



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

January 29, 1992

CHAIRMAN

The Honorable Philip R. Sharp, Chairman  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
United States House of Representatives  
Washington, D.C. 20515

Dear Chairman Sharp:

I am responding to your letter dated December 19, 1991, in which you raised several questions about the recent transportation accident in Springfield, Massachusetts. Our answers are provided in the enclosure.

The truck was carrying unirradiated nuclear fuel assemblies from Wilmington, North Carolina, to the Vermont Yankee Nuclear Power Station in Vernon, Vermont. The nuclear fuel assemblies consist of sealed Zircaloy tubes containing low enriched uranium dioxide pellets. This material can be handled without shielding and does not pose a significant health or safety hazard.

As discussed in the answer to Question 4 in the enclosure, the Nuclear Regulatory Commission is studying the circumstances of the accident, the damage that the shipping containers and their contents sustained, and the emergency response actions taken by local authorities. We will provide you the results of this study as soon as they become available.

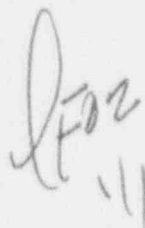
Sincerely,

  
Ivan Selin

Enclosure:  
Answers to Questions

cc: The Honorable Carlos J. Moorhead

9202130111 920129  
PDR COMMS NRCC  
CORRESPONDENCE PDR





CHAIRMAN

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

January 29, 1992

The Honorable Al Swift, Chairman  
Subcommittee on Transportation  
and Hazardous Materials  
Committee on Energy and Commerce  
United States House of Representatives  
Washington, D.C. 20515

Dear Chairman Swift:

I am responding to your letter dated December 19, 1991, in which you raised several questions about the recent transportation accident in Springfield, Massachusetts. Our answers are provided in the enclosure.

The truck was carrying unirradiated nuclear fuel assemblies from Wilmington, North Carolina, to the Vermont Yankee Nuclear Power Station in Vernon, Vermont. The nuclear fuel assemblies consist of sealed Zircaloy tubes containing low enriched uranium dioxide pellets. This material can be handled without shielding and does not pose a significant health or safety hazard.

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Sincerely,

Ivan Selin

Enclosure:  
Answers to Questions

cc: The Honorable Don Ritter



CHAIRMAN

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

January 29, 1992

The Honorable Peter H. Kostmayer, Chairman  
Subcommittee on Energy and the Environment  
Committee on Interior and Insular Affairs  
United States House of Representatives  
Washington, D.C. 20515

Dear Chairman Kostmayer:

I am responding to your letter dated December 19, 1991, in which you raised several questions about the recent transportation accident in Springfield, Massachusetts. Our answers are provided in the enclosure.

The truck was carrying unirradiated nuclear fuel assemblies from Wilmington, North Carolina, to the Vermont Yankee Nuclear Power Station in Vernon, Vermont. The nuclear fuel assemblies consist of sealed Zircaloy tubes containing low enriched uranium dioxide pellets. This material can be handled without shielding and does not pose a significant health or safety hazard.

As discussed in the answer to Question 4 in the enclosure, the Nuclear Regulatory Commission is studying the circumstances of the accident, the damage that the shipping containers and their contents sustained, and the emergency response actions taken by local authorities. We will provide you the results of this study as soon as they become available.

Sincerely,

A handwritten signature in cursive script, appearing to read "Ivan Selin".

Ivan Selin

Enclosure:  
Answers to Questions

cc: The Honorable John J. Rhodes



CHAIRMAN

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

January 29, 1992

The Honorable Gerry E. Studds  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
United States House of Representatives  
Washington, D.C. 20515

Dear Congressman Studds:

I am responding to your letter dated December 19, 1991, in which you raised several questions about the recent transportation accident in Springfield, Massachusetts. Our answers are provided in the enclosure.

The truck was carrying unirradiated nuclear fuel assemblies from Wilmington, North Carolina, to the Vermont Yankee Nuclear Power Station in Vernon, Vermont. The nuclear fuel assemblies consist of sealed Zircaloy tubes containing low enriched uranium dioxide pellets. This material can be handled without shielding and does not pose a significant health or safety hazard.

As discussed in the answer to Question 4 in the enclosure, the Nuclear Regulatory Commission is studying the circumstances of the accident, the damage that the shipping containers and their contents sustained, and the emergency response actions taken by local authorities. We will provide you the results of this study as soon as they become available.

Sincerely,

Ivan Selin

Enclosure:  
Answers to Questions



CHAIRMAN

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

January 29, 1992

The Honorable Edward J. Markey  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
United States House of Representatives  
Washington, D.C. 20515

Dear Congressman Markey:

I am responding to your letter dated December 19, 1991, in which you raised several questions about the recent transportation accident in Springfield, Massachusetts. Our answers are provided in the enclosure.

