Robert E. Fronczak, P.E.
Executive Director
of Environmental Affairs

ASSOCIATION
OF AMERICAN
RAILROADS

18 July 1996

Mr. William Knoll
Department of Navy
Code NAVSEA 08U
2531 Jefferson Davis Highway
Arlington, VA 22242-5160

Subject: Comments of the Association of American Railroads (AAR) on the "Department of Navy Draft Environmental Impact Statement for a Container System for the Management of Naval Spent Nuclear Fuel"

Dear Mr. Knoll:

On behalf of its member railroads, the Association of American Railroads (AAR) submits the following comments on the Department of Navy Draft Environmental Impact Statement (EIS) for a Container System for the Management of Naval Spent Nuclear Fuel. AAR's member railroads are transporters of radioactive materials and hence have a significant interest in the container system.

General

A The railroads believe that in the interests of public health, safety, environment, and property, the risks of transporting radioactive waste must be identified. A plan for managing those risks in the rail transportation environment must be developed that is consistent with the rail industry's goal of operating trains carrying radioactive waste at prevailing track speeds. The best available technology should be used to provide safe and seamless transportation over the life of the Department's Naval Spent Nuclear Fuel (NSNF) shipping campaign.

Dedicated Trains

B The Draft EIS states in several locations that "dedicated trains may be used if appropriate." The railroads believe that a dedicated train system would provide the greatest degree of safety and operating flexibility. The train should be short to permit braking over a short distance and avoid unduly slow acceleration and low operating speeds. A dedicated train would not have to make time-consuming stops in rail classification yards and could be given high priority.

The government should own all of the rail equipment, including buffer cars, cask cars, and escort cars. The Navy should use the most technologically advanced equipment, such as electro-pneumatic braking systems, AAR's 1-B wheel profile, an onboard defect detection system, the best available suspension, and passenger car (tightlock) or tank car (double shelf) couplers

All cars in a train should use the same suspension and braking equipment and be a consistent weight car to ensure safe dynamic operation. A prototype of an entire train should be thoroughly tested to ensure consistent performance in a variety of railroad operating environments. Thorough and frequent maintenance should be required to ensure long-term peak performance.

Buffer cars should be low-sided to permit unobstructed visibility by security escorts at all times. Design of the buffer car should not impair the crash worthiness of the cask. Ordinary freight cars would be inappropriate since they would not necessarily be equipped with innovative features and would not be specifically designed for spent fuel transportation. Similarly, cabooses would not be suitable cars for security escorts because of the cabooses' light weight, lack of creature comforts, and lack of onboard monitoring equipment.

Performance Monitoring

C Automatic Equipment Identification (AEI) or satellite tracking technology should be used by the Navy to track the location of its trains. Industry-developed AEI technology would be adequate to monitor periodically changes in the location of trains. However, satellite tracking would permit real-time monitoring.

The Navy should consider the development of defect detection systems providing real-time monitoring of train system performance. Such systems would minimize the likelihood of accidents caused, for example, by overheated wheels and wheel bearings, brake failure, and coupler failure.

Devices that monitor the contents of a cask car, such as Sandia Labs' "green box," should be employed to provide real-time information to the Navy. This technology, coupled with communication equipment, would alert the Navy to any problems that require attention. Onboard Navy technical experts, in addition to security escorts, should be available to provide initial technical assistance.

Train Speed

Concern over the crash worthiness of casks has led AAR to recommend that trains containing NSNF be restricted to 35 mph and that when a train containing NSNF meets another train, one train should stop while the other passes. These operating restrictions interfere with normal railroad operations, hindering the railroads' ability to provide their customers with fast, efficient service. Passenger trains and freight operate at speeds as high as 90 and 70 mph, respectively. With increasing demands for efficient rail service, it is likely that train speeds will further increase over the next several decades. FRA, in fact, authorizes freight trains to operate at 80 m.p.h.

D The NSNF transportation system should preclude the need for risk management techniques such as special speed limits for NSNF or stopping NSNF trains while opposing traffic passes by on another track. In addition to facilitating rail transportation, a transportation system permitting the operation of NSNF trains just like other freight rains would minimize the number of shipping canisters and other rail transportation equipment the Navy will need to purchase.

