



Congress Watch • Critical Mass • Global Trade Watch • Health Research Group • Litigation Group
Joan Claybrook, President

Challenging Prerequisites for Safe Transport of Irradiated Nuclear Fuel Identified in NAS Study¹

“Implementation of DOE’s transportation program for Yucca Mountain will be a daunting task...,” page 5.11

A February 2006 National Academies of Science (NAS) report on the transport of irradiated, or “spent,” nuclear fuel and high-level radioactive waste in the United States concluded that, while safe transport is *technically* possible, “the social risks and related institutional challenges may impinge on the successful implementation of large-quantity shipping programs.” In other words, simply designing waste packages that can withstand an accident is not enough to make a “safe” transportation program. It also has to be well planned and well managed, with stringent regulations carefully enforced, over the entire period of the transportation program. Given the prerequisites for safe transport identified by the NAS, it is clear that the U.S. Department of Energy (DOE) is far from prepared for large-scale shipment of irradiated nuclear fuel through 45 states and the District of Columbia to Yucca Mountain in Nevada or anywhere else.

Notably, the committee chose not to evaluate the risks and benefits of transportation versus leaving the waste at reactor sites for an indefinite period of time. The conclusions of the study, therefore, do not argue for or against at-reactor storage of waste.

More Research Is Needed

The NAS report identifies several vital issues that must be studied before any large-scale shipments of irradiated nuclear fuel commence:

- **Full-scale crash testing of transport packages under severe accident conditions:** The committee “strongly endorses” full-scale testing of waste packages that test the performance of the casks required under current regulations, as well as under conditions that exceed these regulations. The Nuclear Regulatory Commission (NRC) does not currently require full-scale testing to license a cask design.
- **A study of security issues:** The committee found that “malevolent acts against spent fuel and high-level waste shipment are a major technical and societal concern.” However, the committee was not able to examine the security issues of transportation, because they did not have access to classified and restricted information. The report recommends that “an independent examination of the security of spent fuel and high-level waste transportation be carried out *prior to* the commencement of large-quantity shipments to a federal repository or to interim storage.” [Emphasis added.] Private Fuel Storage (PFS) could be ready to start transporting waste through dozens of states to an “interim” surface storage site in Utah in only two years.

¹ The NAS full report, *Going the Distance? The Safe Transport of Spent Nuclear Fuel and High-Level Radioactive Waste in the United States* (2006), is available at <http://fermat.nap.edu/catalog/11538.html>.

- **A study of very-long-duration fires:** The report also concluded that “extreme accident conditions involving very-long-duration fires could compromise” waste containers. The committee recommended that the NRC do additional analyses of these scenarios and “implement operational controls and restrictions” on shipments to reduce the likelihood of conditions that would lead to such fires. It also recommended that transportation planners survey the transportation routes to reduce the number of hazards, such as routes that include tunnels or large-volume shipments of flammable materials, that could lead to accidents resulting in very-long-duration fires. According to the 2002 Final Environmental Impact Statement (EIS) for Yucca Mountain, there are currently numerous of tunnels nationwide along the proposed routes to the site.

DOE May Not Be Up To The Task

The committee expressed concerns about the DOE’s ability to plan and manage a safe program, finding that “the challenges of sustained implementation should not be underestimated.” It is clear from the report’s recommendations that DOE is not meeting the basic requirements for safe transport.

- **DOE should avoid an extended truck transportation program and should not begin large-scale transport of waste until measures for mostly rail shipments are in place.** DOE officially prefers “mostly rail” for transporting waste to Yucca Mountain. As recently as March 2004, however, DOE issued a memo evaluating the possibility of transporting the waste by rail in truck casks to Nevada, where they would then be trucked to Yucca Mountain for the first six years of shipments while a rail line is built to the site. This option had been rejected in the 2002 Final EIS as too costly and too dangerous. In addition, the NAS study found that a “Congressional directive to open an interim storage facility...could also result in large numbers of truck shipments,” which would increase the potential for accidents and the public’s routine radiological exposures, as well as complicate logistics. The study cautions that “the extensive use of trucks in the early stages....could divert time and resources away from implementation of the mostly rail option.”
- **DOE should make public its preferred routes for transporting waste as soon as possible to support state, tribal, and local planning, especially for emergency response.** DOE has not released a specific plan for selecting rail and highway routes, and intends only to select routes four years before Yucca Mountain opens.
- **DOE should fully implement its decision to use dedicated trains² before beginning the large-scale shipment of waste.** The committee concluded that dedicated trains increase efficiency, safety, and security of transport operations. Yet, DOE’s official policy statement declaring the use of dedicated trains leaves open the possibility of continued shipments by general trains.³
- **DOE should negotiate with utilities to ship older fuel first, and if the negotiations are not successful, Congress should consider a legislative fix.** The NAS report concluded that the

² Dedicated trains haul only radioactive waste.

³ General trains haul other cargo in addition to the radioactive waste, including hazardous, flammable, and explosive materials.

shipping order has “important implications for safety, operational efficiency, and possibly security” of the transportation program. Under the terms of the contracts between DOE and utilities, DOE cannot select the locations or ages of the waste to be shipped. Utilities are likely to want DOE to take waste from the irradiated fuel pools, rather than older waste that has been transferred to dry casks, in order to make space in the pools and avoid the cost of moving waste into dry casks. The acceptance order mandated by the Nuclear Waste Policy Act, in fact, could result in cross-country shipments of younger (hotter) irradiated fuel from disparate parts of the country at the early phases of the transportation program.

- **DOE should immediately carry out its emergency responder preparedness responsibilities required by the Nuclear Waste Policy Act, including technical assistance and funding to states and tribes.** DOE does not intend to finalize its procedures for providing this assistance until the transportation routes are selected. Moreover, states and tribes will be eligible for grants only four years before shipments are scheduled to begin through or along their borders, leaving only three years for implementation. Direct training is not required. The committee found that “early training will be essential for developing appropriate organizational memory, culture, and setting expectations.” No emergency responder program is required if waste is shipped to PFS, the privately-owned surface storage site in Utah. A cross county train shipment of irradiated nuclear fuel from West Valley, New York to the Idaho National Lab in July 2003 was similarly veiled in secrecy, leaving elected officials, emergency responders, and the public in the dark.
- **DOE, DHS, DOT, and NRC should promptly develop consistent and reasonable criteria for protecting sensitive information about waste shipments and commit to publicly sharing and providing timely access to information that does not require protection.** The committee concluded that the conflict between security and the public’s right-to-know is “impeding effective risk communication and may reduce public acceptance and confidence.” The report recommends that “the class of information to be protected should be clearly defined and small.” Yet, DOE has further restricted information regarding shipments to the transuranic waste site, WIPP in New Mexico, including refusing to inform the public about any incidents.

Other Government Bodies Must Be Involved

The committee concluded that a successful transportation program requires the active involvement of other federal agencies, including the Nuclear Regulatory Commission, the Department of Homeland Security, and the Department of Transportation, and “in strict adherence to regulations.” The NAS also found that states and tribal governments must play a central role in any waste transportation program. In particular, “state- and tribal-supplied information on local transport conditions is an essential element in route selection decisions.”

Public Concerns Are Legitimate

The study clearly states that opposition to a transportation program and questions about its safety and competence are completely rationale and cannot be dismissed as an unreasonable fear of radiation. According to the report, “most people recognize that transportation programs are run by fallible institutions and that institutional and human error play a large role in determining transportation risks.” The committee concluded that an important failing of DOE is its lack of understanding about the social impacts that could result from a transportation program.