The truck was carrying unirradiated nuclear fuel assemblies from Wilmington, North Carolina, to the Vermont Yankee Nuclear Power Station in Vernon, Vermont. The nuclear fuel assemblies consist of sealed Zircaloy tubes containing low enriched uranium dioxide pellets. This material can be handled without shielding and does not pose a significant health or safety hazard.

As discussed in the answer to Question 4 in the enclosure, the Nuclear Regulatory Commission is studying the circumstances of the accident, the damage that the shipping containers and their contents sustained, and the emergency response actions taken by local authorities. We will provide you the results of this study as soon as they become available.

Sincerely,

Ivan Selin

Enclosure:  
Answers to Questions



ENCLOSURE

ANSWERS TO QUESTIONS

QUESTION 1.

Review the role of the Nuclear Regulatory Commission (NRC) in ensuring the safe transport of nuclear materials, including nuclear fuel, radioactive wastes, and strategic special nuclear materials (SSNM). Please summarize the relationship of the NRC to other federal, state, and local agencies, especially the Department of Transportation under the current Memorandum of Understanding.

ANSWER.

Nuclear Regulatory Commission (NRC) activities to ensure that radioactive materials are transported safely are divided into four broad areas. First, we review transport package designs for fissile material (e.g., unirradiated nuclear fuel) and larger quantities of radioactive material to ensure that the material will be transported in a safe container. Second, fabricators of packages are inspected to provide additional assurance that packages conform to NRC-approved designs and have been fabricated in accordance with licensee Quality Assurance Programs accepted by the NRC. Third, we have an active shipment inspection program in which NRC inspects 100 percent of the initial spent fuel assembly shipments from a nuclear reactor's spent fuel pool to another storage location. Once it has been established that the shipments are conducted in accordance with our requirements, the inspection frequency is lowered. Finally, NRC has developed safeguards requirements for spent fuel shipments, including immobilization devices on cargo vehicles, communications, NRC pre-approval of routes, driver and escort training, arrangements with law enforcement officials along the route, notification of governors, and armed

escorts through high density population areas, all of which combine to enhance protection of the public health and safety. Safeguards requirements have also been established for strategic special nuclear materials (SSNM) to ensure adequate control and accountability of SSNM in transport.

With respect to the regulation of the transportation of licensed radioactive material, the statutory jurisdiction of NRC and the Department of Transportation (DOT) overlap. The respective regulatory roles of DOT and NRC are set forth in a Memorandum of Understanding (MOU) agreed to on June 8, 1979 (44 Fed. Reg. 38690 - July 2, 1979, see Attachment 1). Under the MOU, DOT is responsible for regulating safety during the transportation of all radioactive materials. DOT also regulates packagings for smaller quantities of radioactive materials, including those used in nuclear medicine and low-level waste shipments. NRC is responsible for regulating the design, manufacture, and use of packages containing fissile material and larger quantities of radioactive material that include high-level waste packages. NRC is also normally the lead agency for investigating all incidents involving actual or suspected leakage from packages of radioactive material regulated by NRC.

NRC has defined, in a General Statement of Policy (49 Fed. Reg. 12335 - March 19, 1984, see Attachment 2) its role in responding to transportation incidents. The statement recognizes the State's primary responsibility for protecting the health and safety of its citizens from public hazards such as transportation incidents. Basically, NRC actions include ensuring that affected parties are aware of the incident, and offering, as well as responding



to requests for, technical assistance by providing information, advice, and evaluations. According to NRC's "Survey of State and Tribal Response Capabilities for Radiological Transportation Incidents" (NUREG/CR-5399, published May 1990, see Attachment 3), the Commonwealth of Massachusetts, in its "Nuclear Incident Advisory Team Handbook," identified the Department of Public Health, Radiation Control Program, as the State agency with the lead for responding with personnel and equipment to assess the radiological impact of transportation incidents involving radioactive materials.

QUESTION 2.

What is the present status of NRC's approval of transportation routes and field surveys of proposed routes for the shipment of nuclear materials? What are the number and proportions of shipments of nuclear materials on NRC approved routes? Was the shipment of fuel through Springfield on an NRC approved route?

ANSWER.

The Department of Transportation (DOT) regulates routing for the transport of all hazardous materials, including radioactive material. In general, DOT regulations require that a carrier, or any other person operating a motor vehicle that contains radioactive material which requires placarding, to operate on routes that minimize radiological risk (49 CFR 177.825(a)). Placarded vehicles which contain a highway route controlled quantity of radioactive material (as defined in 49 CFR 173.403(1)) must operate over preferred routes consisting of interstate highways or state-designated routes (49 CFR 177.825(b) and (c)).