Routing

E The railroad industry believes that regulatory control over rail routing to avoid population centers would be counterproductive from a safety perspective. Routing to avoid populated areas would increase transit times and the potential for an incident to occur because of the circuitous route the trains would take. Not only would routes avoiding urban areas be significantly longer, but train speeds over such routes would be slower. Main line tracks are the tracks maintained for the fastest service, and such routes typically pass through urban areas.

Accident Prevention

F Regardless of the crash worthiness of casks, steps must be taken to minimize derailments of trains containing NSNF. Research and testing should be conducted on the dynamics of NSNF train operation at various speeds. Alerting systems and the best possible braking systems should be employed to help prevent accidents. Thus, a short dedicated train capable of stopping in a short distance is of critical importance.

G The Navy also must take appropriate steps to avoid harm to railroad employees through long-term exposure to NSNF. Since NSNF trains will be used for perhaps 30 years, there may be a potential for buildup of radiation.

Emergency Response

H Should an incident occur, emergency response roles must be clearly defined. The Navy should assume the responsibility for any and all consequences of an accident that is related to NSNF. The Navy should arrive at an accident scene promptly, prepared to manage radiological threats, real or perceived. Local officials should be provided with the appropriate training and be prepared to work cooperatively with the railroad officials in restoring rail service as soon as possible. Training on the potential risks associated with the transportation of NSNF should also be available to railroad supervisors and employees. Railroad officials should be trained on what to expect and how to interface with public officials in the event of an incident involving NSNF.

Emergency recovery of casks should be planned in advance for all possible situations. It may be extremely difficult to recover a cask by traditional railroad methods. DOE should shoulder the responsibility for ensuring emergency response personnel and equipment are available for all conceivable types of accidents.

The railroad industry has long been concerned about the potential economic impact of an incident occurring on its property. The Navy should be financially responsible for any event that occurs on railroad property, including evacuation, human casualties, environmental contamination, and loss of revenue from delays in reopening rail service. The indemnification provided by the Price-Anderson Act does not cover private property damage, such as the loss of track and equipment involved in a derailment.

It is our understanding that Price-Anderson indemnification does cover consequential damages, including liability for evacuations and the cost of rerouting traffic. However, there is little experience with Price-Anderson's provisions and further clarification of its scope would be appropriate.

Cask Crash Worthiness

I The Nuclear Regulatory Commission standards for cask design and testing should be reevaluated in light of the current railroad operating environment and anticipated changes. Trains are longer, heavier, and faster than they were when the standards were first developed. There are many more new car designs today and more to come. The weight of rail vehicles has increased from the 70-ton load typical of the 1960's and 70's, when the regulations were developed, to 100-125 tons today. The gross weight of future rail cars may be even greater. Train speed is expected to increase further in many parts of the country.

The railroad industry understands that an NRC-certified cask is capable of withstanding a 30-mph impact onto an unyielding surface. What we don't understand is how the NRC standards translate to the railroad environment. What is the maximum impact speed against a bridge abutment, mountainside, or some other unyielding surface that an NSNF canister can withstand without leaking radiation? What would happen if several NSNF canisters piled up in such an accident (piling up is not unusual in railroad accidents)? How long can an NSNF canister withstand a flame impingement on its side or head? How long can an NSNF canister be submerged in water before it poses a radiological hazard? How does the scale-model testing compare to real-world situations that can occur in the railroad environment? We need a much better understanding of the whole testing process that the Navy will use.

Cask Weight

In comments submitted in response to the Department of Energy (DOE) concerning the Multipurpose Canister (MPC) EIS in December of 1994, the AAR expressed concerns about the weight of the proposed large MPC cask. AAR noted that:

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> Current DOT hazardous materials regulations limit tank car gross rail load (GRL) to 263,000 pounds for four axle cars. Six axle cars have a weight restriction of 394,000 pounds for unrestricted interchange. The gross rail load (GRL) of a loaded cask car would be about 400,000 pounds. Presently, AAR standards require that any four axle tank car weighing in excess of 263,000 pounds and six axle car in excess of 394,000 pounds must move under a special exception.

Weight is a critical factor because of track and bridge weight limits. Cars over the normal weight limits may require more than the normal number of axles in order to distribute the weight safely. Such cars must be specially designed and tested extensively.

