



**UNITED STATES DEPARTMENT OF TRANSPORTATION**

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**Hearing on  
the Safety and Security of Spent Nuclear Fuel Transportation  
before the  
Committee on Commerce, Science, and Transportation  
United States Senate**

**Written Statement of the  
U.S. Department of Transportation**

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**WRITTEN STATEMENT  
OF  
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U.S. DEPARTMENT OF TRANSPORTATION  
BEFORE THE  
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION  
UNITED STATES SENATE**

**September 24, 2008**

**INTRODUCTION**

Chairman Inouye, Ranking Member Hutchison, and Members of the Committee, we want to thank you for the opportunity to appear today on behalf of the Department of Transportation (DOT). We are pleased to discuss DOT's role in the safe and secure transportation of spent nuclear fuel (SNF) and high-level radioactive waste (HLRW) to the proposed geological repository at Yucca Mountain, Nevada.

**THE SAFETY RECORD**

SNF and HLRW have been transported within the United States for more than 50 years, with a solid record of safety and security. More than 1500 shipments of commercial SNF from nuclear power reactors have moved by road and rail without a single incident resulting in an injury, death, or release of the material from the packaging. Likewise, numerous military shipments of SNF; thousands of non-commercial spent fuel and HLRW shipments by the

Department of Energy (DOE); and approximately 30,000 international shipments of SNF have occurred without serious incident.

## **REGULATORY ROLES**

Under the Nuclear Waste Policy Act of 1982, DOE has primary responsibility to plan for and arrange the transportation of SNF to a geological repository.

The Nuclear Regulatory Commission (NRC) is responsible for licensing the geological repository and whatever interim facilities may be needed.

Transportation will be conducted, in accordance with hazardous materials transport regulations issued by DOT, in transport casks approved by the NRC.

States will bear primary responsibility for responding to accidents and incidents within their jurisdictions and in many cases have enacted additional requirements for carrier inspections and escorts. DOE, DOT, and the Federal Emergency Management Agency have provided grants, courses, and course materials for emergency responder training and preparedness related to this transportation. Because DOE plans to take title to the SNF at nuclear reactor sites, that department will be responsible for ensuring the security of the shipments.

## **DOT ROLE IN PROMOTING TRANSPORTION SAFETY**

Within DOT, several agencies are involved in overseeing the transportation of SNF. The Pipeline and Hazardous Materials Safety Administration (PHMSA) administers a national program designed to protect life, property, and the environment from risks inherent in the transportation of hazardous materials, including SNF, in intrastate and interstate commerce. To these ends, PHMSA

identifies and evaluates safety risks; develops and enforces standards for transporting hazardous materials; educates shippers and carriers; investigates transport and packaging incidents and failures; conducts research; and awards grants to improve emergency response to incidents. PHMSA regulations, issued under the Federal hazardous materials transportation safety laws (49 U.S.C. ch. 51), establish commodity-specific standards for the classification, packaging, marking, labeling, and documentation of hazardous materials shipments by rail, highway, vessel, and air. PHMSA's Hazardous Materials Regulations (HMR) also prescribe standards for the loading and unloading of transport conveyances; training of transportation employees; and security of hazardous materials in transportation.

PHMSA shares responsibility for enforcement of the HMR with the Federal Railroad Administration (FRA), the Federal Motor Carrier Safety Administration (FMCSA), the United States Coast Guard, the Federal Aviation Administration, and state law enforcement officials.

For shipments of SNF, PHMSA also works closely with the NRC. PHMSA's regulations incorporate rigorous packaging standards that are developed and overseen by the NRC. Pursuant to a 1979 Memorandum of Understanding, with PHMSA, the NRC has lead regulatory responsibility for the review and certification of the shipping casks used to transport SNF. These casks are performance-tested to assure they can survive "hypothetical" accident scenarios. The tests, which include impact, puncture, thermal and immersion testing, also assure that the casks provide excellent radiation protection to transportation workers who load, unload, or carry SNF and to any member of the general public who may come into proximity with a shipment of nuclear material during its movement in transportation. Because the time that it takes

to move a shipment from origin to destination directly affects radiation exposure, the NRC requires that shipments of SNF be planned to avoid intermediate stops to the extent practicable. PHMSA's regulations also prohibit unnecessary delay in the transportation of hazardous materials.

