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BEFORE THE NUCLEAR WASTE TECHNICAL REVIEW BOARD

TRANSPORTATION & SYSTEMS PANEL

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TRANSPORTATION OF NUCLEAR MATERIALS BY RAIL

I appreciate this opportunity to share with the Nuclear Waste Technical Review Board some railroad industry views on the transportation of nuclear materials. While the transportation of spent fuel has not taken place on the scale that is envisioned for the nuclear repository, the railroad industry has gained substantial experience transporting spent fuel. That experience has shown that the railroad industry can transport spent fuel safely, serving its customers while being protective of the public interest. Today, I would like to spend a few minutes reviewing the history of the transportation of spent fuel by rail and the issues of concern in this area.

BACKGROUND

While the last twenty years were both exciting and difficult times for the nuclear industry, during this same time period the freight railroads in the United States were also undergoing dramatic changes. In 1975 there were 67 Class I railroads; however, because of mergers, this number had dropped to 14 by 1989. Although the number of railroad companies declined, the industry continued to grow, with net investment increasing from 28 billion dollars in 1970 to 47 billion dollars in 1988. Traffic also increased, with a record 996 billion revenue ton-miles carried in 1988. This record was accomplished using fewer employees, fewer locomotives, and less fuel. Railroad safety also improved dramatically, with annual train accidents dropping from 8,451 in 1980 to 3,080 in 1989, a 63.5 percent reduction. Thus, over the last decade, the railroad industry has improved its productivity and safety record, rationalized its physical and human resources, and substantially increased its investment in track and equipment.

In the early 1970's several large railroads became concerned about the movement of spent nuclear fuel by rail and requested the Association of American Railroads (AAR) to study the problem. Acting on the findings of a select committee, the Board of Directors of the AAR recommended, among other things, that spent fuel shipments be carried only in special trains in which spent fuel was the only commodity.

Disputes over the rates railroads were charging to cover the costs of these special train movements wound up before the Interstate Commerce Commission (ICC) in 1976. Following lengthy hearings, the ICC's Administrative Law Judge ruled that the ICC could not hear questions of safety, as that was the domain of the Department of Transportation (DOT).

Without safety as a basis for requiring the use of special trains, the ICC found the special train tariff to be excessive. As a result, railroads were prohibited from charging special train rates for these shipments unless the shipper requested such service. The ICC and the courts have rules that railroads are required as common carriers to transport spent fuel when tendered. Consequently, the ICC's decision on rates meant that railroads have to bear the extra cost of dedicated train service.

In the early 1980's the AAR joined forces with the Department of Energy (DOE) to sponsor workshops on nuclear materials transportation and on emergency response planning. In addition, DOE sponsored field trips for railroad personnel to Rocky Flats, Sandia, and WIPP. The AAR sponsored field trips to railroad facilities to acquaint DOE personnel with railroad operational procedures. AAR and railroad personnel have also served on the TRUPACT Peer Review Group. Following passage of the 1982 Civilian Waste Act the AAR established a standing committee to address problems associated with the transport of nuclear materials and to interface with DOE's Office of Civilian Radioactive Waste Materials (OCRWM).

TRANSPORTATION ISSUES

A. Accident Prevention

The railroad industry approaches the transportation of spent fuel as it does hazardous materials in general. Safety involves accident prevention; the prevention of releases when accidents occur; and appropriate emergency response measures. Accident prevention requires the dedication of resources to the prevention of derailments. Most derailments are caused by human error, track defects, or rail car mechanical problems. The 1980's saw a dramatic decline in the accident rate because railroad deregulation resulted in railroads having the financial wherewithal to invest in their facilities.

The railroad industry does not claim expertise in the design of spent fuel casks. We do know something about the design, testing, and operation of loaded and empty railcars. We are always concerned about new railcars, as experience has taught us that new designs sometimes have problems that must be resolved before the car can be safely used in service. To date the AAR has held two car construction workshops for DOE personnel and their contractors and is willing to continue to work with DOE in the development of their new railcars. Discussions have been held with DOE regarding the full scale testing and certification of the new railcars at the AAR Transportation Test Center (TTC) in Pueblo, Colorado. We strongly recommend that DOE follow through with its intent to test its new cars at TTC before introducing them into service. The railcar tests should be undertaken for both loaded and empty configurations, and the results should be made available to the railroad industry.

