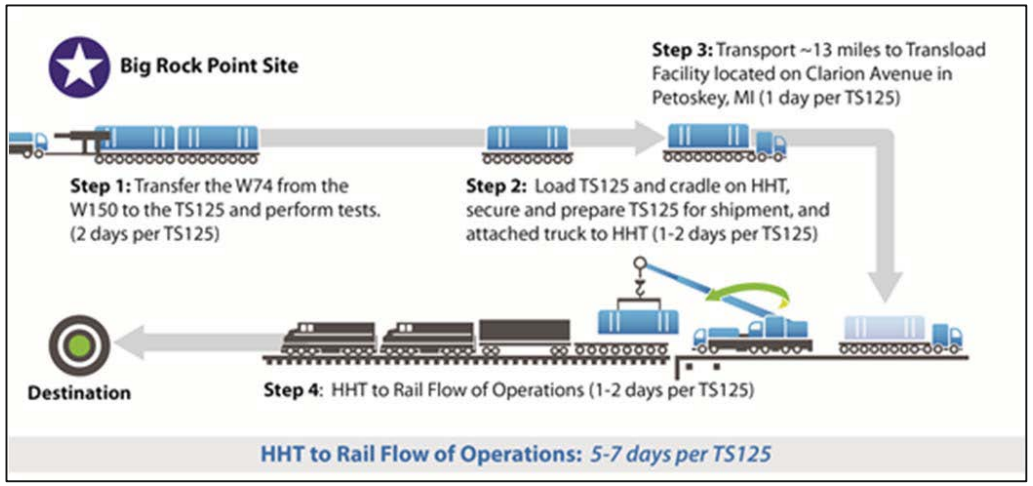
This map is not intended to indicate that de-inventory reports will be completed for all shutdown sites

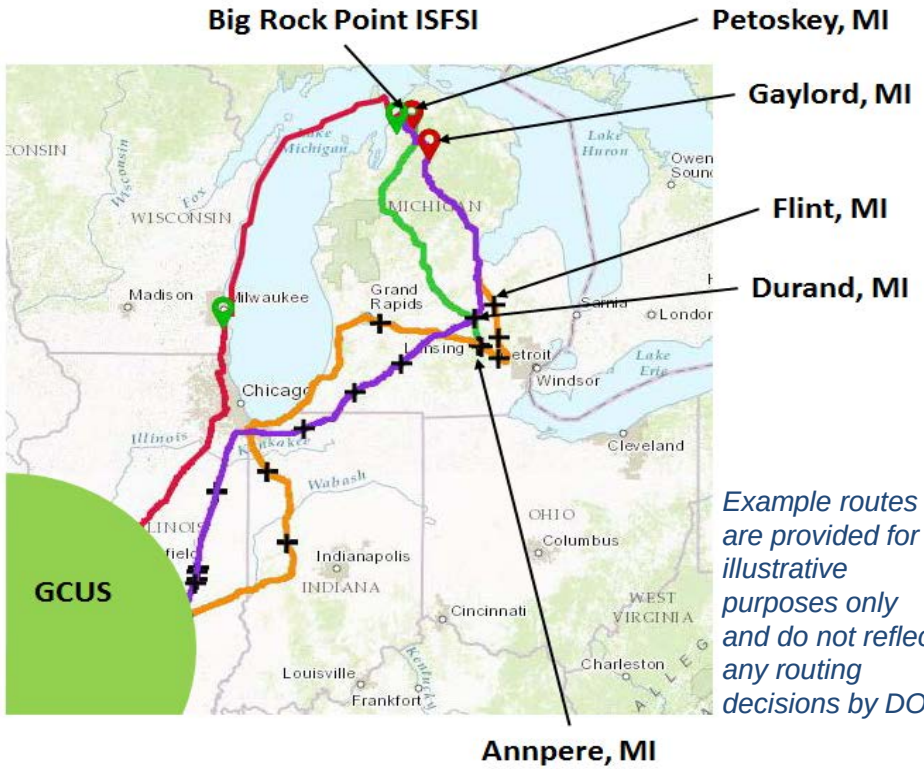
Big Rock Point (BRP) Background

- Located on the eastern shore of Lake Michigan
  - 11 miles west of Petoskey
- Site inventory includes 8 casks
  - FuelSolutions storage systems
  - 7 SNF
  - 1 GTCC

Photo courtesy of Big Rock Point







Example routes are provided for illustrative purposes only and do not reflect any routing decisions by DOE