FRA enforces the HMR applicable to rail shipments as part of a national safety program covering all aspects of railroad operations. FRA regulations issued under the Federal railroad safety laws (49 U.S.C. ch. 201-213) govern the design, maintenance, and inspection of track, equipment, signals, and train control systems and prescribe standards for employee qualifications, training, and operating practices. FRA also advises PHMSA on rulemakings involving the rail transportation of hazardous material and enforces the HMR in the rail mode. Railroads are required to conduct their own inspections to ensure that these safety standards are being met. Approximately 500 Federal and State safety inspectors monitor the railroad companies' own inspection forces to verify compliance with applicable Federal safety standards. FRA and State inspectors accomplish this task by conducting routine inspections and programmed focused inspections of railroad properties and comparing their findings to a railroad's own inspection records, as well as conducting compliance investigations. Thus, while primary responsibility for inspecting the railroad property and operations rests with the railroads themselves, FRA's inspection strategy is to ensure the integrity and effectiveness of the railroads' own inspection programs in complying with applicable Federal safety regulations and standards. In the case of SNF shipments, as set forth in the following section, FRA and rail carriers have taken a number of actions to further strengthen safety and security controls.

Although rail will be the primary mode of transportation for SNF shipments to the repository, some motor carrier movements also will be necessary. In addition to the HMR, these movements will in accordance with FMCSA regulations governing vehicle condition, driver safety, and security. Under FMCSA's regulations, a motor carrier transporting SNF must hold a safety permit issued by FMCSA, and a pre-trip inspection of the shipment must be performed by an authorized State or Federal law enforcement official. In addition, States may designate preferred routes for highway shipments of SNF, in accordance with FMCSA's regulations. Preferred routes are interstate highways and alternate routes designated by a State routing agency. An interstate bypass or beltway around a city, when available, must be used rather than an interstate route through a city. Under these regulations, a State or locality may not designate (or restrict the use of) routes that "export" transportation risks to a neighboring jurisdiction or unnecessarily delay the transportation of hazardous materials.

### **EMERGENCY RESPONSE**

Effective response to a transportation accident or incident involving SNF is enhanced through Federal requirements and resources, including financial assistance to States and localities for emergency response planning and training. DOE maintains regional emergency management field offices that can dispatch qualified response teams to an incident involving nuclear material, but first responders are primarily local fire departments and law enforcement agencies. (In the event of a radiation emergency, emergency response is typically handled by the appropriate state radiation control agency and first responders are trained to stay clear and call the state radiation control

officer.) PHMSA's hazard communication requirements (shipping papers, package marking and labeling, and vehicle placarding) inform these responders of the hazards involved. For shipments of SNF, coordination with local responders is also enhanced by the NRC's physical protection requirements that provide for advance notification to the State governor (or his representative) of each shipment to or through the State and advance arrangements with local law enforcement agencies for response to an emergency or a call by escorts for assistance. Local emergency response capabilities are strengthened by PHMSA's planning and training grants to States, who in turn pass at least 75 percent of the grants through to local communities.

### **RAIL TRANSPORTATION OF RADIOACTIVE MATERIALS**

With regard to rail transportation of SNF and HLRW in particular, FRA conducts inspections to verify that shipments are properly prepared for rail transportation and in compliance with all applicable provisions of the HMR. FRA also helps to ensure that the track, signal systems, grade crossings, bridges, and rail vehicles used for these shipments are in safe condition and that responsible railroad employees involved in these movements are trained, briefed, and properly performing their jobs. In these activities, FRA works very closely with the railroads, their employees, and the affected communities. Ultimately, the safe movement of SNF and HLRW depends on the application of sound safety regulations, policies, and procedures. This requires extensive planning and coordination among Federal agencies, State and local governments, and commercial transportation companies.

Since the mid-1980s, FRA has implemented a basic focused inspection policy for all known rail shipments of SNF and HLRW. In 1998, with the advent of a significant potential for increased SNF and HLRW by rail, FRA recognized the need to enhance the existing policy to ensure that the railroad industry's outstanding safety record for nuclear material shipments could continue unabated. This updated policy, the *Safety Compliance Oversight Plan for Rail Transportation of High-Level Radioactive Waste and Spent Nuclear Fuel*, known as SCOP, set forth an enhanced FRA policy to address the safety of rail shipments of SNF and HLRW. FRA applies this enhanced policy to ensure the safety of all known rail shipments of SNF and HLRW. The SCOP is a "living document" periodically requiring modification and update as needed based on new regulations, technologies, and procedures.

The development of the SCOP involved a coordinated effort among FRA, DOE, the Association of American Railroads (AAR), railroad labor organizations, and representatives of affected States and Native American groups, and FRA acknowledges the invaluable contribution of each of them. Key elements of the SCOP include the following: (1) coordinated planning for selecting the most appropriate and viable routes, (2) ensuring appropriate training of railroad employees and emergency responders, and (3) enhancing and focusing FRA's safety inspections and monitoring activities on all facets of the rail shipments of SNF and HLRW.