The weight of the latest series of DODX cask cars is 513,000 pounds. The overall weight of the cask and car raises the question of whether the cask should be an integral part of the car, as is the case with the DODX cask, or a breakaway design, as proposed in DOE's preliminary engineering plans. The NSNF canister cannot be cut up to aid in wreck recovery so keeping it an integral part of the rail car has the advantage of more to hook onto should hoisting be necessary. On the other hand, a 400,000 pound MPC car would be difficult to recover in a wreck.

The weight of NSNF cars provide further support for the use of dedicated trains. Cars this heavy present special train handling problems. Mixing cars this heavy into regular freight service would compound train handling difficulties.

K Cask weight also needs to be considered from a multi-modal perspective. The proposed repository site at Yucca Mountain is not served by rail and studies indicate significant obstacles to rail line construction to the site. Motor carrier transportation of casks from a rail siding to the repository might be more economical. It is not apparent that planners have taken this into account.

Summary

In summary, the AAR believes that a new NSNF transportation system should be designed and built. Such a system should minimally disrupt the rail transportation system and employ the best available technology, to minimize the chance for an incident involving this material.

Sincerely,

Robert E. Fronczak/ret

cc. Nuclear Waste Transportation Task Force
Chuck Dettmann
Al Reinschmidt

Commenter: Robert E. Fronczak - Association of American Railroads, Washington, D.C.

Response to Comment:

A. Two environmental impact statements (EIS) have been prepared during the last two years which provide details on various analyses conducted on the storage, handling, and transportation of naval spent nuclear fuel. These documents are this EIS and the Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental restoration and Waste Management Programs Final Environmental Impact Statement of April 1995 (DOE 1995), referenced in this EIS. In both of these documents the risks related to naval spent nuclear fuel are described for routine facility and transportation operations, as well as the accident risks for reasonably foreseeable design and beyond design events. The risks are described for workers, members of the general population, and for the hypothetical individuals who are considered to be maximally exposed to releases from all potential sources.

The management of transportation risks is provided for in the various laws and regulations which apply to the design of Type B shipping containers for high-level radiological materials and their safe transportation (Appendix B, Section B.2.2 of this EIS). The Nuclear Regulatory Commission, the Department of Energy, and the Department of Transportation require certification or licensing of shipping containers. The containers must meet stringent design and testing criteria including a series of 30-foot drop tests to unyielding surfaces, puncture tests, the open-fire tests which must sustain 1475 degree Fahrenheit temperatures for 30 minutes, and the water submersion tests to assure water-tight, pressure-resistant Type B packages.

Just as it has for almost 40 years, moving naval spent fuel shipments from shipyards and land-based prototype sites to Idaho (Chapter 2, Section 2.5 of this EIS), the Naval Nuclear Propulsion Program will work with the Association of American Railroads and the individual railroads to provide for safe, efficient, cost-effective transportation of naval spent nuclear fuel from Idaho to the geologic repository or centralized interim storage site when they are available for use.

B. The use of general freight trains has been proven safe during the almost 40 years of shipping over 660 container shipments of naval spent nuclear fuel. These shipments have been made with no release of radioactivity to the environment. Dedicated trains have been used only when the need for urgent delivery or other considerations justified the increased cost.

From the mid-1970s to the early 1990s the U.S. Department of Energy and U.S. Department of Defense argued before the Interstate Commerce Commission and civil courts in multiple proceedings against the railroads imposition of special (dedicated) train service on radioactive shipments. In every case, including exhaustive reviews of safety and railroad and train operations, the Interstate Commerce Commission and courts determined and upheld that special train service for radioactive shipments, including spent nuclear fuel, was unnecessary, wasteful and unlawful. In 1993, the railroad industry refunded to the federal government $8 million it had collected, plus interest, for imposed special train service.

The Navy remains of the view that any additional safety resulting from dedicated train service is insignificant and when compared to the substantial increase in cost associated with dedicated trains simply cannot be justified. A dedicated train may be used in a particular instance if schedule or other considerations dictate that it is necessary but not as a matter of policy or routine and clearly not to increase safety.

