

# Beyond Nuclear

working for a world free from nuclear power and nuclear weapons



## The Current Status: Storage of Highly Radioactive Nuclear Waste at Reactor Sites.

At present, about 90,000 metric tons of nuclear waste are stored at reactor sites in storage pools and/or dry storage containers. Experts agree that nuclear waste should be moved from densely packed storage pools to dry storage containers to minimize the risk of catastrophic pool fires.<sup>1</sup> And at-reactor storage containers should be monitored, inspected, maintained, and should be capable of repair and re-packaging. All highly radioactive nuclear waste must be transferred out of wet storage before shipping it away from reactor sites.

**Re-Packaging.** Before it can be shipped away from a reactor site, highly radioactive nuclear waste must be packaged appropriately. All nuclear waste sent to a repository will have to be packaged suitably for transportation, temporary storage at the repository site, and ultimate disposal in the repository. But no cask has been designed that would meet all three purposes, because the packaging demands of a repository are not yet known. In the meantime, the only multi-purpose packages that are available are certified for transportation and storage, not disposal.

<sup>1</sup>The potential for catastrophic pool fires caused by accidents and terrorist attacks was recognized in *Safety and Security of Commercial Spent Nuclear Fuel Storage* (National Academy of Sciences Press 2006), [http://www.nap.edu/catalog.php?record\\_id=11263](http://www.nap.edu/catalog.php?record_id=11263).

<sup>2</sup>According to the NRC's Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel, NUREG-2157 at 2-19 (2014), each cask can hold up to 32 fuel assemblies from a pressurized water reactor (PWR), comprising 10 metric tons (MTU) of nuclear waste. In 2014, GAO estimated the cost of a single cask at up to \$1.5 million, not including the cost of activities and equipment necessary to transfer spent nuclear fuel from wet to dry storage (up to \$42.8 million), storage pads (\$6.5 million), and annual Maintenance and Operation costs (up to \$6.5 million/year). GAO-15-141, Spent Nuclear Fuel Management: Outreach Needed to Help Gain Public Acceptance for Federal Activities (2014).

DOE research from 2015 shows that repackaging of nuclear waste for transport would add \$40,000 to \$87,000 per PWR fuel assembly, not including loading and capital costs. U.S. Last Updated August 30, 2021

## Packaging and Transporting Highly Radioactive Nuclear Waste: Adding Unnecessary Costs and Risks

*Thus, if Congress amends the NWPA and allows federally-sponsored transportation of nuclear waste to consolidated "interim" storage facilities before a permanent geologic repository is licensed, nuclear waste must necessarily be placed in containers designed only for transportation and storage, not disposal. Assuming the current inventory of 90,000 metric tons of commercial highly radioactive nuclear waste is shipped to a consolidated storage facility in 9,000 transportation/storage casks, those 9,000 casks will have to be replaced with another 9,000 transportation/disposal casks before they can be shipped to a repository -- at astronomical additional expense and occupational waste handling risk.<sup>2</sup>*

**Transportation.** Transporting nuclear waste from around the U.S. to a permanent geologic repository ultimately will put well over 100,000 tons of nuclear waste onto highways, waterways, and/or rail lines. The proposed routes for Yucca Mountain, for example, would have used 22,000 miles of railways and 7,000 miles of highways, as well as additional barge shipments on waterways, traversing at least 30 Native American Tribal Nations, more than 40 states and the District of Columbia, and 960 counties with a total 2010 Census population of about 175 million people. This area encompasses most of the nation's congressional districts (330 of 435 districts in the 115th Congress).<sup>3</sup>

Department of Energy, Office of Nuclear Energy, Standardized Transportation, Aging, and Disposal (STAD) Canister Design, Presentation to the Nuclear Waste Technical Review Board, June 24, 2015.

<https://www.nwtrb.gov/docs/default-source/meetings/2015/june/jarrell.pdf?sfvrsn=7>. That amounts to an additional \$1,280,000 to \$1,784,000 for a single transportation cask holding 10 MTU of nuclear waste.