Under current route-selection requirements, FRA works with DOE, utility companies, or other shippers, and the involved railroad companies in planning and selecting the routes, emphasizing the selection of the highest classes of track. (Under FRA's regulations, each higher class of track has a greater permissible operating speed and more stringent safety standards.) Additional



requirements for selecting the safest and most secure routes for transporting SNF and other high-hazards materials were also adopted in PHMSA's interim final rule, "Enhancing Rail Transportation Safety and Security for Hazardous Materials Shipments," published on April 16, 2008. Under these requirements, a rail carrier must analyze the routes over which these materials may be transported and, based on that analysis, select the safest and most secure route to be used. The Transportation Security Administration (TSA) is also engaged in a rulemaking that includes proposals to enhance the security of rail shipments of certain hazardous materials, including SNF, by requiring carriers to designate a security coordinator, report security concerns to TSA, establish a chain of custody for shipments, and advise TSA of the location and other specific information regarding shipments within one hour of a request from TSA.

FRA also coordinates with Operation Lifesaver, Inc., a private safety organization, to increase grade crossing safety awareness and education in communities along routes. FRA works with appropriate agencies of the Department of Homeland Security, the NRC, and DOT's Office of Intelligence and Security in identifying security issues and measures. FRA assists with coordination among the shipper, Federal and local law enforcement representatives, and intelligence communities on security matters. Finally, FRA reviews the security and emergency response plans of the shipper and the rail carrier to ensure that they adequately address the transportation security risks and the actions to be taken along the route in the unlikely event of an accident or incident.

Another important element of the SCOP is training. It is FRA's policy to assist DOE and other shippers in the development of emergency response

training and safety briefings and to monitor the rail carrier and the shipper to verify that requisite training and briefings have been performed. FRA also conducts reviews to ensure that train crews who operate the trains in which nuclear materials are transported are properly certified, trained, and experienced in running over the routes. Finally, FRA checks to see that these crews have received specific training concerning the nature of the shipments.

Federal regulations for shipment of nuclear material by rail are augmented by a series of safety and security protocols and special operating restrictions that have been agreed upon by DOE and the railroads. These protocols and operating restrictions, AAR Circular OT-55-I, Recommended Railroad Operating Practices for Transportation of Hazardous Materials and AAR Standard S-2043, Performance Specification for Trains Used to Carry High-Level Radioactive Material, for example, have evolved over the years and are often tailored to the particular needs of these types of shipments. Under these protocols, a train carrying SNF or HLRW would typically include the cask cars, at least two buffer cars, and an escort car. One buffer car is before and one is after the cask cars; the buffer cars are required by regulation and not only provide separation from the occupied locomotive and from the escort car but also act as a cushion against direct impacts on the cask cars in the event of a collision. The escort car would be staffed with appropriate nuclear safety and security personnel. Special operating restrictions have included limitations on the maximum speed of trains carrying nuclear materials, requirements to stop opposing trains on adjacent tracks when they meet a train carrying nuclear materials, and requirements that cars carrying nuclear material be switched only with an attached locomotive rather than allowing them to roll to a stop on their own during switching.

Another convention involving the shipment of SNF and HLRW by rail concerns the use of dedicated trains. Until the mid-1970s, most rail shipments of these radioactive materials were handled in regular service trains that carried a wide variety of other freight in addition to radioactive materials. However, in 1974, the railroad industry adopted a strong position that radioactive materials shipments should move in dedicated trains that transport only the radioactive material. Under a congressional mandate, FRA engaged the services of the John A. Volpe National Transportation Systems Center to conduct a thorough study of the safety implications surrounding the transportation of SNF and HLRW in dedicated trains versus regular service trains. In September 2005, FRA transmitted its March 2005 report containing the study's results to the Congress, "Use of Dedicated Trains for Transportation of High-Level Radioactive Waste and Spent Nuclear Fuel." The report concluded that dedicated train service offers the lowest accident probability and can reduce radiation exposure in the event of an accident by mitigating the consequences and simplifying wreck clearance. The report also stated that additional research is needed to fully assess the costs and risks of transporting SNF. The Department is conducting additional research to assess conditions for the transportation of SNF and expects to issue a responsive notice of proposed rulemaking in fiscal year 2009.

The security of rail shipments of radioactive materials has long been a priority even before the tragic events of September 11th. Some of the protocols described above contain stringent security measures to protect against terrorist threats, including the accompaniment of these shipments by armed security forces, direct liaison with State and local law enforcement and first

responders, and requirements to protect the cars when sitting in rail yards or sidings.

## **CONCLUSION**

Through its comprehensive safety programs, and key partnerships with other Federal, State, and local authorities, DOT is prepared for the additional shipments of high-level radioactive materials associated with the opening of a proposed new geological repository for SNF. As planning for the repository progresses, DOT will continue to work with the Congress, the nuclear industry, the transport community, and appropriate Federal, State, and local agencies to review and improve existing safety standards; promote the development of new risk-reducing technologies; strengthen the preparation of emergency responders; and otherwise enhance the system of safety controls for SNF and HLRW transportation. With continued vigilance, DOT is committed to maintaining the strong record of safety and security established over the last 50 years.

We appreciate the opportunity to discuss DOT's transportation safety and security program for SNF. Thank you. We would be pleased to answer any questions you may have.

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