The safety of naval spent nuclear fuel shipments rests squarely on the robust shipping containers and the rugged nature of the contents as discussed below in the response to comment I. Generally speaking, naval spent nuclear fuel shipments do not need to be treated or handled any differently than any other hazardous materials handled by the railroads in interchange service. Certainly unnecessary or lengthy delays and layovers in railyards and at interchanges should be avoided; but the normal times required for train switching and makeup, train crew reliefs, and connections between railroads are not a concern during movement of naval spent nuclear fuel just as they are not a concern during movement of any other hazardous material. Expedited movement beyond what the Code of Federal Regulations, Title 49, Section 174.14 requires for any hazardous material is not necessary for naval spent nuclear fuel shipments for safety.

The Government will own the escort and container cars to be used in the future for shipping naval spent nuclear fuel to a geologic repository or centralized interim storage site just as it has for almost 40 years of naval spent nuclear fuel movements. This equipment is unique to the purpose and cargo and must be dedicated to naval spent nuclear fuel shipments without availability for other railroad customers, therefore it is appropriate for it to be government, not railroad owned. Current practice is and future practice will be to ensure in careful fashion that the equipment meets all railroad industry standards of railcar construction and operation, including Association of American Railroads review of the railcar design prior to construction and testing of new equipment at the Transportation Test Center in Pueblo, Colorado for dynamic handling. Association of American Railroads requirements for railcars used to transport radioactive material, for example as set forth in Field Manual Of Interchange Rule 88.A.15.c.(2), will be met.

If onboard defect detection equipment is required under Department of Transportation regulations, it will be used for naval spent nuclear fuel shipments.

Naval spent nuclear fuel shipments are intended to move in regular interchange freight service. Since specially designed buffer cars are not necessary for any other hazardous material which moves in regular interchange freight service in order to achieve 49 CFR separation and segregation requirements, then they should not be necessary for naval spent nuclear fuel shipments.

The current fleet of six escort cabooses has been used successfully, without any significant operational problems, in regular and dedicated interchange freight service in conjunction with naval spent nuclear fuel and other Naval Nuclear Propulsion Program shipments for approximately 20 years. Scrapping this equipment in favor of newer equipment before the existing equipment's useful life of 40 years, as defined by railroad industry standards, is not considered warranted. Navy equipment would be replaced after the year 2010. When the time comes to replace the existing escort cabooses, the Naval Nuclear Propulsion Program will work closely with the Association of American Railroads, as it does for container cars, to ensure the new equipment meets railroad industry standards.

C. Current naval spent nuclear fuel shipments are tracked via the same satellite tracking/monitoring system managed by the Department of Energy's Albuquerque Operations Office, Transportation Safeguards Division used for nuclear weapons shipments. Naval spent nuclear fuel shipments using the new container system will be tracked and monitored in the same or an equivalent manner. The equipment and monitoring of fuel shipments is beyond the scope of this EIS. This EIS includes discussions of transportation of naval spent nuclear fuel in order to provide a general basis for the comparison of alternative container systems which will meet the requirements as they are defined at this time.

Container contents do not require additional monitoring due to the robust nature of naval reactor fuel (see Chapter 2, Section 2.3) which is manufactured to withstand severe battle conditions and reactor operation transients. Similarly, on-board technical experts are not justified because the escorts are trained and prepared to implement immediate emergency actions and have communications equipment which allows them to establish contact with the full range of technical expertise of the Naval Nuclear Propulsion Program wherever the train may be located.

D. The crash worthiness of casks used for high-level radiological materials shipments, such as naval spent nuclear fuel, is part of the design of the Type B containers which must meet technical requirements of the Code of Federal Regulations for the Departments of Energy and Transportation.

The shipping regulations require spent nuclear fuel shipping containers to be among the most robust hazardous material packaging in existence. Each container costs millions of dollars to design, test, and manufacture. Hundreds of millions of dollars are invested in the handling equipment and facilities to properly load and unload the containers. Crash tests of radioactive material packages, conducted by Sandia National Laboratories and in the United Kingdom, have already demonstrated that the regulatory design requirements, state-of-the-art engineering technologies, vigorous quality assurance, and detailed manufacturing applicable to spent nuclear fuel containers ensure that the containers would perform as advertised even in the most severe accidents. The result is that when naval spent nuclear fuel is offered to the railroads for transport it can be moved and handled in the same manner as any other freight, and certainly in the same manner as any other hazardous material.

