STATEMENT OF

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UNITED STATES HOUSE OF REPRESENTATIVES

COMMITTEE ON ENERGY AND COMMERCE

SUBCOMMITTEE ON ENVIRONMENT AND THE ECONOMY

HEARING ON THE TRANSPORTATION OF SPENT NUCLEAR FUEL

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The Association of American Railroads (AAR) appreciates this opportunity to address the transportation of spent nuclear fuel (SNF).[1] AAR members account for the vast majority of freight railroad mileage, employees, and traffic in Canada, Mexico, and the United States.

If policymakers determine that it's in the public interest for meaningful amounts of spent nuclear fuel to be transported to one or more repositories, AAR members would probably be called upon to handle many, if not most, of those movements. The Department of Energy (DOE) has long indicated its preference for using rail to transport SNF, and the Yucca Mountain project had formally established a "mostly rail" policy before the program was cancelled. In 2006, a National Academy of Sciences committee reaffirmed the preference for using rail, saying that it "strongly endorses DOE's decisions to ship spent fuel and high-level waste to the federal repository by mostly rail using dedicated trains."[2] And in January 2012, the Transportation and Storage Subcommittee of the Blue Ribbon Commission on America's Nuclear Future repeated the NAS point that "Mostly rail has clear advantages."[3]

The preference for rail is based predominantly on safety. To our knowledge, there has never been a release of radioactive materials in connection with the transportation of SNF by rail. To date, only small volumes of SNF have been transported by rail — from 2000 through 2014, total shipments were 391 carloads. Railroads are confident that they would be able to transport larger volumes of SNF safely and securely, though rigorous measures focused on safety and security would clearly be necessary.

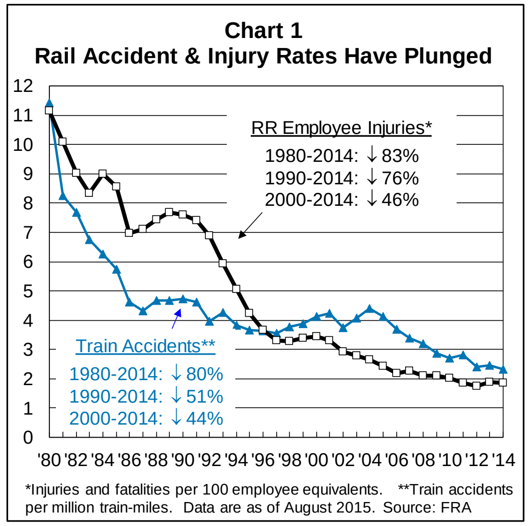
[1] For simplicity, in this testimony "SNF" refers to spent nuclear fuel and similar high-level waste.

[2] National Academy of Sciences, National Research Council, Committee on Transportation of Radioactive Waste, Going the Distance? The Safe Transport of Spent Nuclear Fuel and High-Level Radioactive Waste in the United States, 2006, p. 4.

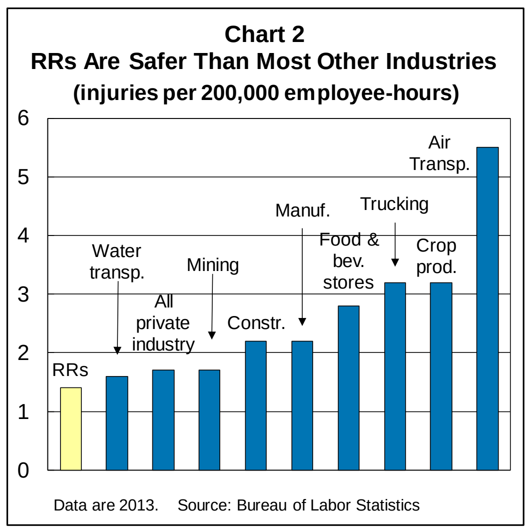
[3] Blue Ribbon Commission on America's Nuclear Future, Transportation and Storage Subcommittee, Report to the Full Commission: Updated Report, January 2012, p. 65.

Overview of Freight Rail Safety

Nothing is more important to railroads than safety, and the industry's commitment to safety is reflected in safety statistics from the Federal Railroad Administration (FRA). The train accident rate in 2014 was the lowest ever, down 80 percent from 1980 and down 44 percent from 2000; the employee injury rate in 2014 was down 83 percent from 1980 and down 46 percent from 2000; and the grade crossing collision rate in 2014 was down 80 percent from 1980 and down 38 percent from 2000 (see Chart 1).



Moreover, according to data from the Bureau of Labor Statistics, railroads today have lower employee injury rates than other transportation modes (including trucks, water transportation, and airlines) and most other major industries, including agriculture, mining, manufacturing, and construction (see Chart 2). Available data also indicate that U.S. railroads have employee injury rates well below those of most major foreign railroads.