B. Cask Integrity

The spent fuel cask itself is probably one of the best shipping containers we handle. Unlike the case with most hazardous materials, the cask/car system is designed specifically for the commodity it will transport, spent fuel. We are familiar with the test criteria and are confident that the cask will successfully pass the tests. Further work needs to be done in this area, however. DOE, with the assistance of the railroads, needs to better explore the relationship between the test criteria and the actual forces that would be generated in a train accident. We need to determine the failure modes and mechanical and thermal failure thresholds of the cask.

To date the railroads have been committed to dedicated trains because they enable railroads to control the mechanical and thermal forces that the cask would be subjected to. Not allowing any other commodities to be carried on the train reduces the risk of exposing the cask to excessive thermal forces. If a cask is breached and no subsequent fire is available for dispersing the radioactive material, the problem remains local. If, however, other commodities on the train provide combustible materials to generate a fire of sufficient magnitude to disperse the radioactive materials over a wide area, the problem could reach catastrophic proportions. Through the use of dedicated trains, railroads can prohibit other commodities in the train consist that would pose such hazards. Dedicated trains also enable railroads to impose appropriate operating controls which will limit the mechanical forces that could be generated in an accident.

It should be noted that the issue of dedicated trains will be the subject of a Department of Transportation study in the near future. The Hazardous Materials Transportation Uniform Safety Act of 1990 requires DOT to study whether dedicated trains should be used for spent fuel within two years of enactment of the new law. DOT is to promulgate whatever regulations it deems appropriate for the transportation of spent fuel. DOT also is to undertake a study examining a wide variety of issues involved in the transportation of spent fuel, such as the selection of modes and routes.

C. Accident Response

Emergency response is critical for two reasons. It obviously is important that adequate emergency response capabilities exist to respond to releases of spent fuel like any hazardous material. It also is important that the public be assured that sufficient emergency response capabilities exist so that the public has confidence in the transportation system.

Sufficient emergency response capabilities to respond to accidents are necessary to protect the public and to protect railroads as economic enterprises. Railroads are unique in that only railroads own the rights-of-way over which they operate. When an accident does occur, other transportation modes have considerable flexibility in being able to detour around the accident. A railroad generally does not have this luxury. A truck, for example, can easily detour around a highway closure. A train

must follow the tracks. Any obstruction to the railroad's track system will stop the movement of all rail transportation through that territory. Delay in opening the track to service can result in large losses in revenue not only to the railroad, but also to the myriad industries and communities that rely on rail transportation. In addition, when an accident does occur on a railroad, the railroad generally pays for repairing the right-of-way.

Viewed from this perspective, spent fuel poses special problems. When hazardous materials accidents occur, railroad industry experts and outside contractors with necessary expertise respond as necessary. Neither industry personnel nor their contractors, however, possess expertise on responding to emergencies involving spent fuel. Plan and procedures must be developed by DOE for responding to emergencies, including decontamination and disposal of material involved in or affected by such an accident.

The railroad industry looks forward to working with government agencies to develop the emergency response capability that must be in place before large scale radioactive material shipments take place. The railroads need to be assured that responsible, properly trained individuals will be available in a timely fashion at the scene of an accident involving spent fuel. These individuals must have the authority and willingness to act in a decisive manner. Contractors capable of cleaning up releases of radioactive materials must be available when the spent fuel is shipped. First responders must be provided with appropriate equipment and training.

Public perception of the adequacy of emergency response capabilities is critical. Rightly or wrongly, the public views the transportation of spent fuel as presenting unique problems. The public must be assured that government emergency response personnel possess the necessary expertise and are making the right decisions.

LIABILITY

One final issue concerns the railroads' potential liability for transporting nuclear materials. Three Mile Island (TMI) taught us that enormous costs can be incurred as a result of a "nuclear accident", and if there is no release of product, Price-Anderson does not cover these costs. For a railroad to stay in business, it must be able to charge an amount sufficient to cover the actual cost of the move, an amount for profit, and an amount to cover the risk associated with the move. How can we do this when Congress has left uncertain the extent of Price-Anderson coverage? Are the railroads covered by DOE for the costs incurred for the shutdown of a mainline, or for the evacuation of a city even though there is no release of radioactive material?

The railroads can transport spent fuel safety and efficiently. The railroads look forward to working with public agencies so that the steps necessary to ensure this are accomplished. Further work needs to be done to ensure that the cask and the rail car are the best that can be designed and will meet all the conditions of the transportation system; that railroads have all the necessary data to determine how the cask will respond in derailments; that adequate emergency response capabilities are developed; that the public is assured that railroads and government agencies are doing everything necessary to protect the public interest; and that liability issues are resolved.

Thank you.