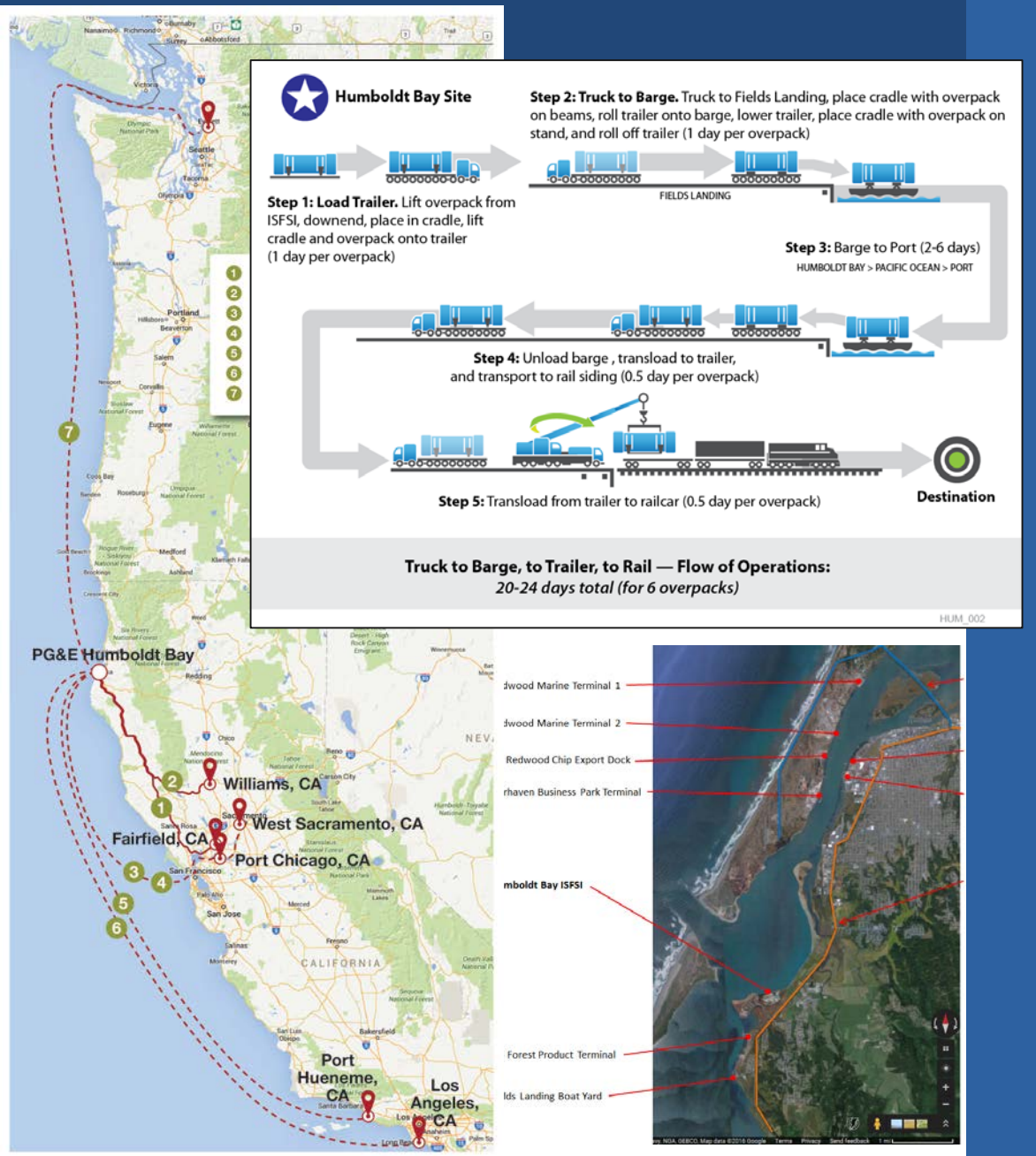
BRP operations estimated to take ~36 weeks, cost $7.3M

- Likely transport package: TS125
  - ~285,000 lbs loaded
  - maximum diameter of 143.5”
- Recommended route/mode:
  - Heavy-haul truck to Petoskey, local rail to Durand, Canadian National to destination/interchange
- 8 mini-campaigns of 1 cask each
- 5–7 days per cask to get from ISFSI to rail
- Round-trip takes ~25 days

Humboldt Bay (HB) Background

- Located on the shore of Humboldt Bay, near Eureka, California
  - ~260 miles north of San Francisco, CA
- Site inventory includes 6 casks
  - HI-STAR HB storage systems
  - 5 SNF
  - 1 GTCC

Photo courtesy of Humboldt Bay



HB operations estimated to take ~5 weeks, cost ~$2.7M

- Likely transport package: HI-STAR HB
  - ~187,000 lbs loaded
  - maximum diameter of 128”
- Recommended route/mode:
  - Heavy-haul truck 2 miles to Fields Landing, barge to Concord, CA, UP or BNSF rail to destination/interchange
- 1 campaign of 6 casks
- Transportation takes ~20-24 days

Example routes are provided for illustrative purposes only and do not reflect any routing decisions by DOE

