

# Spent Nuclear Fuel and Low Level Radioactive Waste: Current and Future Storage Options

State of Vermont:  
Senate Committee on Finance, and  
Senate Committee on Natural Resources and Energy  
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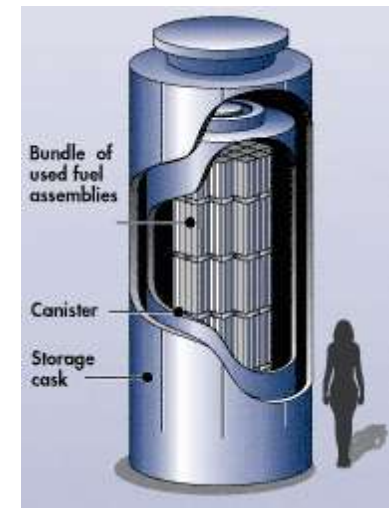
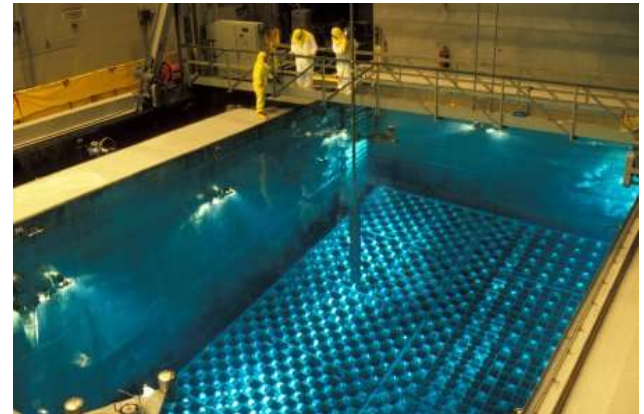
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# Spent Nuclear Fuel (SNF) Summary

- Current and future storage options are unchanged from January 2009 legislative briefing
  - Wet and dry SNF interim storage capability continues to be available at the Vermont Yankee site
  - A federal repository for SNF continues to be the key for long term SNF disposition

# SNF Storage Capacity at Vermont Yankee

- Short term shielding and cooling needs of SNF are provided in the spent fuel pool (wet storage)
- After five years the residual heat production and radiation levels of SNF are low enough to allow it to move to dry storage
- The Hi-Storm 100 dry storage canister and cask system at Vermont Yankee is certified by the US NRC
- During plant operation, the spent fuel pool and existing dry storage capacity can meet storage needs through 2012 and 2032
- After plant operation ceases, additional dry storage capacity will be needed to empty the spent fuel pool in support of decommissioning



# National Perspective on Dry Storage

- 54 Independent Spent Fuel Storage Installations (ISFSI) in 33 States
- All aspects of dry storage, including transportation, are regulated by the US NRC
- Two types of site licenses
  - Site specific (15),
  - General (39), including Vermont Yankee
- Primary siting criteria involve:
  - Soil Stability
  - Seismic
  - Air temperature
  - Flooding
- Security is required for ISFSI's until the last SNF leaves the site
- Humboldt Bay and Diablo Canyon in California are most recent to load SNF into dry storage
- NRC has proposed extending dry storage licenses to 40 years with option of a 40 year extension