NRC route approval requirements (10 CFR 73.37) apply only to shipments of irradiated fuel to ensure that such shipments are adequately safeguarded from radiological sabotage during transit. The latest summary of routes approved by the NRC and used for NRC-licensee irradiated fuel is published in NUREG-0725, Rev. 7 (see Attachment 4). Table 3.2 on page 7 of this NUREG provides shipment summary data, by year, for 1979 to 1989. During the 1979 to 1989 period, between 20 and 250 irradiated fuel shipments per year were made on routes approved by the NRC.

The number of irradiated fuel shipments which require an NRC-approved route represents a small fraction of the approximately 3 million radioactive material packages that are shipped each year. The NRC does not have information on the proportion of the 3 million nuclear material packages shipped on NRC-approved routes since NRC route approval is not required for a majority of these packages.

The shipment of unirradiated fuel through Springfield did not require and was not on an NRC-approved route.

QUESTION 3.

What is the present status of NRC's inspection programs for safeguarding selected shipments of spent fuel, transportation-related safety, and transportation containers. What has been done to correct the nonconformance with regulatory requirements identified in fiscal year 1989 by the pilot inspections under the transportation containers program?

Answer.

In FY 1990, the Nuclear Regulatory Commission (NRC) conducted six safeguards inspections of spent fuel shipments. No significant problems were identified from the inspections. More than 1,400 transportation-related safety inspections were conducted during this period. This included reactor, fuel cycle, industrial, academic, and medical licensee shipment activities. These inspections include ensuring that shipping activities by NRC licensees comply with Department of Transportation regulations (e.g., labeling and marking of packages, and placarding of vehicles). Transportation violations (mostly minor) were identified in about six percent of these inspections.

In 1989, NRC initiated a program for inspection of transportation-package suppliers. This program has been expanded from six inspections conducted in Fiscal Year 1989, the pilot inspections, to nine inspections conducted in Fiscal Year 1991. The inspections focused on implementation and procedures of NRC-accepted Quality Assurance (QA) Programs in the fabrication and maintenance of shipping containers.

The package suppliers' implementation of QA Programs was found to meet, in varying degrees, their commitments to NRC in the QA Program approval process. Most nonconformances were found in the areas of records control, definition of management duties and responsibilities, materials control, design changes, and staff training. In one of the inspections a series of welding defects was identified through radiography examinations.

Package suppliers are required to propose measures to preclude recurrences of nonconformances and to take corrective actions on identified nonconformances. Follow-up inspections have also been conducted to ensure that corrective measures and actions are satisfactorily completed. All nonconformances identified in the pilot inspection program have been resolved. Since the inspection program for transportation package suppliers was initiated, a decrease in the number of nonconformances has been observed.

As an NRC-certified fissile Type A package, the Model RA-2/RA-3 container (the type of container involved in the Springfield accident) is subject to NRC's transportation package supplier and transportation-related safety inspection programs. The NRC has inspected the implementation of General Electric Company's QA Program used for fabrication and maintenance of the Model RA-2/RA-3 container under its package suppliers inspection program. The inspection, which was conducted in November 1990, identified three maintenance-related nonconformances. These nonconformances were subsequently corrected by GE. The NRC has also conducted transportation-related safety inspection of GE's shipping activities. There were no violations identified during the last two inspections, which were conducted in 1990.



QUESTION 4.

What is the present status of the NRC's approval of transportation containers for nuclear materials? Please evaluate the safety performance of the containers used for the fuel bundles involved in the Springfield accident, including a comparison to the expected performance of such containers. This evaluation should include an analysis of any lessons learned from this accident that would have implications for the use of any other NRC approved containers such as the TRUPACT-II design.

ANSWER.

Nuclear Regulatory Commission (NRC) reviews and certifies package designs for fissile material and larger quantities of radioactive materials where the package must provide adequate shielding, containment, or subcriticality control under accident conditions. Package designs are independently reviewed to verify that they meet NRC requirements in 10 CFR Part 71. An NRC certification must be issued before the use of these package designs.

The General Electric Company (GE) designed and tested the package involved in the Springfield accident. As part of the request for NRC approval, GE subjected a representative package to impact and fire testing. The fire test was carried out with only the inner container exposed to a hydrocarbon pool fire. Photographs show that the inner container, after the fire test, was similar in appearance to the packages observed during the Springfield accident. The packages in each case continued to provide the spacing required for subcriticality control.

NRC initiated a study of the circumstances of the accident in Springfield. The study will address the circumstances of the accident, the damage sustained by the package and its contents, and the emergency response actions taken by local, State, and Federal authorities. We will provide you the results of this study as soon as they become available. Should the study indicate that changes are needed to maintain public health and safety for NRC-approved packages, they will be made.

Attachments:

1. Nuclear Regulatory Commission/Department of Transportation Memorandum of Understanding
2. Nuclear Regulatory Commission Policy Statement on Emergency Response
3. NUREG/CR-5399, "Survey of State and Tribal Response Capabilities for Radiological Transportation Incidents"
4. NUREG-0725, "Public Information Circular for Shipments of Irradiated Reactor Fuel"