



U.S. DEPARTMENT OF  
**ENERGY**

**Nuclear Energy**

## **Near Term Planning for Storage and Transportation of Used Nuclear Fuel**

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**Nuclear Fuels Storage and Transportation Planning Project**

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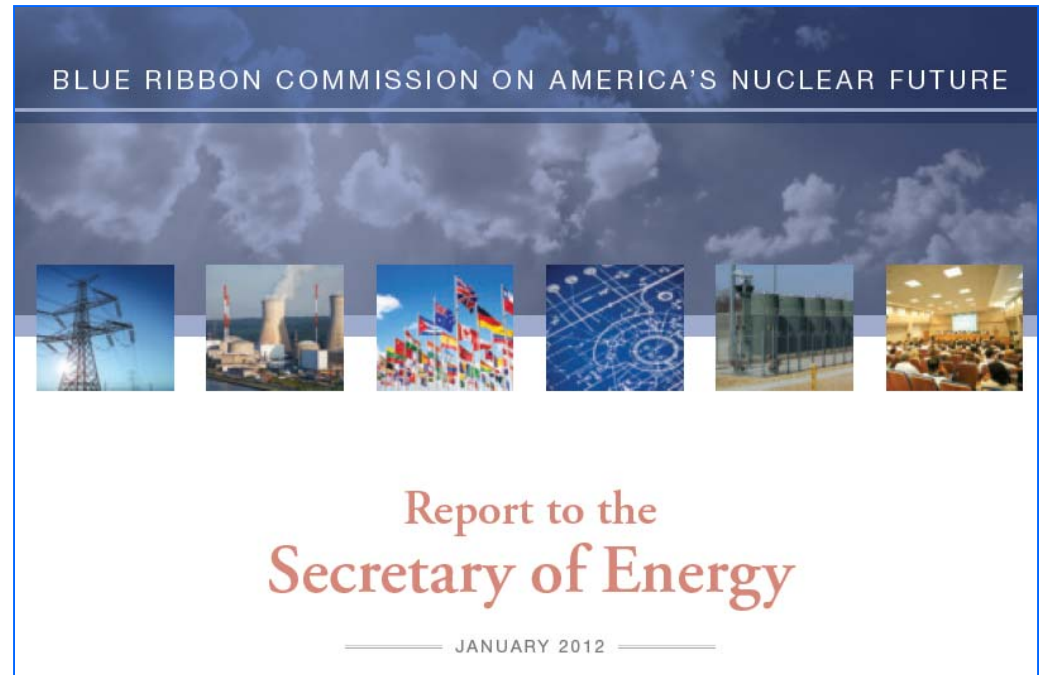
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## The BRC Recommended: Storage Facilities, *Transportation* *Preparation, and Stranded Sites “First”*

“**Prompt efforts** to develop one or more **consolidated storage facilities**”

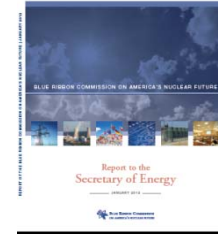
“**Early preparation** for the eventual large-scale **transport** of spent nuclear fuel and high-level waste to consolidated storage and disposal facilities”



“Consolidated storage would allow for the removal of “stranded” used fuel from shutdown reactor sites: ...the Commission recommends that spent fuel currently being stored at **shutdown reactor sites** be “**first in line**” for transfer to a **consolidated storage facility.**”



## BRC Report - Chapter 13 Near-Term Actions



**“DOE remains responsible for nuclear waste management activities of the Federal Government, it is important that those steps that do not require the new organization to be in place be initiated as soon as possible.”**

**DOE should :**

- Begin laying the groundwork for implementing consolidated storage (e.g. perform system analyses, design studies)
- Prepare to respond to information requests from communities, states, and tribes interested in hosting a consolidated storage facility
- Begin providing funding, for working with state and regional-state government groups and training local and tribal officials in preparation for movement of spent fuel from shutdown reactor sites to consolidated storage
- Work with nuclear utilities, the nuclear industry, and other stakeholders to promote better integration of storage into the waste management system, including standardization of dry cask storage systems



## Nuclear Waste Policy Act Guidance on Storage

- Authorizes the Secretary to site, construct and operate one monitored retrievable storage (MRS) facility subject to conditions.
- Limited the Secretary from conducting a survey and evaluation of potentially suitable sites until after the MRS Commission submitted its report to the Congress.
  - This report was submitted November 1, 1989.
- The Secretary may not select a site until the Secretary recommends to the President approval of a site for development as a repository.
- Site specific activities at each site surveyed to support the application for a license for an MRS may be conducted.
- **Construction of an MRS facility may not begin until the Commission has issued a license for the construction of a repository.**
- The quantity of spent nuclear fuel at an MRS is limited to 10,000 metric tons of heavy metal (MTHM) until a repository first accepts spent fuel and may not exceed 15,000 MTHM.