The Naval Nuclear Propulsion Program's 35 mile per hour speed limitation is not a requirement for safety purposes or railcar stability; nor is it imposed because of a concern over the ability of the container to maintain its integrity in an accident. There is utmost confidence in the containers. The railcars have been tested and have demonstrated satisfactory performance. The speed restriction is imposed to minimize the financial and schedule risk of exterior damage requiring refurbishment to a scarce, multi-million dollar asset. The ability to get a container back in service quickly at minimal refurbishment cost is the overriding concern. The Navy does note that based on our extensive public interface, we have also found the fact that the speed of these shipments is restricted has been reassuring to many members of the general public.

E. The results of the analysis of the three possible routing scenarios presented in the EIS in Appendix B indicate the most direct route has the lowest risks. The Navy agrees that routing of spent nuclear fuel rail shipments to avoid population centers is unwarranted. The three routes selected for this EIS were evaluated in order to portray a range of routes so the alternative container systems could be compared and these routes do not include any attempt to avoid populations centers. They represent the normal routing for the localities involved.

The requirements for railroad track inspections and the standards for track condition and safety are established by the Federal Railroad Administration, a part of the Department of Transportation, and are set forth in federal regulations (49 CFR 213). In advance of each shipment of naval spent nuclear fuel, the Navy provides railroad companies who will move the naval spent nuclear fuel with the number of railcars and the weight of each railcar. The railroad companies ensure that locomotives, tracks, and bridges are capable of accommodating the shipment and completing it safely.

F.&G. The minimization of derailments is a subject which is not within the scope of this EIS. The accident analyses assume derailments and other accidents occur at the typical rate found historically. Thus, while the Navy agrees with minimizing the likelihood of such an event, this does not result in higher risks to the public or the environment. Discussion is provided above in response D which describes the use of Type B shipping containers and transportation systems which meet the applicable railroad industry safety standards that exist at this time. The Navy has proved its commitment to safe shipping practices and will continue to do so in the future in accordance with changing safety regulations. The Navy also supports all reasonable steps to prevent accidents and ensure safety, as applied to all hazardous material shipments and commensurate with the small risks involved.

All Type B shipping containers regardless of the amount of high-level radiological materials contained within must meet the maximum external exposure rate of 10 millirem per hour at 2 meters from the container. In reality the shipping containers, such as the M-140 used by the Navy, have actual external exposure rates of about 1 millirem per hour at 2 meters or less. In this EIS (Appendix B) evaluations of the exposure risks to workers and members of the general population have been provided in Table B.10.

H. Naval spent nuclear fuel itself is rugged and stable, the containers are robust (see Chapter 2, Section 2.3), and the railcars are and will continue to be well maintained. As a result, the probability of an accident resulting in release of radioactive contents or significant radiological exposure, or requiring unique response capability on the part of the first responder emergency services personnel is extremely remote. The risks associated with the complete range of accidents which might occur during these shipments are analyzed in detail and discussed in the DOE 1995 reference in Attachment A of Appendix D to Volume 1 and were shown to be very small. Accordingly, special precautions or preparations by state or local agencies are not warranted.

Emergency response roles have been defined by regulation and Federal Emergency Management Administration procedures, and the organizations already exist to cope with emergencies involving radioactive materials. The responsible agencies of the federal and state governments and local jurisdictions have received funding, conducted training, and where appropriate have tested the response. The Navy acknowledges the need to work more closely with railroad emergency response/accident recovery personnel to ensure that plans and current thinking about accident recovery and response are accurate. The Navy has and will continue to work with the railroad industry along these lines.

Naval spent nuclear fuel shipments are and will be shipped under Government Bills of Lading in accordance with prevailing or negotiated discount rates establishing the railroads as common carriers of the shipment. Price Anderson Nuclear Hazards Indemnity provides relief to the railroads for accident response and recovery costs related to highly unlikely nuclear consequences resulting from an accident. Non-nuclear consequences such as railroad property damage and lost revenue from line shutdown would be born by the railroad just as it is now for any type of accident/derailment. Accident consequences related to the hazardous nature of the cargo will be far less for a naval spent nuclear fuel shipment than for many other hazardous materials handled by railroads.