Technical issues to be addressed

- Each report included a section on “Recommended Next Steps”
- Based on data from DOE Shutdown Sites Report, AREVA, MHF, and NAC experience, etc.
  - NAC experience at sites that use NAC storage systems
  - Additional data obtained from sites as requested by AREVA
  - Shutdown Sites Report leveraged earlier work of DOE-RW in Facility Interface Capability Assessment (FICA) Reports, Near-Site Transportation Infrastructure (NSTI) Reports, Services Planning Documents (SPDs), and Facility Interface Data Sheets (FIDS)

Common Themes

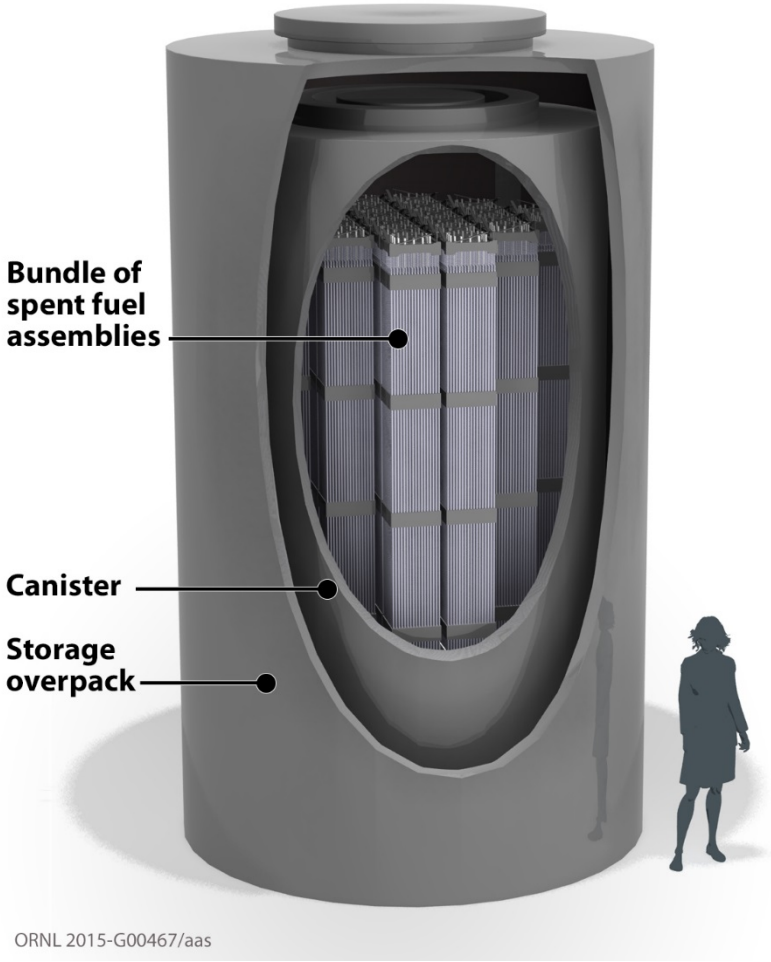
- Verify dry storage canister contents allowed by transportation CoC
  - Monitor status of 5-year renewal intervals
  - Verify any storage canister changes made through the 10 CFR 72.48 process have propagated to the transportation CoC
- Establish detailed equipment needs for transportation
  - Transportation casks, transfer casks, impact limiters, spacers, cradles, personnel barriers, etc.
  - Additional equipment as needed - mobile cranes, rigging equipment, etc.

Common Themes continued

- Establish electrical power requirements for performing operations and verify availability at the site
- Establish/re-establish on-site and near-site infrastructure
- Conduct route clearances and permitting for heavy-haul routes
  - If barge used, dredging may be required, which may require permits

Unique Challenges

- Big Rock Point:
  - Update TS125 transportation CoC to allow for fabrication (-85 to -96) and to allow for GTCC waste, **OR**
  - Modify transportation CoC for another transportation cask to allow transport of W74 canisters
- Kewaunee:
  - Transportation CoC for MAGNATRAN transportation cask has not been issued by NRC



Unique Challenges continued

- Humboldt Bay:
  - Revise transportation CoC for HI-STAR HB to allow transport of SNF with lower enrichments and GTCC waste
  - Potential issues associated with fuel channel thickness and lid bolts with reduced effective thread length
  - Clarification on need to perform vacuum drying, helium backfill, or leak-testing of GTCC waste containing cask prior to transportation
  - Using existing vertical cask transporter (shared with Diablo Canyon)

Photo from Holtec International

Summary

- Initial Site-Specific De-Inventory Reports build on Shutdown Sites work DOE has conducted
- Provide proposed next steps, activities, interfaces, schedules, and estimated costs for removing fuel from the sites
- Some sites have unique challenges
- No “showstopper” technical issues identified among the six sites studied

Questions?