## Evolution of Used Fuel Disposition to respond to Blue Ribbon Commission

### ***Used Fuel Disposition Research and Development mission:***

- *Conduct research to enable long term storage and subsequent transportation of existing and future spent fuel and waste forms*
- *Develop a fundamental understanding of disposal system performance in a range of geologic media*

**Blue Ribbon  
Commission**



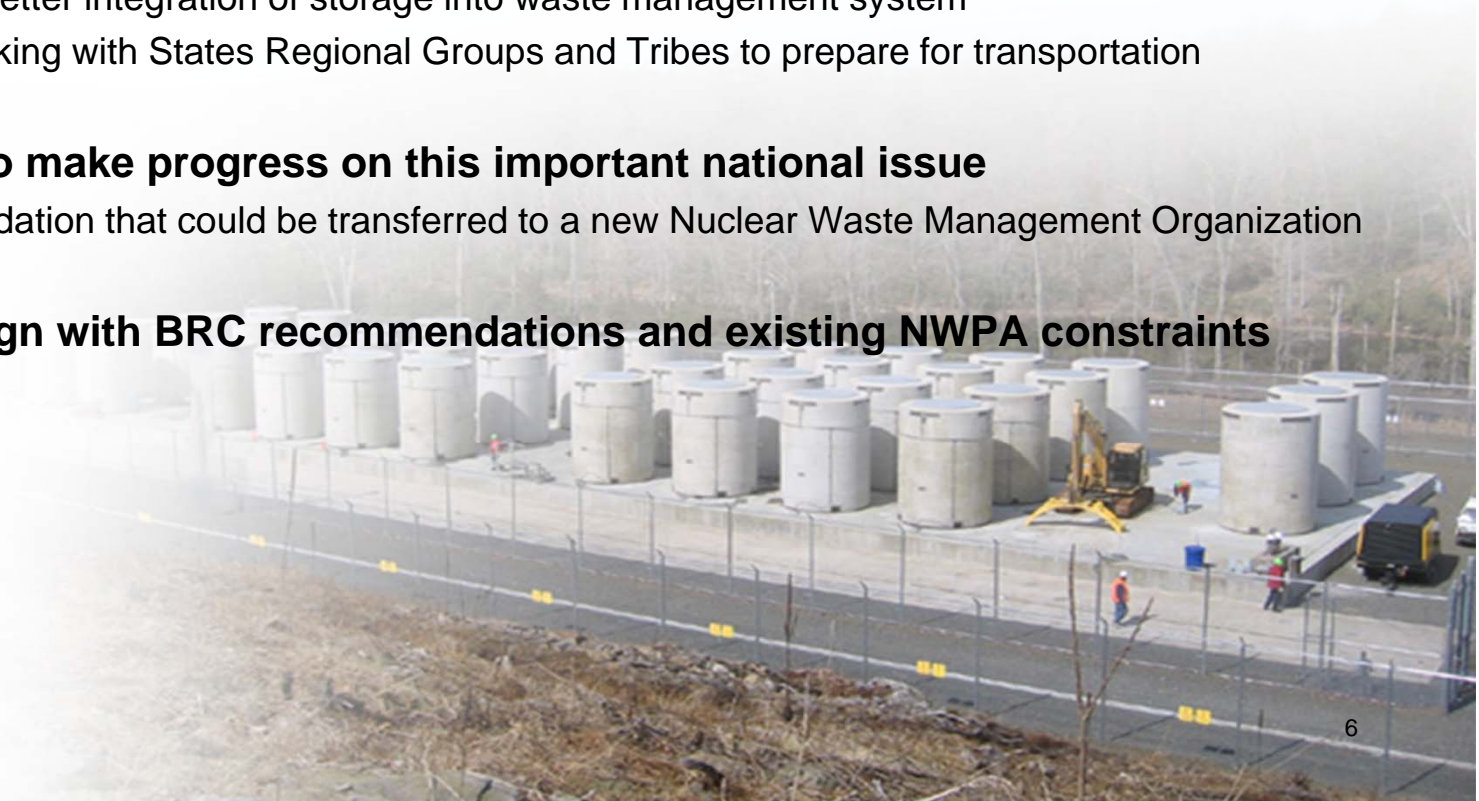
- Recommendations for near term program shifts and a major restructuring in the longer term
- Lay the groundwork for implementing consolidated storage and transportation of fuel from shutdown sites

**Nuclear Fuels  
Storage and  
Transportation  
(NFST) Planning  
Project**



## NFST Planning Project

- **NFST Planning Project established to plan for potential storage and transportation activities, October 1, 2012**
- **Initial focus consistent with BRC recommendations for near-term actions related to storage and transportation**
  - Perform systems analysis and design studies for storage facility
  - Promote better integration of storage into waste management system
  - Begin working with States Regional Groups and Tribes to prepare for transportation
- **Purpose is to make progress on this important national issue**
  - Build foundation that could be transferred to a new Nuclear Waste Management Organization
- **Activities align with BRC recommendations and existing NWPA constraints**





# NFST Planning Project Storage Activities

## Objective:

Begin laying the ground work by conducting feasibility studies and technical evaluations for implementing the concept of consolidated storage

- **Design Concepts:** DOE acquired services of industry to develop design concepts of a consolidated storage facility (CSF).
  - Three contracts were awarded which have developed three Draft Design Concepts Reports.
- **Standardization:** DOE has acquired services of the industry (AREVA and Energy Solutions) to evaluate the feasibility of standardized storage, transportation, and disposal canisters.
- **Generic Conceptual Designs:** Based on the Design Concepts Reports, the generic conceptual designs for storage facilities will be developed further.