The Navy will meet all applicable Nuclear Regulatory Commission and Department of Transportation regulations governing shipment of spent nuclear fuel to a repository under the Nuclear Waste Policy Act and may impose on itself additional requirements as well, but the analysis in the EIS is correct and accurate assuming compliance with Nuclear Regulatory Commission and DOT requirements.

I. The management of transportation risks is provided for in the various laws and regulations which apply to the design of Type B shipping containers for high-level radiological materials and their safe transportation (Appendix B, Section B.2.2 of the Draft EIS) and reflect the assessment of risks presented by current conditions for shipping. The Nuclear Regulatory

Commission, the Department of Energy and the Department of Transportation require certification or licensing of shipping containers. The containers must meet stringent design and testing criteria including the series of 30-foot drop tests to unyielding surfaces, puncture tests, the open-fire tests which must sustain 1475 degree Fahrenheit temperatures for 30 minutes, and the water submersion tests to assure water-tight, pressure-resistant Type B packages. Additional crash testing of casks has been conducted at the Sandia National Laboratory where simulations using trains and trucks carrying Type B containers traveling at speeds of approximately 60-80 miles per hour have been crashed into concrete barriers and at railroad crossings. The results of such crash tests have shown that the casks would not release their radiological contents.

J.&K. As was done for the latest series of DODX spent nuclear fuel cask cars, the Navy would review the proposed design, including size and weight, of the container system containers and associated railcars with the railroads that will handle the containers. Any necessary clearances, both from a size and weight perspective, will be obtained. Any special handling requirements owing to the size and weight will be discussed. It is important to recognize though that the larger and heavier containers require a smaller number of shipments to be made. Since containers of all sizes and weights are designed to produce similar maximum radiation exposure levels, fewer shipments can be expected to produce a lower total radiation exposure to the public and workers associated with the transport of the shipments. Accordingly, a design goal will be to make the containers as large as practical and still be able to move them in regular interchange freight service.

The requirements for railroad track inspections and the standards for track condition and safety are established by the Federal Railroad Administration, a part of the Department of Transportation, and are set forth in federal regulations (49 CFR 213). In advance of each shipment of naval spent nuclear fuel, the Navy provides railroad companies who will move the naval spent nuclear fuel with the number of railcars and the weight of each railcar. The railroad companies ensure that locomotives, tracks, and bridges are capable of accommodating the shipment and completing it safely.

Naval spent nuclear fuel has been shipped from the various Navy sites by rail using such heavy containers for almost 40 years without any release of radioactive material. Nevertheless, as described in Section A.4.1.4 of Appendix D to Volume 1 of the DOE 1995 EIS and in this EIS Chapter 2, Section 2.5, each shipment of naval spent nuclear fuel is accompanied by escorts who remain in contact with the communications or monitoring center. In the event of an emergency, state and federal resources would be quickly summoned to stabilize the situation. Moreover, naval spent nuclear fuel is shipped in large, rugged, certified shipping containers which are designed to withstand accidents which might occur during shipment. DOE 1995 Section A.4.1 of Appendix D and Appendix B, Section B.2 of this EIS provide descriptions and photographs of the shipping containers used for naval spent nuclear fuel.

All Type B shipping containers regardless of the amount of high-level radiological materials contained within must meet the maximum external exposure rate of 10 millirem per hour at 2 meters from the container. In reality the shipping containers, such as the M-140 used by the Navy, have actual external exposure rates of about 1 millirem per hour at 2 meters or less. In the EIS (Appendix B) evaluations of the exposure risks to workers and members of the general population have been provided in Table B.10.

Commenter: Robert E. Fronczak - Association of American Railroads, Washington, D.C.

The Navy has successfully completed many shipments using the M-140 shipping container in general interchange. This container and its car weigh approximately 390,000 pounds and are representative of the weights for all of the alternatives considered. These shipments have not resulted in safety or train handling difficulties.

As discussed in Section B.4 of the EIS, all of the container systems considered will be compatible with heavy-haul truck transport. If a rail connection to a centralized interim storage site or geologic repository were not available, this mode of transportation would be utilized. The impacts associated with transportation of shipments by this mode have been considered in this EIS.