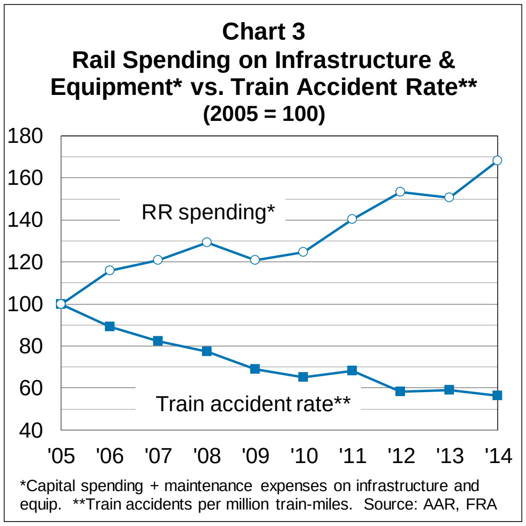


Rail safety extends to hazardous materials as well. U.S. railroads transport approximately two million carloads of hazardous materials each year. In 2014, 99.999 percent of rail hazmat shipments reached their destination without a release caused by a train accident. Rail hazmat accident rates in 2014 were down 95 percent since 1980, down 74 percent since 1990, and down 66 percent since 2000. Although no firm in any industry can guarantee that it will never suffer an accident, the railroads' overall safety record should give this committee and the public confidence in the rail transport of SNF if policymakers decide that the public interest requires its transportation.

Working to Ensure That Rail Safety Continues to Improve

Railroads devote enormous resources in a multi-pronged strategy to help ensure that rail safety continues to improve.

For example, in recent years, America's freight railroads have been spending more than ever — including $28 billion in 2014 and a projected $29 billion in 2015 — on their infrastructure and equipment, part of more than $575 billion U.S. freight railroads have spent since 1980 to maintain and enhance their networks. The vast majority of this spending has improved rail safety directly or indirectly. In fact, in many cases, improving safety is the primary reason for the spending. The more railroads put back into their systems, the safer they become (see Chart 3).



Railroads are also constantly incorporating new technologies to improve rail safety, including sophisticated detectors along tracks that identify potential defects in passing rail cars and specialized inspection cars that identify defects in tracks. Many technological advancements are developed at the Transportation Technology Center, Inc. (TTCI) in Pueblo, Colorado, a subsidiary of the Association of American Railroads that is widely considered to be the finest rail research facility in the world. In the past, studies involving SNF transportation have taken place at TTCI.

Virtually every aspect of rail operations is subject to oversight by the FRA. Among many other areas, railroads are subject to stringent FRA regulation regarding track and equipment inspections; employee certification; operating speeds; and signaling systems. FRA safety inspectors travel the country evaluating rail facilities and operations. In many states, FRA inspectors are supplemented by state inspectors. Railroads are also subject to safety oversight by a number of other federal agencies, including the Occupational Safety and Health Administration (OSHA), the Pipeline and Hazardous Materials Safety Administration (PHMSA), and the Department of Homeland Security (DHS).

How Can the Safety of SNF Transport be Maximized?

Railroads recognize that public concern over radioactive materials requires that all parties involved in the transport of SNF take special measures to ensure safe movement. In particular, the DOE and Department of Defense (as the shippers of SNF), the Department of Transportation (the regulator of the safety aspects of hazmat transport), and the railroads must work together to design the safest possible transportation system for SNF.

For many years, the rail industry has urged the use of dedicated trains — *i.e.*, trains with no other freight than SNF, carefully monitored and traveling from origin to destination — to transport SNF. Dedicated trains offer numerous safety advantages that would reduce the already very small possibility of an accident involving SNF transport.

First, SNF cars in dedicated trains would not have to be "switched" in and out of trains at rail yards, many of which are located in or near major metropolitan areas. Switching would be required if SNF cars were transported in general freight service. Switching increases the amount of handling a freight car receives. All else equal, the more a freight car has to be handled, the greater the risk of an accident.

Second, because of the extreme weight of SNF cars, it's safer for them to be in dedicated trains. The vast majority of loaded rail cars on the U.S. freight rail network weigh no more than 286,000 pounds.[4] SNF cars, though, would weigh approximately 400,000 pounds. If hauled in general freight service, these extremely heavy SNF cars could generate high in-train forces, such as slack action (the force exerted throughout the train as trains accelerate, decelerate, and operate over undulating and curved terrain) that increases the possibility of a derailment. Slack action is much easier to control in a short, dedicated train than in a long, general service train, especially in trains with extremely heavy cars mixed with other normal-weight cars.

Third, dedicated trains are needed to accommodate the customized rail cars that would be used to carry the casks in which spent nuclear fuel is transported. For example, car wheel assemblies that are specially designed to handle both the weight and the delicacy of this commodity can be incorporated in all rail cars in dedicated SNF trains. These customized designs reduce lateral wheel forces and vertical dynamic impact forces, which can result in derailments. If SNF were transported in general freight service, it is unlikely that other freight cars would have the custom features necessary to properly manage these overweight and delicate loads. More generally, dedicated trains eliminate the possibility of a derailment of an unrelated car having as a side effect the derailment of or damage to a car carrying SNF.