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## System Analysis - System Architecture Evaluation

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- Evaluate an integrated approach to storage, transportation, and disposal in the waste management system with an emphasis on providing flexibility.
- Evaluate the implications of on-site storage of UNF in large dry storage systems on direct disposal options.
- Consider factors including emplacement capability, thermal constraints, the need for re-packaging techniques, storage alternatives, transportation, impacts on utility operations.
- Evaluate measures for flexibility and order of magnitude cost factors associated with each alternative.



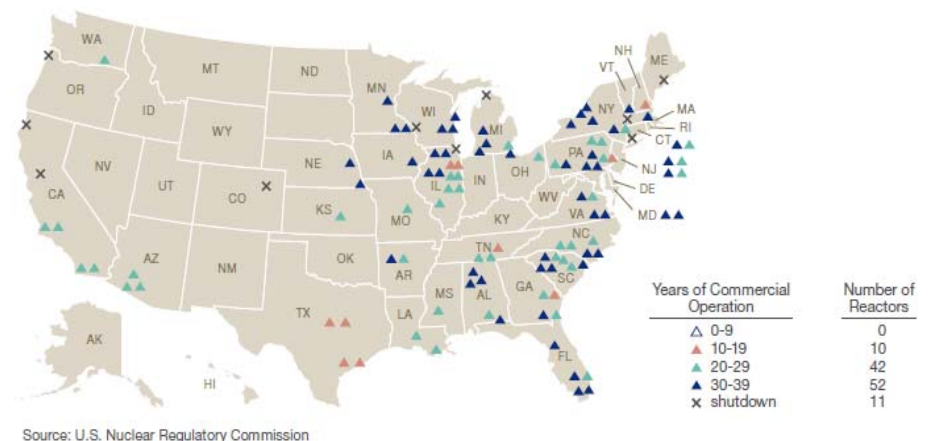


# NFST Planning Project Transportation Activities

## Objective:

Ensure the implementation of a collaborative transportation process for UNF and HLW

- Re-engage with State Regional Groups and Tribes to better understand stakeholder issues related to the movement of used nuclear fuel.
- Examine successful approaches from past experiences.



**Relationships and processes built to support logistics of shipments to the Waste Isolation Pilot Plant (WIPP) have been successful and the infrastructure and lessons learned from this experience will be utilized moving forward**



# NFST Planning Project Transportation Activities

- Prepare planning report for shipping stranded fuel from shutdown sites to a consolidated storage facility.
- Collaborate with stakeholders to address their issues and publish revised NWSA 180(c) policy regarding financial and technical assistance to states along transportation routes for UNF.
- Develop draft National Transportation Plan.
- Explore preliminary routes for shipments from shutdown sites.





- **Finding a suitable site is the key to success.**
- **The approach to siting and NEPA compliance is in the planning stages.**
- **DOE is developing a siting data base documenting past siting efforts (recommended by BRC).**
- **Completing a report on findings on public attitudes and preferences concerning the siting of nuclear repositories and interim storage facilities.**
- **This work will be able to inform policy makers on plans for initiating a consent based siting process.**
- **Legislation will be required to permit many activities.**
  - e.g. linkage between storage and disposal is critical but should not restrict forward movement on storage facilities



## Ideas for Furthering the Generic Design of Interim Storage

- **Design Concepts work ongoing (Shaw, AREVA, Energy Solutions)**
  - DOE did not specify requirements (looking for industry ideas)
  - Good inputs received, differing ideas on consolidated storage facilities
  - All teams agree that getting rail cars compliant with new FRA rail car standards is a critical path item and should start very soon.
- **DOE will need to prescribe requirements consistent with policy direction**
- **Develop in a staged manner**
  - Start with what is simplest and easiest (pilot interim storage facility)
  - Shutdown sites first
  - Additional fuel handling capability later (larger interim storage facility)
  - Flexibility
- **Design would be developed consistent with local and state consent**
  - Could include size, fuel handling capability (e.g. pools, hot cells), land requirements
  - Consideration of jobs and other benefits
  - Capacity (i.e. amount of UNF)
  - Type of material to be handled (e.g. DOE owned materials be considered)
  - Throughput and ramp-up rates



## Conclusions

- **DOE has initiated activities that align with the BRC near-term action recommendations.**
  - Planning project established to initiate actions
  - Evaluating consolidated storage options
  - Focusing initially on stranded fuel at shutdown sites
  - Established cooperative agreements with State Regional Groups for transportation planning
  - Progress on siting is key to being able to establish a Pilot Interim Storage Facility by 2021
- **Activities conducted will stay within existing authorizations (Atomic Energy Act and Nuclear Waste Policy Act) until we have new authorization and money to proceed.**
- **If a new organization is established, the Administration will carefully evaluate the appropriate activities to be transferred.**