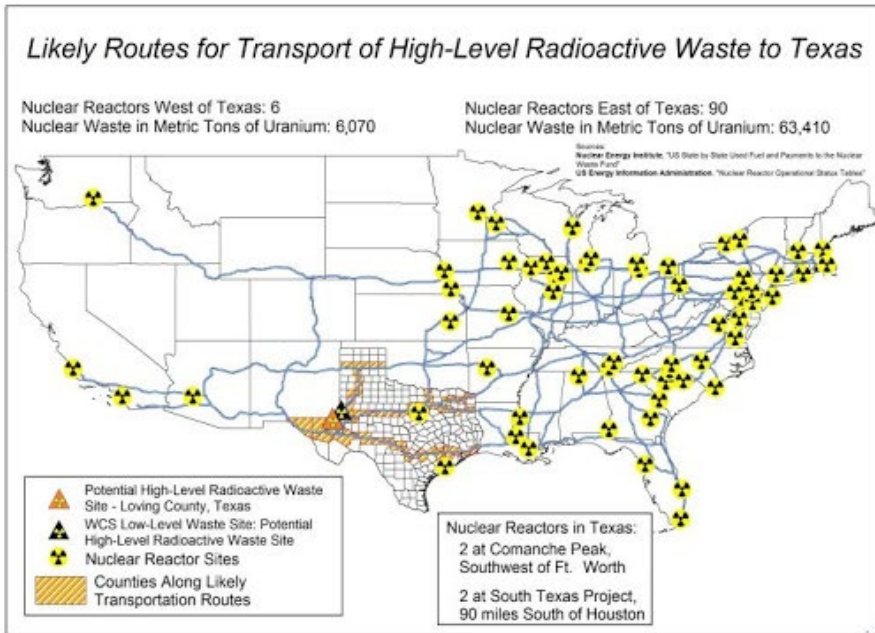
<sup>3</sup>Report and Recommendations of the Nevada Commission on Nuclear Projects at page 43 (Nov. 2019), available at:

<http://www.state.nv.us/nucwaste/pdf/2019.11.04%20Draft%20Commission.pdf>. See also Fred Dilger, Ph.D., Nevada Agency for Nuclear Projects, Congressional Districts Potentially Affected by Shipments to Yucca Mountain (May 22, 2017), available at [http://www.state.nv.us/nucwaste/news2017/pdf/Congressional\\_Districts\\_Affected.pdf](http://www.state.nv.us/nucwaste/news2017/pdf/Congressional_Districts_Affected.pdf).

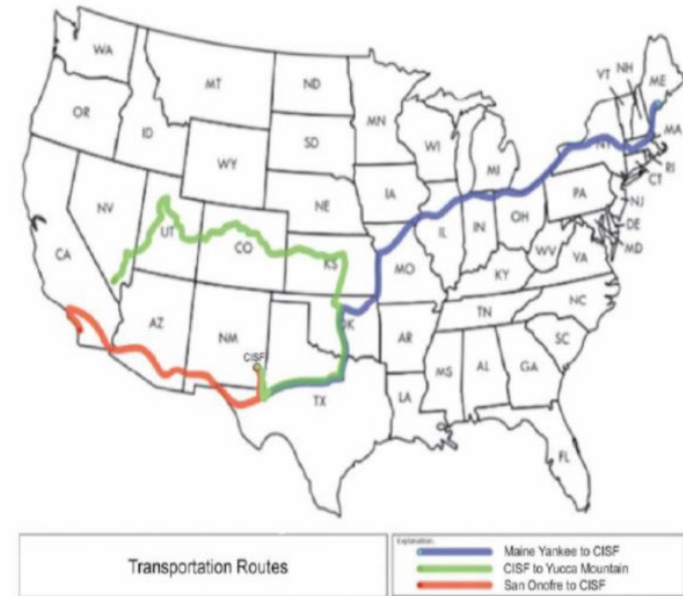
## Transportation Detour

**Adding a detour of consolidated storage along the way would require two rounds of transport instead of one. Not only would this significantly increase**

*packaging costs, but it would significantly increase radiation exposures and accident risks by putting nuclear waste on the public roads, railroads, and waterways for more time and more miles. Even during so-called “routine” or “incident-free” shipments, workers and members of the public along shipment routes will be exposed to radiation. And these additional shipments would increase the risk of accidents and sabotage.*



Potential transport routes for waste being moved to a proposed consolidated storage facility in Texas, via [https://nonuclearwasteaqui.org/images/Keeping\\_Radioactive\\_Waste\\_Onsite\\_graphic.png](https://nonuclearwasteaqui.org/images/Keeping_Radioactive_Waste_Onsite_graphic.png) (shutdown reactors not pictured).



Potential transportation routes from two reactor sites to a proposed consolidated storage site in New Mexico, and the route the waste would later have to take from the New Mexico site to Yucca Mountain, via <http://www.beyondnuclear.org/centralized-storage/2020/5/27/wcsisp-deis-ideas-for-comments-you-can-use-to-write-your-own.html>.

**New Mexico Governor Michelle Lujan Grisham, U.S. Senator Martin Heinrich, U.S. Senator Ben Ray Luján, U.S. Representative Melanie A. Stansbury: “Without a strategy in place at the Department of Energy for permanent waste disposal, any CISF constructed in or near New Mexico could become a waste storage site that is, in essence, permanent. New Mexico has not and will not consent to such a situation.”**

Letter to Jennifer Granholm, Secretary of Energy, July 1, 2021, <https://www.heinrich.senate.gov/download/letter-to-energy-secretary-opposing-interim-storage-of-nuclear-waste-in-new-mexico>.