Fourth, dedicated trains minimize the time spent in transportation, an important factor for security. It would take longer (possibly significantly longer) to transport SNF from origin to destination if SNF were transported in mixed-freight trains instead of dedicated trains, because

[4] A small minority of rail cars in general service weigh up to 315,000 pounds. In extremely rare cases (for example, movements of power plant generators), railroads will haul much heavier shipments, but almost always in special train service.

the switching of rail cars in and out of trains takes time and because railroads can more readily schedule dedicated trains to move quickly and smoothly through sensitive areas.

Finally, dedicated SNF trains can be transported with greater security. Escorts, which are required by the Nuclear Regulatory Commission (NRC) for all SNF movements, are able to monitor SNF much more easily in dedicated trains than in general freight service.

The FRA has determined that dedicated trains for the transportation of SNF would reduce accident risks through avoidance of yards, reduced derailment potential, and reduced risk of the involvement of other hazardous materials in an accident.[5] Similarly, the National Academy of Sciences has determined that dedicated train transportation of SNF has operational, safety, security, communications, and planning advantages over transportation in general merchandise trains.[6]

Steps railroads take to enhance rail safety in general, including those discussed earlier — upgrading of infrastructure through new investments, new inspection technologies, and so on — also enhance the safety of hazmat transportation. That said, railroads also have long been taking additional concrete steps to make hazmat transportation in particular safer. Many of these are pertinent to SNF transportation. Some examples:

- Routing model. Several years ago, the rail industry and several federal agencies jointly developed the Rail Corridor Risk Management System (RCRMS), a sophisticated statistical routing model designed to help railroads analyze and identify the overall safest and most secure routes for transporting highly hazardous materials. The model uses a minimum of 27 risk factors — including hazmat volume, trip length, population density along the route, and emergency response capability — to assess the overall safety and security of rail routes. This routing model would be used to ship SNF.
- Chain of custody. Railroads follow stringent Transportation Security Administration "chain of custody" requirements for rail cars carrying toxic-by-inhalation (TIH)

[5] Federal Railroad Administration, Use of Dedicated Trains for Transportation of High-Level Radioactive Waste and Spent Nuclear Fuel: Report to Congress (March 2005).

[6] National Academy of Sciences, Going the Distance?, op. cit.

materials[7]. Transfer of TIH cars from a shipper to a railroad, from one railroad to another, and from a railroad to a receiver must be carefully documented. The same requirements apply to SNF.

- Information sharing. Rail industry personnel are in constant communication with the TSA, other agencies within DHS, the Department of Defense, DOT, the FBI, and state and local law enforcement agencies to share intelligence and security information.
- Inspections. Railroads would conduct at least two comprehensive track geometry inspections each year on main line routes over which SNF trains were moving.[8] Current FRA regulations do not require railroads to perform comprehensive track geometry inspections.
- Emergency response. Railroads have extensive emergency response capabilities. Railroad personnel work in cooperation with federal, state and local governments, to assist communities in the event of an incident involving hazardous materials. All the major railroads have teams of full-time personnel whose primary focus is hazmat safety and emergency response. Teams of environmental, industrial hygiene, and medical professionals are available at all times to provide assistance during hazmat incidents. Each year, railroads actively train well over 20,000 emergency responders throughout the country. This training ranges from general awareness training to much more in-depth offerings.
- Tunnels. If a train carrying SNF were to meet another train carrying loaded tank cars of flammable gas, flammable liquids, or combustible liquids in a single bore double track tunnel, one train will stop outside the tunnel until the other train is completely through the tunnel.

Equipment standards for SNF trains are exceedingly stringent. Spent fuel requires transport in massive steel casks that are several feet in diameter, with walls many inches thick and that contain materials that shield the outside against radioactivity. These casks have to be able to withstand a range of extreme forces, including long drops, a fully engulfing fire, and extensive underwater submersion. To the extent that there is not an adequate supply of these casks to meet transportation needs, they would obviously have to be built and tested before transportation could occur.

[7] TIH materials are gases or liquids (such as chlorine and anhydrous ammonia) that are especially hazardous if released.

[8] Track geometry includes such parameters as track gauge, curvature, alignment, profile, and the cross level of the two rails. Track geometry inspections are generally performed by sophisticated stand-alone cars that use a variety of sensors, measuring systems, and data management systems to create a representation of the track being inspected.

Conclusion

Many of the issues surrounding the transportation of spent nuclear fuel and other high-level waste are controversial, and many issues remain to be resolved. What isn't controversial is that the transportation of spent nuclear fuel requires extreme care. If policymakers determine that a single or several regional repositories for spent nuclear fuel are in the public interest, the railroads will work with the relevant entities on all issues regarding the transportation of SNF to those repositories. Railroad are confident that they can provide the necessary level of care, but doing so will require close cooperation and extensive planning involving DOE, DOT, and others if safety and security is to be maximized.