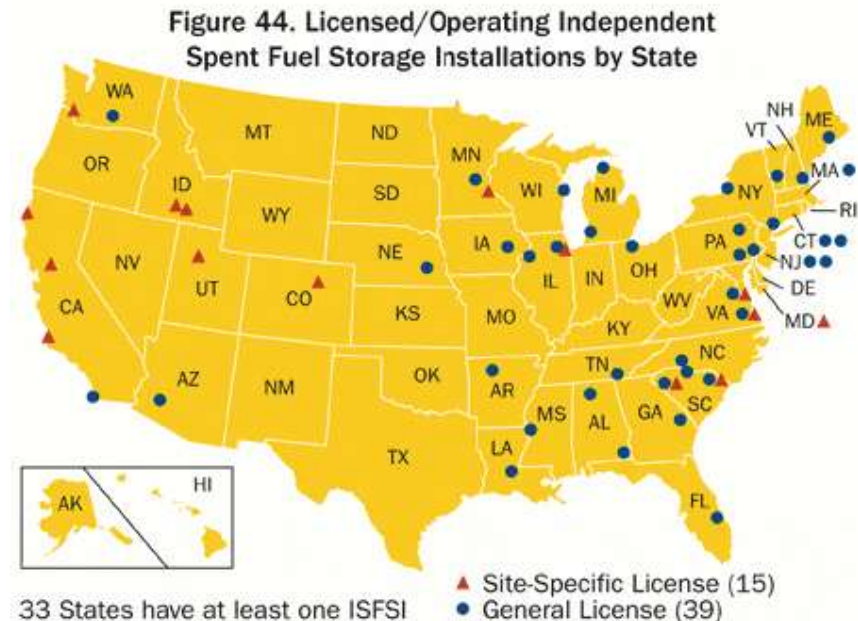


Figure 44. from NRC Webpage, October 22, 2009

# National Perspective on a Permanent Repository for SNF

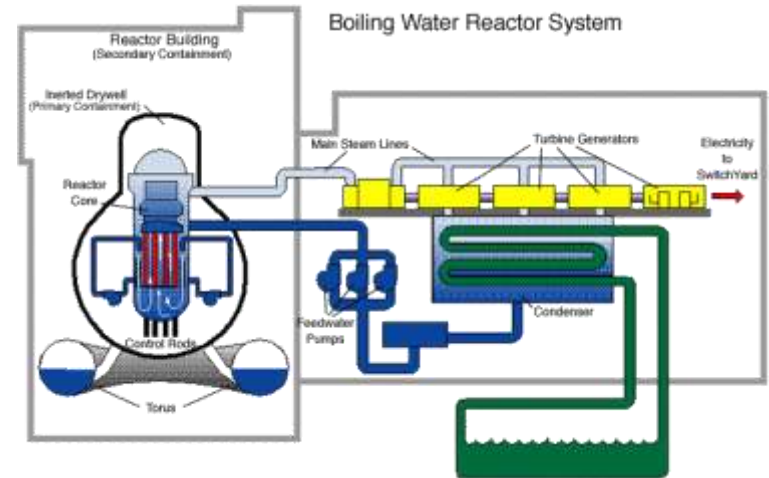
- The Obama administration has announced its intention of ending work at Yucca Mountain on a permanent repository for SNF
- The Administration's proposed alternative, a "Blue Ribbon Panel" to evaluate options for SNF, is yet to be appointed
- Both Secretary of Energy Chu and Chairman Jaczko of the NRC have publicly affirmed their view that SNF can be successfully managed
- Success at the national level provides the only substantive resolution of long term interim storage at the Vermont Yankee site
- Given the history of Congress and Administrations, it is reasonable to contemplate that SNF at Vermont Yankee, and other commercial nuclear plants in the US, will be at the reactor sites well past the end of plant operations and possibly after decommissioning of the power plants

# Low Level Radioactive Waste (LLRW) Summary

- Current and future storage options are unchanged from January 2009 legislative briefing
  - Class A low level radioactive waste burial continues to be available at Clive, Utah with adequate long term storage capability for other classes available at the Vermont Yankee site
  - Class B and C low level radioactive waste burial options went away with closure of Barnwell and Hanford sites to non-compact members
  - Long term options for Class B and C waste are good with continued Vermont participation in Texas Compact development of their waste burial site

# Low Level Radioactive Waste and Vermont Yankee

- What is it?
  - Class A: contaminated clothes, equipment, and some plant water resins (least intense radioactivity)
  - Class B: concentrated water purification resins
  - Class C: materials directly exposed to neutrons in the reactor core
- What do you do with it?
  - Reduce volume by compaction, incineration and metal melting
  - Burial in NRC approved sites
- Burial site options
  - Class A, Clive, Utah
  - Class B & C, pending in Texas
- Routine aspect of normal plant operations
- Class A, B & C disposal capability is essential for decommissioning



# National Perspective on Low Level Radioactive Waste

- Barnwell, SC and Hanford, WA have historically provided the bulk of US LLW disposal capability
- In response to concerns, Congress passed the Low Level Radioactive Waste Policy Act in 1980
  - Objective was to motivate the development of additional disposal sites
  - States were encouraged to join into “Compacts” where they would agree on development of a site within the compact
  - Non-compact states could be excluded from burial sites
- A new site was developed and opened in Clive, Utah, accepting Class A LLW from all states
- Most “Compacts” have not been successful in agreeing on development of new sites
- Closure of Barnwell and Hanford to non-compact members has eliminated Class B and C disposal options
- Texas, Vermont’s Compact partner, is making good progress on opening a facility that will accept Class B and C waste
- Economics has and will continue to play an important role in availability of and access to LLW waste disposal